Simple Poverty Scorecard® Poverty-Assessment Tool Ethiopia

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This document is in English at SimplePovertyScorecard.com.

Abstract

The Simple Poverty Scorecard-brand poverty-assessment tool uses eight low-cost indicators from Ethiopia's 2011 Welfare Monitoring Survey to estimate the likelihood that a household has consumption (from Ethiopia's 2010/11 Household Consumption and Expenditure Survey) below a given poverty line. Field workers can collect responses in about ten minutes. The scorecard's accuracy is reported for a range of poverty lines. The scorecard is a practical way for pro-poor programs in Ethiopia to measure poverty rates, to track changes in poverty rates over time, and to segment clients for differentiated treatment.

Version note

This paper uses 2010/11 data, replacing Schreiner and Chen (2009), which uses 2004/5 data. The new 2010/11 scorecard here should be used from now on. The poverty lines supported for the old 2004/5 scorecard are also supported for the new 2010/11 scorecard, so existing users can measure change over time for those lines with a baseline from the old 2004/5 scorecard and a follow-up from the new 2010/11 scorecard, subject to the caveats in the text.

Acknowledgements

Simple Poverty Scorecard® Poverty-Assessment Tool

					Name	Identifier
Interview ID:						
Interview date:			Participant:			
Country:	ETH		Field agent:			
Scorecard:	002		Service point:			
Sampling wgt.:			Number of household members:			

Indicator	Response	Points	Score
1. How many members does the household have?	A. Seven or more	0	
	B. Six	7	
	C. Five	11	
	D. Four	18	
	E. Three	25	
	F. Two	38	
	G. One	47	
2. Can the male head/spouse read and write?	A. No male head/spouse	0	
	B. No	2	
	C. Yes	6	
3. Can the (oldest) female head/spouse read and write?	A. No female head/spouse	0	
	B. No	5	
	C. Yes	12	
4. What is the main source of energy for cooking?	A. Firewood, charcoal, or crop residue/leaves	0	
	B. Dung/manure	4	
	C. Saw dust, kerosene, butane gas, electricity, solar energy, biogas, none, or other	9	
5. Does the household currently own any mattresses or beds?	A. No	0	
	B. Yes	5	
6. Does the household currently own any radios/radio-and-tape players/tape players?	A. No	0	
	B. Yes	7	
7. How many *gabi* does the household currently own?	A. None	0	
	B. One	3	
	C. Two or more	6	
8. If the household farms, then does it currently own any plows?	A. Does not farm	0	
	B. Farms, but does not have plows	6	
	C. Farms, and has plows	8	

Score:

Back-page Worksheet: Household Membership

In the scorecard header, write the interview's unique identifier (if known), the interview date, and the sampling weight of the participant (if known). Then record the names and the unique identification numbers of the participant (who may differ from the respondent), of yourself as the field agent, and of the service point that the participant uses.

Read to the respondent: *What are the first names or nicknames of the members of your household? A* household *is a social unit made up of people—regardless of blood or marital relationship—who live in the same residence and who cook and eat together.*

Count as *household members* those people who are currently absent if the expected total duration of their absence is less than six months. People currently staying with the household for whom the expected total duration of their stay is six months or more also count as *household members* as long as they do not have another usual residence.

For your own future use, make a note of who is the male head/spouse (if he exists) and who is the (oldest) female head/spouse (if she exists).

Count the number of household members, and write it in the scorecard header by "Number of household members:". Then mark the response to the first scorecard indicator.

Always keep in mind the full definitions in the "Guidelines for the Interpretation of Scorecard Indicators" for *household* and *household member.*

First name or nickname
1.
2.
3.
4.
5.
6.
7.
8.
9.
10.
12.
13.
14.
15.
HH members:

Look-up table to convert scores to poverty likelihoods: National lines

Score	Poverty likelihood (%)			
	National poverty lines			
Score	**Food**	**100%**	**150%**	**200%**
0–4	15.1	74.8	98.0	100.0
5–9	15.1	74.8	98.0	99.0
10–14	14.7	57.4	88.0	95.4
15–19	10.6	52.2	83.1	93.9
20–24	6.6	47.0	77.7	92.2
25–29	4.1	36.5	74.4	89.8
30–34	3.3	31.8	68.4	87.3
35–39	1.6	25.8	63.5	83.4
40–44	1.0	16.1	50.4	78.2
45–49	0.6	12.3	45.2	69.4
50–54	0.6	11.9	39.0	64.1
55–59	0.3	8.4	31.7	59.8
60–64	0.1	4.5	23.0	45.1
65–69	0.1	3.1	15.0	31.3
70–74	0.0	2.7	11.7	25.0
75–79	0.0	1.4	4.1	15.7
80–84	0.0	0.9	2.8	11.2
85–89	0.0	0.9	2.0	6.5
90–94	0.0	0.0	0.0	0.0
95–100	0.0	0.0	0.0	0.0

Look-up table to convert scores to poverty likelihoods: International 2005 and 2011 PPP lines

	Poverty likelihood (%)									
	2005 PPP poverty lines						2011 PPP poverty lines			
Score	$1.00	$1.25	$1.75	$2.00	$2.50	$5.00	$1.90	$3.10	$3.80	$4.00
0–4	53.4	81.5	98.0	98.0	100.0	100.0	81.5	100.0	100.0	100.0
5–9	53.4	81.5	98.0	98.0	99.0	100.0	81.5	98.8	99.0	99.0
10–14	42.5	65.8	86.5	94.0	97.3	100.0	65.9	94.3	97.4	97.5
15–19	35.4	56.6	81.1	87.1	94.9	99.9	58.6	89.0	95.5	96.1
20–24	31.8	50.9	76.4	85.6	93.4	99.7	53.6	88.1	93.8	94.8
25–29	23.9	39.3	73.1	82.3	91.4	99.5	41.0	85.2	91.9	93.8
30–34	19.0	35.7	65.9	77.1	88.9	99.3	37.4	79.7	90.1	91.9
35–39	14.3	30.3	61.7	73.4	84.8	99.3	31.6	76.4	85.8	88.1
40–44	7.3	19.2	47.9	59.7	79.2	98.1	20.6	64.0	81.6	85.5
45–49	5.0	14.3	41.1	51.5	70.2	96.3	15.7	56.4	72.3	76.2
50–54	4.4	12.5	34.8	46.4	65.9	95.6	13.8	50.8	68.3	70.7
55–59	3.6	8.6	27.7	38.8	61.1	94.4	8.9	43.2	63.5	66.4
60–64	2.0	4.5	18.5	28.2	45.1	88.0	5.5	31.7	46.1	51.0
65–69	1.5	3.2	11.0	17.0	31.7	75.5	3.9	18.4	32.2	36.2
70–74	1.4	2.8	7.6	12.5	24.6	61.8	3.2	14.1	25.3	27.1
75–79	0.8	1.6	2.5	4.8	14.5	47.1	1.6	5.1	15.8	17.3
80–84	0.5	0.7	1.8	2.0	9.2	44.4	0.7	2.0	13.3	14.9
85–89	0.0	0.7	1.7	1.9	2.0	23.6	0.7	1.9	2.0	6.7
90–94	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
95–100	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Look-up table to convert scores to poverty likelihoods: Relative and percentile-based lines

Score	Poorest half <100% Natl.	Percentile-based lines				
		20th	40th	50th	60th	80th
0–4	43.9	58.6	96.4	98.0	98.0	100.0
5–9	43.9	58.6	96.4	98.0	98.0	98.8
10–14	38.1	43.7	72.8	79.0	86.5	95.0
15–19	30.3	38.4	64.0	72.6	81.1	93.1
20–24	26.7	35.4	59.6	68.1	76.4	91.5
25–29	20.1	25.3	48.9	62.9	73.0	88.9
30–34	14.8	21.0	44.6	54.2	65.7	86.5
35–39	10.6	16.5	37.2	49.1	61.4	81.9
40–44	5.8	8.3	26.0	34.6	47.6	73.6
45–49	3.9	6.1	20.5	29.0	40.6	65.5
50–54	3.6	5.9	17.6	25.4	34.7	60.8
55–59	2.5	4.1	12.4	19.1	27.7	55.6
60–64	1.4	2.2	6.9	12.6	18.5	41.0
65–69	0.6	1.6	4.6	6.7	11.0	27.2
70–74	0.6	1.5	3.6	5.2	7.6	20.3
75–79	0.6	1.2	1.7	2.1	2.5	13.3
80–84	0.5	0.5	0.7	1.3	1.8	8.1
85–89	0.0	0.0	0.7	1.2	1.7	2.0
90–94	0.0	0.0	0.0	0.0	0.0	0.0
95–100	0.0	0.0	0.0	0.0	0.0	0.0

Simple Poverty Scorecard® Poverty-Assessment Tool Ethiopia

1. Introduction

Pro-poor programs in Ethiopia can use the Simple Poverty Scorecard poverty-assessment tool to estimate the likelihood that a household has consumption below a given poverty line, to estimate a population's poverty rate at a point in time, to track changes in a population's poverty rate over time, and to segment participants for differentiated treatment.

The direct approach to poverty measurement via consumption surveys is difficult and costly. Ethiopia's 2010/11 Household Consumption and Expenditure Survey (HCES) together with its 2011 Welfare Monitoring Survey (WMS) are a case in point.[1] They have a total of 62 pages and include about 400 questions, many of which have many sub-questions or which may be asked multiple times (for example, for each household member, each crop, or each consumption item). Enumerators visited each interviewed household twice a week for two weeks to record consumption items.[2]

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[1] "The HCES focuses on the income dimension of poverty through measurement of consumption, expenditure, and income, while the WMS specializes in the non-income aspects of poverty such as health, education, and access to services" (Central Statistical Agency, 2012, p. 8). The HCES covers a representative sample of the nationally representative sample of households covered in the WMS (Stifel and Woldehanna, 2013). This paper uses data on the 24,261 households interviewed in both surveys and analyzed in Ministry of Finance and Economic Development (2012).

[2] Central Statistical Agency (2012, p. 18).

In comparison, the indirect approach of the scorecard is quick and low-cost. It uses 8 verifiable indicators drawn from the WMS (such as "What is the main source of energy for cooking?" and "How many *gabi* does the household currently own?") to get a score that is correlated with poverty status as measured by the exhaustive HCES survey.

The scorecard differs from "proxy-means tests" (Coady, Grosh, and Hoddinott, 2004) in that it is transparent, it is freely available,[3] and it is tailored to the capabilities and purposes not of national governments but rather of local, pro-poor organizations. The feasible poverty-measurement options for local organizations are typically blunt (such as rules based on land ownership or housing quality) or subjective and relative (such as participatory wealth ranking facilitated by skilled field workers). Poverty measures from these approaches may be costly, their accuracy is unknown, and they are not comparable across places, organizations, nor time.

The scorecard can be used to measure the share of a program's participants who are below a given poverty line (for example, Ethiopia's national line). USAID microenterprise partners in Ethiopia can use scoring with the $1.25/day 2005 PPP poverty line to report how many of their participants are "very poor".[4] Scoring can also

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[3] The Simple Poverty Scorecard tool for Ethiopia is not, however, in the public domain. Copyright is held by Microfinance Risk Management, L.L.C.

[4] USAID defines a household as *very poor* if its daily per-capita consumption is less than the highest of the $1.25/day 2005 PPP line (ETB8.33, Table 1) or the line (ETB6.68) that marks the poorest half of people below 100% of the national line.

be used to measure net movement across a poverty line over time. In all these applications, the scorecard provides a consumption-based, objective tool with known accuracy. While consumption surveys are costly even for governments, some local pro-poor organizations may be able to implement a low-cost scorecard to help with monitoring poverty and (if desired) segmenting clients for differentiated treatment.

The statistical approach here aims to be understood by non-specialists. After all, if managers are to adopt the scorecard on their own and apply it to inform their decisions, then they must first trust that it works. Transparency and simplicity build trust. Getting "buy-in" matters; proxy-means tests and regressions on the "determinants of poverty" have been around for decades, but they are rarely used to inform decisions by local, pro-poor organizations. This is not because they do not work, but because they are often presented (when they are presented at all) as tables of regression coefficients incomprehensible to non-specialists (with cryptic indicator names such as "`LGHHSZ_2`" and with points with negative values and many decimal places). Thanks to the predictive-modeling phenomenon known as the "flat maximum", simple, transparent approaches are usually about as accurate as complex, opaque ones (Schreiner, 2012a; Caire and Schreiner, 2012).

USAID (2014, p. 8) has approved scorecards that are re-branded as a Progress Out of Poverty Index® for use by its microenterprise partners.

Beyond its low cost and transparency, the technical approach of the scorecard is innovative in how it associates scores with poverty likelihoods, in the extent of its accuracy tests, and in how it derives formulas for standard errors. Although the accuracy tests are simple and commonplace in statistical practice and in the for-profit field of credit-risk scoring, they have rarely been applied to poverty-assessment tools.

The scorecard is based on data from the 2010/11 HCES and from the 2011 WMS, both by Ethiopia's Central Statistical Agency (CSA). Indicators are selected to be:

- Inexpensive to collect, easy to answer quickly, and simple to verify
- Strongly correlated with poverty
- Liable to change over time as poverty status changes
- Applicable in all regions in Ethiopia

All points in the scorecard are non-negative integers, and total scores range from 0 (most likely below a poverty line) to 100 (least likely below a poverty line). Non-specialists can collect data and tally scores on paper in the field in about ten minutes.

The scorecard can be used to estimate three basic quantities. First, it can estimate a particular household's *poverty likelihood*, that is, the probability that the household has per-adult-equivalent or per-capita consumption below a given poverty line.

Second, the scorecard can estimate the poverty rate of a population of households at a point in time. This estimate is the average of poverty likelihoods among a representative sample of households from the population.

Third, the scorecard can estimate the annual rate of change in the poverty rate. With two independent samples from the same population, this is the difference in the average poverty likelihood in the baseline sample versus the average likelihood in the follow-up sample, divided by the difference (in years) between the average interview date in the baseline sample and the average interview date in the follow-up sample. With one sample in which each household is scored twice, the estimate is the sum of the change in each household's poverty likelihood from baseline to follow-up, divided by the sum of the years that passed between each household's two interviews (Schreiner, 2014a).

The scorecard can also be used to segment participants for differentiated treatment. To help managers choose appropriate targeting cut-offs for their purposes, several measures of targeting accuracy are reported for a range of possible cut-offs.

This paper presents a single scorecard whose indicators and points are derived with Ethiopia's national poverty line applied to data from the 2010/11 HCES and from the 2011 WMS. Scores from this one scorecard are calibrated with this same data to poverty likelihoods for 20 poverty lines.

The scorecard is constructed using data from half of the households in the 2010/11 HCES and the 2011 WMS. Data from that same half of households is also used to calibrate scores to poverty likelihoods for 20 poverty lines. Data from the other half of households is used to validate the scorecard's accuracy for estimating households'

poverty likelihoods, for estimating populations' poverty rates at a point in time, and for segmenting participants.

All three scoring-based estimators (the poverty likelihood of a household, the poverty rate of a population at a point in time, and the annual rate of change in a population's poverty rate) are *unbiased*. That is, they match the true value on average in repeated samples when constructed from (and applied to) a single, unchanging population in which the relationship between scorecard indicators and poverty is unchanging. Like all predictive models, the scorecard is constructed from a single sample and so misses the mark to some unknown extent when applied (as in this paper) to a validation sample. Furthermore, it makes errors when applied (in practice) to a different population or when applied before or after 2010/11 (because the relationships between indicators and poverty change over time).[5]

Thus, while the indirect scoring approach is less costly than the direct survey approach, it makes errors when applied in practice. (Estimates from the direct survey approach are correct by definition.) There are errors because scoring necessarily assumes that future relationships between indicators and poverty in all populations will be the same as in the construction data. Of course, this assumption—inevitable in predictive modeling—holds only partly.

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[5] Important cases include nationally representative samples at a later point in time or sub-national populations that are not nationally representative (Diamond *et al.*, 2016; Tarozzi and Deaton, 2007).

On average across 1,000 bootstraps of $n = 16{,}384$ from the validation sample, the average error (difference between the scorecard's estimate of a poverty rate versus the true rate) at a point in time for 100% of the national poverty line is $+0.8$ percentage points. Across all 20 poverty lines, the average absolute error is about 0.6 percentage points, and the maximum average absolute error is 1.2 percentage points. These estimation errors are due to sampling variation, not bias; the average difference would be zero if the whole 2010/11 HCES and the whole 2011 WMS were to be repeatedly re-fielded and divided into sub-samples before repeating the entire process of constructing and validating scorecards.

With $n = 16{,}384$, the 90-percent confidence intervals are ± 0.7 percentage points or less. For $n = 1{,}024$, the 90-percent intervals are ± 2.9 percentage points or less.

CSA (2012) and Ministry of Finance and Economic Development (MoFED, 2012) compare poverty estimates from the 2010/11 surveys with estimates from the 2004/5 Household Income, Consumption, and Expenditure Survey (HICE) and the 2004 WMS without caveats. Assuming that this is appropriate,[6] users of the old 2004/5 scorecard in Schreiner and Chen (2009) can switch to the new 2010/11 scorecard here and still be able to use a poverty line supported by both scorecards to estimate changes in poverty

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[6] Stifel and Woldehanna (2013) warn against comparing poverty estimates from the 2004/5 HICE and 2010/11 HCES. They note that the surveys cover different numbers of food items, that they were fielded in different periods (in two rounds from 4 July to 3 August 2004 and from 4 February to 5 March 2005 for the HICE, and in one round from 8 July 2010 to 7 July 2011 for the HCES), and that inflation was about 30 percent during fieldwork for the 2010/11 HCES.

rates over time with a baseline from the old 2004/5 scorecard and a follow-up from the new 2010/11 scorecard.

Section 2 below documents data and poverty lines. Sections 3 and 4 describe scorecard construction and offer guidelines for implementation. Sections 5 and 6 tell how to estimate households' poverty likelihoods and populations' poverty rates at a point in time. Section 7 discusses estimating changes in poverty rates over time. Section 8 covers targeting. Section 9 places the scorecard here in the context of related exercises for Ethiopia. The last section is a summary.

The "Guidelines for the Interpretation of Scorecard Indicators" (found after the "References") tells how to ask questions—and how to interpret responses—so as to mimic practice in Ethiopia's 2011 WMS as closely as possible. These "Guidelines" (and the "Back-page Worksheet") are integral parts of the Simple Poverty Scorecard tool.

2. Data and poverty lines

This section presents the data used to construct and validate the scorecard. It also documents the 20 poverty lines to which scores are calibrated.

2.1   Data

Indicators and points for the scorecard are selected (*constructed*) based on data from a random half of the 24,261 households interviewed in both the 2010/11 HCES and in the 2011 WMS and who were analyzed in MoFED (2012). Taken together, this is Ethiopia's most-recent available national consumption survey.

Data from the half of households that is used to construct the scorecard is also used to associate (*calibrate*) scores to poverty likelihoods for all poverty lines.

Data from the other half of households is used to test (*validate*) scorecard accuracy *out-of-sample*, that is, with data that is not used in construction/calibration.

Interviews for the 2010/11 HCES took place from 8 July 2010 to 7 July 2011. Interviews for the 2011 WMS took place from 21 April 2011 to 25 June 2011. Consumption is in units of ETB per adult equivalent or per person per day in average prices for Ethiopia in December 2010.

2.2 Poverty rates at the household, person, or participant level

A *poverty rate* is the share of units in households in which total household consumption (divided by the number of adult equivalents or by the number of household members) is below a given poverty line. The unit of analysis is either the household itself or a person in the household.[7] By assumption, each household member has the same poverty status (or estimated poverty likelihood) as the other members in that same household.

To illustrate, suppose that a program serves two households. The first household is poor (its per-adult-equivalent or per-capita consumption is less than a given poverty line), and it has three members, one of whom is a program participant. The second household is non-poor and has four members, two of whom are program participants.

Poverty rates are in terms of either households or people. If the program defines its *participants* as households, then the household level is relevant. The estimated household-level poverty rate is the weighted[8] average of poverty statuses (or estimated poverty likelihoods) across households with participants. This is

$\frac{1 \cdot 1 + 1 \cdot 0}{1 + 1} = \frac{1}{2} = 0.5 = 50$ percent. In the "$1 \cdot 1$" term in the numerator, the first "1" is the first household's weight, and the second "1" represents the first household's poverty status (poor). In the "$1 \cdot 0$" term in the numerator, the "1" is the second household's

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[7] Even though consumption is sometimes measured in per-adult-equivalent units, the unit of analysis for estimates of poverty rates is always households or people.
[8] The examples here assume simple random sampling at the household level. This means that each household has the same weight, taken here to be one (1).

weight, and the "0" represents the second household's poverty status (non-poor). The

"1 + 1" in the denominator is the sum of the weights of the two households. Household-

level weights are used because the unit of analysis is the household.

Alternatively, a person-level rate is relevant if a program defines all people in

households that benefit from its services as *participants*. In the example here, the

person-level rate is the household-size-weighted[9] average of poverty statuses for

households with participants, or $\dfrac{3 \cdot 1 + 4 \cdot 0}{3 + 4} = \dfrac{3}{7} = 0.43 = 43$ percent. In the "$3 \cdot 1$" term

in the numerator, the "3" is the first household's weight because it has three members,

and the "1" represents its poverty status (poor). In the "$4 \cdot 0$" term in the numerator,

the "4" is the second household's weight because it has four members, and the zero

represents its poverty status (non-poor). The "$3 + 4$" in the denominator is the sum of

the weights of the two households. A household's weight is its number of members

because the unit of analysis is the household member.

As a final example, a program might count as *participants* only those household

members who directly participate in the program. For the example here, this means

that some—but not all—household members are counted. The person-level rate is now

the participant-weighted average[10] of the poverty statuses of households with

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[9] Given simple random sampling at the household level, a household's person-level
weight is the number of people in the household.
[10] Given simple random sampling at the household level, a household's participant-level
weight is the number of participants in the household.

participants, or $\dfrac{1 \cdot 1 + 2 \cdot 0}{1 + 2} = \dfrac{1}{3} = 0.33 = 33$ percent. The first "1" in the "1 $\cdot$ 1" in the

numerator is the first household's weight because it has one participant, and the second

"1" represents its poverty status (poor). In the "2 $\cdot$ 0" term in the numerator, the "2" is

the second household's weight because it has two participants, and the zero represents

its poverty status (non-poor). The "1 + 2" in the denominator is the sum of the weights

of the two households. Each household's weight is its number of participants because

the unit of analysis is the participant.

To sum up, estimated poverty rates are weighted averages of households' poverty

statuses (or estimated poverty likelihoods), where—assuming simple random sampling

at the household level—the weights are the number of relevant units in the household.

When reporting, organizations should make explicit the unit of analysis—whether

household, household member, or participant—and explain why that unit is relevant.

Table 1 reports poverty lines and poverty rates for households and people in the

2010/11 HCES for Ethiopia as a whole, for the construction/calibration sample, and for

the validation sample. For all-Ethiopia and for each of Ethiopia's 11 administrative

regions, Table 2 reports poverty lines and poverty rates for households and people by

urban/rural/all.

Household-level poverty rates are reported because—as shown above—household-

level poverty likelihoods can be straightforwardly converted into poverty rates for other

units of analysis and because sampling is almost always done at the level of households.

This is also why the scorecard is constructed, calibrated, and validated with household

weights. Person-level poverty rates are also included in Tables 1 and 2 because these are the rates reported by the government of Ethiopia. Furthermore, popular discussions and policy discourse usually proceed in terms of person-level rates, and the goal of pro-poor programs is to help people (not households) to improve their well-being.

2.3 Definition of *poverty*, and the national poverty line

A household's *poverty status* as poor or non-poor depends on whether its per-adult-equivalent or per-capita consumption is below a given poverty line. Thus, a definition of *poverty* is the combination of a poverty line along with a measure of consumption.

Based on the 1995/6 HICE and information from the CSA, Dercon (1997) uses Ravallion's (1998) "cost-of-basic-needs" method to calculate a food poverty line and a food-plus-non-food ("national") poverty line of ETB1.77 and ETB2.95 per adult equivalent per day in 1995/6 prices.

The food line is the cost of the average food basket with 2,200 Calories in the 1995/6 HICE for people in the lower half of the distribution of consumption.

The national (food-plus-non-food) line is the result of "increasing the food line so as to keep the food share implied by the [food-plus-non-food] line equal to the food share for [people in] the lower half [of the distribution of consumption]" (Dercon, 1997, p. 19).

The all-Ethiopia lines are adjusted for price differences across regions, and they are brought forward to December 2010 by adjusting for price changes over time.

For Ethiopia overall in the 2010/11 HCES, the food line is ETB5.10 per adult equivalent per day, giving a household-level poverty rate of 2.4 percent and a person-level poverty rate of 3.5 percent (Table 1).[11] The food-plus-non-food line (here called "100% of the national line") for Ethiopia overall is ETB10.34, giving a household-level poverty rate of 23.4 percent and a person-level poverty rate of 29.6 percent.

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[11] MoFED (2012, p. 9) reports a person-level poverty rate for the food line of 33.6 percent. This paper reports 3.5 percent because it follows international common practice in comparing *total* consumption with the food line. MoFED's comparing *food* consumption with food line is not common practice, but it is nevertheless sensible and useful to report the share of people who do not meet caloric norms.

2.4   Supported poverty lines

Because pro-poor organizations in Ethiopia may want to use different or various

poverty lines, this paper calibrates scores from its single scorecard to poverty likelihoods

for 20 lines:

- Food
- 100% of national
- 150% of national
- 200% of national
- $1.00/day 2005 PPP
- $1.25/day 2005 PPP
- $1.75/day 2005 PPP
- $2.00/day 2005 PPP
- $2.50/day 2005 PPP
- $5.00/day 2005 PPP
- $1.90/day 2011 PPP
- $3.10/day 2011 PPP
- $3.80/day 2011 PPP
- $4.00/day 2011 PPP
- Line marking the poorest half of people below 100% of the national line
- First-quintile (20th-percentile) line
- Second-quintile (40th-percentile) line
- Median (50th-percentile) line
- Third-quintile (60th-percentile) line
- Fourth-quintile (80th-percentile) line

The lines for 150% and 200% of the national line are multiples of 100% of the

national line.

The international 2005 and 2011 PPP lines are derived from:

- PPP exchange rate for Ethiopia for "individual consumption expenditure by households":
  — 2005:[12] ETB2.751 per \$1.00
  — 2011:[13] ETB5.439 per \$1.00
- Average Consumer Price Index (CPI) for all of Ethiopia:[14]
  — 2005 calendar-year: 83.3333
  — December 2010:   202.4000
  — 2011 calendar-year: 244.5542
- 100% of the national line in each of the 2010/11 HCES poverty-line regions (Table 2)
- Person-weighted average of 100% of the national line for all-Ethiopia: ETB10.34 (Table 1)

Given this, the average \$1.25/day 2005 PPP line in average prices in Ethiopia as a whole in December 2010 is (Sillers, 2006):

$$\$1.25 \cdot \left(\frac{2005 \text{ PPP factor}}{\$1.00} \right) \cdot \left(\frac{\text{CPI}_{\text{dec2010}}}{\text{CPI}_{2005}} \right) = \$1.25 \cdot \left(\frac{\text{ETB2.751}}{\$1.00} \right) \cdot \left(\frac{202.4000}{83.3333} \right) = \text{ETB8.35.}^{[15]}$$

The other 2005 PPP lines are multiples of the \$1.25/day line.

The 2005 PPP lines in Table 1 are all-Ethiopia averages. In a given poverty-line region, the \$1.25/day line is the all-Ethiopia \$1.25/day line, multiplied by 100% of the national line for that region, and divided by 100% of the national line for Ethiopia as a whole.

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[12] World Bank, 2008.

[13] `iresearch.worldbank.org/PovcalNet/Detail.aspx?Format=Detail&CO=ETH_3&PPP0=5.44&PL0=1.90&Y0=2010.5&NumOfCountries=1`, retrieved 11 June 2016.

[14] The CPI series comes from `www.csa.gov.et/images/documents/pdf_files/CPI/cpi%20january%202013.pdf` (retrieved 11 June 2016) and various issues of CSA's "Country and Regional Level Consumer Price Indexes" from `www.csa.gov.et/index.php/price-indices/consumer-price-index` (retrieved 11 June 2014).

[15] This differs from the ETB8.33 in Table 1 due to rounding.

For example, the regional $1.25/day 2005 PPP line for rural Afar is the all-Ethiopia $1.25/day line (ETB8.33), multiplied by 100% of the national line in rural Afar (ETB10.42, Table 2), and divided by 100% of the national line for Ethiopia as a whole (ETB10.34). This is 8.33 x 10.42 ÷ 10.34 = ETB8.39.[16]

The World Bank's PovcalNet reports a person-level poverty rate for $1.25/day 2005 PPP of 36.8 percent (versus the 32.6 percent here).[17] The $1.25/day estimates here are to be preferred (Schreiner, 2014b) because PovcalNet does not report:

- Its $1.25/day 2005 PPP line in ETB
- The time/place of its price units
- Whether/how it adjusts for regional differences in prices
- How it deflates 2005 PPP factors over time

The average $1.90/day 2011 PPP line in average prices in Ethiopia during the 2010/11 HCES fieldwork is:

$$\$1.90 \cdot \left(\frac{2011\,\text{PPP factor}}{\$1.00}\right) \cdot \left(\frac{\text{CPI}_{\text{dec2010}}}{\text{CPI}_{2011}}\right) = \$1.90 \cdot \left(\frac{\text{ETB5.439}}{\$1.00}\right) \cdot \left(\frac{202.4000}{244.5542}\right) = \text{ETB8.55.}$$

The other 2011 PPP lines are multiples of this $1.90/day line.

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[16] Again, this differs from the ETB8.40 in Table 2 due to rounding.

[17] `iresearch.worldbank.org/PovcalNetPPP2005/Detail.aspx?Format=Detail&CO=ETH_3&PPP0=2.75&PL0=1.25&Y0=2010.5&NumOfCountries=1`, retrieved11 June 2016.

The 2011 PPP lines are adjusted for price differences across Ethiopia's poverty-line regions in the same way as the 2005 PPP lines are.

The World Bank's PovcalNet reports a \$1.90/day 2005 PPP line for 2010/11 of ETB9.05 (versus ETB8.53 here) and person-level poverty rate of 33.6, which is close to the 34.3 percent here.[18] As noted above in the context of the \$1.25/day 2005 PPP line, this paper's derivation of the \$1.90/day is to be preferred because it makes sense and is fully documented.

The line that marks the poorest half of people below 100% of the national line is defined as the median aggregate household per-capita consumption of people (not households) below 100% of the national line (U.S. Congress, 2004). Unlike all the previous (non-relative) lines, this line (and the percentile-based lines below) is derived by putting all regional price adjustments in the measure of consumption rather than in the poverty line, deriving a single line for all of Ethiopia, and then taking all price adjustments out of consumption and putting them back in the regional lines.[19]

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[18] `iresearch.worldbank.org/PovcalNet/Detail.aspx?Format=Detail&C0=ETH_3 &PPP0=5.44&PL0=1.90&Y0=2010.5&NumOfCountries=1`, retrieved 11 June 2016.

[19] This corrects how the scorecard derived this line prior to 2016 (in particular, in Schreiner and Chen, 2009). Formerly, price adjustments were left in the poverty line and compared with nominal consumption to find a line in each poverty-line region that marked the poorest half of people below 100% of the national line in that particular poverty-line region. Both approaches produce a person-level poverty rate that is half that of 100% of the national line, but the set of people who are identified as *poor* differs. Unlike the former approach, the current approach correctly identifies as *poor* the poorest half of all people in the country whose price-adjusted consumption is below the

Microenterprise programs in Ethiopia who use the scorecard to report the number of their participants who are "very poor" to USAID should use the $1.25/day 2005 PPP line. This is because USAID defines the "very poor" as those people in households whose daily per-capita consumption is below the highest of the following two poverty lines:

- The line that marks the poorest half of people below 100% of the national line (ETB6.68, with a person-level poverty rate of 14.7 percent, Table 1)
- $1.25/day 2005 PPP (ETB8.33, with a person-level poverty rate of 32.6 percent)

The scorecard also supports percentile-based poverty lines for Ethiopia. This facilitates a number of types of analyses. For example, the second-quintile (40th-percentile) line might be used to help track Ethiopia's progress toward the World Bank's (2013) goal of "shared prosperity/inclusive economic growth", defined as income growth among the bottom 40 percent of the world's people.

The five quintile lines, analyzed together, could also be used to look at the relationship of consumption with health outcomes (or anything else related with the distribution of consumption). The scorecard thus offers an alternative for health-equity analyses that have typically used a "wealth index" such as that supplied with the data from the Demographic and Health Surveys (Rutstein and Johnson, 2004) to compare some estimation of wealth with health outcomes.

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single, all-country national line. This implies that the correction in Schreiner (2014b) of the derivation used for this line by IRIS Center for its Poverty-Assessment Tool is itself wrong, and IRIS Center's approach (the one now used here) is correct (although IRIS Center still incorrectly derives this line based on households instead of people).

Of course, analysts could always do (and can still do) relative-wealth analyses with scores from the scorecard. But support for relative consumption lines now allows a more straightforward use of a single tool (the scorecard) to analyze any or all of:

- Relative wealth (via scores)
- Absolute consumption (via poverty likelihoods and absolute poverty lines)
- Relative consumption (via poverty likelihoods and percentile-based poverty lines)

Unlike the scorecard, wealth indexes only serve to analyze relative wealth. Furthermore, the scorecard—unlike wealth indexes based on Principal Component Analysis or similar approaches—uses a straightforward, well-understood standard whose definition is external to the scorecard itself (consumption related to a poverty line defined in monetary terms).

In contrast, a wealth index opaquely defines *poverty* in terms of its own indicators and points, without reference to an external standard. This means that two wealth indexes with different indicators or different points—even if derived from the same data for a given country—imply two different definitions of *poverty*. In the same set-up, two scorecards would both apply a single definition of *poverty*.

3. Scorecard construction

For Ethiopia, about 90 candidate indicators are initially prepared in the areas of:

- Household composition (such as the number of members)
- Education (such as whether the (oldest) female head/spouse can read and write)
- Housing (such as the main material of the floor)
- Ownership of durable assets (such as mattresses or beds)
- Employment (such as the number of household members who work)
- Agriculture (such as the ownership of plows)

Table 3 lists the candidate indicators, ordered by the entropy-based "uncertainty coefficient" (Goodman and Kruskal, 1979) that measures how well a given indicator predicts poverty status on its own.[20]

One possible application of the scorecard is to measure *changes* in poverty through time. Thus, when selecting indicators—and holding other considerations constant—preference is given to more sensitive indicators. For example, the ownership of a *gabi* is probably more likely to change in response to changes in poverty than is the age of the male head/spouse.

The scorecard itself is built using 100% of the national poverty line and Logit regression on the construction sub-sample. Indicator selection uses both judgment and statistics. The first step is to use Logit to build one scorecard for each candidate indicator. Each scorecard's power to rank households by poverty status is measured as "c" (SAS Institute Inc., 2004).

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[20] The uncertainty coefficient is not used to help select scorecard indicators. It is just a way to order the candidate indicators listed in Table 3.

One of these one-indicator scorecards is then selected based on several factors (Schreiner *et al.*, 2014; Zeller, 2004). These include improvement in accuracy, likelihood of acceptance by users (determined by simplicity, cost of collection, and "face validity" in terms of experience, theory, and common sense), sensitivity to changes in poverty, variety among indicators, applicability across regions, tendency to have a slow-changing relationship with poverty over time, relevance for distinguishing among households at the poorer end of the distribution of consumption, and verifiability.

A series of two-indicator scorecards are then built, each adding a second indicator to the one-indicator scorecard selected from the first round. The best two-indicator scorecard is then selected, again using judgment to balance statistical accuracy with the non-statistical criteria. These steps are repeated until the scorecard has 8 indicators[21] that work well together.[22]

The final step is to transform the Logit coefficients into non-negative integers such that total scores range from 0 (most likely below a poverty line) to 100 (least likely below a poverty line).

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[21] The scorecard usually has ten indicators, but this number is not carved in stone. For Ethiopia, only eight met the chief criteria for selection.

[22] For Ethiopia, indicator selection was also informed by feedback from a field test organized by the Association of Ethiopian Microfinance Institutions.

This algorithm is similar to common R^2-based stepwise least-squares regression. It differs from naïve stepwise in that the selection of indicators considers both statistical[23] and non-statistical criteria. The use of non-statistical criteria can improve robustness through time and across non-nationally representative groups. It also helps ensure that indicators are simple, common-sense, and acceptable to users.

The single scorecard here applies to all of Ethiopia. Tests for Indonesia (World Bank, 2012), Bangladesh (Sharif, 2009), India and Mexico (Schreiner, 2006 and 2005a), Sri Lanka (Narayan and Yoshida, 2005), and Jamaica (Grosh and Baker, 1995) suggest that segmenting poverty-assessment tools by urban/rural does not improve targeting accuracy much. In general, segmentation may improve the accuracy of estimates of poverty rates (Diamond *et al.*, 2016; Tarozzi and Deaton, 2007), but it may also increase the risk of overfitting (Haslett, 2012).

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[23] The statistical criterion for selecting an indicator is not the p values of its coefficients but rather the indicator's contribution to the ranking of households by poverty status.

4. Practical guidelines for scorecard use

The main challenge of scorecard design is not to maximize statistical accuracy but rather to improve the chances that the scorecard is actually used (Schreiner, 2005b). When scoring projects fail, the reason is not usually statistical inaccuracy but rather the failure of an organization to decide to do what is needed to integrate scoring in its processes and to train and convince its employees to use the scorecard properly (Schreiner, 2002). After all, most reasonable scorecards have similar targeting accuracy, thanks to the empirical phenomenon known as the "flat maximum" (Caire and Schreiner, 2012; Hand, 2006; Baesens *et al.*, 2003; Lovie and Lovie, 1986; Kolesar and Showers, 1985; Stillwell, Barron, and Edwards, 1983; Dawes, 1979; Wainer, 1976; Myers and Forgy, 1963). The bottleneck is less technical and more human, not statistics but organizational-change management. Accuracy is easier to achieve than adoption.

The scorecard here is designed to encourage understanding and trust so that users will want to adopt it on their own and use it properly. Of course, accuracy matters, but it must be balanced with simplicity, ease-of-use, and "face validity". Programs are more likely to collect data, compute scores, and pay attention to the results if, in their view, scoring does not imply a lot of additional work and if the whole process generally seems to them to make sense.

To this end, Ethiopia's scorecard fits on one page. The construction process, indicators, and points are simple and transparent. Additional work is minimized; non-specialists can compute scores by hand in the field because the scorecard has:

- Only 8 indicators
- Only "multiple-choice" indicators
- Only simple points (non-negative integers, and no arithmetic beyond addition)

The scorecard (and its "Back-page Worksheet") is ready to be photocopied. A field worker using the scorecard in Ethiopia would:

- Record the interview identifier, interview date, country code ("ETH"), scorecard code ("002") and the sampling weight assigned by the organization's survey design to the household of the participant (if known)
- Record the names and identifiers of the participant (who may not be the same as the respondent), of the field agent, and of the relevant organizational service point
- Complete the "Back-page Worksheet" with each household member's first name or nickname
- Based on what has already been recorded on the "Back-page Worksheet", record household size (the number of household members) in the scorecard header next to "Number of household members:"
- Based on what has already been recorded on the "Back-page Worksheet", mark the response to the first scorecard indicator ("How many members does the household have?") based on the number of household members
- Read the rest of the scorecard indicators to the respondent one-by-one, drawing a circle around the relevant responses and their points, and writing each point value in the far right-hand column
- Add up the points to get a total score
- Implement targeting policy (if any)
- Deliver the paper scorecard to a central office for data entry and filing

Of course, field workers must be trained. The quality of outputs depends on the quality of inputs. If organizations or field workers gather their own data and believe that they have an incentive to exaggerate poverty rates (for example, if managers or funders reward them for higher poverty rates), then it is wise to do on-going quality control via data review and random audits (Matul and Kline, 2003).[24] IRIS Center

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[24] If a program does not want field workers and respondents to know the points associated with responses, then it can use a version of the scorecard that does not display the points and then apply the points and compute scores later at a central office. Even if points are hidden, however, field workers and respondents can apply common sense to guess how response options are linked with poverty. Schreiner (2012b) argues that hiding points in Colombia (Camacho and Conover, 2011) did little to deter

(2007a) and Toohig (2008) are useful nuts-and-bolts guides for budgeting, training field workers and supervisors, logistics, sampling, interviewing, piloting, recording data, and controlling quality.

In particular, while collecting scorecard indicators is relatively easier than alternative ways of measuring poverty, it is still absolutely difficult. Training and explicit definitions of terms and concepts in the scorecard are essential, and field workers should scrupulously study and follow the "Guidelines for the Interpretation of Scorecard Indicators" found in this paper after the "References" section, as these "Guidelines"—along with the "Back-page Worksheet"—are integral parts of the Simple Poverty Scorecard tool.[25]

For the example of Nigeria, one study (Onwujekwe, Hanson, and Fox-Rushby, 2006) found distressingly low inter-rater and test-retest correlations for indicators as seemingly simple as whether a household owns an automobile. At the same time, Grosh and Baker (1995) suggest that gross underreporting of assets does not affect targeting. For the first stage of targeting in a conditional cash-transfer program in Mexico, Martinelli and Parker (2007, pp. 24–25) find that "underreporting [of asset ownership] is widespread but not overwhelming, except for a few goods . . . [and] overreporting is common for a few goods". Still, as is done in Mexico in the second stage of its targeting

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cheating and that, in any case, cheating by the user's central office was more damaging than cheating by field workers and respondents.

[25] The guidelines here are the only ones that organizations should give to field workers. All other issues of interpretation should be left to the judgment of field workers and respondents, as this seems to be what Ethiopia's CSA did in the WMS.

process, most false self-reports can be corrected (or avoided in the first place) by field workers who make a home visit. This is the recommended procedure for organizations who use scoring for targeting in Ethiopia.

In terms of implementation and sampling design, an organization must make choices about:

- Who will do the interviews
- How responses and scores will be recorded
- Which participants will be interviewed
- How many participants will be interviewed
- How frequently participants will be interviewed
- Whether scoring will be applied at more than one point in time
- Whether the same participants will be scored at more than one point in time

In general, the sampling design should follow from the organization's goals for the exercise, the questions to be answered, and the budget. The main goal should be to make sure that the sample is representative of a well-defined population and that the scorecard will inform an issue that matters to the organization.

The non-specialists who apply the scorecard with participants in the field can be:

- Employees of the organization
- Third parties

Responses, scores, and poverty likelihoods can be recorded on:

- Paper in the field, and then filed at a central office
- Paper in the field, and then keyed into a database or spreadsheet at a central office
- Portable electronic devices in the field, and then uploaded to a database

Given a population of participants relevant for a particular business question, the participants to be scored can be:

- All relevant participants (a census)
- A representative sample of relevant participants
- All relevant participants in a representative sample of relevant field offices and/or in a representative sample of relevant field agents
- A representative sample of relevant participants in a representative sample of relevant field offices and/or in a representative sample of relevant field agents

If not determined by other factors, the number of participants to be scored can be derived from sample-size formulas (presented later) to achieve a desired confidence level and a desired confidence interval. To have a chance to meaningfully inform questions that matter to the organization, however, the focus should be less on having a sample size large enough to achieve some arbitrary level of statistical significance and more on having a representative sample from a well-defined population that is relevant for an issue that matters to the program.

The frequency of application can be:

- As a once-off project (precluding measuring change)
- Every three years (or at any other fixed or variable time interval, allowing measuring change)
- Each time a field worker visits a participant at home (allowing measuring change)

When a scorecard is applied more than once in order to measure change in poverty rates, it can be applied:

- With a different set of participants from the same population
- With the same set of participants

An example set of choices is illustrated by BRAC and ASA, two microfinance organizations in Bangladesh who each have about 7 million participants and who declared their intention to apply the Simple Poverty Scorecard tool for Bangladesh (Schreiner, 2013a) with a sample of about 25,000. Their design is that all loan officers in a random sample of branches will score all participants each time they visit a homestead (about once a year) as part of their standard due diligence prior to loan disbursement. They record responses on paper in the field before sending the forms to a central office to be entered into a database and converted to poverty likelihoods.

5. Estimates of a household's poverty likelihood

The sum of scorecard points for a household is called the *score*. For Ethiopia, scores range from 0 (most likely below a poverty line) to 100 (least likely below a poverty line). While higher scores indicate less likelihood of being poor, the scores themselves have only relative units. For example, doubling the score decreases the likelihood of being below a given poverty line, but it does not cut it in half.

To get absolute units, scores are converted to *poverty likelihoods*, that is, probabilities of being below a poverty line. This is done via simple look-up tables. For the example of 100% of the national line, scores of 25–29 have a poverty likelihood of 36.5 percent, and scores of 30–34 have a poverty likelihood of 31.8 percent (Table 4).

The poverty likelihood associated with a score varies by poverty line. For example, scores of 25–29 are associated with a poverty likelihood of 36.5 percent for 100% of the national line but 41.0 percent for the $1.90/day 2011 PPP line.[26]

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[26] From Table 4 on, many tables have 20 versions, one for each of the 20 poverty lines. To keep them straight, they are grouped by line. Single tables pertaining to all lines appear with the first group of tables for 100% of the national line.

5.1 Calibrating scores with poverty likelihoods

A given score is associated ("calibrated") with a poverty likelihood by defining the poverty likelihood as the share of households in the calibration sub-sample who have the score and who have per-adult-equivalent or per-capita consumption below a given poverty line.

For the example of 100% of the national line (Table 5), there are 10,379 (normalized) households in the calibration sub-sample with a score of 25–29. Of these, 3,788 (normalized) are below the poverty line. The estimated poverty likelihood associated with a score of 25–29 is then 36.5 percent, because 3,788 ÷ 10,379 = 36.5 percent.

To illustrate with 100% of the national line and a score of 30–34, there are 14,674 (normalized) households in the calibration sub-sample, of whom 4,666 (normalized) are below the line (Table 5). The poverty likelihood for this score range is then 4,666 ÷ 14,674 = 31.8 percent.

The same method is used to calibrate scores with estimated poverty likelihoods for all 20 poverty lines.[27]

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[27] To ensure that poverty likelihoods never increase as scores increase, likelihoods across series of adjacent scores are sometimes iteratively averaged before grouping scores into ranges. This preserves unbiasedness while keeping users from balking when sampling variation in score ranges with few households would otherwise lead to higher scores being linked with higher poverty likelihoods.

Even though the scorecard is constructed partly based on judgment related to non-statistical criteria, the calibration process produces poverty likelihoods that are objective, that is, derived from quantitative poverty lines and from survey data on consumption. The calibrated poverty likelihoods would be objective even if the process of selecting indicators and points did not use any data at all. In fact, objective scorecards of proven accuracy are often constructed using only expert judgment to select indicators and points (Fuller, 2006; Caire, 2004; Schreiner *et al.*, 2014). Of course, the scorecard here is constructed with both data and judgment. The fact that this paper acknowledges that some choices in scorecard construction—as in any statistical analysis—are informed by judgment in no way impugns the objectivity of the poverty likelihoods, as their objectivity depends on using data in score calibration, not on using data (and nothing else) in scorecard construction.

Although the points in the Ethiopia scorecard are transformed coefficients from a Logit regression, (untransformed) scores are not converted to poverty likelihoods via the Logit formula of $2.718281828^{\text{score}} \times (1 + 2.718281828^{\text{score}})^{-1}$. This is because the Logit formula is esoteric and difficult to compute by hand. Non-specialists find it more intuitive to define the poverty likelihood as the share of households with a given score in the calibration sample who are below a poverty line. Going from scores to poverty likelihoods in this way requires no arithmetic at all, just a look-up table. This approach to calibration can also improve accuracy, especially with large samples.

5.2 Accuracy of estimates of households' poverty likelihoods

As long as the relationships between indicators and poverty do not change over time, and as long as the scorecard is applied to households who are representative of the same population from which the scorecard was originally constructed, then this calibration process produces unbiased estimates of poverty likelihoods. *Unbiased* means that in repeated samples from the same population, the average estimate matches the true value. Given the assumptions above, the scorecard also produces unbiased estimates of poverty rates at a point in time and unbiased estimates of changes in poverty rates between two points in time.[28]

Of course, the relationships between indicators and poverty do change to some unknown extent over time and also across sub-national groups in Ethiopia's population. Thus, the scorecard will generally be biased when applied after July 2011 (the last month of fieldwork for the 2010/11 HCES) or when applied with sub-groups that are not nationally representative.

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[28] This is because these estimates of populations' poverty rates are linear functions of the unbiased estimates of households' poverty likelihoods.

How accurate are estimates of households' poverty likelihoods, given the assumption of unchanging relationships between indicators and poverty over time and the assumption of a sample that is representative of Ethiopia as a whole? To find out, the scorecard is applied to 1,000 bootstrap samples of size $n = 16,384$ with the 2010/11 validation sample. Bootstrapping means to:

- Score each household in the validation sample
- Draw a bootstrap sample *with replacement* from the validation sample
- For each score range, compute the true poverty likelihood in the bootstrap sample, that is, the share of households with the score and with consumption below a poverty line
- For each score range, record the difference between the estimated poverty likelihood (Table 4) and the true poverty likelihood in the bootstrap sample
- Repeat the previous three steps 1,000 times
- For each score range, report the average difference between estimated and true poverty likelihoods across the 1,000 bootstrap samples
- For each score range, report the two-sided intervals containing the central 900, 950, and 990 differences between estimated and true poverty likelihoods

For each score range and for $n = 16,384$, Table 6 shows the errors, that is, the average difference between estimated poverty likelihoods and true poverty likelihoods. It also shows confidence intervals for the differences.

For the 100% of the national line, the average poverty likelihood across bootstrap samples for scores of 25–29 in the validation sample is too low by 3.3 percentage points. For scores of 30–34, the estimate is too high by 2.2 percentage points.[29]

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[29] These differences are not zero, in spite of the estimator's unbiasedness, because the scorecard comes from a single sample. The average difference by score would be zero if samples were repeatedly drawn from the population and split into sub-samples before repeating the entire process of scorecard construction/calibration and validation.

The 90-percent confidence interval for the differences for scores of 25–29 is ±2.7 percentage points (Table 6). This means that in 900 of 1,000 bootstraps, the average difference between the estimate and the true value for households in this score range is between –6.0 and –0.6 percentage points (because –3.3 – 2.7 = –6.0, and –3.3 + 2.7 = –0.6). In 950 of 1,000 bootstraps (95 percent), the difference is –3.3 ± 2.9 percentage points, and in 990 of 1,000 bootstraps (99 percent), the difference is –3.3 ± 3.4 percentage points.

A couple of the absolute differences between estimated poverty likelihoods and true values in Table 6 for 100% of the national line are large. There are differences because the validation sample is a single sample that—thanks to sampling variation—differs in distribution from the construction/calibration sub-samples and from Ethiopia's population (and also because very few households fall in some score ranges). For targeting, however, what matters is less the difference in all score ranges and more the difference in the score ranges just above and below the targeting cut-off. This mitigates the effects of bias and sampling variation on targeting (Friedman, 1997). Section 8 below looks at targeting accuracy in detail.

In addition, if estimates of groups' poverty rates are to be usefully accurate, then errors for individual households' poverty likelihoods must largely balance out. As discussed in the next section, this is generally the case for nationally representative samples in 2010/11, although it holds less well for samples from sub-national populations or in later time periods.

Another possible source of differences between estimates and true values is overfitting. The scorecard here is unbiased, but it may still be *overfit* when applied after the end of the HCES fieldwork in July 2011. That is, the scorecard may fit the data from 2010/11 so closely that it captures not only some real patterns but also some random patterns that, due to sampling variation, show up only in the 2010/11 HCES data but not in the overall population of Ethiopia. Or the scorecard may be overfit in the sense that it is not robust when relationships between indicators and poverty change over time or when the scorecard is applied to samples that are not nationally representative.

Overfitting can be mitigated by simplifying the scorecard and by not relying only on data but rather also considering theory, experience, and judgment. Of course, the scorecard here does this. Combining scorecards can also reduce overfitting, at the cost of greater complexity.

Most errors in individual households' likelihoods do balance out in the estimates of poverty rates for nationally representative samples (see the next two sections). Furthermore, at least some of the differences in change-over-time estimates come from non-scorecard sources such as changes in the relationships between indicators and poverty, sampling variation, changes in poverty lines, inconsistencies in data quality across time, and imperfections in price adjustments across time and across geographic regions. These factors can be addressed only by improving the availability, frequency, quantity, and quality of data from national consumption surveys (which is beyond the scope of the scorecard) or by reducing overfitting (which likely has limited returns, given the scorecard's parsimony).

6. Estimates of a poverty rate at a point in time

A population's estimated poverty rate at a point in time is the average of the estimated poverty likelihoods of the sampled households in the group.

To illustrate, suppose a program samples three households on 1 January 2016 and that they have scores of 20, 30, and 40, corresponding to poverty likelihoods of 47.0, 31.8, and 16.1 percent (100% of the national line, Table 4). The group's estimated poverty rate is the households' average poverty likelihood of $(47.0 + 31.8 + 16.1) \div 3 = 31.6$ percent.

Be careful; the group's poverty rate is *not* the poverty likelihood associated with the average score. Here, the average score is 30, which corresponds to a poverty likelihood of 31.8 percent. This differs from the 31.6 percent found as the average of the three individual poverty likelihoods associated with each of the three scores. Unlike poverty likelihoods, scores are ordinal symbols, like letters in the alphabet or colors in the spectrum. Because scores are not cardinal numbers, they cannot meaningfully be added up or averaged across households. Only three operations are valid for scores: conversion to poverty likelihoods, analysis of distributions (Schreiner, 2012a), or comparison—if desired—with a cut-off for targeting. There are a few contexts in which the analysis of scores is appropriate, but, in general, the safest rule to follow is: If you are not completely sure what to do, then use poverty likelihoods, not scores.

Scores from the new 2010/11 scorecard are calibrated with data from the 2010/11 HCES for all 20 poverty lines. The process of calibrating scores to poverty likelihoods and the approach to estimating poverty rates is exactly the same for all poverty lines. For users, the only difference in terms of what they do with one poverty line versus with another is the specific look-up table used to convert scores to poverty likelihoods.

Existing users of the old 2004/5 scorecard who switch to the new 2010/11 scorecard can salvage existing poverty-rate estimates for measuring change over time by using supported poverty lines for use in estimates of change with a baseline from the old 2004/5 scorecard and a follow-up from the new 2010/11 scorecard.

6.1 Accuracy of estimated poverty rates at a point in time

For the new 2010/11 scorecard applied to 1,000 bootstraps of $n = 16,384$ from the validation sample and 100% of the national poverty line, the average error (difference between the estimate and the true value) for an estimated poverty rate at a point in time is +0.8 percentage points (Table 8, summarizing Table 7 across all poverty lines). Across all 20 poverty lines in the validation sample, the maximum average absolute error is 1.2 percentage points, and the average absolute error is about 0.6 percentage points. At least part of these differences is due to sampling variation in the division of the 2010/11 HCES into sub-samples.

When estimating poverty rates at a point in time for a given poverty line, the average error reported in Table 8 should be subtracted from the average poverty likelihood to give a corrected estimate. For the example of the scorecard here and 100% of the national line in the validation sample, the error is +0.8 percentage points, so the corrected estimate in the three-household example above is 31.6 − (+0.8) = 30.8 percent.

In terms of precision, the 90-percent confidence interval for a group's estimated poverty rate at a point in time with $n = 16{,}384$ is ±0.7 percentage points or better for all poverty lines (Table 8). This means that in 900 of 1,000 bootstraps of this size, the estimate (after correcting for the known average error) is within 0.7 percentage points of the true value.

For example, suppose that the (uncorrected) average poverty likelihood in a sample of $n = 16{,}384$ with the new 2010/11 scorecard and 100% of the national line is 31.6 percent. Then estimates in 90 percent of such samples would be expected to fall in the range of 31.6 − (+0.8) − 0.6 = 30.2 percent to 31.6 − (+0.8) + 0.6 = 31.4 percent, with the most likely true value being the corrected estimate in the middle of this range, that is, 31.6 − (+0.8) = 30.8 percent. This is because the original (uncorrected) estimate is 31.6 percent, the average error is +0.8 percentage points, and the 90-percent confidence interval for 100% of the national line in the validation sample with this sample size is ±0.6 percentage points (Table 8).

6.2 Formula for standard errors for estimates of poverty rates

How precise are the point-in-time estimates? Because these estimates are averages, they have (in "large" samples) a Normal distribution and can be characterized by their error (average difference vis-à-vis true values), together with their standard error (precision).

Schreiner (2008) proposes an approach to deriving a formula for the standard errors of estimated poverty rates at a point in time from indirect measurement via poverty-assessment tools. It starts with Cochran's (1977) textbook formula of $\pm c = \pm z \cdot \sigma$ that relates confidence intervals with standard errors in the case of the direct measurement of ratios, where:

$\pm c$ is a confidence interval as a proportion (*e.g.*, 0.02 for ± 2 percentage points),

z is from the Normal distribution and is $\begin{cases} 1.04 \text{ for confidence levels of 70 percent} \\ 1.28 \text{ for confidence levels of 80 percent} \\ 1.64 \text{ for confidence levels of 90 percent} \end{cases}$,

σ is the standard error of the estimated poverty rate, that is, $\sqrt{\dfrac{\hat{p} \cdot (1 - \hat{p})}{n}} \cdot \phi$,

$\hat{p}$ is the estimated proportion of households below the poverty line in the sample,

ϕ is the finite population correction factor $\sqrt{\dfrac{N - n}{N - 1}}$,

N is the population size, and

n is the sample size.

For example, Ethiopia's 2010/11 HCES gives a direct-measurement estimate of the household-level poverty rate for 100% of the national line in the validation sample of $\hat{p} = 23.4$ percent (Table 1). If this estimate came from a sample of $n = 16{,}384$ households from a population N of 14,374,888 (the number of households in Ethiopia in 2010/11 according to the HCES sampling weights), then the finite population correction ϕ is $\sqrt{\dfrac{14{,}374{,}888 - 16{,}384}{14{,}374{,}888 - 1}} = 0.9994$, which very close to $\phi = 1$. If the desired confidence level is 90-percent ($z = 1.64$), then the confidence interval $\pm c$ is

$$\pm z \cdot \sqrt{\frac{\hat{p} \cdot (1 - \hat{p})}{n}} \cdot \sqrt{\frac{N - n}{N - 1}} = \pm 1.64 \cdot \sqrt{\frac{0.234 \cdot (1 - 0.234)}{16{,}384}} \cdot \sqrt{\frac{14{,}374{,}888 - 16{,}384}{14{,}374{,}888 - 1}} =$$

± 0.542 percentage points. (If ϕ were taken as 1, then the interval is still ± 0.542 percentage points.)

Unlike the 2010/11 HCES, however, the scorecard does not measure poverty directly, so this formula is not applicable. To derive a formula for the new 2010/11 scorecard, consider Table 7, which reports empirical confidence intervals $\pm c$ for the errors for the scorecard applied to 1,000 bootstrap samples of various sizes from the validation sample. For example, with $n = 16{,}384$ and 100% of the national line in the validation sample, the 90-percent confidence interval is ± 0.576 percentage points.[30]

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[30] Due to rounding, Table 7 displays 0.6, not 0.576.

Thus, the 90-percent confidence interval with $n = 16{,}384$ is ± 0.576 percentage points for the new 2010/11 scorecard and ± 0.542 percentage points for direct measurement. The ratio of the two intervals is $0.576 \div 0.542 = 1.06$.

Now consider the same exercise, but with $n = 8{,}192$. The confidence interval under direct measurement and 100% of the national line in the validation sample is

$$\pm 1.64 \cdot \sqrt{\frac{0.234 \cdot (1 - 0.234)}{8{,}192}} \cdot \sqrt{\frac{14{,}374{,}888 - 8{,}192}{14{,}374{,}888 - 1}} = \pm 0.767 \text{ percentage points. The}$$

empirical confidence interval with the new 2010/11 scorecard (Table 7) is ± 0.837 percentage points. Thus for $n = 8{,}192$, the ratio of the two intervals is $0.837 \div 0.767 = 1.09$.

This ratio of 1.09 for $n = 8{,}192$ is close to the ratio of 1.06 for $n = 16{,}384$. Across all sample sizes of 256 or more in Table 7, these ratios are generally close to each other, and the average of these ratios in the validation sample turns out to be 1.08, implying that confidence intervals for indirect estimates of poverty rates via Ethiopia's new 2010/11 scorecard and 100% of the national line are—for a given sample size—about 8-percent wider than confidence intervals for direct estimates via the 2010/11 HCES. This 1.08 appears in Table 8 as the "α factor for precision" because if $\alpha = 1.08$, then the formula for confidence intervals c for the new 2010/11 scorecard is $\pm c = \pm z \cdot \alpha \cdot \sigma$. That is, the formula for the standard error σ for point-in-time estimates of poverty rates via scoring is $\alpha \cdot \sqrt{\dfrac{\hat{p} \cdot (1 - \hat{p})}{n}} \cdot \sqrt{\dfrac{N - n}{N - 1}}$.

In general, α can be more or less than 1.00. When α is greater than 1.00, it means that the scorecard is less precise than direct measurement. It turns out that α is more than 1.00 for 19 of the 20 poverty lines in Table 8, although it is never higher than 1.12.

The formula relating confidence intervals with standard errors for the scorecard can be rearranged to give a formula for determining sample size before measurement. If $\widetilde{p}$ is the expected poverty rate before measurement, then the formula for sample size n from a population of size N that is based on the desired confidence level that corresponds to z and the desired confidence interval $\pm c$ is

$n = N \cdot \left(\dfrac{z^2 \cdot \alpha^2 \cdot \widetilde{p} \cdot (1 - \widetilde{p})}{z^2 \cdot \alpha^2 \cdot \widetilde{p} \cdot (1 - \widetilde{p}) + c^2 \cdot (N - 1)} \right)$. If the population N is "large" relative to the sample size n, then the finite-population correction factor ϕ can be taken as one (1), and the formula becomes $n = \left(\dfrac{\alpha \cdot z}{c} \right)^2 \cdot \widetilde{p} \cdot (1 - \widetilde{p})$.

To illustrate how to use this, suppose the population N is 14,374,888 (the number of households in Ethiopia in 2010/11), suppose $c = 0.04533$, $z = 1.64$ (90-percent confidence), and the relevant poverty line is 100% of the national line so that the most sensible expected poverty rate $\widetilde{p}$ is Ethiopia's overall poverty rate for that line in 2010/11 (23.4 percent at the household level, Table 1). The α factor is 1.08 (Table 8). Then the sample-size formula gives

$n = 14{,}374{,}888 \cdot \left(\dfrac{1.64^2 \cdot 1.08^2 \cdot 0.234 \cdot (1 - 0.234)}{1.64^2 \cdot 1.08^2 \cdot 0.234 \cdot (1 - 0.234) + 0.04533^2 \cdot (14{,}374{,}888 - 1)} \right) = 274,$

which is not too far from the sample size of 256 observed for these parameters in Table

7 for 100% of the national line. Taking the finite population correction factor ϕ as one

(1) gives the same result, as $n = \left(\dfrac{1.08 \cdot 1.64}{0.04533}\right)^2 \cdot 0.234 \cdot (1 - 0.234) = 274.$[31]

Of course, the α factors in Table 8 are specific to Ethiopia, its poverty lines, its

poverty rates, and this scorecard. The derivation of the formulas for standard errors

using the α factors, however, is valid for any poverty-measurement tool following the

approach in this paper.

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[31] Although USAID has not specified confidence levels nor intervals, IRIS Center (2007a and 2007b) says that a sample size of $n = 300$ is sufficient for USAID reporting. USAID's microenterprise partners in Ethiopia should report using the \$1.25/day 2005 PPP line. Given the α factor of 1.08 for this line (Table 8), an expected before-measurement household-level poverty rate of 26.0 percent (the all-Ethiopia rate for this line in 2010/11, Table 1), and a confidence level of 90 percent ($z = 1.64$), then $n = 300$ implies a confidence interval of $\pm 1.64 \cdot 1.08 \cdot \sqrt{\dfrac{0.260 \cdot (1 - 0.260)}{300}} = \pm 4.5$ percentage points.

In practice after the end of fieldwork for the HCES in July 2011, a program

would select a poverty line (say, 100% of the national line), note its participants'

population size (for example, $N = 10{,}000$ participants), select a desired confidence level

(say, 90 percent, or $z = 1.64$), select a desired confidence interval (say, ± 2.0 percentage

points, or $c = \pm 0.02$), make an assumption about $\tilde{p}$ (perhaps based on a previous

measurement such as the household-level poverty rate for 100% of the national line for

Ethiopia of 23.4 percent in the 2010/11 HCES in Table 1), look up α (here, 1.08 in

Table 8), assume that the scorecard will still work in the future and for sub-groups that

are not nationally representative,[32] and then compute the required sample size. In this

illustration, $n = 10{,}000 \cdot \left(\dfrac{1.64^2 \cdot 1.08^2 \cdot 0.234 \cdot (1 - 0.234)}{1.64^2 \cdot 1.08^2 \cdot 0.234 \cdot (1 - 0.234) + 0.02^2 \cdot (10{,}000 - 1)} \right) = 1{,}233.$

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[32] This paper reports accuracy for the scorecard applied to its validation sample, but it
does not test accuracy for later years or for sub-populations that are not nationally
representative. Performance after July 2011 will resemble that in the 2010/11 HCES
with deterioration over time to the extent that the relationships between indicators and
poverty status change.

7. Estimates of changes in poverty rates over time

The change in a population's poverty rate between two points in time is estimated as the change in the average poverty likelihood of a sample of households from the population.

This paper does not test the accuracy of estimates of change over time for Ethiopia. Nonetheless, the relevant concepts are presented here because, in practice, pro-poor organizations in Ethiopia can apply the scorecard to collect their own data and measure change through time.

7.1 Warning: *Change* is not necessarily *impact*

Scoring can estimate change. Of course, poverty could get better or worse, and scoring does not indicate what caused change. This point is often forgotten or confused, so it bears repeating: the scorecard merely estimates change, and it does not, in and of itself, indicate the reasons for the change. In particular, estimating the impact of participation requires knowing what would have happened to participants if they had not been participants. Knowing this requires either strong assumptions or a control group that resembles participants in all ways except participation. To belabor the point, the scorecard can help estimate the impact of participation only if there is some way to know—or explicit assumptions about—what would have happened in the absence of participation. And that information must come from beyond the scorecard.

7.2 Estimating changes in poverty rates over time

Consider the illustration begun in the previous section. On 1 January 2016, an organization samples three households who score 20, 30, and 40 and so have poverty likelihoods of 47.0, 31.8, and 16.1 percent (100% of the national line, Table 4). Correcting for the known average error in the validation sample of +0.8 percentage points (Table 8), the corrected baseline estimated poverty rate is the households' average poverty likelihood of $[(47.0 + 31.8 + 16.1) \div 3] - (+0.8) = 30.8$ percent.

After baseline, two sampling approaches are possible for the follow-up round:

- Score a new, independent sample from the same population
- Score the same sample that was scored at baseline

By way of illustration, suppose that three years later on 1 January 2019, the organization samples three additional households who are in the same population as the three original households and finds that their scores are 25, 35, and 45 (poverty likelihoods of 36.5, 25.8, and 12.3 percent, 100% of the national line, Table 4). Adjusting for the known average error, the average poverty likelihood at follow-up is $[(36.5 + 25.8 + 12.3) \div 3] - (+0.8) = 24.1$ percent, an improvement of $30.8 - 24.1 = 6.7$ percentage points.[33] Supposing that exactly three years passed between the average baseline interview and the average follow-up interview, the estimated annual rate of decrease in poverty is $6.7 \div 3 = 2.2$ percentage points per year. About one in 15 participants in this hypothetical example cross the poverty line between 2016 and

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[33] Of course, such a huge reduction in poverty in three years is highly unlikely, but this is just an example to show how the scorecard can be used to estimate change.

2019.[34] Among those who start below the line, about one in five (6.7 ÷ 30.8 = 21.8 percent) on net end up above the line.[35]

Alternatively, suppose that the three original households who were scored at baseline are scored again on 1 January 2019. Given scores of 25, 35, and 45, their follow-up poverty likelihoods are 36.5, 25.8, and 12.3 percent. The average across households of the difference in each given household's baseline poverty likelihood and its follow-up poverty likelihood is [(47.0 − 36.5) + (31.8 − 25.8) + (16.1 − 12.3)] ÷ 3 = 6.7 percentage points.[36] Assuming in this example that there are exactly three years between each household's interviews, the estimated annual decrease in poverty is 6.7 ÷ 3 = 2.2 percentage points per year.

Given the assumptions of the scorecard, both approaches to estimating change through time are unbiased. In general, however, they will give different estimates due to differences in the timing of interviews, in the composition of the samples, and in the nature of two samples being scored once versus one sample being scored twice (Schreiner, 2014a).

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[34] This is a net figure; some start above the line and end below it, and vice versa.
[35] The scorecard does not reveal the reasons for this change.
[36] In this case, the error for this line in Table 8 should *not* be subtracted off.

7.3 Precision for estimates of change in two samples

For two equal-sized independent samples, the same logic as in the previous section can be used to derive a formula relating the confidence interval $\pm c$ with the standard error σ of a scorecard's estimate of the change in poverty rates over time:

$$\pm c = \pm z \cdot \sigma = \pm z \cdot \alpha \cdot \sqrt{\frac{2 \cdot \hat{p} \cdot (1 - \hat{p})}{n}} \cdot \sqrt{\frac{N - n}{N - 1}} \;.$$

Here, z, c, $\hat{p}$ and N are defined as above, n is the sample size at both baseline and follow-up,[37] and α is the average (across a range of bootstrapped sample sizes) of the ratio of the observed confidence interval from a scorecard and the theoretical confidence interval under direct measurement.

As before, the formula for standard errors can be rearranged to give a formula for sample sizes before indirect measurement via a scorecard, where $\tilde{p}$ is based on previous measurements and is assumed equal at both baseline and follow-up:

$n = 2 \cdot N \cdot \left(\dfrac{z^2 \cdot \alpha^2 \cdot \tilde{p} \cdot (1 - \tilde{p})}{z^2 \cdot \alpha^2 \cdot \tilde{p} \cdot (1 - \tilde{p}) + c^2 \cdot (N - 1)} \right)$. If ϕ can be taken as one, then the

formula becomes $n = 2 \cdot \left(\dfrac{\alpha \cdot z}{c} \right)^2 \cdot \tilde{p} \cdot (1 - \tilde{p})$.

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[37] This means that—for a given level of precision—estimating the change in a poverty rate between two points in time requires four times as many total interviews (not twice as many) as does estimating a poverty rate at a point in time.

This α has been measured for 14 countries (Schreiner, 2016, 2015a, 2015b, 2015c, 2015d, 2013a, 2013b, 2012c, 2010, 2009a, 2009b, 2009c; Schreiner and Woller (2010); and Chen and Schreiner, 2009). The simple average of α across countries—after averaging α across poverty lines and survey years within each country—is 1.08. This rough figure is as reasonable as any to use for Ethiopia.

To illustrate the use of this formula to determine sample size for estimating changes in poverty rates across two independent samples, suppose the desired confidence level is 90 percent ($z = 1.64$), the desired confidence interval is ± 2 percentage points ($\pm c = \pm 0.02$), the poverty line is 100% of the national line, $\alpha = 1.08$, $\hat{p} = 0.234$ (the household-level poverty rate in 2010/11 for 100% of the national line in Table 1), and the population N is large enough relative to the expected sample size n that the finite population correction ϕ can be taken as one (1). Then the baseline sample size is $n = 2 \cdot \left(\dfrac{1.08 \cdot 1.64}{0.02} \right)^2 \cdot 0.234 \cdot (1 - 0.234) \cdot 1 = 2,812$, and the follow-up sample size is also 2,812.

7.4 Precision for estimated change for one sample, scored twice

Analogous to previous derivations, the general formula relating the confidence interval $\pm c$ to the standard error σ when using a scorecard to estimate change for a single group of households, all of whom are scored at two points in time, is:[38]

$$\pm\, c = \pm z \cdot \sigma = \pm z \cdot \alpha \cdot \sqrt{\frac{\hat{p}_{12} \cdot (1 - \hat{p}_{12}) + \hat{p}_{21} \cdot (1 - \hat{p}_{21}) + 2 \cdot \hat{p}_{12} \cdot \hat{p}_{21}}{n}} \cdot \sqrt{\frac{N - n}{n - 1}},$$

where z, c, α, N, and n are defined as usual, $\hat{p}_{12}$ is the share of all sampled households that move from below the poverty line to above it, and $\hat{p}_{21}$ is the share of all sampled households that move from above the line to below it. With the available data for Ethiopia, it is not possible to estimate values of α here.

The formula for confidence intervals can be rearranged to give a formula for sample size before measurement. This requires an estimate (based on information available before measurement) of the expected shares of all households who cross the poverty line $\tilde{p}_{12}$ and $\tilde{p}_{21}$. Before measurement, a conservative assumption is that the change in the poverty rate will be zero, which implies $\tilde{p}_{12} = \tilde{p}_{21} = \tilde{p}_*$, giving:

$$n = 2 \cdot \left(\frac{\alpha \cdot z}{c} \right)^2 \cdot \tilde{p}_* \cdot \sqrt{\frac{N - n}{n - 1}}.$$

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[38] See McNemar (1947) and Johnson (2007). John Pezzullo helped find this formula.

Because $\widetilde{p}_*$ could be anything between 0 and 0.5, more information is needed to apply this formula. Suppose that the observed relationship between $\widetilde{p}_*$, the number of years y between baseline and follow-up, and $p_{\text{pre-baseline}} \cdot (1 - p_{\text{pre-baseline}})$ is—as in Peru (Schreiner, 2009d)—close to:

$$\widetilde{p}_* = -0.02 + 0.016 \cdot y + 0.47 \cdot [p_{\text{pre-baseline}} \cdot (1 - p_{\text{pre-baseline}})].$$

Given this, a sample-size formula for a group of households to whom the new 2010/11 scorecard is applied twice (once after July 2011 and then again later) is

$$n = 2 \cdot \left(\frac{\alpha \cdot z}{c} \right)^2 \cdot \{ [-0.02 + 0.016 \cdot y + 0.47 \cdot [p_{\text{pre-baseline}} \cdot (1 - p_{\text{pre-baseline}})]] \} \cdot \sqrt{\frac{N - n}{n - 1}}.$$

In Peru (the only source of a data-based estimate, Schreiner, 2009d), the average α across years and poverty lines is about 1.30.

To illustrate the use of this formula, suppose the desired confidence level is 90 percent ($z = 1.64$), the desired confidence interval is ± 2.0 percentage points ($\pm c = \pm 0.02$), the poverty line is 100% of the national line, the sample will first be scored in 2016 and then again in 2019 ($y = 3$), and the population N is so large relative to the expected sample size n that the finite population correction ϕ can be taken as one (1). The pre-baseline poverty rate p_{2016} is taken as 23.4 percent (Table 1), and α is assumed to be 1.30. Then the baseline sample size is

$$n = 2 \cdot \left(\frac{1.30 \cdot 1.64}{0.02} \right)^2 \cdot \{ -0.02 + 0.016 \cdot 3 + 0.47 \cdot [0.234 \cdot (1 - 0.234)] \} \cdot 1 = 2{,}551. \text{ The}$$

same group of 2,551 households is scored at follow-up as well.

8. Targeting

When a program uses scoring for segmenting clients for differentiated treatment (*targeting*), households with scores at or below a cut-off are labeled *targeted* and given one type of treatment by the program. Households with scores above a cut-off are labeled *non-targeted* and given another type of treatment by the program.

There is a distinction between *targeting status* (scoring at or below a targeting cut-off) and *poverty status* (having consumption below a poverty line). Poverty status is a fact that is defined by whether consumption is below a poverty line as directly measured by a survey. In contrast, targeting status is a program's policy choice that depends on a cut-off and on an indirect estimate from a poverty-assessment tool.

Households who score at or below a given cut-off should be labeled as *targeted*,[39] not as *poor*. After all, unless all targeted households have poverty likelihoods of 100 percent, some of them are non-poor (their consumption is above a given poverty line). With scoring, the terms *poor* and *non-poor* have specific definitions. Using these same terms for targeting status is incorrect and misleading.

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[39] Others labels are acceptable as long as they describe the segment and do not confuse targeting status (having a score below a program-selected cut-off) with poverty status (having consumption below an externally-defined poverty line). Examples of acceptable labels include *Groups A, B, and C*; *Households scoring 29 or less, 30 to 69, or 70 or more*; and *Households who qualify for reduced fees, or do not qualify for reduced fees.*

Targeting is successful when households truly below a poverty line are targeted (*inclusion*) and when households truly above a poverty line are not targeted (*exclusion*). Of course, no poverty-assessment tool is perfect, and targeting is unsuccessful when households truly below a poverty line are not targeted (*undercoverage*) or when households truly above a poverty line are targeted (*leakage*).

Table 9 depicts these four possible targeting outcomes. Targeting accuracy varies by the cut-off score; a higher cut-off has better inclusion (but worse leakage), while a lower cut-off has better exclusion (but worse undercoverage).

Programs should weigh these trade-offs when setting a cut-off. A formal way to do this is to assign net benefits—based on a program's values and mission—to each of the four possible targeting outcomes and then to choose the cut-off that maximizes total net benefits (Adams and Hand, 2000; Hoadley and Oliver, 1998).

Table 10 shows the distribution of households by targeting outcome for Ethiopia. For an example cut-off of 29 or less, outcomes for 100% of the national line in the validation sample are:

- Inclusion: 9.9 percent are below the line and correctly targeted
- Undercoverage: 13.4 percent are below the line and mistakenly not targeted
- Leakage: 12.4 percent are above the line and mistakenly targeted
- Exclusion: 64.3 percent are above the line and correctly not targeted

Increasing the cut-off to 34 or less improves inclusion and undercoverage but worsens leakage and exclusion:

- Inclusion: 14.3 percent are below the line and correctly targeted
- Undercoverage: 9.0 percent are below the line and mistakenly not targeted
- Leakage: 22.7 percent are above the line and mistakenly targeted
- Exclusion: 54.1 percent are above the line and correctly not targeted

Which cut-off is preferred depends on total net benefit. If each targeting outcome has a per-household benefit or cost, then total net benefit for a given cut-off is:

Benefit per household correctly included   x   Households correctly included   –
Cost per household mistakenly not covered x   Households mistakenly not covered –
Cost per household mistakenly leaked   x   Households mistakenly leaked   +
Benefit per household correctly excluded   x   Households correctly excluded.

To set an optimal cut-off, a program would:

- Assign benefits and costs to possible outcomes, based on its values and mission
- Tally total net benefits for each cut-off using Table 10 for a given poverty line
- Select the cut-off with the highest total net benefit

The most difficult step is assigning benefits and costs to targeting outcomes. A program that uses targeting—with or without scoring—should thoughtfully consider how it values successful inclusion and exclusion versus errors of undercoverage and leakage. It is healthy to go through a process of thinking explicitly and intentionally about how possible targeting outcomes are valued.

A common choice of benefits and costs is the "hit rate", where total net benefit is the number of households correctly included or correctly excluded:

Hit rate = 1   x   Households correctly included   –
         0   x   Households mistakenly undercovered   –
         0   x   Households mistakenly leaked   +
         1   x   Households correctly excluded.

Table 10 shows the hit rate for all cut-offs for the new 2010/11 scorecard. For 100% of the national line in the validation sample, total net benefit—under the hit rate—is greatest (77.1) for a cut-off of 19 or less, with about three in four households in Ethiopia correctly classified.

The hit rate weighs successful inclusion of households below the line the same as successful exclusion of households above the line. If a program values inclusion more (say, twice as much) than exclusion, then it can reflect this by setting the benefit for inclusion to 2 and the benefit for exclusion to 1. Then the chosen cut-off will maximize (2 x Households correctly included) + (1 x Households correctly excluded).[40]

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[40] Figure 10 also reports BPAC, the Balanced Poverty Accuracy Criteria adopted by USAID for certifying poverty-assessment tools. IRIS Center (2005) made BPAC to consider accuracy in terms of the error of estimated poverty rates and in terms of targeting inclusion. BPAC = (Inclusion – |Undercoverage – Leakage|) x [100 ÷ (Inclusion + Undercoverage)]. Schreiner (2014b) explains why BPAC does not add any useful information beyond that provided by the more-standard measures used here. See the next section for additional discussion.

As an alternative to assigning benefits and costs to targeting outcomes and then choosing a cut-off to maximize total net benefits, a program could set a cut-off to achieve a desired poverty rate among targeted households. The third column of Table 11 ("% targeted HHs who are poor") shows, for the new 2010/11 scorecard applied to the validation sample, the expected poverty rate among households who score at or below a given cut-off. For the example of 100% of the national line, targeting households in the validation sample who score 29 or less would target 22.3 percent of all households (second column) and would be associated with a poverty rate among those targeted of 44.2 percent (third column).

Table 11 also reports two other measures of targeting accuracy. The first is a version of coverage ("% poor HHs who are targeted"). For the example of 100% of the national line with the validation sample and a cut-off of 29 or less, 42.4 percent of all poor households are covered.

The final targeting measure in Table 11 is the number of successfully targeted poor households for each non-poor household mistakenly targeted (right-most column). For 100% of the national line with the validation sample and a cut-off of 29 or less, covering 0.8 poor households means leaking to 1 non-poor household.

9. Context of poverty-measurement tools in Ethiopia

This section discusses five existing poverty-measurement tools for Ethiopia in terms of their goals, methods, definitions of *poverty*, data, indicators, bias, precision, and cost. In general, the advantages of the scorecard are its:

- Using data from the most-recent available nationally representative consumption survey
- Having fewer and lower-cost indicators
- Using a consumption-based definition of *poverty* that is widely understood and that is used by the government of Ethiopia
- Reporting errors and precision for estimates of poverty rates at a point in time from out-of-sample tests, including formulas for standard errors
- Reporting targeting accuracy, and having targeting accuracy that is likely similar to that of alternative approaches
- Being feasible for pro-poor programs in Ethiopia, due to its low cost and transparency

9.1 Gwatkin *et al.*

Gwatkin *et al.* (2007) construct a poverty-measurement tool for Ethiopia with an approach that they use in 56 countries with Demographic and Health Surveys (Rutstein and Johnson, 2004). They use Principal Components Analysis to make an asset index from low-cost indicators available for the 14,072 households in Ethiopia's 2000 DHS.[41] The PCA index is like the scorecard here except that, because the DHS does not collect data on consumption, the index is based on a different conception of *poverty*, its

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[41] All DHS datasets for Ethiopia since 2000 include each household's asset-index score (`dhsprogram.com/topics/wealth-index/Wealth-Index-Construction.cfm`, retrieved 11 June 2016).

accuracy vis-à-vis consumption-based poverty is unknown, and it can only be assumed

to be a proxy for long-term wealth/economic status.[42] Well-known examples of the PCA

asset-index approach include Stifel and Christiaensen (2007), Zeller *et al.* (2006), Sahn

and Stifel (2003 and 2000), Henry *et al.* (2003), and Filmer and Pritchett (2001).

The 23 indicators in Gwatkin *et al.* are similar to those in the scorecard in terms

of their low cost and verifiability:

- Characteristics of the residence:
    — Presence of electricity
    — Type of floor
    — Type of roof
    — Source of drinking water
    — Type of fuel for cooking
    — Type of toilet arrangement
- Number of people per sleeping room
- Whether any household members work their own or family's agricultural land
- Ownership of agricultural assets:
    — Crop land
    — Cash crops
    — Cattle or camels
    — Horses, mules, or donkeys
    — Sheep or goats

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[42] Nevertheless, the indicators are similar and the "flat maximum" is important, so carefully built PCA indexes and consumption-based poverty-assessment tools may pick up the same underlying construct (perhaps "permanent income", see Bollen, Glanville, and Stecklov, 2007), and they may rank households much the same. Comparisons of rankings of households by PCA indexes, directly-measured consumption, and consumption-based scorecards include Filmer and Scott (2012), Howe *et al.* (2009), Lindelow (2006), Sahn and Stifel (2003 and 2000), Wagstaff and Watanabe (2003), and Montgomery *et al.* (2000).

- Ownership of consumer durables:
  — Radio
  — Television
  — Telephone
  — House
  — Bicycle
  — Motorcycle or scooter
  — Car or truck
  — Electric griddle (*mitad*) for making *injera*
  — Kerosene lamps or pressure lamps
  — Beds or tables

Gwatkin *et al.* suggest three possible uses for their index:

- Segmenting households by the quintile of their index to see how health varies with socio-economic status
- Monitoring (via exit surveys) how well local health-service posts reach the poor
- Measuring local coverage of health services via small-scale surveys

The first goal is segmentation, and the last two goals deal with performance monitoring, so the asset index would be used much like the scorecard here. In particular, the scorecard's support for relative (percentile-based) poverty lines allows the segmentation of households by quintile to see how health (or other things) vary with consumption. Of course, it is also possible to segment households by quintiles based on scores from the scorecard to see how health (or other things) vary with wealth.

The Gwatkin *et al.* index is more costly and difficult-to-use than the scorecard. The index has 23 indicators (versus 8), and while the scorecard requires adding up 8 integers (some of them usually zeroes), Gwatkin *et al.*'s index requires adding up 56 numbers, each with five decimal places and about half with negative signs.

A strength of asset indexes is that, because they do not require consumption data, they can be constructed from data from a wide array of "light" surveys such as censuses, Demographic and Health Surveys, Welfare Monitoring Surveys, and Core Welfare Indicator Questionnaires. In comparison, the scorecard is linked directly to a consumption-based poverty line. Thus, while both approaches can rank households, only the scorecard can estimate consumption-based poverty status. Like an asset index, the scorecard can be applied to data from a "light" survey that does not collect consumption as long as the "light" survey collects indicators that match those in the scorecard (Schreiner, 2011).

In essence, Gwatkin *et al.*—like all asset indexes—define *poverty* in terms of the indicators and points in the index itself. Thus, the index is not a proxy standing in for something else (such as consumption). Rather, it is a direct measure of a non-consumption-based definition of *poverty*. There is nothing wrong—and a lot right— about defining *poverty* in this way, but it is not as common as a consumption-based definition. It also means that ranks are not comparable across different asset indexes because the definition of *poverty* varies with a given index's indicators and points.

In general, the asset-based approach defines people as *poor* if their assets (physical, human, financial, and social) fall below a threshold. Arguments for an asset-based view of development include Carter and Barrett (2006), Schreiner and Sherraden (2006), Sahn and Stifel (2003), and Sherraden (1991). The main advantages of the asset-based view are that:

- Asset ownership is easier to measure accurately than consumption
- Access to resources in the long term—and thus capacity to produce income and to consume—depends on the control of assets
- Assets get at capability more directly, the difference between, say, "Would income allow for adequate sanitation?" versus "Does the toilet drain to a septic tank?"

While the asset view and the income/consumption view are distinct, they are also tightly linked. After all, income and consumption are flows of resources received/consumed from the use of stocks of assets. Both views are low-dimensional simplifications—due to practical limits on definitions and measurement—of a higher-dimensional and more complete conception of the production of human well-being.

9.2 Devereux and Sharp

Devereux and Sharp (2003)[43] suggest that the measured decrease in poverty in Ethiopia in the early 1990s (attributed by Dercon—2002 and 2000—to improved governance and economic liberalization) might be an artifact of small, non-representative samples combined with swings in weather and aid. To check, they survey 2,127 households in the Wollo (now Amhara) region in 2001/2, collecting "objective indicators of basic needs and livelihood resources, plus one more holistic indicator of household (in)dependence based on self-assessment" (p. 16). They define *destitution* as extreme poverty that leads to livelihoods that are unsustainable in that they erode a household's base of productive assets (labor, land, and livestock), leading to dependence on support from outside the household.

Devereux and Sharp build a 15-indicator PCA-based index and compare its scores to self-assessed destitution. They find that 95 percent of those who self-identify as destitute fall in the bottom two quintiles of the PCA index, and they define these cases as "poor".

To check whether destitution has worsened over time, Devereux and Sharp ask respondents to recall values of the indicators in the PCA index and to self-assess their destitution as of one, two, and ten years ago. Based on this estimate of change, they find that poverty by their definition in Wollo more than doubled in the 1990s.

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[43] Also, Devereux and Sharp (2006).

Like the scorecard, Devereux and Sharp's PCA index can be used for targeting, measuring poverty rates (by their non-consumption definition), and measuring changes in poverty rates. Their definition of *poverty* depends on self-assessed (in)dependence; this is a valid definition, although it is qualitative and not-often used.

The other major difference is that Devereux and Sharp's PCA index is more difficult for non-specialists to implement. In particular, their 15 indicators are generally more complex and costly to verify:

- Agricultural assets:
  — Whether any livestock are owned
  — Whether any oxen are owned
  — Whether less than half a hectare of land is owned
  — Whether less than half a hectare of land is cultivated
- Labor capacity:
  — Whether there are less than two adult-equivalent potential workers
  — Whether there are any adult male potential workers
  — Whether there is access to non-household labor
- Basic needs:
  — Whether the roof and walls are of poor quality
  — Whether "basic items" are present in the home
  — Whether clothes were bought three or more times in the past three years
  — Whether the household ate one or zero times in a day in the worst month in the past year
  — Whether the household had food shortages in three or more months in the past year
- Social capital:
  — Whether the household has social support networks that offer help
  — Whether the household participates in any social institutions
- Whether the household receives formal or informal credit in cash or any cash gifts or remittances

These indicators are more difficult (and thus probably more inaccurate) than scorecard indicators because they involve subjective judgments (What is "access" to non-household labor? What is a "poor quality" roof or wall? What are "basic items"?),

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non-verifiable reports of past events (food consumed and clothes purchased), calculations (adult-equivalent workers), and sensitive issues (receipt of cash gifts or remittances, and hunger spells).

Devereux and Sharp's work nevertheless breaks new ground in poverty measurement, effectively combining quantitative methods (PCA index) with qualitative methods (self-assessment of (in)dependence) as well as using recall to measure changes in poverty over time.[44]

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[44] Hernández and Schreiner (2012) use recall data with the scorecard to measure changes in consumption-based poverty rates over time in Bangladesh.

9.3 Vyas and Kumaranayake

Vyas and Kumaranayake (2006) bills itself as a "how-to" primer on PCA indexes. As a running example, they use urban and rural indexes from the 14,072 households in Ethiopia's 2000 DHS. Vyas and Kumaranayake's indicators resemble those here and in Gwatkin *et al.* (2007) in that they are few, simple, and verifiable:

- Characteristics of the residence:
  — Presence of electricity
  — Type of floor
  — Number of rooms for sleeping
  — Source of drinking water
  — Type of toilet arrangement
- Asset ownership:
  — Radio
  — Television
  — Refrigerator
  — Telephone
  — Bicycle
  — Car

As usual, Vyas and Kumaranayake can only assume that their indexes represent economic status. Indeed, they do not relate their indexes to anything, not a quantitative measure of health as in Gwatkin *et al.* (2007) nor a qualitative measure of destitution as in Devereux and Sharp (2003). They do not present ready-to-use indexes.

9.4 Rogers *et al.*

In the spirit of Sahn and Stifel (2000), Rogers *et al.* (2011) pool DHS data from Eritrea (2002), Kenya (2003), Uganda (2001), and Ethiopia (2005) to make a single regional PCA asset index. They then use geographic indicators (environmental and remotely-sensed) to estimate the deciles of the asset index for households in the four DHS countries as well as in Djibouti, Somalia, and Sudan, three countries in the Horn of Africa that lack DHS data. While there is no benchmark to check accuracy, Rogers *et al.* say that the broad patterns in their poverty maps look reasonable, suggesting that the environmental poverty-mapping approach can be useful in countries without a national survey that measures poverty (as long as its neighbors are similar and have comparable national surveys).

The goal of Rogers *et al.* (2011) is to show the potential usefulness of their poverty-mapping approach. As such, they mostly demonstrate that the data required for their calculations are available and that the calculations can be done. They offer no specific policy implications for Ethiopia nor for the other six countries.

Like other PCA-based asset indexes based on DHS data, Rogers *et al.*'s 11

indicators are low-cost and verifiable:

- Characteristics of the residence:
    — Presence of electricity
    — Type of floor
    — Source of drinking water
    — Type of toilet arrangement
- Ownership of consumer durables:
    — Radio
    — Television
    — Refrigerator
    — Telephone
    — Bicycle
    — Motorcycle
    — Car

Roger's *et al.* do not propose that their asset index be turned into a survey to collect indicator values from individual households. Instead, they they derive the index values from DHS data. The index values then serve as measures of a household's poverty that is extrapolated to small areas (the size of which are not reported) via non-linear discriminant analysis in which the indicators have been selected in a stepwise fashion.[45] This provides estimates of poverty rates for small areas not covered by the DHS. For the model favored by Rogers *et al.* that predicts the decile of the index value for individual households, the 8 indicators (all of which are objectively measured, often by satellite) are:

- Human Influence Index
- Enhanced Vegetation Index (mean)
- ETR (second phase)[46]
- Precipitation (mean)
- Actual evapotranspiration (first amplitude, second amplitude, and maximum)
- Potential evapotranspiration (maximum)
- Night Land Surface Temperature (second amplitude)
- Day Land Surface Temperature (third phase)

Rogers *et al.* for Ethiopia is part of a series of papers[47] (hereafter, "Rogers and Robinson, *et al.*) that apply their poverty-mapping approach in Uganda to predict consumption with geographic and remotely-sensed (satellite) environmental indicators instead of household-level socio-economic indicators from a national consumption

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[45] Rogers *et al.* note that the first indicator selected by the stepwise algorithm strongly influences later selections and the overall look of the resulting poverty map.

[46] Rogers *et al.* do not define "ETR".

[47] Nelson, Rogers, and Robinson, 2011; Robinson, Emwanu, and Rogers, 2007; Rogers, Emwanu, and Robinson, 2006.

survey. Their aim is to inform pro-poor policy by describing poverty, explaining the drivers of poverty, and predicting how changes in the drivers will lead to changes in poverty (Robinson, Emwanu, and Rogers, 2007, p. 205). They present their approach as an alternative to the poverty-mapping approach in economics (Elbers, Lanjouw, and Lanjouw, 2002) that uses consumption-based poverty-assessment tools based on data from national consumption surveys to "circularly" (Rogers *et al.*, 2006, p. 1) estimate poverty in small areas based on socio-economic indicators (such as those used by the scorecard and by the other poverty-assessment tools reviewed here) with census data.

According to Rogers and Robinson *et al.*, environmental factors (such as the distance from a main road, aridity, or the length of the growing season) differ from socio-economic characteristics (such as number of household members, type of roof, or ownership of a radio) in that the environment affects a given household more strongly and more immediately than the household affects its environment (as long as the household does not move). Thus, a statistical association between an environmental indicator and poverty is more likely to reflect the causal effect of the environmental indicator on poverty rather than vice versa (and rather than the effect of a third factor that causes or is correlated with both poverty and the environmental indicator). In contrast, radio ownership (for example) is probably mostly caused by poverty, rather than being a cause of poverty. This means that finding (for example) that distance from a main road is statistically linked with poverty may lead more directly to policy recommendations (build more and better roads closer to where the poor live) than does

finding that radio ownership is linked with poverty. Furthermore, environmental indicators change slowly over time, exist in centralized repositories, and are available for much of the world.

For Uganda, Nelson, Rogers, and Robinson (2011) report that—for their preferred cell size of 31 km^2—estimates from their environmental poverty map have lower errors and provide about seven times better spatial resolution than the socio-economic poverty map in Emwanu *et al.* (2003). They conclude (p. 43) that "an environmental approach to poverty mapping in Uganda consistently out-performs [socio-economic poverty mapping] at equivalent spatial resolution."

Rogers and Robinson *et al.* say that their environmental-indicator poverty maps are superior to socio-economic poverty maps (and, by extension, superior to the scorecard). "Brutally put, [with socio-economic indicators] we end up with a relatively poor description of poverty, no explanation, and no clear idea of how to intervene to make a difference. . . . It is time to take poverty mapping out of the realm purely of socio-economics" (Rogers, Emwanu, and Robinson, 2006, pp. 1 and 36).

While environmental poverty maps do provide greater resolution and so more accurate geographic targeting in small areas, and while environmental poverty maps do provide more unequivocal identification of some of the fundamental drivers of poverty, it does not necessarily follow that environmental poverty maps provide better information for improving pro-poor policy. After all, policy-makers cannot pass laws to

change aridity or the length of the growing season.[48,49] The actionable recommendations that the environmental approach does highlight—for example, to extend improved agricultural extension services to more poor farmers, to build more and better roads in poor areas, and to eradicate disease and vector-borne pathogens—are already at the top of the list of most careful poverty-alleviation strategies. But the technical solutions to the environmental drivers of poverty are developed and delivered by people and institutions embedded in socio-economic/political systems ruled not by the laws of physics or biology but by human-made incentives. Development is a social process, not a chemical reaction; if doing the right thing for the poor were merely a technical problem, then governments (and non-government organizations, and individuals) would single-mindedly, efficiently, and continuously develop improved technical solutions and deliver those that already exist. Would that it were enough to identify the drivers of poverty. Of course, it is useful, but poverty measurement, in and of itself (and this includes, of course, the scorecard), does only a little to provide people and organizations with the incentives to combine estimates of poverty with other information to try to determine ways to change drivers and then to execute the changes.

In this sense, environmental science and social science are complements, not substitutes. In fact, it would make sense—as Rogers and Robinson *et al.* speculate—to make poverty maps with both environmental and socio-economic indicators. Overlap

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[48] Except inasmuch as, in the long term, policy affects environmental change.
[49] As Rogers, Emwanu, and Robinson (2006, p. 36) themselves note, "Poverty mapping is an exercise in development, not statistics."

between the two domains is likely low, offering the possibility of improving accuracy for smaller areas. Of course, more accuracy still does not solve the incentive issues involved in development and delivery, but it does improve the contribution can be made by an analyst at a desk.

As Rogers and Robinson *et al.* acknowledge, environmental poverty mapping is mostly useful in rural areas, especially where subsistence agriculture dominates. In urban areas, poorer households are more likely to live close to richer households in the same spatial cell, reducing the accuracy of environmental poverty maps (Bird *et al.*, 2014; Tatem *et al.* 2014).

Finally, Nelson, Rogers, and Robinson (2011, p. 44) recognize that, because the environmental approach does not predict consumption at the level of the household, it cannot estimate person-level poverty rates. This matters because head-count, consumption-based poverty rates are well-understood and tend to dominate conversations about poverty among policymakers and in the press.

9.5   IRIS Center

USAID commissioned IRIS Center (2009) to build a "Poverty Assessment Tool"

(PAT) with data from the 2004/5 HICE and the 2005 WMS for use by USAID's

microenterprise partners in Ethiopia who are required to report the share of their

participants who are "very poor". As discussed in Schreiner (2014b), the PAT for

Ethiopia is like the scorecard, except that the PAT:

- Estimates consumption (rather than poverty likelihoods) and then converts estimated consumption into a poverty likelihood of either 0 or 100 percent (rather than a poverty likelihood that is between 0 and 100 percent)
- Has more indicators (18 rather than 10)

The PAT supports two poverty lines:

- $1.25/day 2005 PPP
- $2.50/day 2005 PPP

IRIS (2009) tests four regression-based approaches in both one-stage and two-stage versions (IRIS, 2005), settling on a one-step quantile regression that estimates the 45th percentile of the logarithm of per-capita household consumption. It uses 18 indicators:

- Demographics:
    - Number of household members (and its square)
    - Sex of the household head
    - Age of the household head (and its square)
    - Marital status of the household head
- Share of household members (excluding the head) who can read and write
- Residence:
    - Number of rooms
    - Type of roof
    - Type of cooking fuel
    - Source of energy for lighting
    - Source of drinking water
- Ownership of consumer durables:
    - *Gabi*
    - Radio
    - Television
    - Video playback device
- Ownership of agricultural assets:
    - Number of cattle
    - Number of axes
- Location of residence:
    - Region
    - Urban/rural

All these indicators are inexpensive and verifiable.

Schreiner (2014b) does not report an apples-to-apples comparison of accuracy for IRIS (2009) versus the old 2004/5 scorecard from Schreiner and Chen (2009). This is because IRIS (2009) reports out-of-sample bias and targeting accuracy for the PAT only for a previous version of the $1.25/day 2005 PPP line that used an incorrect PPP factor.

In its documentation of accuracy, IRIS focuses on the Balanced Poverty Accuracy Criterion. IRIS Center (2005) introduced BPAC, and USAID adopted it as its criterion for approving poverty-assessment tools for use by its microenterprise partners. BPAC considers accuracy in terms of targeting inclusion and in terms of the absolute difference between targeting undercoverage and leakage (which, under the PAT's approach, is equal to the absolute value of the error in the estimated poverty rate). The formula is:

$$\text{BPAC} = 100 \cdot \left(\frac{\text{Inclusion} - \mid \text{Undercoverage} - \text{Leakage} \mid}{\text{Inclusion} + \text{Undercoverage}} \right).$$

Because the error (in the PAT approach) is the difference between undercoverage and leakage, and because the normalization term $\dfrac{100}{\text{Inclusion} + \text{Undercoverage}}$ is possibly relevant only when comparing tools across populations with different poverty rates (but irrelevant when selecting among alternative tools for a given country in a given year for a given poverty line), the simpler formula $\text{BPAC} = \text{Inclusion} - \mid \text{Average error} \mid$ ranks poverty-measurement tools the same as the more complex formula.

Expressing BPAC as Inclusion – | Average error | helps to show why BPAC is not useful for comparing the PAT with the scorecard (Schreiner, 2014b). Given the assumptions discussed earlier,[50] the scorecard produces unbiased estimates of poverty rates, regardless of whether undercoverage differs from leakage. While BPAC can be used to compare alternative scorecards that use the PAT's consumption-estimation approach, it does not make sense to apply BPAC to the scorecard's likelihood-estimation approach. This is because—unlike the PAT—the scorecard does not use a single cut-off to classify households as either 100-percent poor or 0-percent poor. Instead, households have an estimated poverty likelihood somewhere between 0 to 100 percent. If a scorecard user sets a targeting cut-off, then that cut-off matters only for targeting, without affecting the estimation of poverty rates at all.

Although IRIS reports the PAT's targeting accuracy and although the BPAC formula considers targeting accuracy, IRIS—following the developers of poverty-mapping—says that the PAT should not be used for targeting.[51]

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[50] The unbiasedness of the PAT also requires these same assumptions.
[51] `povertytools.org/faq/faq.html#11`, retrieved 19 February 2009.

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IRIS also doubts that the PAT can be useful for measuring change over time, noting that "it is unclear that the tools will be able to identify real changes in poverty over time due to their inherent measurement errors. Unless the changes in the poverty rate are exceptionally large and unless the tools are exceptionally accurate, then the changes identified are likely to be contained within the margin of error."[52]

That is, IRIS asserts[53] that the confidence interval for estimates of change—for some unstated confidence level, some unstated sample size, and some unstated true change—will usually include zero. As noted earlier, this paper does not test the accuracy of estimates of change over time with the new 2010/11 scorecard for Ethiopia. Nevertheless, tests for other countries—for example, Bolivia, see Schreiner (2015b)—suggest that it is not uncommon for scorecard estimates of change to be in the right direction as well as statistically different from zero.

In the same way and as discussed earlier, targeting is a possible use that is supported for the scorecard, despite IRIS' doubts. In particular, this paper reports targeting accuracy so users can decide for themselves whether scoring targets adequately for their purposes.

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[52] `povertytools.org/faq/faq2.html`, retrieved 7 December 2012.

[53] IRIS has not reported the accuracy for estimates of change over time by the PAT.

10. Conclusion

Pro-poor programs in Ethiopia can use the scorecard to segment clients for differentiated treatment as well as to estimate:

- The likelihood that a household has consumption below a given poverty line
- The poverty rate of a population at a point in time
- The change in the poverty rate of a population over time

The scorecard is inexpensive to use and can be understood by non-specialists. It is designed to be practical for pro-poor organizations in Ethiopia that want to improve how they monitor and manage their social performance.

The scorecard is constructed with data from half of the households in Ethiopia's 2010/11 HCES and in the 2011 WMS. Those households' scores are then calibrated to poverty likelihoods for 20 poverty lines. The accuracy of the scorecard is tested out-of-sample on data that is not used in scorecard construction. Errors and precision are reported for estimates of households' poverty likelihoods and for populations' poverty rates at a point in time. Of course, the scorecard's estimates of change are not necessarily the same as estimates of program impact. Targeting accuracy is also reported.

When the scorecard is applied to the 20 poverty lines in the validation sample, the maximum absolute error for point-in-time estimates of poverty rates is 1.2 percentage points, and the average absolute error is about 0.6 percentage points. Corrected estimates may be had by subtracting the known error for a given poverty line from original, uncorrected estimates.

For $n = 16,384$ and 90-percent confidence, the precision of point-in-time estimates of poverty rates is ± 0.7 percentage points or better. With $n = 1,024$, the 90-percent confidence intervals are ± 2.9 percentage points or better.

If an organization wants to use the scorecard for segmenting clients for differentiated treatment, then the results here provide useful information for selecting a targeting cut-off that fits its values and mission.

Although the statistical technique is innovative, and although technical accuracy is important, the design of the scorecard focuses on transparency and ease-of-use. After all, accuracy is irrelevant if an organization's managers feel so daunted by a scorecard's complexity or its cost that they do not even try to use it.

For this reason, the scorecard uses 8 indicators that are straightforward, low-cost, and verifiable. Points are all zeros or positive integers, and scores range from 0 (most likely below a poverty line) to 100 (least likely below a poverty line). Scores are converted to poverty likelihoods via look-up tables, and targeting cut-offs are likewise straightforward to apply. The design attempts to facilitate voluntary adoption by helping managers to understand and to trust scoring and by allowing non-specialists to add up scores quickly in the field.

In summary, the scorecard is a practical, objective way for pro-poor programs in Ethiopia to estimate consumption-based poverty rates, track changes in poverty rates over time, and segment participants for differentiated treatment. The same approach can be applied to any country with similar data.

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Guidelines for the Interpretation of Scorecard Indicators

The excerpts quoted below come from:

Central Statistical Agency. (2011) "Enumerator Manual for the 2011 Welfare Monitoring Survey", [the *Manual*] (in Amharic).

and

Central Statistical Agency. (2011) "Questionnaire for the 2011 Welfare Monitoring Survey", [the *Questionnaire*].

When an issue comes up that is not addressed here, its resolution should be left to the unaided judgment of the enumerator, as that seems to have been what Ethiopia's Central Statistical Agency (CSA) did in the 2011 WMS. That is, an organization using the scorecard should not promulgate any definitions nor rules (other than those in these "Guidelines") to be used by all its field agents. Anything not explicitly addressed in these "Guidelines" is to be left to the unaided judgment of each individual enumerator.

Admittedly, this is a not a very satisfactory way to resolve such issues, but in the absence of knowledge (from some source other than the *Manual*) of what the CSA taught enumerators for the 2011 WMS to do, there is no better alternative.

General guidelines for asking scorecard questions

Fill out the scorecard header and the "Back-page Worksheet" first, following the directions on the "Back-page Worksheet".

Do not ask the first scorecard indicator directly ("How many members does the household have?"). Instead, use the information recorded on the "Back-page Worksheet" to determine the response to mark. You must also record the number of household members in the scorecard header next to "Number of household members:".

In general, do not read the response options to the respondent. Just read the question, and then stop; wait for a response. If the respondent asks for clarification or otherwise hesitates or seems confused, then read the question again or provide additional assistance based on these "Guidelines" or as you, the enumerator, deem appropriate.

In general, you should accept the responses given by the respondent. Nevertheless, if the respondent says something—or if you see or sense something—that suggests that the response may not be accurate, that the respondent is uncertain, or that the respondent desires assistance in figuring out how to respond, then you should read the question again and provide whatever help you deem appropriate based on these "Guidelines".

While most indicators in the scorecard are verifiable, you do not—in general—need to verify responses. You should verify a response only if something suggests to you that the response may not be accurate and thus that verification might improve data quality.

For example, you might choose to verify if the respondent hesitates, seems nervous, or otherwise gives signals that he/she may be lying or be confused. Likewise, verification is probably appropriate if a child in the household or a neighbor says something that does not square with the respondent's answer.

Verification is also a good idea if you happen to see something yourself—such as a consumer durable that the respondent avers not to possess, or a child eating in the room who has not been counted as a member of the household—that suggests that the response may not be accurate.

In general, your application of the scorecard should mimic as closely as possible CSA's application of the 2011 WMS. For example, poverty-scoring interviews should take place in respondents' homesteads because the 2011 WMS took place in respondents' homesteads.

<u>Questionnaire translation</u>:
The 2011 WMS left translation of the survey instrument to languages other than English to each individual enumerator (perhaps with the help of local translators). When such translation was needed, it apparently was done on the spot.

While the application of the scorecard should, in general, mimic the application of the 2011 WMS, it nevertheless makes sense to have a standard, well-done, checked translation to languages that are common in Ethiopia (such as Amharic and Oromo, among others).

Without a standard translation, the variation in translations and interpretations across enumerators could greatly harm data quality. Of course, any translation should reflect the meaning in the original English WMS survey instrument as closely as possible. Ideally, all organizations using the scorecard in a given dialect or language in Ethiopia would coordinate to produce and use a single translation.

Who is the head of the household?

According to Section 2.2 (G) of the *Manual*, the *head of the household* is "the male or female member of the household who is considered as the head by the other members of the household.

"If a polygamous man splits his time equally among all his wives, and if each wife lives in different household, then the man counts as the *household head* only in the household of his oldest living wife." [If, however, a polygamous man does not split his time equally among all his wives, then he counts as the head only in the household of the wife with whom he spends the most time.]

Guidelines for specific scorecard indicators

1. How many members does the household have?
   A. Seven or more
   B. Six
   C. Five
   D. Four
   E. Three
   F. Two
   G. One

According to Section 2.2 of the *Manual*, a *household* is "one or more people—regardless of blood or marital relationship—who live in the same residence or compound, who cook in the same kitchen, and who eat together. People without a blood or marital relationship who live and eat with the household (such as domestic servants or guards) are considered as *household members* as long as they live and eat with the household.

"A household may have one or more members. For example, an individual living alone is considered as a one-person household.

"Someone who has been away from the household for six months or more—or who is currently away and whose total expected absence is expected to be six months or more—is not considered to be a *household member*. Likewise, someone who has joined another household is not considered to be a member of the interviewed household, even if the total absence so far is less than six months.

"A common household structure is a husband, his wife, their children, their adopted children, their relatives, and non-relatives (such as domestic servants).

"If a man has more than one wife, and if his wives (and the wives' children and relatives and so on) do not live in the same residence or compound and do not cook and eat together, then the husband—if he spends equal time with each wife—is counted as a member of the household with his oldest [living] wife. His other wives and their children and so on are counted as separate households, even if the husband supports them all, and the husband is not counted as a member of those households. On the other hand, if a husband supports more than one household but spends more time with one of them (for example, with the newest wife) than the others, then he is counted as a member of the household of the wife with whom he spends the most time.

"It is possible for two or more households to share a single residence.

"Someone who has lived continuously with the household for six months or more—or who currently lives and eats with the household and whose expects to stay for six months or more—counts as a *household member*. Furthermore, newly-weds and newborns who recently joined the household and who expect to stay permanently count as *household members*, even if they have been with the household for less than six months.

"Examples of household members include the following:

- "Anyone who has lived and eaten with the household for six or more months as of the day of the interview
- Anyone who is currently living and eating with the household who, even though they have not been with the household for six months yet, expects to stay with the household for a total duration of at least six months
- Domestic servants who usually sleep in the residence of the household and who do not have another household to return to
- People who usually live and eat with the household but who, on the day of the interview, are temporarily absent. Such people may be away, for example, on vacation, at a hospital, away on a business trip, or visiting relatives
- Anyone who is living and eating with the household on the day of the interview who has no other place to live nor somewhere else to return to. This includes homeless people who move from place to place but who happen to be with the household on the day of the interview
- Students who travel to school every day count as members of the household that they live with. Students who have moved away from their parents/families and who stay in formal schools, colleges, universities, and so on to pursue their education should not be counted as members the household of their parents/family. Likewise, students who go to boarding school or who have moved away from their parents and live in rented houses or with relatives are not considered as members of the household of their parents/family, even if they visit their parents/family every week or so and even if the family brings them food. Instead, these students should be counted as members of the household with which they live"

2. Can the male head/spouse read and write?
    A. No male head/spouse
    B. No
    C. Yes

According to the *Manual*, if the respondant says that the male head/spouse is literate, then make "C. Yes". If the respondent says that the male head/spouse is not literate, then mark "B. No". Finally, if there is no male head/spouse, mark "A. No male head/spouse".

     Literate means that the male head/spouse can read and write in any language. A person who can only read and write their names or numbers does not count as *literate.* Likewise, a person who can only recite religious passages or memorized sentences does not count as *literate.*

Remember that you already know the name of the male head/spouse (and whether he exists) from the notes you took for your own use while compiling the "Back-page Worksheet". Thus, if there is a male head/spouse, do not mechanically ask, "Can the male head/spouse read and write?". Instead, use the actual name of the male head/spouse, for example: "Can Tesfaye read and write?". If there is no male head/spouse, then do not read the question at all; just mark "A. No male head/spouse" and proceed to the next indicator.

For the purposes of the scorecard, the *male head/spouse* is defined as:

* The household head, if the head is male
* The spouse/conjugal partner of the household head, if the head is female
* Non-existent, if the head is female and if she does not have a spouse/conjugal partner who is a member of the interviewed household

Accept the response of the respondent. In particular, do not test whether the male head/spouse can read, for example, by showing him a short sentence printed on a card.

According to Section 2.2 (G) of the *Manual*, the *head of the household* is "the male or female member of the household who is considered as the head by the other members of the household.

     "If a polygamous man splits his time equally among all his wives, and if each wife lives in different household, then the man counts as the household head only in the household of his oldest living wife." [If, however, a polygamous man does not split his time equally among all his wives, then he counts as the head only in the household of the wife with whom he spends the most time.]

3. Can the (oldest) female head/spouse read and write?
   - A. No female head/spouse
   - B. No
   - C. Yes

According to the *Manual*, if the respondant says that the female head/spouse is literate, then make "C. Yes". If the respondent says that the female head/spouse is not literate, then mark "B. No". Finally, if there is no female head/spouse, mark "A. No female head/spouse".

Literate means that the female head/spouse can read and write in any language. A person who can only read and write their names or numbers does not count as *literate*. Likewise, a person who can only recite religious passages or memorized sentences does not count as *literate*.

Remember that you already know the name of the female head/spouse (and whether she exists) from the notes you took for your own use while compiling the "Back-page Worksheet". Thus, if there is a female head/spouse, do not mechanically ask, "Can the female head/spouse read and write?". Instead, use the actual name of the female head/spouse, for example: "Can Abeba read and write?". If there is no female head/spouse, then do not read the question at all; just mark "A. No female head/spouse" and proceed to the next indicator.

For the purposes of the scorecard, the *female head/spouse* is defined as:

- The household head, if the head is female
- The spouse/conjugal partner of the household head, if the head is male
- Non-existent, if the head is male and if he does not have a spouse/conjugal partner who is a member of the interviewed household

Accept the response of the respondent. In particular, do not test whether the female head/spouse can read, for example, by showing her a short sentence printed on a card.

According to Section 2.2 (G) of the *Manual*, the *head of the household* is "the male or female member of the household who is considered as the head by the other members of the household.

"If a polygamous man splits his time equally among all his wives, and if each wife lives in different household, then the man counts as the household head only in the household of his oldest living wife." [If, however, a polygamous man does not split his time equally among all his wives, then he counts as the head only in the household of the wife with whom he spends the most time.]

4. What is the main source of energy for cooking?
    A. Firewood, charcoal, or crop residue/leaves
    B. Dung/manure
    C. Saw dust, kerosene, butane gas, electricity, solar energy, biogas, none, or other

Firewood includes both purchased and collected firewood.

The *Manual* contains no additional information on this indicator.

5. Does the the household currently own any mattresses or beds?
    A. No
    B. Yes

The *Manual* contains no additional information on this indicator.

6. Does the household currently own any radios/radio-and-tape players/tape players?
    A. No
    B. Yes

The *Manual* contains no additional information on this indicator.

7. How many *gabi* does the household currently own?
   A. None
   B. One
   C. Two or more

The *Manual* contains no additional information on this indicator.

8. If the household farms, then does it currently own any plows?
   A. Does not farm
   B. Farms, but does not have plows
   C. Farms, and has plows

According to the *Manual*, this question asks whether the household is agricultural.

According to the *Questionnaire*, the plow could be traditional or modern.

This indicator should be asked in two parts. First, ask: "Does the household farm?" If the answer is No, then mark "A. Does not farm", and do not ask the second part of the question.
   If the household does farm (that is, if the response to the first part of the question is "Yes"), then ask the second part of the question: "Does the household currently own any plows?" Mark the response as follows:

- If the household does not own any plows, then mark "B. Farms, but does not have plows"
- If the household owns one or more plows, then mark "C. Farms, and has plows"

Does the household farm?	Does the household currently own any plows?	Response
No	No	A
No	Yes	A
Yes	No	B
Yes	Yes	C

Plows refers only to the farming implement or tool used to till the soil. It does not refer to any animals (such as oxen or horses) or mechanical tractors used to pull the plow. For example, a household that farms and that owns a plow but does not own a tractor nor any animals to pull the plow is still recorded as "C. Farms, and has plows".

Table 1: National poverty lines, poverty rates, and sample size for all of Ethiopia and for the construction and validation samples, by households and people in 2010/11

Region	Line or Rate	HHs or People	HHs Surveyed	Poverty lines (ETB/adult equivalent/day) and rates (%)			
					National poverty lines		
				Food	100%	150%	200%
All Ethiopia							
	Line	People		5.10	10.34	15.50	20.67
	Rate	HHs	24,261	2.4	23.4	54.5	74.9
	Rate	People		3.5	29.6	63.1	82.2
Construction and calibration (Selecting indicators and points, and associating scores with poverty likelihoods)							
	Rate	HHs	12,105	2.5	23.5	54.5	74.9
Validation (Measuring accuracy)							
	Rate	HHs	12,156	2.4	23.3	54.4	74.9

Source: 2010/11 HCES.

Poverty lines are in units of daily per-adult-equivalent ETB in average prices for all of Ethiopia in December 2010.

Table 1: International 2005 and 2011 PPP poverty lines, poverty rates, and sample size for all of Ethiopia and for the construction and validation samples, by households and people in 2010/11

Region	Line or Rate	HHs or People	HHs Surveyed	Poverty lines (ETB per person per day) and poverty rates (%)									
				2005 PPP poverty lines						2011 PPP poverty lines			
				$1.00	$1.25	$1.75	$2.00	$2.50	$5.00	$1.90	$3.10	$3.80	$4.00
All Ethiopia													
	Line	People		6.67	8.33	11.67	13.34	16.67	33.34	8.53	13.92	17.07	17.97
	Rate	HHs	24,261	13.8	26.0	51.5	61.9	76.2	95.5	27.5	65.2	77.5	80.0
	Rate	People		18.1	32.6	60.3	70.5	83.4	98.0	34.3	73.7	84.6	86.7
Construction and calibration (Selecting indicators and points, and associating scores with poverty likelihoods)													
	Rate	HHs	12,105	13.8	26.1	51.7	61.9	76.1	95.5	27.5	65.2	77.5	80.0
Validation (Measuring accuracy)													
	Rate	HHs	12,156	13.8	25.9	51.3	61.9	76.2	95.4	27.5	65.3	77.5	79.9

Source: 2010/11 HCES.

Poverty lines are in units of daily per-capita ETB in average prices for all of Ethiopia in December 2010.

Table 1: Relative and percentile-based poverty lines, poverty rates, and sample size for all of Ethiopia and for the construction and validation samples, by households and people in 2010/11

Region	Line or Rate	HHs or People	HHs Surveyed	Poverty lines (ETB per person per day) and poverty rates (%)					
				Poorest half	Percentile-based lines				
				<100% Natl.	20th	40th	50th	60th	80th
All Ethiopia									
	Line	People		6.68	7.46	9.91	11.09	12.56	16.78
	Rate	HHs	24,261	11.0	15.3	32.6	41.7	51.4	72.4
	Rate	People		14.7	19.9	40.0	50.0	60.1	80.3
Construction and calibration (Selecting indicators and points, and associating scores with poverty likelihoods)									
	Rate	HHs	12,105	11.1	15.3	32.7	41.6	51.6	72.5
Validation (Measuring accuracy)									
	Rate	HHs	12,156	10.9	15.3	32.5	41.8	51.2	72.4

Source: 2010/11 HCES.

Poverty lines are in units of daily per-capita ETB in average prices for all of Ethiopia in December 2010.

Table 2 (All of Ethiopia): National poverty lines and poverty rates for households and people by urban/rural/all in 2010/11

| Region | Year | Line/rate | n | Poverty line (ETB/adult equivalent/day) and poverty rate (%) National | | | |
				Food	100%	150%	200%
Urban	2010/11	Line		6.55	13.29	19.93	26.57
		Rate (HHs)	14,939	2.0	18.7	41.8	59.3
		Rate (people)		3.2	26.1	53.3	70.7
Rural	2010/11	Line		4.82	9.76	14.64	19.52
		Rate (HHs)	9,322	2.5	24.6	57.7	79.0
		Rate (people)		3.6	30.3	65.0	84.5
All	2010/11	Line		5.10	10.34	15.51	20.67
		Rate (HHs)	24,261	2.4	23.4	54.5	74.9
		Rate (people)		3.5	29.6	63.1	82.2

Source and definitions: See Table 1 and text.

Table 2 (All of Ethiopia): International 2005 and 2011 PPP poverty lines and poverty rates for households and people by urban/rural/all in 2010/11

Region	Year	Line/rate	n	\$1.00	\$1.25	\$1.75	\$2.00	\$2.50	\$5.00	\$1.90	\$3.10	\$3.80	\$4.00
				Poverty line (ETB/person/day) and poverty rate (%)									
				International 2005 PPP						International 2011 PPP			
Urban	2010/11	Line		8.57	10.71	15.00	17.14	21.42	42.85	10.97	17.90	21.94	23.09
		Rate (HHs)	14,939	10.7	19.6	37.8	45.9	58.5	86.7	20.6	48.3	59.6	62.6
		Rate (people)		15.7	27.0	48.7	57.8	70.5	93.5	28.4	60.3	71.6	74.4
Rural	2010/11	Line		6.30	7.87	11.02	12.59	15.74	31.48	8.06	13.15	16.12	16.97
		Rate (HHs)	9,322	14.6	27.7	55.1	66.1	80.8	97.7	29.3	69.6	82.1	84.5
		Rate (people)		18.6	33.7	62.5	73.0	85.9	98.9	35.4	76.3	87.1	89.1
All	2010/11	Line		6.67	8.33	11.67	13.33	16.67	33.34	8.53	13.92	17.07	17.97
		Rate (HHs)	24,261	13.8	26.0	51.5	61.9	76.2	95.5	27.5	65.2	77.5	80.0
		Rate (people)		18.1	32.6	60.3	70.5	83.4	98.0	34.3	73.7	84.6	86.7

Source and definitions: See Table 1 and text.

Table 2 (All of Ethiopia): Relative and percentile-based poverty lines and poverty rates for households and people by urban/rural/all in 2010/11

				Poverty line (ETB/person/day) and poverty rate (%)					
				Poorest half	**Percentile-based lines**				
Region	**Year**	**Line/rate**	***n***	**< 100% natl.**	**20th**	**40th**	**50th**	**60th**	**80th**
Urban	2010/11	Line		4.01	4.47	5.95	6.65	7.54	10.07
		Rate (HHs)	14,939	8.4	11.9	24.4	30.7	37.6	54.5
		Rate (people)		12.4	17.2	32.9	40.4	48.5	66.5
Rural	2010/11	Line		7.20	8.04	10.68	11.95	13.54	18.09
		Rate (HHs)	9,322	11.7	16.2	34.8	44.6	54.9	77.1
		Rate (people)		15.2	20.5	41.3	51.9	62.4	82.9
All	2010/11	Line		6.68	7.46	9.91	11.09	12.56	16.78
		Rate (HHs)	24,261	11.0	15.3	32.6	41.7	51.4	72.4
		Rate (people)		14.7	19.9	40.0	50.0	60.1	80.3

Source and definitions: See Table 1 and text.

Table 2 (Tigray): National poverty lines and poverty rates for households and people by urban/rural/all in 2010/11

| Region | Year | Line/rate | n | Poverty line (ETB/adult equivalent/day) and poverty rate (%) | | | |
| | | | | National | | | |
				Food	100%	150%	200%
Urban	2010/11	Line		6.04	12.25	18.37	24.50
		Rate (HHs)	1,016	0.5	10.7	26.9	45.1
		Rate (people)		0.9	14.8	35.7	56.3
Rural	2010/11	Line		5.41	10.96	16.44	21.92
		Rate (HHs)	1,034	1.9	30.2	65.0	83.6
		Rate (people)		2.7	37.5	73.9	89.4
All	2010/11	Line		5.54	11.23	16.85	22.46
		Rate (HHs)	2,050	1.5	25.0	54.9	73.5
		Rate (people)		2.3	32.8	65.9	82.5

Source and definitions: See Table 1 and text.

Table 2 (Tigray): International 2005 and 2011 PPP poverty lines and poverty rates for households and people by urban/rural/all in 2010/11

				Poverty line (ETB/person/day) and poverty rate (%)									
				International 2005 PPP						International 2011 PPP			
Region	**Year**	**Line/rate**	***n***	**$1.00**	**$1.25**	**$1.75**	**$2.00**	**$2.50**	**$5.00**	**$1.90**	**$3.10**	**$3.80**	**$4.00**
Urban	2010/11	Line		7.90	9.88	13.83	15.80	19.75	39.51	10.11	16.50	20.23	21.29
		Rate (HHs)	1,016	6.3	11.8	26.0	33.6	47.2	80.9	12.5	36.5	47.7	51.4
		Rate (people)		9.1	15.9	34.1	42.8	57.7	89.4	16.9	45.6	58.2	62.3
Rural	2010/11	Line		7.07	8.84	12.37	14.14	17.68	35.35	9.05	14.77	18.10	19.05
		Rate (HHs)	1,034	19.2	32.8	62.9	71.6	85.6	97.8	34.3	74.1	86.4	88.6
		Rate (people)		24.2	39.8	71.1	79.8	90.4	98.9	41.8	82.0	91.0	92.8
All	2010/11	Line		7.24	9.06	12.68	14.49	18.11	36.22	9.27	15.13	18.54	19.52
		Rate (HHs)	2,050	15.8	27.2	53.2	61.5	75.4	93.3	28.6	64.2	76.2	78.7
		Rate (people)		21.1	34.8	63.4	72.1	83.6	96.9	36.6	74.4	84.2	86.4

Source and definitions: See Table 1 and text.

Table 2 (Tigray): Relative and percentile-based poverty lines and poverty rates for households and people by urban/rural/all in 2010/11

Region	Year	Line/rate	n	Poverty line (ETB/person/day) and poverty rate (%)					
				Poorest half	Percentile-based lines				
				< 100% natl.	20th	40th	50th	60th	80th
Urban	2010/11	Line		4.65	5.19	6.90	7.72	8.75	11.69
		Rate (HHs)	1,016	4.4	6.8	14.1	19.5	25.6	43.3
		Rate (people)		6.5	9.6	19.3	26.0	33.9	53.4
Rural	2010/11	Line		5.55	6.20	8.24	9.22	10.45	13.96
		Rate (HHs)	1,034	14.6	21.4	40.9	51.5	62.8	81.3
		Rate (people)		18.4	26.8	49.3	60.2	71.1	87.6
All	2010/11	Line		5.37	5.99	7.96	8.91	10.10	13.48
		Rate (HHs)	2,050	11.9	17.5	33.8	43.1	53.0	71.3
		Rate (people)		15.9	23.2	43.0	53.1	63.3	80.5

Source and definitions: See Table 1 and text.

Table 2 (Afar): National poverty lines and poverty rates for households and people by urban/rural/all in 2010/11

| Region | Year | Line/rate | *n* | Poverty line (ETB/adult equivalent/day) and poverty rate (%) | | | |
| | | | | National | | | |
				Food	100%	150%	200%
Urban	2010/11	Line		5.74	11.64	17.46	23.28
		Rate (HHs)	647	0.4	16.1	39.6	58.2
		Rate (people)		0.6	24.3	52.8	71.0
Rural	2010/11	Line		5.14	10.42	15.63	20.84
		Rate (HHs)	506	4.1	34.8	64.3	83.3
		Rate (people)		6.4	43.4	73.3	90.1
All	2010/11	Line		5.31	10.77	16.15	21.53
		Rate (HHs)	1,153	2.8	28.3	55.8	74.6
		Rate (people)		4.7	38.0	67.5	84.7

Source and definitions: See Table 1 and text.

Table 2 (Afar): International 2005 and 2011 PPP poverty lines and poverty rates for households and people by urban/rural/all in 2010/11

Region	Year	Line/rate	n	Poverty line (ETB/person/day) and poverty rate (%)									
				International 2005 PPP						International 2011 PPP			
				$1.00	$1.25	$1.75	$2.00	$2.50	$5.00	$1.90	$3.10	$3.80	$4.00
Urban	2010/11	Line		7.51	9.38	13.14	15.01	18.77	37.53	9.61	15.68	19.22	20.23
		Rate (HHs)	647	7.6	15.1	34.8	44.0	58.6	86.3	16.6	46.1	60.8	63.3
		Rate (people)		12.8	23.7	48.7	57.9	71.5	93.7	26.0	59.8	74.4	76.2
Rural	2010/11	Line		6.72	8.40	11.76	13.44	16.80	33.60	8.60	14.04	17.21	18.11
		Rate (HHs)	506	20.5	34.5	60.0	70.1	83.6	99.1	35.8	73.5	84.0	85.5
		Rate (people)		27.3	43.4	70.2	80.0	91.4	99.8	44.7	82.9	91.6	92.5
All	2010/11	Line		6.94	8.68	12.15	13.89	17.36	34.72	8.89	14.50	17.78	18.71
		Rate (HHs)	1,153	16.1	27.8	51.3	61.1	75.0	94.7	29.2	64.0	76.0	77.8
		Rate (people)		23.2	37.8	64.1	73.7	85.8	98.0	39.4	76.4	86.7	87.8

Source and definitions: See Table 1 and text.

Table 2 (Afar): Relative and percentile-based poverty lines and poverty rates for households and people by urban/rural/all in 2010/11

Region	Year	Line/rate	n	Poverty line (ETB/person/day) and poverty rate (%)					
				Poorest half < 100% natl.	Percentile-based lines				
					20th	40th	50th	60th	80th
Urban	2010/11	Line		5.02	5.61	7.45	8.34	9.45	12.62
		Rate (HHs)	647	5.4	9.1	19.5	24.9	34.8	52.1
		Rate (people)		9.4	15.1	29.1	37.1	48.7	65.4
Rural	2010/11	Line		6.14	6.86	9.11	10.19	11.55	15.43
		Rate (HHs)	506	16.9	21.9	40.0	50.1	59.3	79.6
		Rate (people)		23.3	28.8	48.6	59.0	69.2	88.1
All	2010/11	Line		5.82	6.50	8.64	9.67	10.95	14.63
		Rate (HHs)	1,153	12.9	17.5	32.9	41.4	50.9	70.1
		Rate (people)		19.3	25.0	43.1	52.8	63.4	81.6

Source and definitions: See Table 1 and text.

Table 2 (Amahara): National poverty lines and poverty rates for households and people by urban/rural/all in 2010/11

Region	Year	Line/rate	*n*	Poverty line (ETB/adult equivalent/day) and poverty rate (%)			
					National		
				Food	100%	150%	200%
Urban	2010/11	Line		6.78	13.75	20.62	27.50
		Rate (HHs)	2,526	3.1	21.3	44.6	61.5
		Rate (people)		4.5	28.6	55.4	72.0
Rural	2010/11	Line		4.58	9.28	13.92	18.56
		Rate (HHs)	1,827	1.2	24.4	55.9	76.4
		Rate (people)		1.6	30.7	64.2	82.9
All	2010/11	Line		4.83	9.80	14.70	19.59
		Rate (HHs)	4,353	1.5	23.9	54.2	74.0
		Rate (people)		2.0	30.5	63.2	81.7

Source and definitions: See Table 1 and text.

Table 2 (Amahara): International 2005 and 2011 PPP poverty lines and poverty rates for households and people by urban/rural/all in 2010/11

Region	Year	Line/rate	n	Poverty line (ETB/person/day) and poverty rate (%)									
				International 2005 PPP						International 2011 PPP			
				$1.00	$1.25	$1.75	$2.00	$2.50	$5.00	$1.90	$3.10	$3.80	$4.00
Urban	2010/11	Line		8.87	11.09	15.52	17.74	22.17	44.34	11.35	18.52	22.70	23.90
		Rate (HHs)	2,526	11.5	23.1	39.9	48.3	60.0	86.8	24.2	50.2	61.1	64.1
		Rate (people)		16.1	30.5	50.0	59.2	71.0	93.1	31.9	61.4	72.2	75.1
Rural	2010/11	Line		5.99	7.48	10.48	11.97	14.97	29.93	7.66	12.50	15.33	16.13
		Rate (HHs)	1,827	13.7	26.6	52.3	63.0	78.5	97.3	28.3	67.3	79.9	82.2
		Rate (people)		17.8	33.2	60.8	71.2	84.7	98.7	35.0	75.2	85.9	87.8
All	2010/11	Line		6.32	7.90	11.06	12.64	15.80	31.60	8.09	13.20	16.18	17.03
		Rate (HHs)	4,353	13.4	26.0	50.3	60.7	75.6	95.6	27.6	64.6	76.9	79.3
		Rate (people)		17.6	32.9	59.6	69.8	83.1	98.0	34.6	73.6	84.3	86.3

Source and definitions: See Table 1 and text.

Table 2 (Amahara): Relative and percentile-based poverty lines and poverty rates for households and people by urban/rural/all in 2010/11

Region	Year	Line/rate	n	Poorest half < 100% natl.	Percentile-based lines				
					20th	40th	50th	60th	80th
Urban	2010/11	Line		3.60	4.03	5.35	5.99	6.78	9.06
		Rate (HHs)	2,526	9.3	13.2	28.0	33.5	39.7	56.2
		Rate (people)		12.9	18.4	36.2	42.8	49.8	67.5
Rural	2010/11	Line		7.94	8.87	11.78	13.18	14.94	19.95
		Rate (HHs)	1,827	10.2	14.9	33.4	42.1	51.9	74.5
		Rate (people)		13.5	19.2	40.6	50.3	60.4	81.3
All	2010/11	Line		7.44	8.31	11.04	12.35	14.00	18.69
		Rate (HHs)	4,353	10.1	14.6	32.5	40.7	50.0	71.7
		Rate (people)		13.5	19.1	40.1	49.4	59.2	79.7

The column header "Poverty line (ETB/person/day) and poverty rate (%)" spans the last six data columns.

Source and definitions: See Table 1 and text.

Table 2 (Oromiya): National poverty lines and poverty rates for households and people by urban/rural/all in 2010/11

Region	Year	Line/rate	n	Poverty line (ETB/adult equivalent/day) and poverty rate (%)			
				National			
				Food	100%	150%	200%
Urban	2010/11	Line		5.99	12.15	18.22	24.30
		Rate (HHs)	2,977	2.0	17.7	41.5	59.1
		Rate (people)		3.3	25.7	53.4	70.5
Rural	2010/11	Line		5.02	10.17	15.26	20.34
		Rate (HHs)	2,102	2.3	23.9	56.3	78.8
		Rate (people)		3.2	29.3	63.4	84.3
All	2010/11	Line		5.15	10.43	15.65	20.87
		Rate (HHs)	5,079	2.2	22.8	53.7	75.4
		Rate (people)		3.2	28.8	62.1	82.5

Source and definitions: See Table 1 and text.

Table 2 (Oromiya): International 2005 and 2011 PPP poverty lines and poverty rates for households and people by urban/rural/all in 2010/11

Region	Year	Line/rate	n	Poverty line (ETB/person/day) and poverty rate (%)									
				International 2005 PPP						International 2011 PPP			
				$1.00	$1.25	$1.75	$2.00	$2.50	$5.00	$1.90	$3.10	$3.80	$4.00
Urban	2010/11	Line		7.84	9.79	13.71	15.67	19.59	39.18	10.03	16.36	20.06	21.11
		Rate (HHs)	2,977	11.3	19.4	37.6	45.7	57.7	86.5	20.6	48.0	58.7	61.4
		Rate (people)		17.4	27.9	49.0	58.1	69.9	93.0	29.3	60.7	70.9	73.6
Rural	2010/11	Line		6.56	8.20	11.48	13.12	16.40	32.80	8.40	13.70	16.79	17.68
		Rate (HHs)	2,102	13.8	27.0	54.3	65.7	80.6	98.0	28.5	69.2	82.1	84.7
		Rate (people)		17.5	32.6	61.5	72.6	85.8	99.2	34.3	76.1	87.1	89.4
All	2010/11	Line		6.73	8.41	11.78	13.46	16.82	33.65	8.61	14.05	17.23	18.13
		Rate (HHs)	5,079	13.4	25.7	51.4	62.2	76.6	96.0	27.1	65.5	78.0	80.6
		Rate (people)		17.5	32.0	59.8	70.7	83.7	98.4	33.6	74.0	85.0	87.3

Source and definitions: See Table 1 and text.

Table 2 (Oromiya): Relative and percentile-based poverty lines and poverty rates for households and people by urban/rural/all in 2010/11

Region	Year	Line/rate	n	Poverty line (ETB/person/day) and poverty rate (%)					
				Poorest half	Percentile-based lines				
				< 100% natl.	20th	40th	50th	60th	80th
Urban	2010/11	Line		4.62	5.16	6.86	7.68	8.70	11.61
		Rate (HHs)	2,977	8.7	12.4	24.4	30.4	37.5	53.8
		Rate (people)		13.6	18.9	33.5	40.4	48.9	66.1
Rural	2010/11	Line		6.53	7.29	9.68	10.84	12.28	16.40
		Rate (HHs)	2,102	11.2	15.7	33.7	43.5	54.2	77.1
		Rate (people)		14.4	19.6	40.0	50.5	61.4	83.0
All	2010/11	Line		6.27	7.01	9.31	10.42	11.80	15.76
		Rate (HHs)	5,079	10.8	15.1	32.1	41.2	51.3	73.0
		Rate (people)		14.3	19.5	39.1	49.1	59.7	80.7

Source and definitions: See Table 1 and text.

Table 2 (Somali): National poverty lines and poverty rates for households and people by urban/rural/all in 2010/11

Region	Year	Line/rate	n	Poverty line (ETB/adult equivalent/day) and poverty rate (%)			
				National			
				Food	100%	150%	200%
Urban	2010/11	Line		6.55	13.28	19.91	26.55
		Rate (HHs)	939	2.7	21.2	45.0	61.2
		Rate (people)		4.1	27.5	57.5	74.6
Rural	2010/11	Line		5.47	11.09	16.64	22.18
		Rate (HHs)	470	2.7	26.6	58.8	78.2
		Rate (people)		3.8	34.0	67.5	84.4
All	2010/11	Line		5.70	11.55	17.32	23.09
		Rate (HHs)	1,409	2.7	25.5	55.8	74.6
		Rate (people)		3.9	32.6	65.4	82.3

Source and definitions: See Table 1 and text.

Table 2 (Somali): International 2005 and 2011 PPP poverty lines and poverty rates for households and people by urban/rural/all in 2010/11

Region	Year	Line/rate	n	Poverty line (ETB/person/day) and poverty rate (%)									
				International 2005 PPP						International 2011 PPP			
				$1.00	$1.25	$1.75	$2.00	$2.50	$5.00	$1.90	$3.10	$3.80	$4.00
Urban	2010/11	Line		8.56	10.70	14.98	17.13	21.41	42.81	10.96	17.88	21.92	23.07
		Rate (HHs)	939	12.9	25.1	42.9	50.8	65.5	91.9	25.8	53.2	66.7	70.3
		Rate (people)		17.4	31.8	54.4	64.1	78.5	97.2	32.7	66.8	79.7	83.0
Rural	2010/11	Line		7.15	8.94	12.52	14.31	17.89	35.77	9.16	14.94	18.31	19.28
		Rate (HHs)	470	16.9	29.1	56.9	67.2	80.8	97.7	31.3	68.9	82.1	85.3
		Rate (people)		23.1	37.3	65.5	75.2	86.5	99.1	39.2	76.6	87.7	90.7
All	2010/11	Line		7.45	9.31	13.03	14.90	18.62	37.24	9.53	15.55	19.07	20.07
		Rate (HHs)	1,409	16.0	28.3	53.9	63.7	77.5	96.5	30.1	65.5	78.8	82.1
		Rate (people)		21.9	36.1	63.1	72.9	84.9	98.8	37.9	74.5	86.0	89.1

Source and definitions: See Table 1 and text.

Table 2 (Somali): Relative and percentile-based poverty lines and poverty rates for households and people by urban/rural/all in 2010/11

Region	Year	Line/rate	n	Poorest half < 100% natl.	Percentile-based lines				
					20th	40th	50th	60th	80th
Urban	2010/11	Line		4.09	4.57	6.07	6.79	7.70	10.28
		Rate (HHs)	939	10.3	13.9	29.2	36.6	42.8	61.7
		Rate (people)		14.1	18.5	37.0	46.2	54.3	74.9
Rural	2010/11	Line		5.50	6.14	8.16	9.13	10.34	13.82
		Rate (HHs)	470	13.5	18.4	37.3	48.6	56.7	76.2
		Rate (people)		18.7	25.0	45.2	56.5	65.3	82.6
All	2010/11	Line		5.20	5.81	7.72	8.64	9.79	13.08
		Rate (HHs)	1,409	12.8	17.4	35.6	46.0	53.7	73.1
		Rate (people)		17.8	23.7	43.5	54.4	63.0	81.0

The header spanning note: Poverty line (ETB/person/day) and poverty rate (%)

Source and definitions: See Table 1 and text.

Table 2 (Benishangul-Gumuz): National poverty lines and poverty rates for households and people by urban/rural/all in 2010/11

Region	Year	Line/rate	n	Poverty line (ETB/adult equivalent/day) and poverty rate (%)			
				National			
				Food	100%	150%	200%
Urban	2010/11	Line		5.81	11.78	17.67	23.56
		Rate (HHs)	673	1.2	14.5	34.0	53.3
		Rate (people)		2.3	21.3	45.0	65.0
Rural	2010/11	Line		5.08	10.29	15.44	20.58
		Rate (HHs)	512	2.6	24.2	56.2	77.8
		Rate (people)		3.6	29.8	64.1	84.4
All	2010/11	Line		5.18	10.50	15.75	21.00
		Rate (HHs)	1,185	2.4	22.6	52.6	73.8
		Rate (people)		3.4	28.6	61.4	81.7

Source and definitions: See Table 1 and text.

Table 2 (Benishangul-Gumuz): International 2005 and 2011 PPP poverty lines and poverty rates for households and people by urban/rural/all in 2010/11

Region	Year	Line/rate	n	Poverty line (ETB/person/day) and poverty rate (%)									
				International 2005 PPP						International 2011 PPP			
				$1.00	$1.25	$1.75	$2.00	$2.50	$5.00	$1.90	$3.10	$3.80	$4.00
Urban	2010/11	Line		7.60	9.50	13.30	15.20	19.00	38.00	9.73	15.87	19.45	20.48
		Rate (HHs)	673	8.0	14.9	32.3	38.6	53.7	83.1	15.4	41.8	55.1	58.0
		Rate (people)		12.5	22.6	43.1	50.8	66.7	92.6	23.3	54.4	68.2	70.9
Rural	2010/11	Line		6.64	8.30	11.62	13.27	16.59	33.19	8.50	13.86	16.99	17.89
		Rate (HHs)	512	16.6	27.4	55.4	64.6	79.1	95.4	28.7	67.4	80.1	82.9
		Rate (people)		21.2	34.1	63.7	71.7	86.0	97.4	35.3	75.3	86.7	88.8
All	2010/11	Line		6.77	8.46	11.85	13.54	16.93	33.86	8.67	14.14	17.33	18.25
		Rate (HHs)	1,185	15.2	25.4	51.6	60.4	75.0	93.4	26.5	63.3	76.1	78.9
		Rate (people)		20.0	32.5	60.8	68.8	83.3	96.7	33.6	72.4	84.1	86.3

Source and definitions: See Table 1 and text.

Table 2 (Benishangul-Gumuz): Relative and percentile-based poverty lines and poverty rates for households and people by urban/rural/all in 2010/11

Region	Year	Line/rate	n	Poverty line (ETB/person/day) and poverty rate (%)					
				Poorest half	Percentile-based lines				
				< 100% natl.	20th	40th	50th	60th	80th
Urban	2010/11	Line		4.96	5.54	7.36	8.24	9.33	12.46
		Rate (HHs)	673	6.9	9.6	20.3	25.4	32.1	48.5
		Rate (people)		10.8	14.6	29.2	34.9	42.9	61.9
Rural	2010/11	Line		6.42	7.17	9.53	10.66	12.08	16.13
		Rate (HHs)	512	14.2	17.6	33.7	43.8	55.0	75.7
		Rate (people)		18.4	22.4	40.7	52.7	63.4	82.2
All	2010/11	Line		6.22	6.94	9.23	10.32	11.70	15.62
		Rate (HHs)	1,185	13.0	16.3	31.5	40.8	51.3	71.3
		Rate (people)		17.3	21.3	39.1	50.2	60.6	79.4

Source and definitions: See Table 1 and text.

Table 2 (Southern Nations, Nationalities, and Peoples): National poverty lines and poverty rates for households and people by urban/rural/all in 2010/11

| Region | Year | Line/rate | n | Poverty line (ETB/adult equivalent/day) and poverty rate (%) | | | |
| | | | | National | | | |
				Food	100%	150%	200%
Urban	2010/11	Line		6.12	12.41	18.61	24.82
		Rate (HHs)	1,615	2.0	17.9	44.3	60.4
		Rate (people)		3.0	25.0	56.0	72.3
Rural	2010/11	Line		4.48	9.08	13.61	18.15
		Rate (HHs)	1,828	4.8	24.6	60.5	81.2
		Rate (people)		6.7	29.6	65.8	84.9
All	2010/11	Line		4.64	9.41	14.11	18.82
		Rate (HHs)	3,443	4.4	23.7	58.5	78.6
		Rate (people)		6.3	29.1	64.8	83.7

Source and definitions: See Table 1 and text.

Table 2 (Southern Nations, Nationalities, and Peoples): International 2005 and 2011 PPP poverty lines and poverty rates for households and people by urban/rural/all in 2010/11

Region	Year	Line/rate	n	Poverty line (ETB/person/day) and poverty rate (%)									
				International 2005 PPP						International 2011 PPP			
				$1.00	$1.25	$1.75	$2.00	$2.50	$5.00	$1.90	$3.10	$3.80	$4.00
Urban	2010/11	Line		8.00	10.00	14.01	16.01	20.01	40.02	10.24	16.71	20.49	21.57
		Rate (HHs)	1,615	9.9	18.6	39.3	47.4	59.4	85.3	19.7	49.7	60.3	63.0
		Rate (people)		13.8	25.6	50.2	59.7	72.4	93.5	27.4	62.1	73.3	75.8
Rural	2010/11	Line		5.85	7.32	10.24	11.71	14.63	29.27	7.49	12.22	14.98	15.77
		Rate (HHs)	1,828	15.7	29.0	57.8	69.0	82.6	97.8	30.7	72.0	83.9	85.9
		Rate (people)		19.6	34.2	63.7	73.4	86.2	98.8	36.1	76.3	87.2	88.9
All	2010/11	Line		6.07	7.59	10.62	12.14	15.17	30.35	7.77	12.67	15.54	16.35
		Rate (HHs)	3,443	15.0	27.7	55.5	66.3	79.7	96.2	29.3	69.2	80.9	83.0
		Rate (people)		19.0	33.4	62.3	72.0	84.8	98.2	35.2	74.9	85.8	87.6

Source and definitions: See Table 1 and text.

Table 2 (Southern Nations, Nationalities, and Peoples): Relative and percentile-based poverty lines and poverty rates for households and people by urban/rural/all in 2010/11

| Region | Year | Line/rate | n | Poverty line (ETB/person/day) and poverty rate (%) | | | | | |
| | | | | Poorest half | Percentile-based lines | | | | |
				< 100% natl.	20th	40th	50th	60th	80th
Urban	2010/11	Line		4.57	5.11	6.79	7.60	8.61	11.50
		Rate (HHs)	1,615	7.8	10.7	23.1	31.6	39.2	55.7
		Rate (people)		10.9	14.8	31.6	41.3	50.1	68.3
Rural	2010/11	Line		8.24	9.20	12.23	13.68	15.50	20.70
		Rate (HHs)	1,828	13.5	17.4	36.7	47.3	57.7	79.2
		Rate (people)		17.1	21.5	42.4	53.7	63.5	83.3
All	2010/11	Line		7.87	8.79	11.68	13.07	14.81	19.78
		Rate (HHs)	3,443	12.8	16.5	35.0	45.3	55.4	76.2
		Rate (people)		16.5	20.8	41.3	52.4	62.2	81.8

Source and definitions: See Table 1 and text.

Table 2 (Gambela): National poverty lines and poverty rates for households and people by urban/rural/all in 2010/11

Region	Year	Line/rate	n	Food	National 100%	150%	200%
				Poverty line (ETB/adult equivalent/day) and poverty rate (%)			
Urban	2010/11	Line		5.92	12.00	17.99	23.99
		Rate (HHs)	623	7.5	22.4	42.4	57.6
		Rate (people)		12.6	32.0	57.4	72.8
Rural	2010/11	Line		5.61	11.37	17.06	22.75
		Rate (HHs)	524	1.8	24.4	67.5	86.9
		Rate (people)		2.9	31.8	76.9	92.7
All	2010/11	Line		5.70	11.56	17.34	23.12
		Rate (HHs)	1,147	3.7	23.8	59.1	77.1
		Rate (people)		5.9	31.9	71.0	86.7

Source and definitions: See Table 1 and text.

Table 2 (Gambela): International 2005 and 2011 PPP poverty lines and poverty rates for households and people by urban/rural/all in 2010/11

Region	Year	Line/rate	*n*	\$1.00	\$1.25	\$1.75	\$2.00	\$2.50	\$5.00	\$1.90	\$3.10	\$3.80	\$4.00
				International 2005 PPP						International 2011 PPP			
Urban	2010/11	Line		7.74	9.67	13.54	15.48	19.34	38.69	9.90	16.16	19.81	20.85
		Rate (HHs)	623	17.7	24.2	40.7	46.7	60.4	84.8	24.5	48.7	61.4	64.4
		Rate (people)		26.9	34.2	55.9	62.7	75.4	94.7	34.6	64.7	76.2	78.5
Rural	2010/11	Line		7.34	9.17	12.84	14.67	18.34	36.68	9.39	15.32	18.78	19.77
		Rate (HHs)	524	14.3	26.0	61.6	75.7	86.9	99.4	27.9	80.3	87.5	88.8
		Rate (people)		20.3	34.4	71.9	85.6	93.2	99.8	36.4	88.7	93.5	94.1
All	2010/11	Line		7.46	9.32	13.05	14.92	18.64	37.29	9.55	15.57	19.09	20.10
		Rate (HHs)	1,147	15.4	25.4	54.6	66.1	78.1	94.6	26.8	69.8	78.8	80.7
		Rate (people)		22.3	34.3	67.0	78.6	87.8	98.2	35.9	81.4	88.2	89.4

Note: column header "Poverty line (ETB/person/day) and poverty rate (%)" spans all value columns.

Source and definitions: See Table 1 and text.

Table 2 (Gambela): Relative and percentile-based poverty lines and poverty rates for households and people by urban/rural/all in 2010/11

| Region | Year | Line/rate | n | Poverty line (ETB/person/day) and poverty rate (%) | | | | | |
| | | | | Poorest half < 100% natl. | Percentile-based lines | | | | |
					20th	40th	50th	60th	80th
Urban	2010/11	Line		4.68	5.23	6.94	7.77	8.80	11.76
		Rate (HHs)	623	16.0	18.6	26.8	32.8	40.5	55.2
		Rate (people)		24.9	27.7	38.3	47.5	55.6	70.8
Rural	2010/11	Line		5.22	5.83	7.74	8.67	9.82	13.11
		Rate (HHs)	524	9.1	15.3	36.4	49.3	61.6	84.5
		Rate (people)		13.1	21.6	45.8	60.0	71.9	91.7
All	2010/11	Line		5.05	5.65	7.50	8.39	9.51	12.70
		Rate (HHs)	1,147	11.4	16.4	33.2	43.8	54.6	74.8
		Rate (people)		16.7	23.5	43.5	56.2	66.9	85.3

Source and definitions: See Table 1 and text.

Table 2 (Harari): National poverty lines and poverty rates for households and people by urban/rural/all in 2010/11

| Region | Year | Line/rate | n | Poverty line (ETB/adult equivalent/day) and poverty rate (%) National | | | |
				Food	100%	150%	200%
Urban	2010/11	Line		6.64	13.47	20.20	26.93
		Rate (HHs)	341	0.3	10.0	32.6	54.0
		Rate (people)		0.4	12.4	40.8	63.1
Rural	2010/11	Line		6.16	12.50	18.74	24.99
		Rate (HHs)	265	0.5	9.2	54.0	77.3
		Rate (people)		0.4	10.7	60.4	85.1
All	2010/11	Line		6.39	12.95	19.42	25.90
		Rate (HHs)	606	0.4	9.6	42.1	64.3
		Rate (people)		0.4	11.5	51.2	74.8

Source and definitions: See Table 1 and text.

Table 2 (Harari): International 2005 and 2011 PPP poverty lines and poverty rates for households and people by urban/rural/all in 2010/11

Region	Year	Line/rate	n	Poverty line (ETB/person/day) and poverty rate (%)									
				International 2005 PPP						International 2011 PPP			
				$1.00	$1.25	$1.75	$2.00	$2.50	$5.00	$1.90	$3.10	$3.80	$4.00
Urban	2010/11	Line		8.69	10.86	15.20	17.37	21.71	43.43	11.12	18.14	22.23	23.40
		Rate (HHs)	341	4.4	11.1	27.9	37.5	53.8	88.2	11.1	42.0	56.2	60.9
		Rate (people)		5.6	14.5	34.3	46.0	63.4	93.8	14.5	49.9	65.6	70.1
Rural	2010/11	Line		8.06	10.07	14.10	16.12	20.15	40.30	10.32	16.83	20.63	21.72
		Rate (HHs)	265	3.6	15.8	51.9	66.3	80.1	97.7	17.3	69.0	80.5	82.7
		Rate (people)		4.5	19.0	59.9	73.7	86.6	99.4	20.8	76.4	87.0	89.4
All	2010/11	Line		8.35	10.44	14.62	16.70	20.88	41.76	10.69	17.44	21.38	22.50
		Rate (HHs)	606	4.0	13.1	38.6	50.2	65.5	92.4	13.8	53.9	67.0	70.5
		Rate (people)		5.1	16.9	47.9	60.8	75.8	96.8	17.8	64.0	77.0	80.4

Source and definitions: See Table 1 and text.

Table 2 (Harari): Relative and percentile-based poverty lines and poverty rates for households and people by urban/rural/all in 2010/11

Region	Year	Line/rate	*n*	Poorest half < 100% natl.	Percentile-based lines 20th	40th	50th	60th	80th
Urban	2010/11	Line		3.73	4.17	5.54	6.20	7.02	9.38
		Rate (HHs)	341	2.7	5.2	14.6	20.7	27.9	49.1
		Rate (people)		3.3	6.8	18.7	25.6	34.3	57.8
Rural	2010/11	Line		4.31	4.81	6.40	7.16	8.11	10.83
		Rate (HHs)	265	1.8	3.9	25.0	39.3	51.6	76.8
		Rate (people)		2.4	5.1	29.9	45.5	59.5	83.9
All	2010/11	Line		4.04	4.51	6.00	6.71	7.60	10.15
		Rate (HHs)	606	2.3	4.6	19.2	28.9	38.4	61.4
		Rate (people)		2.8	5.9	24.7	36.2	47.7	71.7

Source and definitions: See Table 1 and text.

Table 2 (Addis Ababa): National poverty lines and poverty rates for households and people by urban/rural/all in 2010/11

Region	Year	Line/rate	n	Poverty line (ETB/adult equivalent/day) and poverty rate (%)			
				National			
				Food	100%	150%	200%
Urban	2010/11	Line		7.72	15.65	23.47	31.29
		Rate (HHs)	3,249	1.6	21.0	43.8	61.7
		Rate (people)		2.7	28.9	55.5	73.1
Rural	2010/11	Line		7.50	15.20	22.80	30.40
		Rate (HHs)	1	0.0	0.0	0.0	100.0
		Rate (people)		0.0	0.0	0.0	100.0
All	2010/11	Line		7.72	15.65	23.47	31.29
		Rate (HHs)	3,250	1.6	21.0	43.8	61.7
		Rate (people)		2.7	28.9	55.5	73.2

Source and definitions: See Table 1 and text.

Table 2 (Addis Ababa): International 2005 and 2011 PPP poverty lines and poverty rates for households and people by urban/rural/all in 2010/11

Region	Year	Line/rate	*n*	Poverty line (ETB/person/day) and poverty rate (%)									
				International 2005 PPP						International 2011 PPP			
				$1.00	**$1.25**	**$1.75**	**$2.00**	**$2.50**	**$5.00**	**$1.90**	**$3.10**	**$3.80**	**$4.00**
Urban	2010/11	Line		10.09	12.62	17.66	20.18	25.23	50.46	12.92	21.08	25.84	27.20
		Rate (HHs)	3,249	11.0	19.7	39.2	47.5	61.0	89.6	20.5	50.2	62.5	65.9
		Rate (people)		15.9	27.1	50.3	59.2	72.7	95.5	28.1	61.8	74.0	76.8
Rural	2010/11	Line		9.80	12.26	17.16	19.61	24.51	49.02	12.55	20.47	25.10	26.42
		Rate (HHs)	1	0.0	0.0	0.0	0.0	0.0	100.0	0.0	0.0	0.0	100.0
		Rate (people)		0.0	0.0	0.0	0.0	0.0	100.0	0.0	0.0	0.0	100.0
All	2010/11	Line		10.09	12.62	17.66	20.18	25.23	50.46	12.92	21.08	25.84	27.20
		Rate (HHs)	3,250	11.0	19.7	39.2	47.5	60.9	89.6	20.5	50.2	62.5	65.9
		Rate (people)		15.9	27.1	50.3	59.2	72.7	95.5	28.1	61.8	73.9	76.8

Source and definitions: See Table 1 and text.

Table 2 (Addis Ababa): Relative and percentile-based poverty lines and poverty rates for households and people by urban/rural/all in 2010/11

Region	Year	Line/rate	n	Poverty line (ETB/person/day) and poverty rate (%)					
				Poorest half < 100% natl.	Percentile-based lines				
					20th	40th	50th	60th	80th
Urban	2010/11	Line		2.76	3.09	4.10	4.59	5.20	6.94
		Rate (HHs)	3,249	8.7	12.2	25.5	32.0	39.0	56.8
		Rate (people)		12.9	17.4	34.3	42.2	50.1	68.3
Rural	2010/11	Line		2.85	3.18	4.23	4.73	5.36	7.16
		Rate (HHs)	1	0.0	0.0	0.0	0.0	0.0	0.0
		Rate (people)		0.0	0.0	0.0	0.0	0.0	0.0
All	2010/11	Line		2.76	3.09	4.10	4.59	5.20	6.94
		Rate (HHs)	3,250	8.7	12.2	25.4	32.0	39.0	56.7
		Rate (people)		12.9	17.4	34.3	42.2	50.1	68.3

Source and definitions: See Table 1 and text.

Table 2 (Dire Dawa): National poverty lines and poverty rates for households and people by urban/rural/all in 2010/11

| Region | Year | Line/rate | n | Poverty line (ETB/adult equivalent/day) and poverty rate (%) | | | |
| | | | | National | | | |
				Food	100%	150%	200%
Urban	2010/11	Line		6.90	13.99	20.99	27.98
		Rate (HHs)	333	2.2	23.6	49.9	69.7
		Rate (people)		3.5	35.4	64.1	82.2
Rural	2010/11	Line		5.36	10.86	16.29	21.72
		Rate (HHs)	253	0.0	12.4	61.4	84.2
		Rate (people)		0.0	14.9	68.8	89.8
All	2010/11	Line		6.40	12.97	19.45	25.94
		Rate (HHs)	586	1.6	20.6	53.0	73.5
		Rate (people)		2.4	28.7	65.6	84.7

Source and definitions: See Table 1 and text.

Table 2 (Dire Dawa): International 2005 and 2011 PPP poverty lines and poverty rates for households and people by urban/rural/all in 2010/11

Region	Year	Line/rate	n	Poverty line (ETB/person/day) and poverty rate (%)									
				International 2005 PPP						International 2011 PPP			
				$1.00	$1.25	$1.75	$2.00	$2.50	$5.00	$1.90	$3.10	$3.80	$4.00
Urban	2010/11	Line		9.02	11.28	15.79	18.05	22.56	45.12	11.55	18.85	23.10	24.32
		Rate (HHs)	333	13.6	23.7	44.6	53.0	68.6	90.6	25.4	55.5	69.2	72.3
		Rate (people)		20.7	35.1	58.7	67.6	82.2	96.5	37.0	70.1	82.8	85.3
Rural	2010/11	Line		7.01	8.76	12.26	14.01	17.51	35.03	8.97	14.63	17.93	18.88
		Rate (HHs)	253	4.1	15.7	58.6	72.3	89.0	98.9	17.2	76.3	89.3	90.7
		Rate (people)		6.0	19.0	64.8	78.8	93.9	99.7	20.3	82.9	94.2	95.2
All	2010/11	Line		8.37	10.46	14.64	16.73	20.91	41.83	10.71	17.47	21.42	22.54
		Rate (HHs)	586	11.1	21.6	48.3	58.1	74.0	92.8	23.2	61.0	74.5	77.2
		Rate (people)		15.9	29.8	60.7	71.3	86.1	97.6	31.6	74.3	86.5	88.5

Source and definitions: See Table 1 and text.

Table 2 (Dire Dawa): Relative and percentile-based poverty lines and poverty rates for households and people by urban/rural/all in 2010/11

| Region | Year | Line/rate | n | Poverty line (ETB/person/day) and poverty rate (%) | | | | | |
| | | | | Poorest half < 100% natl. | Percentile-based lines | | | | |
					20th	40th	50th	60th	80th
Urban	2010/11	Line		3.44	3.85	5.11	5.72	6.48	8.66
		Rate (HHs)	333	11.8	15.4	30.2	35.9	44.4	64.0
		Rate (people)		17.9	23.4	42.7	49.6	58.5	78.6
Rural	2010/11	Line		5.67	6.34	8.42	9.42	10.68	14.26
		Rate (HHs)	253	2.9	5.4	26.2	45.5	58.6	84.2
		Rate (people)		4.6	7.4	31.1	51.2	64.8	90.1
All	2010/11	Line		4.17	4.66	6.19	6.93	7.85	10.49
		Rate (HHs)	586	9.4	12.8	29.1	38.5	48.2	69.4
		Rate (people)		13.6	18.1	38.9	50.1	60.6	82.4

Source and definitions: See Table 1 and text.

Table 3: Poverty indicators

Uncertainty coefficient	Indicator (Responses ordered starting with those linked with higher poverty likelihoods)
724	How many members does the household have? (Seven or more; Six; Five; Four; Three; Two; One)
664	How many members does the household are 18-years-old or younger? (Six or more; Five; Four; Three; Two; One; None)
632	How many members does the household are 17-years-old or younger? (Five or more; Four; Three; Two; One; None)
607	How many members does the household are 16-years-old or younger? (Five or more; Four; Three; Two; One; None)
571	How many members does the household are 15-years-old or younger? (Five or more; Four; Three; Two; One; None)
500	How many members does the household are 14-years-old or younger? (Five or more; Four; Three; Two; One; None)
470	Are all household members ages 7 to 15 currently attending school? (No; Yes; No members in age range)
454	Are all household members ages 7 to 16 currently attending school? (No; Yes; No members in age range)
453	Are all household members ages 7 to 14 currently attending school? (No; Yes; No members in age range)
446	How many members does the household are 13-years-old or younger? (Four or more; Three; Two; One; None)
445	Are all household members ages 7 to 13 currently attending school? (No; Yes; No members in age range)
444	Are all household members ages 7 to 12 currently attending school? (No; Yes; No members in age range)
440	Are all household members ages 7 to 17 currently attending school? (No; Yes; No members in age range)
419	How many members does the household are 12-years-old or younger? (Four or more; Three; Two; One; None)
399	Are all household members ages 7 to 11 currently attending school? (No; Yes; No members in age range)
394	Are all household members ages 7 to 18 currently attending school? (No; Yes; No members in age range)

Table 3 (cont.): Poverty indicators

Uncertainty coefficient	Indicator (Responses ordered starting with those linked with higher poverty likelihoods)
358	How many members does the household are 11-years-old or younger? (Four or more; Three; Two; One; None)
317	How many household members 10-years-old or older were, in their main occupation during the last seven days, skilled agricultural or fishery worker or workers in elementary occupations? (Four or more; Three; Two; One; None)
278	How many household members 10-years-old or older who were engaged in any productive activity during the last seven days were unpaid family workers, unpaid apprentices, or did unpaid work for the community? (Three or more; Two; One; None)
212	How many household members 10-years-old or older were, in their main occupation during the last seven days, workers in elementary occupations? (Three or more; Two; One; None)
204	What is the highest grade that the female head/spouse completed? (No female head/spouse; None, or pre-school (grade 1 not completed), can read and write but never completed a grade, or grade 1; Grade 2 to 4; Grade 5 or higher)
170	How many household members 10-years-old or older engaged in any productive activity during the last seven days? (Two or more; One; None)
169	Does the household currently own any mobile telephones? (No; Yes)
167	What is the highest grade that the male head/spouse completed? (None, or pre-school (grade 1 not completed), or can read and write but never completed a grade; Grade 1 to 6; No male head/spouse; Grade 7 or higher)
158	Can the (oldest) female head/spouse read and write? (No female head/spouse; No; Yes)
144	If the female head/spouse worked in the past seven day, what was her main occupation? (Elementary occupations; Skilled agricultural and fishery workers; Service workers and shop and market sales workers, craft and related trade workers, plant and machine operators and assemblers, armed forces, or other; Did not work; No female head/spouse; Professionals, clerks, technicians, associate professionals, legislators, senior officials, and managers)

Table 3 (cont.): Poverty indicators

Uncertainty coefficient	Indicator (Responses ordered starting with those linked with higher poverty likelihoods)
141	If the male head/spouse worked in the past seven day, what was his main occupation? (Skilled agricultural and fishery workers; Elementary occupations; Did not work; No male head/spouse; Service workers and shop and market sales workers, craft and related trade workers, plant and machine operators and assemblers, armed forces, professionals, clerks, technicians, associate professionals, legislators, senior officials, and managers, or other)
135	What is the main source of lighting for the household? (Firewood, biogas, or other; Electric lantern/dry cell with switch; Local kerosene lamp (*kuraz*), or wax candle; Kerosene lamp (imported), or lantern; Metered electricity (shared), electricity (generator), solar energy; Metered electricity (private))
127	Does the household currently own any radios/radio-and-tape players/tape players? (No; Yes)
125	What is the distance in kilometers to the nearest kebele administration office? (<1; 1; >1 to 2; >2 to 3; 4 or more)
125	What is the distance in kilometers to the nearest primary school (grades 1 to 4)? (<1; 1; >1 to 2; >2 to 3; 4 or more)
119	Can the male head/spouse read and write? (No male head/spouse; No; Yes)
118	Does the the household currently own any mattresses or beds? (No; Yes)
117	What is the distance in kilometers to the nearest all-weather road for driving? (<1; 1; >1 to 2; >2 to 3; 4 or more)
115	How many members does the household are 6-years-old or younger? (Three or more; Two; One; None)
112	If the female head/spouse worked in the past seven days, what was her employment status in her main job? (Unpaid family work, unpaid apprentice, community volunteer, member of a cooperative, participated/employed in safety-net program, or other; Own-account worker (self-employed); Did not work; No female head/spouse; Employed (for any type of enterprise, organization, or private household/person), or employs workers in own business or activity)

Table 3 (cont.): Poverty indicators

Uncertainty coefficient	Indicator (Responses ordered starting with those linked with higher poverty likelihoods)
103	What is the main source of drinking water in the dry season? (River/lake/pond, rainwater, or other; Unprotected well/spring; Protected well/spring (shared); Protected well/spring (private); Communal tap outside the compound; Kiosk/retailer; Private or shared tap in the compound, or tap inside the dwelling)
99	The ceiling of the main dwelling is predominantly made of what material? (None, or reeds/bamboo; Polytne sheet sacks, cloth, chip wood/hardboard, parquet or polished wood/wood planks, concrete/cement, or other)
98	How many household members 10-years-old or older were, in their main occupation during the last seven days, skilled agricultural or fishery workers? (Two or more; One; None)
96	What is the distance in kilometers to the nearest health post? (<1; 1; >1 to 2; >2 to 3; >3 to 4; >4 to 5; >5 to 6, More than 6)
96	What is the distance in kilometers to the nearest agricultural-extension service? (<1; 1; >1 to 2; >2 to 3; 4 or more)
94	Does the household currently own any jewels (gold and silver)? (No; Yes)
85	How many meals did the household eat yesterday? (Two or less; Three or more)
82	Were any household members 10-years-old or older, in their main occupation during the last seven days, professionals, clerks, technicians, associate professionals, legislators, senior officials, or managers? (No; Yes)
81	The floor of the main dwelling is predominantly made of what material? (Mud/dung; Parquet or polished wood, reeds/bamboo, wood planks, cement screed, plastic tiles, cement tiles/brick tiles, ceramic/marble tiles, or other)
81	The roof of the main dwelling is predominantly made of what material? (Thatch, wood and mud, reeds/bamboo, plastic canvas, or other; Corrugated iron sheets, concrete/cement, asbestos, or bricks)

Table 3 (cont.): Poverty indicators

Uncertainty coefficient	Indicator (Responses ordered starting with those linked with higher poverty likelihoods)
80	If the household farms, then does it currently own any transport animals (horse, camel, . . .) or other draught animals (excluding farm animals)? (Does not farm; Farms, but no transport nor draught animals; Farms, and has transport or draught animals)
75	If the household farms, then does it currently own any chat or coffee plants? (Farms, and has chat or coffee plants; Farms, but no chat or coffee plants; Does not farm)
74	If the household farms, then does it currently own any sheep or goats? (Does not farm; Farms, but no sheep nor goats; Farms, and has sheep or goats)
74	Does this household have agricultural holdings? (Yes; No)
71	If the household farms, then does it currently own any sickles (*machid*)? (Does not farm; Farms, but no sickles (*machid*); Farms, and has sickles (*machid*))
71	If the household farms, then does it currently own any cattle (indigenous or exotic/hybrid, excluding farm animals)? (Farms, and has cattle; Farms, but no cattle; Does not farm)
71	If the household farms, then does it currently own any cattle (indigenous or exotic/hybrid), farm animals, transport animals (horse, camel, . . .), other draught animals, sheep, or goats? (Farms, and has large livestock; Farms, but no large livestock; Does not farm)
71	If the male head/spouse worked in the past seven days, what was his employment status in his main job? (Own-account worker (self-employed), or participated/employed in safety-net program; Did not work; Unpaid family work, unpaid apprentice, community volunteer, member of a cooperative, or other; No male head/spouse; Employed (for any type of enterprise, organization, or private household/person), or employs workers in own activity or business)
71	If the household farms, then does it currently own any pick axes (*geso*)? (Does not farm; Farms, but no pick axes (geso); Farms, and has pick axes (*geso*))
70	If the household farms, then does it currently own any *mofer* and *kember*? (Does not farm; Farms, but no *mofer* and *kember*; Farms, and has *mofer* and *kember*)

Table 3 (cont.): Poverty indicators

Uncertainty coefficient	Indicator (Responses ordered starting with those linked with higher poverty likelihoods)
70	Does the household currently own any stoves (kerosene, butane, or electric)? (No; Yes)
70	If the household farms, then does it currently own any plows? (Does not farm; Farms, but does not have plows; Farms, and has plows)
70	If the household farms, then does it currently own any axes (*gejera*)? (Does not farm; Farms, but no axes (*gejera*); Farms, and has axes (*gejera*))
70	If the household farms, then does it currently own any farm animals? (Does not farm; Farms, but no farm animals; Farms, and has farm animals)
70	Does the household farm? (Yes; No)
69	What is the main source of energy for cooking? (Firewood, charcoal, or crop residue/leaves; Dung/manure; Saw dust, kerosene, butane gas, electricity, solar energy, biogas, none, or other)
66	What type of bath facility does the household use? (Fixed place for bathing; Bathtub (private or shared), shower (private or shared), or room reserved for bathing (private or shared))
66	Does the household currently own any televisions, video decks, VCD/DVD players, or satellite dishes? (None; Only television; Video deck, VCD/DVD player, or satellite dish (regardless of television))
65	How many household members 10-years-old or older who were engaged in any productive activity during the last seven days were employers or own-account (self-employed) workers? (Two or more; One; None)
62	In what ecological zone does the household live? (Lowland; Highland; Temperate; Other)
56	Does the household currently own any VCD/DVD players? (No; Yes)
55	Were any household members 10-years-old or older who were engaged in any productive activity during the last seven days employed? (No; Yes)
52	Does the household currently own any televisions? (No; Yes)
51	Does the household currently own any shelves for storing goods? (No; Yes)
50	If the household has a kitchen, is it shared with another household? (Yes; No)

Table 3 (cont.): Poverty indicators

Uncertainty coefficient	Indicator (Responses ordered starting with those linked with higher poverty likelihoods)
50	Does any member of the household (including the head) own any land? (No; Yes)
47	What is the male head/spouse's marital status? (Married, or living together; No male head/spouse; Single, never-married, divorced, separated, or widowed)
46	Did the female head/spouse engage in any productive activity during the last seven days? (Yes; No; No female head/spouse)
38	What is the female head/spouse's marital status? (Married, or living together; Widowed; No female head/spouse; Single, never-married, divorced, or separated)
38	Does the household currently own any satellite dishes? (No; Yes)
37	The walls of the main dwelling are predominantly made of what material? (Reeds/bamboo, wood and thatch, wood only, stone only, or other; Stone and mud, wood and mud, stone and cement, blocks plastered with cement, unplastered blocks, bricks, traditional mud bricks, steel (*lamera*), cargo container, parquet or polished wood, chip wood, corrugated iron sheets, or asbestos)
33	Does the household currently own any wrist watches/clocks? (No; Yes)
32	Does the household currently own any refrigerators? (No; Yes)
31	What is the structure of household headship? (Female head/spouse only; Male head/spouse only; Both male and female heads/spouses)
31	Does the household currently own any wardrobes? (No; Yes)
29	How many *gabi* does the household currently own? (None; One; Two or more)
27	What type of toilet facility does the household use? (Field/forest, bucket, pit latine (shared, whether ventilated or not), or other; Pit latrine (private, whether ventilated or not); Flush toilet (private or shared)
25	Does the household currently own any video decks? (No; Yes)
25	What type of kitchen does the household use? (No kitchen; Room used for traditional kitchen outside the dwelling; Room used for traditional kitchen inside the dwelling, room used for modern kitchen inside the dwelling, or room used for modern kitchen outside the dwelling)

Table 3 (cont.): Poverty indicators

Uncertainty coefficient	Indicator (Responses ordered starting with those linked with higher poverty likelihoods)
19	What is the primary type of oven (*mitad*) used for baking *injera*/bread? (Traditional *mitad* (removable); Traditional *mitad* (not removable); None; Improved energy-saving *mitad* (rural technology product); Electric *mitad*)
18	Does the household currently own any sofa sets? (No; Yes)
17	Does the household currently own any chairs and tables (excluding stools and benches)? (No; Yes)
15	Does the household currently own any fixed-line telephones? (No; Yes)
15	Does the household currently own any irons (charcoal or electric)? (No; Yes)
14	Did the male head/spouse engage in any productive activity during the last seven days? (No male head/spouse; No; Yes)
1	How many rooms does the household occupy (excluding kitchen, toilet, and bathrooms)? (One; Two; Three or more)
1	During the past seven days, did the male or female head/spouse work in non-agriculture as an employer or an own-account (self-employed) worker? (No; Yes)
1	If the household has a kitchen inside the dwelling, does it have a chimney? (No; Yes)

Source: 2011 WMS and the 2010/11 HCES with 100% of the national poverty line

Tables for
100% of the National Poverty Line

(and Tables Pertaining
to All Poverty Lines)

Table 4 (100% of the national line): Estimated poverty likelihoods associated with scores

If a household's score is . . .	. . . then the likelihood (%) of being below the poverty line is:
0–4	74.8
5–9	74.8
10–14	57.4
15–19	52.2
20–24	47.0
25–29	36.5
30–34	31.8
35–39	25.8
40–44	16.1
45–49	12.3
50–54	11.9
55–59	8.4
60–64	4.5
65–69	3.1
70–74	2.7
75–79	1.4
80–84	0.9
85–89	0.9
90–94	0.0
95–100	0.0

Table 5 (100% of the national line): Derivation of estimated poverty likelihoods associated with scores

Score	Households in range and < poverty line		All households in range		Poverty likelihood (%)
0–4	3	÷	4	=	74.8
5–9	135	÷	181	=	74.8
10–14	631	÷	1,099	=	57.4
15–19	1,692	÷	3,242	=	52.2
20–24	3,474	÷	7,388	=	47.0
25–29	3,788	÷	10,379	=	36.5
30–34	4,666	÷	14,674	=	31.8
35–39	3,127	÷	12,128	=	25.8
40–44	2,072	÷	12,866	=	16.1
45–49	1,238	÷	10,080	=	12.3
50–54	992	÷	8,343	=	11.9
55–59	663	÷	7,860	=	8.4
60–64	226	÷	4,994	=	4.5
65–69	96	÷	3,074	=	3.1
70–74	59	÷	2,167	=	2.7
75–79	14	÷	1,016	=	1.4
80–84	4	÷	460	=	0.9
85–89	0	÷	47	=	0.9
90–94	0	÷	0	=	0.0
95–100	0	÷	0	=	0.0

Number of all households normalized to sum to 100,000.

Table 6 (100% of the national line): Average errors (differences between estimated and true poverty likelihoods) for households by score range, with confidence intervals, from 1,000 bootstraps of $n = 16,384$, 2010/11 scorecard applied to the 2010/11 validation sample

| | | Difference between estimate and true value | | |
| | | Confidence interval ($\pm$percentage points) | | |
Score	Diff.	90-percent	95-percent	99-percent
0–4	–2.6	50.0	50.0	50.0
5–9	–17.9	11.6	12.1	12.3
10–14	–2.0	7.1	8.7	11.0
15–19	+7.8	4.3	5.3	7.3
20–24	+1.7	2.6	3.1	4.2
25–29	–3.3	2.7	2.9	3.4
30–34	+2.2	1.6	2.0	2.9
35–39	+4.8	1.6	1.9	2.6
40–44	–0.8	1.5	1.8	2.4
45–49	–2.6	2.2	2.3	2.8
50–54	+1.7	1.4	1.7	2.4
55–59	+2.9	1.2	1.5	1.9
60–64	–4.5	3.3	3.5	3.9
65–69	+0.6	1.4	1.6	2.1
70–74	+1.9	0.6	0.8	1.0
75–79	+1.3	0.1	0.1	0.1
80–84	–1.0	2.2	2.4	2.8
85–89	+0.9	0.0	0.0	0.0
90–94	0.0	0.0	0.0	0.0
95–100	0.0	0.0	0.0	0.0

Table 7 (100% of the national line): Errors (average differences between estimated poverty rates and true values) for a group at a point in time by sample size, with confidence intervals, for 1,000 bootstraps of various sample sizes, 2010/11 scorecard applied to the 2010/11 validation sample

Sample Size n	Diff.	Difference between estimate and true value Confidence interval (±percentage points) 90-percent	95-percent	99-percent
1	+0.7	65.5	67.4	71.9
4	+1.6	36.3	41.9	52.7
8	+1.8	25.5	29.7	38.5
16	+1.1	18.1	21.2	27.7
32	+0.9	13.1	15.9	20.7
64	+1.0	9.5	11.2	14.3
128	+0.9	6.7	8.0	11.0
256	+0.8	4.5	5.6	7.1
512	+0.9	3.3	4.0	5.1
1,024	+0.8	2.3	2.7	3.6
2,048	+0.8	1.7	1.9	2.7
4,096	+0.8	1.2	1.5	1.8
8,192	+0.8	0.8	1.0	1.4
16,384	+0.8	0.6	0.7	0.9

Table 8 (National poverty lines): Errors (average differences between estimates and true values) for estimated poverty rates of a group of households at a point in time, precision, and the α factor for precision, 2010/11 scorecard applied to the 2010/11 validation sample

	Poverty lines			
	National poverty lines			
	Food	100%	150%	200%
Error (estimate minus true value)	+0.3	+0.8	+0.3	−0.5
Precision of difference	0.2	0.6	0.7	0.6
α factor for precision	1.12	1.08	1.09	1.08

Results pertain to the 2010/11 scorecard applied to the 2010/11 validation sample.

Errors (differences between estimates and true values) are displayed in units of percentage points.

Precision is measured as 90-percent confidence intervals of estimates in units of ± percentage points.

Error and precision estimated from 1,000 bootstraps with $n = 16,384$.

α is estimated from 1,000 bootstrap samples of $n = 256, 512, 1,024, 2,048, 4,096, 8,192$, and $16,384$.

Table 8 (International 2005 and 2011 poverty lines): Errors (average differences between estimates and true values) for estimated poverty rates of a group of households at a point in time, precision, and the α factor for precision, 2010/11 scorecard applied to the 2010/11 validation sample

	Poverty lines									
	2005 PPP poverty lines						2011 PPP poverty lines			
	$1.00	**$1.25**	**$1.75**	**$2.00**	**$2.50**	**$5.00**	**$1.90**	**$3.10**	**$3.80**	**$4.00**
Error (estimate minus true value)	+0.3	+0.7	+0.5	−0.5	−1.2	−0.8	+0.6	−0.6	−1.0	−0.9
Precision of difference	0.5	0.6	0.7	0.6	0.6	0.2	0.6	0.6	0.5	0.5
α factor for precision	1.10	1.08	1.09	1.07	1.04	0.81	1.07	1.07	1.03	1.04

Results pertain to the 2010/11 scorecard applied to the 2010/11 validation sample.

Errors (differences between estimates and true values) are displayed in units of percentage points.

Precision is measured as 90-percent confidence intervals of estimates in units of ± percentage points.

Error and precision estimated from 1,000 bootstraps with n = 16,384.

α is estimated from 1,000 bootstrap samples of n = 256, 512, 1,024, 2,048, 4,096, 8,192, and 16,384.

Table 8 (Relative and percentile-based poverty lines): Errors (average differences between estimates and true values) for estimated poverty rates of a group of households at a point in time, precision, and the α factor for precision, 2010/11 scorecard applied to the 2010/11 validation sample

| | Poverty lines | | | | | |
| | Poorest half | Percentile-based lines | | | | |
	<100% Natl.	20th	40th	50th	60th	80th
Error (estimate minus true value)	+0.6	+0.4	+1.0	+0.3	+0.5	−0.9
Precision of difference	0.4	0.5	0.6	0.7	0.7	0.6
α factor for precision	1.10	1.09	1.05	1.06	1.09	1.05

Results pertain to the 2010/11 scorecard applied to the 2010/11 validation sample.

Errors (differences between estimates and true values) are displayed in units of percentage points.

Precision is measured as 90-percent confidence intervals of estimates in units of ± percentage points.

Error and precision estimated from 1,000 bootstraps with n = 16,384.

α is estimated from 1,000 bootstrap samples of n = 256, 512, 1,024, 2,048, 4,096, 8,192, and 16,384.

Table 9 (All poverty lines): Possible targeting outcomes

		Targeting segment	
		Targeted	**Non-targeted**
True poverty status	**Below poverty line**	**Inclusion** Below poverty line correctly targeted	**Undercoverage** Below poverty line mistakenly non-targeted
	Above poverty line	**Leakage** Above poverty line mistakenly targeted	**Exclusion** Above poverty line correctly non-targeted

Table 10 (100% of the national line): Percentages of households by cut-off score and targeting classification, along with the hit rate and BPAC, 2010/11 scorecard applied to the 2010/11 validation sample

Score	Inclusion: < poverty line correctly targeted	Undercoverage: < poverty line mistakenly non-targeted	Leakage: ≥ poverty line mistakenly targeted	Exclusion: ≥ poverty line correctly non-targeted	Hit rate Inclusion + Exclusion	BPAC See text
≤4	0.0	23.3	0.0	76.7	76.7	−100.0
≤9	0.1	23.1	0.0	76.7	76.8	−98.6
≤14	0.8	22.5	0.5	76.2	77.0	−91.1
≤19	2.4	20.8	2.1	74.6	77.1	−70.1
≤24	5.8	17.5	6.1	70.6	76.4	−23.8
≤29	9.9	13.4	12.4	64.3	74.2	+38.2
≤34	14.3	9.0	22.7	54.1	68.4	+2.6
≤39	17.2	6.1	31.9	44.8	62.0	−37.0
≤44	19.6	3.7	42.4	34.3	53.9	−82.2
≤49	21.1	2.2	51.0	25.7	46.8	−119.0
≤54	22.1	1.1	58.2	18.5	40.6	−150.2
≤59	22.7	0.6	65.5	11.2	33.9	−181.5
≤64	23.1	0.2	70.1	6.6	29.7	−201.4
≤69	23.2	0.1	73.1	3.6	26.9	−214.0
≤74	23.3	0.0	75.2	1.5	24.8	−223.2
≤79	23.3	0.0	76.2	0.5	23.7	−227.6
≤84	23.3	0.0	76.7	0.0	23.3	−229.5
≤89	23.3	0.0	76.7	0.0	23.3	−229.7
≤94	23.3	0.0	76.7	0.0	23.3	−229.7
≤100	23.3	0.0	76.7	0.0	23.3	−229.7

Inclusion, undercoverage, leakage, and exclusion normalized to sum to 100.

Table 11 (100% of the national line): Share of all households who are targeted (that is, score at or below a cut-off), the share of targeted households who are poor (that is, have consumption below the poverty line), the share of poor households who are targeted, and the number of poor households who are successfully targeted (inclusion) per non-poor household mistakenly targeted (leakage), 2010/11 scorecard applied to the 2010/11 validation sample

Targeting cut-off	% all HHs who are targeted	% targeted HHs who are poor	% poor HHs who are targeted	Poor HHs targeted per non-poor HH targeted
≤4	0.0	52.1	0.0	1.1:1
≤9	0.2	78.6	0.6	3.7:1
≤14	1.3	62.0	3.4	1.6:1
≤19	4.5	53.6	10.4	1.2:1
≤24	11.9	48.8	25.0	1.0:1
≤29	22.3	44.2	42.4	0.8:1
≤34	37.0	38.7	61.5	0.6:1
≤39	49.1	35.0	73.9	0.5:1
≤44	62.0	31.6	84.0	0.5:1
≤49	72.0	29.2	90.5	0.4:1
≤54	80.4	27.6	95.2	0.4:1
≤59	88.2	25.7	97.6	0.3:1
≤64	93.2	24.8	99.3	0.3:1
≤69	96.3	24.1	99.8	0.3:1
≤74	98.5	23.6	99.9	0.3:1
≤79	99.5	23.4	99.9	0.3:1
≤84	100.0	23.3	100.0	0.3:1
≤89	100.0	23.3	100.0	0.3:1
≤94	100.0	23.3	100.0	0.3:1
≤100	100.0	23.3	100.0	0.3:1

Tables for
the Food Poverty Line

Table 4 (Food line): Estimated poverty likelihoods associated with scores

If a household's score is . . .	. . . then the likelihood (%) of being below the poverty line is:
0–4	15.1
5–9	15.1
10–14	14.7
15–19	10.6
20–24	6.6
25–29	4.1
30–34	3.3
35–39	1.6
40–44	1.0
45–49	0.6
50–54	0.6
55–59	0.3
60–64	0.1
65–69	0.1
70–74	0.0
75–79	0.0
80–84	0.0
85–89	0.0
90–94	0.0
95–100	0.0

Table 6 (Food line): Average errors (differences between estimated and true poverty likelihoods) for households by score range, with confidence intervals, from 1,000 bootstraps of $n = 16,384$, 2010/11 scorecard applied to the 2010/11 validation sample

| | | Difference between estimate and true value | | |
| | | Confidence interval ($\pm$percentage points) | | |
Score	Diff.	90-percent	95-percent	99-percent
0–4	–62.4	50.0	50.0	50.0
5–9	+1.9	9.9	11.4	16.3
10–14	+3.2	4.1	4.9	6.1
15–19	+6.4	1.2	1.5	2.0
20–24	–2.5	2.0	2.1	2.4
25–29	–0.1	0.9	1.0	1.3
30–34	+0.7	0.6	0.7	1.0
35–39	+0.7	0.3	0.4	0.5
40–44	–0.1	0.4	0.4	0.5
45–49	+0.1	0.3	0.3	0.4
50–54	+0.4	0.2	0.2	0.3
55–59	+0.2	0.0	0.0	0.1
60–64	0.0	0.1	0.2	0.2
65–69	0.0	0.1	0.1	0.1
70–74	0.0	0.0	0.0	0.0
75–79	0.0	0.0	0.0	0.0
80–84	0.0	0.0	0.0	0.0
85–89	0.0	0.0	0.0	0.0
90–94	0.0	0.0	0.0	0.0
95–100	0.0	0.0	0.0	0.0

Table 7 (Food line): Errors (average differences between estimated poverty rates and true values) for a group at a point in time by sample size, with confidence intervals, for 1,000 bootstraps of various sample sizes, 2010/11 scorecard applied to the 2010/11 validation sample

Sample Size	Difference between estimate and true value			
		Confidence interval (±percentage points)		
n	Diff.	90-percent	95-percent	99-percent
1	+0.4	3.3	5.3	55.3
4	+0.5	11.8	16.7	29.6
8	+0.5	8.3	11.3	18.1
16	+0.5	6.0	7.9	11.8
32	+0.5	4.4	5.4	7.9
64	+0.4	3.3	3.8	5.1
128	+0.4	2.4	2.9	3.4
256	+0.4	1.8	2.1	2.7
512	+0.4	1.3	1.5	2.0
1,024	+0.4	0.9	1.0	1.3
2,048	+0.3	0.6	0.7	1.0
4,096	+0.3	0.4	0.5	0.7
8,192	+0.3	0.3	0.4	0.5
16,384	+0.3	0.2	0.2	0.3

Table 10 (Food line): Percentages of households by cut-off score and targeting classification, along with the hit rate and BPAC, 2010/11 scorecard applied to the 2010/11 validation sample

Score	Inclusion: < poverty line correctly targeted	Undercoverage: < poverty line mistakenly non-targeted	Leakage: ≥ poverty line mistakenly targeted	Exclusion: ≥ poverty line correctly non-targeted	Hit rate Inclusion + Exclusion	BPAC See text
≤4	0.0	2.4	0.0	97.6	97.6	−99.8
≤9	0.0	2.3	0.1	97.5	97.5	−90.3
≤14	0.2	2.2	1.1	96.5	96.7	−37.6
≤19	0.4	2.0	4.1	93.5	93.9	−74.7
≤24	1.1	1.3	10.8	86.8	87.9	−359.3
≤29	1.5	0.9	20.8	76.8	78.3	−781.5
≤34	1.9	0.5	35.1	62.5	64.4	−1,387.7
≤39	2.0	0.3	47.1	50.6	52.6	−1,895.5
≤44	2.2	0.2	59.8	37.9	40.1	−2,433.4
≤49	2.3	0.1	69.8	27.9	30.2	−2,857.3
≤54	2.3	0.0	78.1	19.6	21.9	−3,209.5
≤59	2.3	0.0	85.9	11.7	14.1	−3,542.2
≤64	2.4	0.0	90.9	6.8	9.1	−3,753.1
≤69	2.4	0.0	94.0	3.7	6.0	−3,883.1
≤74	2.4	0.0	96.1	1.5	3.9	−3,974.9
≤79	2.4	0.0	97.1	0.5	2.9	−4,018.0
≤84	2.4	0.0	97.6	0.0	2.4	−4,037.4
≤89	2.4	0.0	97.6	0.0	2.4	−4,039.4
≤94	2.4	0.0	97.6	0.0	2.4	−4,039.4
≤100	2.4	0.0	97.6	0.0	2.4	−4,039.4

Inclusion, undercoverage, leakage, and exclusion normalized to sum to 100.

Table 11 (Food line): Share of all households who are targeted (that is, score at or below a cut-off), the share of targeted households who are poor (that is, have consumption below the poverty line), the share of poor households who are targeted, and the number of poor households who are successfully targeted (inclusion) per non-poor household mistakenly targeted (leakage), 2010/11 scorecard applied to the 2010/11 validation sample

Targeting cut-off	% all HHs who are targeted	% targeted HHs who are poor	% poor HHs who are targeted	Poor HHs targeted per non-poor HH targeted
≤4	0.0	52.1	0.1	1.1:1
≤9	0.2	23.4	1.8	0.3:1
≤14	1.3	14.7	8.0	0.2:1
≤19	4.5	8.9	17.1	0.1:1
≤24	11.9	9.1	45.8	0.1:1
≤29	22.3	6.7	63.6	0.1:1
≤34	37.0	5.1	79.5	0.1:1
≤39	49.1	4.1	85.9	0.0:1
≤44	62.0	3.6	93.4	0.0:1
≤49	72.0	3.2	96.8	0.0:1
≤54	80.4	2.9	98.3	0.0:1
≤59	88.2	2.6	98.8	0.0:1
≤64	93.2	2.5	99.7	0.0:1
≤69	96.3	2.4	99.9	0.0:1
≤74	98.5	2.4	100.0	0.0:1
≤79	99.5	2.4	100.0	0.0:1
≤84	100.0	2.4	100.0	0.0:1
≤89	100.0	2.4	100.0	0.0:1
≤94	100.0	2.4	100.0	0.0:1
≤100	100.0	2.4	100.0	0.0:1

Tables for
150% of the National Poverty Line

Table 4 (150% of the national line): Estimated poverty likelihoods associated with scores

If a household's score is . . .	. . . then the likelihood (%) of being below the poverty line is:
0–4	98.0
5–9	98.0
10–14	88.0
15–19	83.1
20–24	77.7
25–29	74.4
30–34	68.4
35–39	63.5
40–44	50.4
45–49	45.2
50–54	39.0
55–59	31.7
60–64	23.0
65–69	15.0
70–74	11.7
75–79	4.1
80–84	2.8
85–89	2.0
90–94	0.0
95–100	0.0

Table 6 (150% of the national line): Average errors (differences between estimated and true poverty likelihoods) for households by score range, with confidence intervals, from 1,000 bootstraps of $n = 16,384$, 2010/11 scorecard applied to the 2010/11 validation sample

| | | Difference between estimate and true value | | |
| | | Confidence interval ($\pm$percentage points) | | |
Score	Diff.	90-percent	95-percent	99-percent
0–4	+10.3	50.0	50.0	50.0
5–9	−1.9	1.0	1.0	1.0
10–14	+7.7	6.1	7.4	9.4
15–19	−4.5	3.5	3.7	4.2
20–24	+1.1	2.2	2.6	3.6
25–29	−0.2	1.9	2.3	2.9
30–34	−0.5	1.7	2.1	2.7
35–39	+8.4	2.0	2.4	3.1
40–44	−3.3	2.7	2.9	3.4
45–49	−1.7	2.3	2.8	4.0
50–54	−5.6	4.3	4.5	5.2
55–59	+8.5	2.2	2.6	3.5
60–64	−4.1	3.7	4.0	5.0
65–69	+2.4	3.0	3.6	4.7
70–74	−0.2	3.9	4.7	5.9
75–79	−15.6	11.5	12.0	14.2
80–84	+0.5	2.2	2.6	3.0
85–89	+0.5	3.6	4.3	6.6
90–94	0.0	0.0	0.0	0.0
95–100	0.0	0.0	0.0	0.0

Table 7 (150% of the national line): Errors (average differences between estimated poverty rates and true values) for a group at a point in time by sample size, with confidence intervals, for 1,000 bootstraps of various sample sizes, 2010/11 scorecard applied to the 2010/11 validation sample

Sample Size	Difference between estimate and true value			
		Confidence interval (±percentage points)		
n	Diff.	90-percent	95-percent	99-percent
1	−1.2	67.7	73.0	84.9
4	+0.6	43.7	50.1	58.2
8	+1.3	32.2	37.8	46.5
16	+0.6	23.0	26.4	32.2
32	+0.5	15.9	18.6	26.1
64	+0.4	11.1	13.1	16.8
128	+0.2	8.1	9.2	11.9
256	+0.2	5.7	6.6	8.8
512	+0.2	4.1	4.8	6.2
1,024	+0.3	2.7	3.3	4.4
2,048	+0.3	2.0	2.3	3.3
4,096	+0.3	1.4	1.6	2.2
8,192	+0.3	1.0	1.2	1.5
16,384	+0.3	0.7	0.8	1.0

Table 10 (150% of the national line): Percentages of households by cut-off score and targeting classification, along with the hit rate and BPAC, 2010/11 scorecard applied to the 2010/11 validation sample

Score	Inclusion: < poverty line correctly targeted	Undercoverage: < poverty line mistakenly non-targeted	Leakage: ≥ poverty line mistakenly targeted	Exclusion: ≥ poverty line correctly non-targeted	Hit rate Inclusion + Exclusion	BPAC See text
≤4	0.0	54.4	0.0	45.6	45.6	−100.0
≤9	0.2	54.3	0.0	45.6	45.7	−99.3
≤14	1.1	53.3	0.2	45.4	46.5	−95.6
≤19	3.9	50.6	0.7	44.9	48.8	−84.6
≤24	9.7	44.8	2.2	43.3	53.0	−60.4
≤29	17.4	37.0	4.9	40.7	58.1	−27.1
≤34	27.6	26.8	9.3	36.2	63.8	+18.6
≤39	34.8	19.7	14.3	31.2	66.0	+54.0
≤44	41.8	12.6	20.1	25.4	67.3	+63.0
≤49	46.5	7.9	25.5	20.1	66.6	+53.2
≤54	50.0	4.4	30.3	15.2	65.3	+44.3
≤59	52.3	2.2	36.0	9.6	61.9	+33.9
≤64	53.6	0.8	39.6	5.9	59.6	+27.2
≤69	54.1	0.4	42.2	3.3	57.4	+22.4
≤74	54.3	0.1	44.2	1.4	55.7	+18.8
≤79	54.4	0.0	45.1	0.5	54.9	+17.2
≤84	54.4	0.0	45.5	0.0	54.5	+16.4
≤89	54.4	0.0	45.6	0.0	54.4	+16.3
≤94	54.4	0.0	45.6	0.0	54.4	+16.3
≤100	54.4	0.0	45.6	0.0	54.4	+16.3

Inclusion, undercoverage, leakage, and exclusion normalized to sum to 100.

Table 11 (150% of the national line): Share of all households who are targeted (that is, score at or below a cut-off), the share of targeted households who are poor (that is, have consumption below the poverty line), the share of poor households who are targeted, and the number of poor households who are successfully targeted (inclusion) per non-poor household mistakenly targeted (leakage), 2010/11 scorecard applied to the 2010/11 validation sample

Targeting cut-off	% all HHs who are targeted	% targeted HHs who are poor	% poor HHs who are targeted	Poor HHs targeted per non-poor HH targeted
≤4	0.0	70.5	0.0	2.4:1
≤9	0.2	98.5	0.3	67.2:1
≤14	1.3	86.0	2.0	6.2:1
≤19	4.5	85.3	7.1	5.8:1
≤24	11.9	81.1	17.8	4.3:1
≤29	22.3	78.1	32.0	3.6:1
≤34	37.0	74.7	50.7	3.0:1
≤39	49.1	70.8	63.9	2.4:1
≤44	62.0	67.5	76.9	2.1:1
≤49	72.0	64.6	85.5	1.8:1
≤54	80.4	62.2	91.9	1.6:1
≤59	88.2	59.2	96.0	1.5:1
≤64	93.2	57.5	98.5	1.4:1
≤69	96.3	56.1	99.3	1.3:1
≤74	98.5	55.1	99.7	1.2:1
≤79	99.5	54.7	100.0	1.2:1
≤84	100.0	54.5	100.0	1.2:1
≤89	100.0	54.4	100.0	1.2:1
≤94	100.0	54.4	100.0	1.2:1
≤100	100.0	54.4	100.0	1.2:1

Tables for
200% of the National Poverty Line

Table 4 (200% of the national line): Estimated poverty likelihoods associated with scores

If a household's score is . . .	. . . then the likelihood (%) of being below the poverty line is:
0–4	100.0
5–9	99.0
10–14	95.4
15–19	93.9
20–24	92.2
25–29	89.8
30–34	87.3
35–39	83.4
40–44	78.2
45–49	69.4
50–54	64.1
55–59	59.8
60–64	45.1
65–69	31.3
70–74	25.0
75–79	15.7
80–84	11.2
85–89	6.5
90–94	0.0
95–100	0.0

Table 6 (200% of the national line): Average errors (differences between estimated and true poverty likelihoods) for households by score range, with confidence intervals, from 1,000 bootstraps of $n = 16,384$, 2010/11 scorecard applied to the 2010/11 validation sample

| | | Difference between estimate and true value | | |
| | | Confidence interval (±percentage points) | | |
Score	Diff.	90-percent	95-percent	99-percent
0–4	0.0	0.0	0.0	0.0
5–9	–1.0	0.5	0.5	0.5
10–14	+12.6	5.9	7.1	9.1
15–19	–0.3	1.7	2.1	2.6
20–24	+1.8	1.6	1.9	2.5
25–29	–1.5	1.3	1.5	1.8
30–34	–0.1	1.2	1.5	1.7
35–39	+1.4	1.7	1.9	2.6
40–44	+1.8	1.9	2.4	3.1
45–49	–2.7	2.5	2.7	3.3
50–54	–1.7	2.8	3.4	4.5
55–59	–2.9	2.8	3.4	4.1
60–64	–7.0	5.3	5.6	6.1
65–69	–1.1	4.4	5.3	7.2
70–74	+7.8	4.5	5.3	6.9
75–79	–23.1	15.7	16.4	18.1
80–84	–8.9	11.0	13.2	18.0
85–89	+5.0	3.6	4.3	6.6
90–94	0.0	0.0	0.0	0.0
95–100	0.0	0.0	0.0	0.0

Table 7 (200% of the national line): Errors (average differences between estimated poverty rates and true values) for a group at a point in time by sample size, with confidence intervals, for 1,000 bootstraps of various sample sizes, 2010/11 scorecard applied to the 2010/11 validation sample

Sample Size	Difference between estimate and true value			
		Confidence interval (±percentage points)		
n	Diff.	90-percent	95-percent	99-percent
1	−2.8	69.1	74.6	89.1
4	−0.5	35.5	41.9	58.2
8	−0.3	26.3	30.7	42.8
16	−0.8	18.2	22.0	27.9
32	−0.5	13.5	15.9	21.4
64	−0.4	9.7	11.6	14.7
128	−0.6	7.0	8.1	10.4
256	−0.5	4.8	5.6	7.6
512	−0.6	3.4	4.0	5.0
1,024	−0.6	2.4	2.8	3.6
2,048	−0.5	1.7	2.0	2.7
4,096	−0.5	1.2	1.4	1.8
8,192	−0.5	0.8	1.0	1.3
16,384	−0.5	0.6	0.7	0.9

Table 10 (200% of the national line): Percentages of households by cut-off score and targeting classification, along with the hit rate and BPAC, 2010/11 scorecard applied to the 2010/11 validation sample

Score	Inclusion: < poverty line correctly targeted	Undercoverage: < poverty line mistakenly non-targeted	Leakage: ≥ poverty line mistakenly targeted	Exclusion: ≥ poverty line correctly non-targeted	Hit rate Inclusion + Exclusion	BPAC See text
≤4	0.0	74.9	0.0	25.1	25.1	−100.0
≤9	0.2	74.7	0.0	25.1	25.3	−99.5
≤14	1.2	73.7	0.1	25.0	26.1	−96.7
≤19	4.2	70.7	0.4	24.8	28.9	−88.4
≤24	10.9	64.0	1.0	24.1	35.1	−69.5
≤29	20.4	54.5	1.9	23.2	43.6	−43.0
≤34	33.2	41.6	3.7	21.4	54.6	−6.2
≤39	43.3	31.6	5.8	19.3	62.5	+23.3
≤44	53.4	21.5	8.6	16.5	69.9	+54.0
≤49	60.6	14.3	11.4	13.7	74.3	+77.1
≤54	66.0	8.9	14.4	10.7	76.7	+80.8
≤59	70.6	4.3	17.6	7.5	78.1	+76.5
≤64	73.1	1.8	20.1	5.0	78.1	+73.1
≤69	74.1	0.8	22.2	2.9	77.1	+70.4
≤74	74.5	0.4	23.9	1.2	75.7	+68.0
≤79	74.8	0.1	24.7	0.4	75.3	+67.0
≤84	74.9	0.0	25.1	0.0	74.9	+66.5
≤89	74.9	0.0	25.1	0.0	74.9	+66.5
≤94	74.9	0.0	25.1	0.0	74.9	+66.5
≤100	74.9	0.0	25.1	0.0	74.9	+66.5

Inclusion, undercoverage, leakage, and exclusion normalized to sum to 100.

Table 11 (200% of the national line): Share of all households who are targeted (that is, score at or below a cut-off), the share of targeted households who are poor (that is, have consumption below the poverty line), the share of poor households who are targeted, and the number of poor households who are successfully targeted (inclusion) per non-poor household mistakenly targeted (leakage), 2010/11 scorecard applied to the 2010/11 validation sample

Targeting cut-off	% all HHs who are targeted	% targeted HHs who are poor	% poor HHs who are targeted	Poor HHs targeted per non-poor HH targeted
≤4	0.0	100.0	0.0	Only poor targeted
≤9	0.2	100.0	0.2	Only poor targeted
≤14	1.3	89.6	1.5	8.6:1
≤19	4.5	92.1	5.6	11.6:1
≤24	11.9	91.8	14.6	11.2:1
≤29	22.3	91.4	27.2	10.7:1
≤34	37.0	89.9	44.4	8.9:1
≤39	49.1	88.1	57.8	7.4:1
≤44	62.0	86.1	71.3	6.2:1
≤49	72.0	84.1	80.9	5.3:1
≤54	80.4	82.1	88.1	4.6:1
≤59	88.2	80.0	94.3	4.0:1
≤64	93.2	78.4	97.6	3.6:1
≤69	96.3	77.0	99.0	3.3:1
≤74	98.5	75.7	99.5	3.1:1
≤79	99.5	75.2	99.9	3.0:1
≤84	100.0	74.9	100.0	3.0:1
≤89	100.0	74.9	100.0	3.0:1
≤94	100.0	74.9	100.0	3.0:1
≤100	100.0	74.9	100.0	3.0:1

Tables for
the $1.00/day 2005 PPP Poverty Line

Table 4 ($1.00/day 2005 PPP line): Estimated poverty likelihoods associated with scores

If a household's score is . . .	. . . then the likelihood (%) of being below the poverty line is:
0–4	53.4
5–9	53.4
10–14	42.5
15–19	35.4
20–24	31.8
25–29	23.9
30–34	19.0
35–39	14.3
40–44	7.3
45–49	5.0
50–54	4.4
55–59	3.6
60–64	2.0
65–69	1.5
70–74	1.4
75–79	0.8
80–84	0.5
85–89	0.0
90–94	0.0
95–100	0.0

Table 6 ($1.00/day 2005 PPP line): Average errors (differences between estimated and true poverty likelihoods) for households by score range, with confidence intervals, from 1,000 bootstraps of $n = 16,384$, 2010/11 scorecard applied to the 2010/11 validation sample

| | | Difference between estimate and true value | | |
| | | Confidence interval (±percentage points) | | |
Score	Diff.	90-percent	95-percent	99-percent
0–4	–24.1	50.0	50.0	50.0
5–9	–39.3	22.3	22.8	23.0
10–14	–2.4	7.2	8.4	10.9
15–19	+6.8	3.7	4.4	5.8
20–24	0.0	2.4	2.9	3.9
25–29	–1.3	1.8	2.2	2.9
30–34	+2.5	1.3	1.6	2.0
35–39	+2.7	1.2	1.6	1.9
40–44	–0.6	1.1	1.3	1.8
45–49	–3.7	2.6	2.7	2.9
50–54	+0.4	0.8	1.0	1.3
55–59	+0.1	1.1	1.2	1.7
60–64	–1.8	1.7	1.8	2.2
65–69	+1.3	0.2	0.2	0.3
70–74	+1.3	0.1	0.1	0.2
75–79	+0.7	0.1	0.1	0.1
80–84	–1.5	2.2	2.4	2.8
85–89	0.0	0.0	0.0	0.0
90–94	0.0	0.0	0.0	0.0
95–100	0.0	0.0	0.0	0.0

Table 7 ($1.00/day 2005 PPP line): Errors (average differences between estimated poverty rates and true values) for a group at a point in time by sample size, with confidence intervals, for 1,000 bootstraps of various sample sizes, 2010/11 scorecard applied to the 2010/11 validation sample

Sample Size n	Diff.	Difference between estimate and true value Confidence interval (±percentage points) 90-percent	95-percent	99-percent
1	−0.6	56.4	63.2	65.5
4	+0.7	29.2	35.3	45.1
8	+1.0	20.0	23.7	30.8
16	+0.5	13.9	17.4	22.0
32	+0.4	10.5	12.3	16.5
64	+0.4	7.6	9.3	12.5
128	+0.4	5.3	6.0	8.6
256	+0.3	3.9	4.5	5.8
512	+0.4	2.8	3.3	4.3
1,024	+0.4	1.9	2.3	3.0
2,048	+0.3	1.4	1.6	2.2
4,096	+0.3	1.0	1.2	1.6
8,192	+0.3	0.7	0.8	1.1
16,384	+0.3	0.5	0.6	0.8

Table 10 ($1.00/day 2005 PPP line): Percentages of households by cut-off score and targeting classification, along with the hit rate and BPAC, 2010/11 scorecard applied to the 2010/11 validation sample

Score	Inclusion: < poverty line correctly targeted	Undercoverage: < poverty line mistakenly non-targeted	Leakage: ≥ poverty line mistakenly targeted	Exclusion: ≥ poverty line correctly non-targeted	Hit rate Inclusion + Exclusion	BPAC See text
≤4	0.0	13.8	0.0	86.2	86.2	−100.0
≤9	0.1	13.7	0.0	86.1	86.3	−97.6
≤14	0.6	13.2	0.6	85.5	86.2	−86.1
≤19	1.7	12.1	2.8	83.3	85.0	−55.0
≤24	4.1	9.7	7.8	78.4	82.4	+15.7
≤29	6.7	7.1	15.6	70.6	77.3	−12.7
≤34	9.3	4.5	27.7	58.5	67.8	−99.9
≤39	10.9	2.9	38.2	48.0	58.9	−176.1
≤44	12.0	1.8	49.9	36.3	48.3	−260.8
≤49	12.8	1.0	59.2	26.9	39.7	−328.1
≤54	13.3	0.5	67.1	19.1	32.4	−385.0
≤59	13.6	0.2	74.6	11.5	25.1	−439.5
≤64	13.8	0.1	79.5	6.7	20.5	−474.4
≤69	13.8	0.0	82.5	3.7	17.5	−496.4
≤74	13.8	0.0	84.7	1.5	15.3	−512.0
≤79	13.8	0.0	85.7	0.5	14.3	−519.3
≤84	13.8	0.0	86.1	0.0	13.9	−522.5
≤89	13.8	0.0	86.2	0.0	13.8	−522.8
≤94	13.8	0.0	86.2	0.0	13.8	−522.8
≤100	13.8	0.0	86.2	0.0	13.8	−522.8

Inclusion, undercoverage, leakage, and exclusion normalized to sum to 100.

Table 11 ($1.00/day 2005 PPP line): Share of all households who are targeted (that is, score at or below a cut-off), the share of targeted households who are poor (that is, have consumption below the poverty line), the share of poor households who are targeted, and the number of poor households who are successfully targeted (inclusion) per non-poor household mistakenly targeted (leakage), 2010/11 scorecard applied to the 2010/11 validation sample

Targeting cut-off	% all HHs who are targeted	% targeted HHs who are poor	% poor HHs who are targeted	Poor HHs targeted per non-poor HH targeted
≤4	0.0	52.1	0.0	1.1:1
≤9	0.2	76.7	1.0	3.3:1
≤14	1.3	49.7	4.6	1.0:1
≤19	4.5	37.5	12.3	0.6:1
≤24	11.9	34.4	29.6	0.5:1
≤29	22.3	30.0	48.4	0.4:1
≤34	37.0	25.2	67.3	0.3:1
≤39	49.1	22.2	78.8	0.3:1
≤44	62.0	19.4	87.1	0.2:1
≤49	72.0	17.8	92.6	0.2:1
≤54	80.4	16.5	96.1	0.2:1
≤59	88.2	15.4	98.4	0.2:1
≤64	93.2	14.8	99.6	0.2:1
≤69	96.3	14.3	99.8	0.2:1
≤74	98.5	14.0	99.9	0.2:1
≤79	99.5	13.9	99.9	0.2:1
≤84	100.0	13.8	100.0	0.2:1
≤89	100.0	13.8	100.0	0.2:1
≤94	100.0	13.8	100.0	0.2:1
≤100	100.0	13.8	100.0	0.2:1

Tables for
the $1.25/day 2005 PPP Poverty Line

Table 4 ($1.25/day 2005 PPP line): Estimated poverty likelihoods associated with scores

If a household's score is . . .	. . . then the likelihood (%) of being below the poverty line is:
0–4	81.5
5–9	81.5
10–14	65.8
15–19	56.6
20–24	50.9
25–29	39.3
30–34	35.7
35–39	30.3
40–44	19.2
45–49	14.3
50–54	12.5
55–59	8.6
60–64	4.5
65–69	3.2
70–74	2.8
75–79	1.6
80–84	0.7
85–89	0.7
90–94	0.0
95–100	0.0

Table 6 ($1.25/day 2005 PPP line): Average errors (differences between estimated and true poverty likelihoods) for households by score range, with confidence intervals, from 1,000 bootstraps of $n = 16,384$, 2010/11 scorecard applied to the 2010/11 validation sample

Score	Diff.	Difference between estimate and true value Confidence interval (±percentage points)		
		90-percent	95-percent	99-percent
0–4	–6.2	50.0	50.0	50.0
5–9	–11.2	8.3	8.8	10.1
10–14	–2.0	6.9	8.0	10.2
15–19	+6.2	4.5	5.2	7.1
20–24	+3.3	2.6	3.1	3.8
25–29	–4.4	3.2	3.4	3.9
30–34	+2.8	1.7	2.0	2.9
35–39	+3.9	1.7	2.0	3.0
40–44	–1.2	1.7	2.0	2.5
45–49	–2.6	2.2	2.3	2.8
50–54	+1.9	1.5	1.7	2.5
55–59	+2.4	1.3	1.6	2.0
60–64	–5.0	3.7	3.8	4.1
65–69	+0.8	1.4	1.7	2.2
70–74	+2.2	0.5	0.6	0.8
75–79	+1.2	0.5	0.6	0.7
80–84	–1.2	2.2	2.4	2.8
85–89	+0.7	0.0	0.0	0.0
90–94	0.0	0.0	0.0	0.0
95–100	0.0	0.0	0.0	0.0

Table 7 ($1.25/day 2005 PPP line): Errors (average differences between estimated poverty rates and true values) for a group at a point in time by sample size, with confidence intervals, for 1,000 bootstraps of various sample sizes, 2010/11 scorecard applied to the 2010/11 validation sample

Sample Size n	Diff.	Difference between estimate and true value Confidence interval (±percentage points)		
		90-percent	95-percent	99-percent
1	+0.8	65.9	68.3	74.0
4	+0.9	37.9	43.4	56.3
8	+1.7	26.8	30.5	40.9
16	+0.9	18.8	22.3	29.1
32	+0.7	13.8	16.1	20.5
64	+0.7	9.6	12.0	15.8
128	+0.7	7.2	8.3	10.8
256	+0.7	4.8	5.6	7.3
512	+0.7	3.3	4.1	5.3
1,024	+0.7	2.4	2.8	3.7
2,048	+0.7	1.8	2.1	2.8
4,096	+0.7	1.2	1.4	2.1
8,192	+0.7	0.9	1.0	1.3
16,384	+0.7	0.6	0.7	0.9

Table 10 ($1.25/day 2005 PPP line): Percentages of households by cut-off score and targeting classification, along with the hit rate and BPAC, 2010/11 scorecard applied to the 2010/11 validation sample

Score	Inclusion: < poverty line correctly targeted	Undercoverage: < poverty line mistakenly non-targeted	Leakage: ≥ poverty line mistakenly targeted	Exclusion: ≥ poverty line correctly non-targeted	Hit rate Inclusion + Exclusion	BPAC See text
≤4	0.0	25.9	0.0	74.1	74.1	−100.0
≤9	0.1	25.8	0.0	74.0	74.2	−98.7
≤14	0.9	25.1	0.4	73.7	74.5	−91.6
≤19	2.7	23.3	1.8	72.2	74.9	−72.2
≤24	6.3	19.7	5.6	68.4	74.7	−29.9
≤29	10.7	15.3	11.6	62.4	73.1	+27.1
≤34	15.7	10.3	21.3	52.8	68.5	+17.9
≤39	19.2	6.7	29.9	44.2	63.4	−15.2
≤44	21.9	4.0	40.0	34.1	56.0	−54.3
≤49	23.7	2.3	48.4	25.7	49.3	−86.5
≤54	24.8	1.2	55.6	18.4	43.2	−114.4
≤59	25.4	0.5	62.9	11.2	36.6	−142.3
≤64	25.8	0.2	67.5	6.6	32.4	−160.1
≤69	25.9	0.1	70.4	3.6	29.5	−171.5
≤74	25.9	0.0	72.6	1.5	27.4	−179.8
≤79	25.9	0.0	73.6	0.5	26.4	−183.6
≤84	25.9	0.0	74.0	0.0	26.0	−185.3
≤89	25.9	0.0	74.1	0.0	25.9	−185.5
≤94	25.9	0.0	74.1	0.0	25.9	−185.5
≤100	25.9	0.0	74.1	0.0	25.9	−185.5

Inclusion, undercoverage, leakage, and exclusion normalized to sum to 100.

Table 11 ($1.25/day 2005 PPP line): Share of all households who are targeted (that is, score at or below a cut-off), the share of targeted households who are poor (that is, have consumption below the poverty line), the share of poor households who are targeted, and the number of poor households who are successfully targeted (inclusion) per non-poor household mistakenly targeted (leakage), 2010/11 scorecard applied to the 2010/11 validation sample

Targeting cut-off	% all HHs who are targeted	% targeted HHs who are poor	% poor HHs who are targeted	Poor HHs targeted per non-poor HH targeted
≤4	0.0	70.5	0.0	2.4:1
≤9	0.2	79.6	0.6	3.9:1
≤14	1.3	68.8	3.4	2.2:1
≤19	4.5	59.2	10.3	1.4:1
≤24	11.9	52.7	24.2	1.1:1
≤29	22.3	47.8	41.1	0.9:1
≤34	37.0	42.4	60.5	0.7:1
≤39	49.1	39.1	74.1	0.6:1
≤44	62.0	35.4	84.6	0.5:1
≤49	72.0	32.8	91.2	0.5:1
≤54	80.4	30.8	95.5	0.4:1
≤59	88.2	28.8	97.9	0.4:1
≤64	93.2	27.6	99.4	0.4:1
≤69	96.3	26.9	99.8	0.4:1
≤74	98.5	26.3	99.9	0.4:1
≤79	99.5	26.1	99.9	0.4:1
≤84	100.0	26.0	100.0	0.4:1
≤89	100.0	25.9	100.0	0.4:1
≤94	100.0	25.9	100.0	0.4:1
≤100	100.0	25.9	100.0	0.4:1

Tables for
the $1.75/day 2005 PPP Poverty Line

Table 4 ($1.75/day 2005 PPP line): Estimated poverty likelihoods associated with scores

If a household's score is . . .	. . . then the likelihood (%) of being below the poverty line is:
0–4	98.0
5–9	98.0
10–14	86.5
15–19	81.1
20–24	76.4
25–29	73.1
30–34	65.9
35–39	61.7
40–44	47.9
45–49	41.1
50–54	34.8
55–59	27.7
60–64	18.5
65–69	11.0
70–74	7.6
75–79	2.5
80–84	1.8
85–89	1.7
90–94	0.0
95–100	0.0

Table 6 ($1.75/day 2005 PPP line): Average errors (differences between estimated and true poverty likelihoods) for households by score range, with confidence intervals, from 1,000 bootstraps of $n = 16,384$, 2010/11 scorecard applied to the 2010/11 validation sample

Score	Diff.	Difference between estimate and true value Confidence interval (±percentage points)		
		90-percent	95-percent	99-percent
0–4	+10.3	50.0	50.0	50.0
5–9	−1.9	1.0	1.0	1.0
10–14	+12.1	6.4	7.4	10.1
15–19	−5.3	4.0	4.1	4.6
20–24	+0.8	2.3	2.6	3.5
25–29	−1.0	1.8	2.3	3.0
30–34	+1.1	1.7	2.2	2.9
35–39	+9.7	2.0	2.4	3.4
40–44	−3.3	2.7	3.0	3.6
45–49	−3.6	3.0	3.2	4.1
50–54	−2.6	2.8	3.5	4.6
55–59	+5.9	2.1	2.5	3.4
60–64	−2.8	2.9	3.4	4.2
65–69	−2.3	3.5	4.1	5.5
70–74	+1.9	2.9	3.4	4.1
75–79	−2.0	3.0	3.5	4.7
80–84	−0.2	2.2	2.4	2.9
85–89	+1.7	0.0	0.0	0.0
90–94	0.0	0.0	0.0	0.0
95–100	0.0	0.0	0.0	0.0

Table 7 ($1.75/day 2005 PPP line): Errors (average differences between estimated poverty rates and true values) for a group at a point in time by sample size, with confidence intervals, for 1,000 bootstraps of various sample sizes, 2010/11 scorecard applied to the 2010/11 validation sample

Sample Size n	Diff.	Difference between estimate and true value Confidence interval (±percentage points)		
		90-percent	95-percent	99-percent
1	−1.1	69.1	74.3	85.1
4	+0.6	43.3	49.8	59.2
8	+1.2	32.3	37.0	46.4
16	+0.9	21.8	24.7	32.9
32	+0.8	15.4	18.2	23.3
64	+0.6	11.0	13.3	16.9
128	+0.5	8.0	9.5	12.6
256	+0.5	5.6	6.8	8.4
512	+0.5	4.0	4.7	6.0
1,024	+0.5	2.8	3.4	4.8
2,048	+0.5	2.0	2.4	3.1
4,096	+0.5	1.4	1.6	2.3
8,192	+0.5	1.0	1.2	1.6
16,384	+0.5	0.7	0.8	1.0

Table 10 ($1.75/day 2005 PPP line): Percentages of households by cut-off score and targeting classification, along with the hit rate and BPAC, 2010/11 scorecard applied to the 2010/11 validation sample

Score	Inclusion: < poverty line correctly targeted	Undercoverage: < poverty line mistakenly non-targeted	Leakage: ≥ poverty line mistakenly targeted	Exclusion: ≥ poverty line correctly non-targeted	Hit rate Inclusion + Exclusion	BPAC See text
≤4	0.0	51.3	0.0	48.7	48.7	−100.0
≤9	0.2	51.2	0.0	48.7	48.8	−99.3
≤14	1.0	50.3	0.2	48.4	49.5	−95.5
≤19	3.8	47.6	0.7	47.9	51.7	−83.8
≤24	9.4	41.9	2.5	46.2	55.6	−58.4
≤29	17.0	34.3	5.3	43.4	60.4	−23.4
≤34	26.7	24.6	10.2	38.4	65.2	+24.1
≤39	33.5	17.9	15.6	33.0	66.5	+60.8
≤44	40.2	11.1	21.7	26.9	67.2	+57.7
≤49	44.6	6.7	27.4	21.2	65.8	+46.5
≤54	47.6	3.7	32.8	15.9	63.5	+36.1
≤59	49.6	1.7	38.6	10.0	59.7	+24.8
≤64	50.7	0.6	42.5	6.2	56.9	+17.2
≤69	51.1	0.2	45.2	3.5	54.6	+12.0
≤74	51.3	0.1	47.2	1.5	52.7	+8.0
≤79	51.3	0.0	48.2	0.5	51.8	+6.2
≤84	51.3	0.0	48.6	0.0	51.4	+5.3
≤89	51.3	0.0	48.7	0.0	51.3	+5.2
≤94	51.3	0.0	48.7	0.0	51.3	+5.2
≤100	51.3	0.0	48.7	0.0	51.3	+5.2

Inclusion, undercoverage, leakage, and exclusion normalized to sum to 100.

Table 11 ($1.75/day 2005 PPP line): Share of all households who are targeted (that is, score at or below a cut-off), the share of targeted households who are poor (that is, have consumption below the poverty line), the share of poor households who are targeted, and the number of poor households who are successfully targeted (inclusion) per non-poor household mistakenly targeted (leakage), 2010/11 scorecard applied to the 2010/11 validation sample

Targeting cut-off	% all HHs who are targeted	% targeted HHs who are poor	% poor HHs who are targeted	Poor HHs targeted per non-poor HH targeted
≤4	0.0	70.5	0.0	2.4:1
≤9	0.2	98.5	0.4	67.2:1
≤14	1.3	81.5	2.0	4.4:1
≤19	4.5	83.5	7.4	5.1:1
≤24	11.9	79.1	18.4	3.8:1
≤29	22.3	76.3	33.1	3.2:1
≤34	37.0	72.4	52.1	2.6:1
≤39	49.1	68.2	65.2	2.1:1
≤44	62.0	64.9	78.4	1.9:1
≤49	72.0	61.9	86.9	1.6:1
≤54	80.4	59.2	92.7	1.5:1
≤59	88.2	56.2	96.7	1.3:1
≤64	93.2	54.4	98.8	1.2:1
≤69	96.3	53.1	99.6	1.1:1
≤74	98.5	52.1	99.9	1.1:1
≤79	99.5	51.6	100.0	1.1:1
≤84	100.0	51.4	100.0	1.1:1
≤89	100.0	51.3	100.0	1.1:1
≤94	100.0	51.3	100.0	1.1:1
≤100	100.0	51.3	100.0	1.1:1

Tables for
the $2.00/day 2005 PPP Poverty Line

Table 4 ($2.00/day 2005 PPP line): Estimated poverty likelihoods associated with scores

If a household's score is . . .	. . . then the likelihood (%) of being below the poverty line is:
0–4	98.0
5–9	98.0
10–14	94.0
15–19	87.1
20–24	85.6
25–29	82.3
30–34	77.1
35–39	73.4
40–44	59.7
45–49	51.5
50–54	46.4
55–59	38.8
60–64	28.2
65–69	17.0
70–74	12.5
75–79	4.8
80–84	2.0
85–89	1.9
90–94	0.0
95–100	0.0

Table 6 ($2.00/day 2005 PPP line): Average errors (differences between estimated and true poverty likelihoods) for households by score range, with confidence intervals, from 1,000 bootstraps of $n = 16,384$, 2010/11 scorecard applied to the 2010/11 validation sample

		Difference between estimate and true value		
		Confidence interval (±percentage points)		
Score	Diff.	90-percent	95-percent	99-percent
0–4	+3.4	10.5	50.0	50.0
5–9	−1.9	1.0	1.0	1.0
10–14	+12.4	6.1	7.3	9.2
15–19	−2.7	2.5	2.8	3.6
20–24	+1.7	1.9	2.2	3.2
25–29	−0.4	1.7	2.0	2.7
30–34	+1.0	1.5	1.8	2.5
35–39	+6.5	1.9	2.2	3.0
40–44	−6.0	4.0	4.2	4.6
45–49	−5.2	3.8	4.0	4.5
50–54	−5.1	4.0	4.2	4.6
55–59	+6.0	2.5	3.1	3.9
60–64	−6.2	4.8	5.2	5.7
65–69	−1.5	3.7	4.4	6.0
70–74	−0.1	3.9	4.8	6.0
75–79	−3.2	3.8	4.6	5.9
80–84	−0.3	2.2	2.6	3.0
85–89	+1.9	0.0	0.0	0.0
90–94	0.0	0.0	0.0	0.0
95–100	0.0	0.0	0.0	0.0

Table 7 ($2.00/day 2005 PPP line): Errors (average differences between estimated poverty rates and true values) for a group at a point in time by sample size, with confidence intervals, for 1,000 bootstraps of various sample sizes, 2010/11 scorecard applied to the 2010/11 validation sample

Sample Size	Difference between estimate and true value			
		Confidence interval (±percentage points)		
n	Diff.	90-percent	95-percent	99-percent
1	−1.9	69.1	77.1	87.3
4	+0.4	41.9	48.2	59.4
8	+0.5	31.3	35.8	45.0
16	0.0	21.1	25.1	31.4
32	−0.2	15.2	18.1	22.2
64	−0.3	10.6	12.5	15.7
128	−0.3	7.6	9.0	11.5
256	−0.4	5.5	6.4	8.3
512	−0.4	3.8	4.5	5.5
1,024	−0.4	2.6	3.0	4.0
2,048	−0.4	1.8	2.2	3.0
4,096	−0.4	1.3	1.6	2.1
8,192	−0.5	1.0	1.2	1.5
16,384	−0.5	0.6	0.7	1.0

Table 10 ($2.00/day 2005 PPP line): Percentages of households by cut-off score and targeting classification, along with the hit rate and BPAC, 2010/11 scorecard applied to the 2010/11 validation sample

Score	Inclusion: < poverty line correctly targeted	Undercoverage: < poverty line mistakenly non-targeted	Leakage: ≥ poverty line mistakenly targeted	Exclusion: ≥ poverty line correctly non-targeted	Hit rate Inclusion + Exclusion	BPAC See text
≤4	0.0	61.9	0.0	38.1	38.1	−100.0
≤9	0.2	61.8	0.0	38.1	38.2	−99.4
≤14	1.1	60.8	0.2	37.9	39.0	−96.1
≤19	4.0	58.0	0.5	37.5	41.5	−86.2
≤24	10.3	51.7	1.7	36.4	46.7	−64.2
≤29	18.8	43.2	3.5	34.5	53.3	−33.7
≤34	30.0	31.9	7.0	31.1	61.1	+8.1
≤39	38.4	23.5	10.7	27.4	65.8	+41.3
≤44	46.8	15.2	15.2	22.9	69.6	+75.5
≤49	52.3	9.6	19.7	18.3	70.7	+68.2
≤54	56.4	5.5	24.0	14.1	70.5	+61.3
≤59	59.3	2.6	28.9	9.2	68.5	+53.3
≤64	61.0	0.9	32.2	5.8	66.8	+47.9
≤69	61.6	0.4	34.7	3.3	64.9	+43.9
≤74	61.8	0.1	36.7	1.4	63.2	+40.8
≤79	61.9	0.0	37.6	0.5	62.4	+39.3
≤84	61.9	0.0	38.0	0.0	62.0	+38.6
≤89	61.9	0.0	38.1	0.0	61.9	+38.6
≤94	61.9	0.0	38.1	0.0	61.9	+38.6
≤100	61.9	0.0	38.1	0.0	61.9	+38.6

Inclusion, undercoverage, leakage, and exclusion normalized to sum to 100.

Table 11 ($2.00/day 2005 PPP line): Share of all households who are targeted (that is, score at or below a cut-off), the share of targeted households who are poor (that is, have consumption below the poverty line), the share of poor households who are targeted, and the number of poor households who are successfully targeted (inclusion) per non-poor household mistakenly targeted (leakage), 2010/11 scorecard applied to the 2010/11 validation sample

Targeting cut-off	% all HHs who are targeted	% targeted HHs who are poor	% poor HHs who are targeted	Poor HHs targeted per non-poor HH targeted
≤4	0.0	86.2	0.0	6.2:1
≤9	0.2	98.8	0.3	85.7:1
≤14	1.3	87.7	1.8	7.1:1
≤19	4.5	88.2	6.4	7.5:1
≤24	11.9	86.1	16.6	6.2:1
≤29	22.3	84.3	30.3	5.4:1
≤34	37.0	81.1	48.4	4.3:1
≤39	49.1	78.2	62.0	3.6:1
≤44	62.0	75.5	75.5	3.1:1
≤49	72.0	72.6	84.5	2.7:1
≤54	80.4	70.2	91.1	2.4:1
≤59	88.2	67.3	95.8	2.1:1
≤64	93.2	65.4	98.5	1.9:1
≤69	96.3	63.9	99.4	1.8:1
≤74	98.5	62.8	99.8	1.7:1
≤79	99.5	62.2	100.0	1.6:1
≤84	100.0	62.0	100.0	1.6:1
≤89	100.0	61.9	100.0	1.6:1
≤94	100.0	61.9	100.0	1.6:1
≤100	100.0	61.9	100.0	1.6:1

Tables for
the $2.50/day 2005 PPP Poverty Line

Table 4 ($2.50/day 2005 PPP line): Estimated poverty likelihoods associated with scores

If a household's score is . . .	. . . then the likelihood (%) of being below the poverty line is:
0–4	100.0
5–9	99.0
10–14	97.3
15–19	94.9
20–24	93.4
25–29	91.4
30–34	88.9
35–39	84.8
40–44	79.2
45–49	70.2
50–54	65.9
55–59	61.1
60–64	45.1
65–69	31.7
70–74	24.6
75–79	14.5
80–84	9.2
85–89	2.0
90–94	0.0
95–100	0.0

Table 6 ($2.50/day 2005 PPP line): Average errors (differences between estimated and true poverty likelihoods) for households by score range, with confidence intervals, from 1,000 bootstraps of $n = 16,384$, 2010/11 scorecard applied to the 2010/11 validation sample

		Difference between estimate and true value		
		Confidence interval (±percentage points)		
Score	Diff.	90-percent	95-percent	99-percent
0–4	0.0	0.0	0.0	0.0
5–9	−1.0	0.5	0.5	0.5
10–14	+14.5	5.9	7.1	9.1
15–19	+0.4	1.7	2.0	2.6
20–24	−0.9	1.2	1.4	1.9
25–29	−0.9	1.2	1.3	1.8
30–34	−0.6	1.1	1.3	1.8
35–39	+0.5	1.6	1.8	2.5
40–44	−3.5	2.5	2.6	3.0
45–49	−4.3	3.2	3.4	3.8
50–54	−3.3	3.0	3.3	4.4
55–59	+4.8	2.9	3.5	4.6
60–64	−5.7	4.6	5.0	5.6
65–69	+3.0	4.2	5.1	6.8
70–74	+2.9	5.2	6.2	8.3
75–79	−25.1	16.7	17.3	19.0
80–84	+6.7	2.3	2.6	3.3
85–89	+0.5	3.6	4.3	6.6
90–94	0.0	0.0	0.0	0.0
95–100	0.0	0.0	0.0	0.0

Table 7 ($2.50/day 2005 PPP line): Errors (average differences between estimated poverty rates and true values) for a group at a point in time by sample size, with confidence intervals, for 1,000 bootstraps of various sample sizes, 2010/11 scorecard applied to the 2010/11 validation sample

| Sample Size | Difference between estimate and true value | | | |
| | | Confidence interval (±percentage points) | | |
n	Diff.	90-percent	95-percent	99-percent
1	−2.3	59.1	71.9	89.8
4	−0.6	34.7	39.7	57.1
8	−0.5	24.8	29.2	42.5
16	−1.0	17.3	21.1	27.8
32	−0.9	12.8	14.6	21.0
64	−1.0	8.7	10.6	14.5
128	−1.1	6.4	7.6	9.8
256	−1.1	4.7	5.7	7.2
512	−1.2	3.3	3.9	5.0
1,024	−1.2	2.3	2.7	3.5
2,048	−1.1	1.6	2.0	2.6
4,096	−1.2	1.1	1.3	1.7
8,192	−1.2	0.8	0.9	1.2
16,384	−1.2	0.6	0.6	0.8

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Table 10 ($2.50/day 2005 PPP line): Percentages of households by cut-off score and targeting classification, along with the hit rate and BPAC, 2010/11 scorecard applied to the 2010/11 validation sample

Score	Inclusion: < poverty line correctly targeted	Undercoverage: < poverty line mistakenly non-targeted	Leakage: ≥ poverty line mistakenly targeted	Exclusion: ≥ poverty line correctly non-targeted	Hit rate Inclusion + Exclusion	BPAC See text
≤4	0.0	76.2	0.0	23.8	23.8	−100.0
≤9	0.2	76.0	0.0	23.8	24.0	−99.5
≤14	1.2	75.1	0.1	23.7	24.8	−96.8
≤19	4.2	72.0	0.3	23.4	27.6	−88.6
≤24	11.2	65.1	0.8	23.0	34.2	−69.7
≤29	20.7	55.5	1.6	22.2	43.0	−43.5
≤34	33.8	42.4	3.2	20.6	54.4	−7.1
≤39	44.1	32.2	5.0	18.8	62.8	+22.2
≤44	54.5	21.7	7.4	16.4	70.9	+52.8
≤49	61.9	14.3	10.1	13.7	75.6	+75.8
≤54	67.6	8.6	12.8	11.0	78.5	+83.2
≤59	72.2	4.1	16.1	7.7	79.8	+78.9
≤64	74.6	1.6	18.7	5.1	79.7	+75.5
≤69	75.5	0.7	20.8	2.9	78.4	+72.7
≤74	75.9	0.3	22.6	1.2	77.1	+70.4
≤79	76.2	0.0	23.3	0.5	76.7	+69.4
≤84	76.2	0.0	23.7	0.0	76.3	+68.9
≤89	76.2	0.0	23.8	0.0	76.2	+68.8
≤94	76.2	0.0	23.8	0.0	76.2	+68.8
≤100	76.2	0.0	23.8	0.0	76.2	+68.8

Inclusion, undercoverage, leakage, and exclusion normalized to sum to 100.

Table 11 ($2.50/day 2005 PPP line): Share of all households who are targeted (that is, score at or below a cut-off), the share of targeted households who are poor (that is, have consumption below the poverty line), the share of poor households who are targeted, and the number of poor households who are successfully targeted (inclusion) per non-poor household mistakenly targeted (leakage), 2010/11 scorecard applied to the 2010/11 validation sample

Targeting cut-off	% all HHs who are targeted	% targeted HHs who are poor	% poor HHs who are targeted	Poor HHs targeted per non-poor HH targeted
≤4	0.0	100.0	0.0	Only poor targeted
≤9	0.2	100.0	0.2	Only poor targeted
≤14	1.3	89.8	1.5	8.8:1
≤19	4.5	92.4	5.5	12.1:1
≤24	11.9	93.6	14.6	14.7:1
≤29	22.3	93.0	27.2	13.3:1
≤34	37.0	91.4	44.3	10.7:1
≤39	49.1	89.8	57.8	8.8:1
≤44	62.0	88.0	71.6	7.3:1
≤49	72.0	86.0	81.3	6.1:1
≤54	80.4	84.1	88.7	5.3:1
≤59	88.2	81.8	94.7	4.5:1
≤64	93.2	80.0	97.9	4.0:1
≤69	96.3	78.4	99.0	3.6:1
≤74	98.5	77.1	99.6	3.4:1
≤79	99.5	76.6	100.0	3.3:1
≤84	100.0	76.2	100.0	3.2:1
≤89	100.0	76.2	100.0	3.2:1
≤94	100.0	76.2	100.0	3.2:1
≤100	100.0	76.2	100.0	3.2:1

Tables for
the $5.00/day 2005 PPP Poverty Line

Table 4 ($5.00/day 2005 PPP line): Estimated poverty likelihoods associated with scores

If a household's score is . . .	. . . then the likelihood (%) of being below the poverty line is:
0–4	100.0
5–9	100.0
10–14	100.0
15–19	99.9
20–24	99.7
25–29	99.5
30–34	99.3
35–39	99.3
40–44	98.1
45–49	96.3
50–54	95.6
55–59	94.4
60–64	88.0
65–69	75.5
70–74	61.8
75–79	47.1
80–84	44.4
85–89	23.6
90–94	0.0
95–100	0.0

Table 6 ($5.00/day 2005 PPP line): Average errors (differences between estimated and true poverty likelihoods) for households by score range, with confidence intervals, from 1,000 bootstraps of $n = 16,384$, 2010/11 scorecard applied to the 2010/11 validation sample

| | | Difference between estimate and true value | | |
| | | Confidence interval (±percentage points) | | |
Score	Diff.	90-percent	95-percent	99-percent
0–4	0.0	0.0	0.0	0.0
5–9	0.0	0.0	0.0	0.0
10–14	0.0	0.0	0.0	0.0
15–19	+0.7	0.6	0.6	0.8
20–24	–0.3	0.2	0.2	0.2
25–29	–0.2	0.2	0.2	0.2
30–34	–0.4	0.3	0.3	0.3
35–39	+0.4	0.4	0.5	0.6
40–44	–0.5	0.5	0.5	0.7
45–49	–1.9	1.2	1.3	1.4
50–54	–0.9	1.0	1.2	1.5
55–59	–1.2	1.1	1.3	1.8
60–64	–2.3	2.2	2.6	3.5
65–69	+1.1	4.3	5.2	7.1
70–74	+6.2	6.5	7.7	10.0
75–79	–31.7	18.6	19.3	20.2
80–84	–41.0	23.2	23.6	24.4
85–89	–61.4	37.0	38.2	40.1
90–94	0.0	0.0	0.0	0.0
95–100	0.0	0.0	0.0	0.0

Table 7 ($5.00/day 2005 PPP line): Errors (average differences between estimated poverty rates and true values) for a group at a point in time by sample size, with confidence intervals, for 1,000 bootstraps of various sample sizes, 2010/11 scorecard applied to the 2010/11 validation sample

Sample Size n	Diff.	Difference between estimate and true value		
		Confidence interval ($\pm$percentage points)		
		90-percent	95-percent	99-percent
1	−0.6	9.1	56.9	76.5
4	−1.0	14.6	22.8	33.0
8	−0.8	10.8	14.1	21.0
16	−0.9	7.4	8.9	13.0
32	−0.9	5.0	6.2	8.9
64	−0.8	3.6	4.5	5.9
128	−0.9	2.5	3.0	3.8
256	−0.8	1.8	2.0	3.1
512	−0.8	1.2	1.5	1.9
1,024	−0.9	0.9	1.0	1.4
2,048	−0.8	0.6	0.7	1.0
4,096	−0.8	0.4	0.5	0.7
8,192	−0.8	0.3	0.4	0.5
16,384	−0.8	0.2	0.3	0.4

Table 10 ($5.00/day 2005 PPP line): Percentages of households by cut-off score and targeting classification, along with the hit rate and BPAC, 2010/11 scorecard applied to the 2010/11 validation sample

Score	Inclusion: < poverty line correctly targeted	Undercoverage: < poverty line mistakenly non-targeted	Leakage: ≥ poverty line mistakenly targeted	Exclusion: ≥ poverty line correctly non-targeted	Hit rate Inclusion + Exclusion	BPAC See text
≤4	0.0	95.4	0.0	4.6	4.6	−100.0
≤9	0.2	95.2	0.0	4.6	4.8	−99.6
≤14	1.3	94.1	0.0	4.6	5.9	−97.3
≤19	4.5	90.9	0.0	4.6	9.1	−90.6
≤24	11.9	83.5	0.0	4.6	16.4	−75.1
≤29	22.2	73.2	0.1	4.5	26.7	−53.4
≤34	36.8	58.6	0.2	4.4	41.2	−22.7
≤39	48.7	46.7	0.4	4.3	53.0	+2.6
≤44	61.4	34.0	0.6	4.0	65.4	+29.3
≤49	71.2	24.2	0.8	3.8	75.0	+50.2
≤54	79.2	16.2	1.2	3.4	82.6	+67.3
≤59	86.5	8.9	1.7	2.9	89.4	+83.2
≤64	90.9	4.5	2.4	2.3	93.1	+93.0
≤69	93.1	2.2	3.2	1.4	94.6	+96.7
≤74	94.4	1.0	4.1	0.5	94.9	+95.7
≤79	95.1	0.3	4.4	0.2	95.3	+95.4
≤84	95.4	0.0	4.6	0.0	95.4	+95.2
≤89	95.4	0.0	4.6	0.0	95.4	+95.2
≤94	95.4	0.0	4.6	0.0	95.4	+95.2
≤100	95.4	0.0	4.6	0.0	95.4	+95.2

Inclusion, undercoverage, leakage, and exclusion normalized to sum to 100.

Table 11 ($5.00/day 2005 PPP line): Share of all households who are targeted (that is, score at or below a cut-off), the share of targeted households who are poor (that is, have consumption below the poverty line), the share of poor households who are targeted, and the number of poor households who are successfully targeted (inclusion) per non-poor household mistakenly targeted (leakage), 2010/11 scorecard applied to the 2010/11 validation sample

Targeting cut-off	% all HHs who are targeted	% targeted HHs who are poor	% poor HHs who are targeted	Poor HHs targeted per non-poor HH targeted
≤4	0.0	100.0	0.0	Only poor targeted
≤9	0.2	100.0	0.2	Only poor targeted
≤14	1.3	99.9	1.3	1,345.2:1
≤19	4.5	99.1	4.7	115.2:1
≤24	11.9	99.6	12.4	266.7:1
≤29	22.3	99.6	23.3	235.9:1
≤34	37.0	99.5	38.6	198.3:1
≤39	49.1	99.3	51.1	135.3:1
≤44	62.0	99.0	64.3	104.1:1
≤49	72.0	98.8	74.6	84.8:1
≤54	80.4	98.5	83.0	66.0:1
≤59	88.2	98.0	90.7	49.8:1
≤64	93.2	97.5	95.3	38.6:1
≤69	96.3	96.7	97.6	29.3:1
≤74	98.5	95.8	98.9	23.0:1
≤79	99.5	95.6	99.7	21.5:1
≤84	100.0	95.4	100.0	20.8:1
≤89	100.0	95.4	100.0	20.7:1
≤94	100.0	95.4	100.0	20.7:1
≤100	100.0	95.4	100.0	20.7:1

Tables for
the $1.90/day 2011 PPP Poverty Line

Table 4 ($1.90/day 2011 PPP line): Estimated poverty likelihoods associated with scores

If a household's score is . . .	. . . then the likelihood (%) of being below the poverty line is:
0–4	81.5
5–9	81.5
10–14	65.9
15–19	58.6
20–24	53.6
25–29	41.0
30–34	37.4
35–39	31.6
40–44	20.6
45–49	15.7
50–54	13.8
55–59	8.9
60–64	5.5
65–69	3.9
70–74	3.2
75–79	1.6
80–84	0.7
85–89	0.7
90–94	0.0
95–100	0.0

Table 6 ($1.90/day 2011 PPP line): Average errors (differences between estimated and true poverty likelihoods) for households by score range, with confidence intervals, from 1,000 bootstraps of $n = 16,384$, 2010/11 scorecard applied to the 2010/11 validation sample

		Difference between estimate and true value		
		Confidence interval (±percentage points)		
Score	Diff.	90-percent	95-percent	99-percent
0–4	–6.2	50.0	50.0	50.0
5–9	–11.3	8.3	8.8	10.1
10–14	–1.9	6.9	8.0	10.2
15–19	+5.1	4.3	5.0	7.0
20–24	+3.4	2.6	3.1	4.1
25–29	–4.7	3.3	3.5	4.0
30–34	+3.2	1.7	2.2	3.0
35–39	+3.4	1.7	2.1	3.1
40–44	–1.2	1.7	2.0	2.6
45–49	–3.4	2.7	2.9	3.2
50–54	+1.7	1.6	1.9	2.7
55–59	+2.5	1.3	1.6	2.1
60–64	–4.0	3.1	3.3	3.6
65–69	+1.5	1.4	1.7	2.2
70–74	+2.6	0.5	0.6	0.8
75–79	+1.2	0.5	0.6	0.7
80–84	–1.2	2.2	2.4	2.8
85–89	+0.7	0.0	0.0	0.0
90–94	0.0	0.0	0.0	0.0
95–100	0.0	0.0	0.0	0.0

Table 7 ($1.90/day 2011 PPP line): Errors (average differences between estimated poverty rates and true values) for a group at a point in time by sample size, with confidence intervals, for 1,000 bootstraps of various sample sizes, 2010/11 scorecard applied to the 2010/11 validation sample

Sample Size n	Diff.	Difference between estimate and true value Confidence interval (±percentage points) 90-percent	95-percent	99-percent
1	+0.5	66.5	68.9	74.8
4	+1.2	38.2	43.5	57.3
8	+1.6	26.9	30.7	41.0
16	+0.7	19.2	23.2	30.3
32	+0.6	14.0	16.7	21.1
64	+0.6	10.0	12.0	15.6
128	+0.6	7.3	8.7	10.8
256	+0.6	4.9	5.9	7.5
512	+0.6	3.5	4.2	5.4
1,024	+0.6	2.4	2.9	3.7
2,048	+0.6	1.8	2.1	2.6
4,096	+0.6	1.2	1.4	2.0
8,192	+0.6	0.9	1.0	1.4
16,384	+0.6	0.6	0.7	0.9

Table 10 ($1.90/day 2011 PPP line): Percentages of households by cut-off score and targeting classification, along with the hit rate and BPAC, 2010/11 scorecard applied to the 2010/11 validation sample

Score	Inclusion: < poverty line correctly targeted	Undercoverage: < poverty line mistakenly non-targeted	Leakage: ≥ poverty line mistakenly targeted	Exclusion: ≥ poverty line correctly non-targeted	Hit rate Inclusion + Exclusion	BPAC See text
≤4	0.0	27.5	0.0	72.5	72.5	−100.0
≤9	0.1	27.4	0.0	72.5	72.6	−98.8
≤14	0.9	26.6	0.4	72.1	73.0	−92.1
≤19	2.8	24.7	1.8	70.7	73.5	−73.5
≤24	6.6	20.9	5.3	67.1	73.7	−32.8
≤29	11.2	16.3	11.1	61.4	72.6	+21.7
≤34	16.5	11.1	20.5	52.0	68.4	+25.4
≤39	20.2	7.3	28.9	43.6	63.8	−5.0
≤44	23.2	4.3	38.8	33.7	56.9	−41.0
≤49	25.1	2.4	47.0	25.5	50.6	−70.8
≤54	26.3	1.2	54.1	18.4	44.7	−96.6
≤59	27.0	0.6	61.3	11.2	38.2	−122.8
≤64	27.3	0.2	65.9	6.6	33.9	−139.5
≤69	27.5	0.1	68.9	3.6	31.1	−150.3
≤74	27.5	0.0	71.0	1.5	29.0	−158.1
≤79	27.5	0.0	72.0	0.5	28.0	−161.7
≤84	27.5	0.0	72.4	0.0	27.6	−163.3
≤89	27.5	0.0	72.5	0.0	27.5	−163.5
≤94	27.5	0.0	72.5	0.0	27.5	−163.5
≤100	27.5	0.0	72.5	0.0	27.5	−163.5

Inclusion, undercoverage, leakage, and exclusion normalized to sum to 100.

Table 11 ($1.90/day 2011 PPP line): Share of all households who are targeted (that is, score at or below a cut-off), the share of targeted households who are poor (that is, have consumption below the poverty line), the share of poor households who are targeted, and the number of poor households who are successfully targeted (inclusion) per non-poor household mistakenly targeted (leakage), 2010/11 scorecard applied to the 2010/11 validation sample

Targeting cut-off	% all HHs who are targeted	% targeted HHs who are poor	% poor HHs who are targeted	Poor HHs targeted per non-poor HH targeted
≤4	0.0	70.5	0.0	2.4:1
≤9	0.2	80.2	0.5	4.1:1
≤14	1.3	68.9	3.2	2.2:1
≤19	4.5	61.0	10.0	1.6:1
≤24	11.9	55.1	23.9	1.2:1
≤29	22.3	50.2	40.7	1.0:1
≤34	37.0	44.5	59.8	0.8:1
≤39	49.1	41.2	73.4	0.7:1
≤44	62.0	37.4	84.3	0.6:1
≤49	72.0	34.8	91.1	0.5:1
≤54	80.4	32.7	95.6	0.5:1
≤59	88.2	30.5	98.0	0.4:1
≤64	93.2	29.3	99.4	0.4:1
≤69	96.3	28.5	99.8	0.4:1
≤74	98.5	27.9	99.9	0.4:1
≤79	99.5	27.6	99.9	0.4:1
≤84	100.0	27.5	100.0	0.4:1
≤89	100.0	27.5	100.0	0.4:1
≤94	100.0	27.5	100.0	0.4:1
≤100	100.0	27.5	100.0	0.4:1

Tables for
the $3.10/day 2011 PPP Poverty Line

Table 4 ($3.10/day 2011 PPP line): Estimated poverty likelihoods associated with scores

If a household's score is . . .	. . . then the likelihood (%) of being below the poverty line is:
0–4	100.0
5–9	98.8
10–14	94.3
15–19	89.0
20–24	88.1
25–29	85.2
30–34	79.7
35–39	76.4
40–44	64.0
45–49	56.4
50–54	50.8
55–59	43.2
60–64	31.7
65–69	18.4
70–74	14.1
75–79	5.1
80–84	2.0
85–89	1.9
90–94	0.0
95–100	0.0

Table 6 ($3.10/day 2011 PPP line): Average errors (differences between estimated and true poverty likelihoods) for households by score range, with confidence intervals, from 1,000 bootstraps of $n = 16,384$, 2010/11 scorecard applied to the 2010/11 validation sample

| | | Difference between estimate and true value | | |
| | | Confidence interval (±percentage points) | | |
Score	Diff.	90-percent	95-percent	99-percent
0–4	+5.3	10.5	50.0	50.0
5–9	–1.2	0.6	0.6	0.6
10–14	+12.8	6.1	7.3	9.2
15–19	–1.5	2.3	2.7	3.5
20–24	+2.3	1.9	2.2	3.1
25–29	–0.4	1.6	1.8	2.3
30–34	+0.5	1.5	1.7	2.3
35–39	+6.4	1.8	2.1	3.1
40–44	–5.7	3.8	4.0	4.4
45–49	–6.6	4.5	4.8	5.1
50–54	–4.9	3.9	4.1	4.6
55–59	+6.4	2.6	3.2	4.2
60–64	–6.9	5.2	5.7	6.1
65–69	–3.7	4.0	4.7	6.7
70–74	–3.5	4.5	5.6	7.4
75–79	–3.5	4.0	4.7	6.0
80–84	–0.3	2.2	2.5	3.1
85–89	+1.9	0.0	0.0	0.0
90–94	0.0	0.0	0.0	0.0
95–100	0.0	0.0	0.0	0.0

Table 7 ($3.10/day 2011 PPP line): Errors (average differences between estimated poverty rates and true values) for a group at a point in time by sample size, with confidence intervals, for 1,000 bootstraps of various sample sizes, 2010/11 scorecard applied to the 2010/11 validation sample

Sample Size n	Diff.	Difference between estimate and true value Confidence interval ($\pm$percentage points)		
		90-percent	95-percent	99-percent
1	−3.0	68.2	76.7	87.5
4	−0.1	39.0	46.5	57.8
8	+0.2	30.2	35.9	43.6
16	−0.4	20.9	24.5	32.4
32	−0.5	14.9	17.5	22.9
64	−0.5	10.3	12.6	16.3
128	−0.7	7.7	8.9	11.2
256	−0.6	5.3	6.2	8.1
512	−0.6	3.9	4.4	5.4
1,024	−0.6	2.5	3.1	4.0
2,048	−0.6	1.8	2.2	3.1
4,096	−0.6	1.3	1.6	2.0
8,192	−0.6	0.9	1.1	1.5
16,384	−0.6	0.6	0.8	1.0

Table 10 ($3.10/day 2011 PPP line): Percentages of households by cut-off score and targeting classification, along with the hit rate and BPAC, 2010/11 scorecard applied to the 2010/11 validation sample

Score	Inclusion: < poverty line correctly targeted	Undercoverage: < poverty line mistakenly non-targeted	Leakage: ≥ poverty line mistakenly targeted	Exclusion: ≥ poverty line correctly non-targeted	Hit rate Inclusion + Exclusion	BPAC See text
≤4	0.0	65.3	0.0	34.7	34.7	−100.0
≤9	0.2	65.1	0.0	34.7	34.9	−99.4
≤14	1.1	64.1	0.2	34.6	35.7	−96.3
≤19	4.0	61.2	0.5	34.2	38.3	−86.9
≤24	10.4	54.8	1.5	33.3	43.7	−65.8
≤29	19.3	46.0	3.0	31.7	51.0	−36.3
≤34	30.9	34.3	6.0	28.7	59.6	+4.0
≤39	39.7	25.5	9.4	25.4	65.1	+36.1
≤44	48.6	16.7	13.4	21.3	69.9	+69.3
≤49	54.7	10.5	17.3	17.4	72.1	+73.5
≤54	59.2	6.1	21.2	13.5	72.7	+67.5
≤59	62.4	2.9	25.9	8.9	71.3	+60.4
≤64	64.2	1.1	29.1	5.7	69.8	+55.5
≤69	64.8	0.4	31.5	3.2	68.1	+51.8
≤74	65.1	0.1	33.3	1.4	66.5	+48.9
≤79	65.2	0.0	34.3	0.5	65.7	+47.5
≤84	65.3	0.0	34.7	0.0	65.3	+46.9
≤89	65.3	0.0	34.7	0.0	65.3	+46.8
≤94	65.3	0.0	34.7	0.0	65.3	+46.8
≤100	65.3	0.0	34.7	0.0	65.3	+46.8

Inclusion, undercoverage, leakage, and exclusion normalized to sum to 100.

Table 11 ($3.10/day 2011 PPP line): Share of all households who are targeted (that is, score at or below a cut-off), the share of targeted households who are poor (that is, have consumption below the poverty line), the share of poor households who are targeted, and the number of poor households who are successfully targeted (inclusion) per non-poor household mistakenly targeted (leakage), 2010/11 scorecard applied to the 2010/11 validation sample

Targeting cut-off	% all HHs who are targeted	% targeted HHs who are poor	% poor HHs who are targeted	Poor HHs targeted per non-poor HH targeted
≤4	0.0	86.2	0.0	6.2:1
≤9	0.2	99.4	0.3	172.4:1
≤14	1.3	87.9	1.7	7.3:1
≤19	4.5	89.0	6.2	8.1:1
≤24	11.9	87.6	16.0	7.0:1
≤29	22.3	86.4	29.5	6.3:1
≤34	37.0	83.7	47.4	5.1:1
≤39	49.1	80.9	60.9	4.2:1
≤44	62.0	78.4	74.4	3.6:1
≤49	72.0	76.0	83.8	3.2:1
≤54	80.4	73.6	90.7	2.8:1
≤59	88.2	70.7	95.6	2.4:1
≤64	93.2	68.8	98.3	2.2:1
≤69	96.3	67.3	99.3	2.1:1
≤74	98.5	66.1	99.8	2.0:1
≤79	99.5	65.6	100.0	1.9:1
≤84	100.0	65.3	100.0	1.9:1
≤89	100.0	65.3	100.0	1.9:1
≤94	100.0	65.3	100.0	1.9:1
≤100	100.0	65.3	100.0	1.9:1

Tables for
the $3.80/day 2011 PPP Poverty Line

Table 4 ($3.80/day 2011 PPP line): Estimated poverty likelihoods associated with scores

If a household's score is . . .	. . . then the likelihood (%) of being below the poverty line is:
0–4	100.0
5–9	99.0
10–14	97.4
15–19	95.5
20–24	93.8
25–29	91.9
30–34	90.1
35–39	85.8
40–44	81.6
45–49	72.3
50–54	68.3
55–59	63.5
60–64	46.1
65–69	32.2
70–74	25.3
75–79	15.8
80–84	13.3
85–89	2.0
90–94	0.0
95–100	0.0

Table 6 ($3.80/day 2011 PPP line): Average errors (differences between estimated and true poverty likelihoods) for households by score range, with confidence intervals, from 1,000 bootstraps of $n = 16,384$, 2010/11 scorecard applied to the 2010/11 validation sample

Score	Diff.	Difference between estimate and true value Confidence interval (±percentage points) 90-percent	95-percent	99-percent
0–4	0.0	0.0	0.0	0.0
5–9	–1.0	0.5	0.5	0.5
10–14	+14.5	5.9	7.1	9.1
15–19	+1.0	1.7	2.0	2.6
20–24	–0.5	1.2	1.4	1.9
25–29	–0.4	1.2	1.4	1.8
30–34	–0.2	1.1	1.3	1.7
35–39	–0.9	1.4	1.7	2.4
40–44	–3.9	2.7	2.8	3.0
45–49	–4.4	3.2	3.4	3.7
50–54	–2.1	2.8	3.4	4.3
55–59	+5.0	2.9	3.6	4.6
60–64	–5.4	4.4	4.8	5.6
65–69	+3.0	4.2	5.1	7.0
70–74	+3.3	5.2	6.2	8.3
75–79	–23.7	16.0	16.6	18.3
80–84	+10.8	2.3	2.6	3.3
85–89	+0.5	3.6	4.3	6.6
90–94	0.0	0.0	0.0	0.0
95–100	0.0	0.0	0.0	0.0

Table 7 ($3.80/day 2011 PPP line): Errors (average differences between estimated poverty rates and true values) for a group at a point in time by sample size, with confidence intervals, for 1,000 bootstraps of various sample sizes, 2010/11 scorecard applied to the 2010/11 validation sample

Sample Size		Difference between estimate and true value		
		Confidence interval (±percentage points)		
n	Diff.	90-percent	95-percent	99-percent
1	−1.8	59.0	72.0	89.4
4	−0.6	33.6	39.0	57.4
8	−0.6	23.8	27.6	40.7
16	−1.0	16.7	19.4	26.2
32	−0.7	12.3	14.7	20.4
64	−0.9	8.6	10.2	13.7
128	−1.0	6.3	7.4	9.4
256	−0.9	4.6	5.5	6.7
512	−1.1	3.2	3.9	4.8
1,024	−1.1	2.2	2.6	3.3
2,048	−1.0	1.6	1.9	2.5
4,096	−1.0	1.1	1.3	1.7
8,192	−1.0	0.8	0.9	1.2
16,384	−1.0	0.5	0.6	0.8

Table 10 ($3.80/day 2011 PPP line): Percentages of households by cut-off score and targeting classification, along with the hit rate and BPAC, 2010/11 scorecard applied to the 2010/11 validation sample

Score	Inclusion: < poverty line correctly targeted	Undercoverage: < poverty line mistakenly non-targeted	Leakage: ≥ poverty line mistakenly targeted	Exclusion: ≥ poverty line correctly non-targeted	Hit rate Inclusion + Exclusion	BPAC See text
≤4	0.0	77.5	0.0	22.5	22.5	−100.0
≤9	0.2	77.3	0.0	22.5	22.7	−99.5
≤14	1.2	76.3	0.1	22.4	23.6	−96.9
≤19	4.2	73.3	0.3	22.2	26.4	−88.8
≤24	11.2	66.3	0.8	21.8	32.9	−70.2
≤29	20.8	56.7	1.5	21.0	41.7	−44.4
≤34	34.0	43.5	3.0	19.5	53.5	−8.5
≤39	44.4	33.0	4.6	17.9	62.3	+20.7
≤44	55.2	22.3	6.8	15.8	71.0	+51.2
≤49	62.8	14.7	9.3	13.3	76.1	+74.0
≤54	68.5	8.9	11.8	10.7	79.2	+84.7
≤59	73.3	4.2	14.9	7.6	80.9	+80.7
≤64	75.8	1.7	17.5	5.1	80.8	+77.5
≤69	76.7	0.8	19.6	2.9	79.6	+74.7
≤74	77.1	0.3	21.3	1.2	78.3	+72.5
≤79	77.4	0.0	22.1	0.5	77.9	+71.5
≤84	77.5	0.0	22.5	0.0	77.5	+71.0
≤89	77.5	0.0	22.5	0.0	77.5	+70.9
≤94	77.5	0.0	22.5	0.0	77.5	+70.9
≤100	77.5	0.0	22.5	0.0	77.5	+70.9

Inclusion, undercoverage, leakage, and exclusion normalized to sum to 100.

Table 11 ($3.80/day 2011 PPP line): Share of all households who are targeted (that is, score at or below a cut-off), the share of targeted households who are poor (that is, have consumption below the poverty line), the share of poor households who are targeted, and the number of poor households who are successfully targeted (inclusion) per non-poor household mistakenly targeted (leakage), 2010/11 scorecard applied to the 2010/11 validation sample

Targeting cut-off	% all HHs who are targeted	% targeted HHs who are poor	% poor HHs who are targeted	Poor HHs targeted per non-poor HH targeted
≤4	0.0	100.0	0.0	Only poor targeted
≤9	0.2	100.0	0.2	Only poor targeted
≤14	1.3	89.9	1.5	8.9:1
≤19	4.5	92.4	5.4	12.2:1
≤24	11.9	93.7	14.4	14.8:1
≤29	22.3	93.1	26.8	13.5:1
≤34	37.0	91.8	43.8	11.3:1
≤39	49.1	90.5	57.4	9.6:1
≤44	62.0	89.1	71.3	8.2:1
≤49	72.0	87.2	81.1	6.8:1
≤54	80.4	85.3	88.5	5.8:1
≤59	88.2	83.1	94.6	4.9:1
≤64	93.2	81.3	97.8	4.3:1
≤69	96.3	79.6	99.0	3.9:1
≤74	98.5	78.3	99.6	3.6:1
≤79	99.5	77.8	100.0	3.5:1
≤84	100.0	77.5	100.0	3.4:1
≤89	100.0	77.5	100.0	3.4:1
≤94	100.0	77.5	100.0	3.4:1
≤100	100.0	77.5	100.0	3.4:1

Tables for
the $4.00/day 2011 PPP Poverty Line

Table 4 ($4.00/day 2011 PPP line): Estimated poverty likelihoods associated with scores

If a household's score is . . .	. . . then the likelihood (%) of being below the poverty line is:
0–4	100.0
5–9	99.0
10–14	97.5
15–19	96.1
20–24	94.8
25–29	93.8
30–34	91.9
35–39	88.1
40–44	85.5
45–49	76.2
50–54	70.7
55–59	66.4
60–64	51.0
65–69	36.2
70–74	27.1
75–79	17.3
80–84	14.9
85–89	6.7
90–94	0.0
95–100	0.0

Table 6 ($4.00/day 2011 PPP line): Average errors (differences between estimated and true poverty likelihoods) for households by score range, with confidence intervals, from 1,000 bootstraps of $n = 16,384$, 2010/11 scorecard applied to the 2010/11 validation sample

| | | Difference between estimate and true value | | |
| | | Confidence interval (±percentage points) | | |
Score	Diff.	90-percent	95-percent	99-percent
0–4	0.0	0.0	0.0	0.0
5–9	−1.0	0.5	0.5	0.5
10–14	+9.0	5.0	6.0	8.0
15–19	+0.6	1.5	1.8	2.5
20–24	−0.3	1.1	1.4	1.8
25–29	+0.7	1.1	1.4	1.7
30–34	+0.4	1.0	1.2	1.6
35–39	−1.7	1.5	1.6	2.1
40–44	−1.6	1.4	1.6	2.1
45–49	−3.5	2.7	3.0	3.3
50–54	−2.4	2.8	3.4	4.3
55–59	+3.3	2.9	3.5	4.7
60–64	−6.2	4.9	5.3	5.9
65–69	−0.2	4.8	5.6	7.3
70–74	+4.7	5.2	6.1	8.3
75–79	−26.2	17.3	18.0	19.4
80–84	−5.5	11.0	13.4	18.1
85–89	+5.2	3.6	4.3	6.6
90–94	0.0	0.0	0.0	0.0
95–100	0.0	0.0	0.0	0.0

Table 7 ($4.00/day 2011 PPP line): Errors (average differences between estimated poverty rates and true values) for a group at a point in time by sample size, with confidence intervals, for 1,000 bootstraps of various sample sizes, 2010/11 scorecard applied to the 2010/11 validation sample

Sample Size n	Diff.	Difference between estimate and true value		
		Confidence interval ($\pm$percentage points)		
		90-percent	95-percent	99-percent
1	−1.9	67.2	72.3	88.7
4	−0.4	32.4	38.0	51.9
8	−0.5	23.5	26.7	40.3
16	−1.0	16.2	19.3	26.6
32	−0.6	11.8	14.3	18.2
64	−0.8	8.2	10.1	13.0
128	−0.9	5.9	6.9	9.3
256	−0.8	4.4	5.2	6.4
512	−0.9	3.1	3.7	4.8
1,024	−0.9	2.1	2.5	3.1
2,048	−0.9	1.5	1.8	2.4
4,096	−0.9	1.1	1.3	1.7
8,192	−0.9	0.8	0.9	1.1
16,384	−0.9	0.5	0.6	0.8

Table 10 ($4.00/day 2011 PPP line): Percentages of households by cut-off score and targeting classification, along with the hit rate and BPAC, 2010/11 scorecard applied to the 2010/11 validation sample

Score	Inclusion: < poverty line correctly targeted	Undercoverage: < poverty line mistakenly non-targeted	Leakage: ≥ poverty line mistakenly targeted	Exclusion: ≥ poverty line correctly non-targeted	Hit rate Inclusion + Exclusion	BPAC See text
≤4	0.0	79.9	0.0	20.1	20.1	−100.0
≤9	0.2	79.7	0.0	20.1	20.3	−99.5
≤14	1.2	78.7	0.1	20.0	21.2	−96.9
≤19	4.3	75.7	0.3	19.8	24.1	−89.0
≤24	11.3	68.6	0.6	19.5	30.8	−71.0
≤29	21.0	59.0	1.3	18.7	39.7	−45.9
≤34	34.4	45.5	2.6	17.5	51.9	−10.7
≤39	45.3	34.7	3.8	16.2	61.5	+18.1
≤44	56.3	23.7	5.7	14.4	70.6	+47.9
≤49	64.2	15.7	7.9	12.2	76.4	+70.4
≤54	70.2	9.7	10.2	9.9	80.1	+87.2
≤59	75.3	4.6	13.0	7.1	82.4	+83.8
≤64	78.0	2.0	15.3	4.8	82.8	+80.9
≤69	79.1	0.9	17.3	2.8	81.9	+78.4
≤74	79.5	0.4	19.0	1.1	80.6	+76.3
≤79	79.9	0.1	19.6	0.4	80.3	+75.4
≤84	79.9	0.0	20.0	0.0	80.0	+74.9
≤89	79.9	0.0	20.1	0.0	79.9	+74.9
≤94	79.9	0.0	20.1	0.0	79.9	+74.9
≤100	79.9	0.0	20.1	0.0	79.9	+74.9

Inclusion, undercoverage, leakage, and exclusion normalized to sum to 100.

Table 11 ($4.00/day 2011 PPP line): Share of all households who are targeted (that is, score at or below a cut-off), the share of targeted households who are poor (that is, have consumption below the poverty line), the share of poor households who are targeted, and the number of poor households who are successfully targeted (inclusion) per non-poor household mistakenly targeted (leakage), 2010/11 scorecard applied to the 2010/11 validation sample

Targeting cut-off	% all HHs who are targeted	% targeted HHs who are poor	% poor HHs who are targeted	Poor HHs targeted per non-poor HH targeted
≤4	0.0	100.0	0.0	Only poor targeted
≤9	0.2	100.0	0.2	Only poor targeted
≤14	1.3	92.7	1.5	12.6:1
≤19	4.5	94.0	5.3	15.7:1
≤24	11.9	94.8	14.1	18.3:1
≤29	22.3	94.1	26.2	15.8:1
≤34	37.0	93.0	43.0	13.4:1
≤39	49.1	92.2	56.6	11.8:1
≤44	62.0	90.8	70.4	9.9:1
≤49	72.0	89.1	80.3	8.2:1
≤54	80.4	87.3	87.8	6.9:1
≤59	88.2	85.3	94.2	5.8:1
≤64	93.2	83.6	97.6	5.1:1
≤69	96.3	82.1	98.9	4.6:1
≤74	98.5	80.8	99.5	4.2:1
≤79	99.5	80.3	99.9	4.1:1
≤84	100.0	80.0	100.0	4.0:1
≤89	100.0	79.9	100.0	4.0:1
≤94	100.0	79.9	100.0	4.0:1
≤100	100.0	79.9	100.0	4.0:1

Tables for
the Poverty Line Marking the Poorest Half of People below 100% of the National Poverty Line

Table 4 (Line marking poorest half of people below 100% of the national line): Estimated poverty likelihoods associated with scores

If a household's score is . . .	. . . then the likelihood (%) of being below the poverty line is:
0–4	43.9
5–9	43.9
10–14	38.1
15–19	30.3
20–24	26.7
25–29	20.1
30–34	14.8
35–39	10.6
40–44	5.8
45–49	3.9
50–54	3.6
55–59	2.5
60–64	1.4
65–69	0.6
70–74	0.6
75–79	0.6
80–84	0.5
85–89	0.0
90–94	0.0
95–100	0.0

Table 6 (Line marking poorest half of people below 100% of the national line): Average errors (differences between estimated and true poverty likelihoods) for households by score range, with confidence intervals, from 1,000 bootstraps of $n = 16,384$, 2010/11 scorecard applied to the 2010/11 validation sample

| | | Difference between estimate and true value | | |
| | | Confidence interval ($\pm$percentage points) | | |
Score	Diff.	90-percent	95-percent	99-percent
0–4	–33.6	50.0	50.0	50.0
5–9	–48.5	26.9	27.3	27.8
10–14	+2.3	6.4	7.7	10.4
15–19	+8.1	3.3	3.9	5.4
20–24	–1.0	2.3	2.7	4.0
25–29	–1.6	1.9	2.1	2.8
30–34	+1.6	1.2	1.5	1.9
35–39	+1.9	1.1	1.3	1.7
40–44	+1.2	0.8	1.0	1.3
45–49	–1.2	1.2	1.3	1.7
50–54	+0.8	0.7	0.9	1.1
55–59	+1.1	0.5	0.6	0.8
60–64	–2.2	1.9	2.0	2.3
65–69	+0.5	0.1	0.1	0.2
70–74	+0.5	0.1	0.1	0.2
75–79	+0.5	0.1	0.1	0.1
80–84	+0.5	0.0	0.0	0.0
85–89	0.0	0.0	0.0	0.0
90–94	0.0	0.0	0.0	0.0
95–100	0.0	0.0	0.0	0.0

Table 7 (Line marking poorest half of people below 100% of the national line): Errors (average differences between estimated poverty rates and true values) for a group at a point in time by sample size, with confidence intervals, for 1,000 bootstraps of various sample sizes, 2010/11 scorecard applied to the 2010/11 validation sample

Sample Size n	Diff.	Difference between estimate and true value Confidence interval ($\pm$percentage points)		
		90-percent	95-percent	99-percent
1	−0.5	56.0	59.9	65.3
4	+0.8	25.8	32.6	43.6
8	+1.0	17.9	21.9	28.6
16	+0.7	13.4	14.7	19.6
32	+0.6	9.8	11.5	14.8
64	+0.6	7.1	8.4	10.9
128	+0.6	4.7	5.6	7.1
256	+0.6	3.6	4.2	5.5
512	+0.6	2.5	3.0	4.0
1,024	+0.6	1.7	2.1	2.8
2,048	+0.6	1.2	1.5	2.0
4,096	+0.6	0.9	1.1	1.4
8,192	+0.6	0.6	0.8	1.0
16,384	+0.6	0.4	0.5	0.7

Table 10 (Line marking poorest half of people below 100% of the national line): Percentages of households by cut-off score and targeting classification, along with the hit rate and BPAC, 2010/11 scorecard applied to the 2010/11 validation sample

Score	Inclusion: < poverty line correctly targeted	Undercoverage: < poverty line mistakenly non-targeted	Leakage: ≥ poverty line mistakenly targeted	Exclusion: ≥ poverty line correctly non-targeted	Hit rate Inclusion + Exclusion	BPAC See text
≤4	0.0	10.9	0.0	89.1	89.1	−99.9
≤9	0.1	10.8	0.0	89.0	89.2	−97.0
≤14	0.5	10.4	0.7	88.3	88.9	−83.3
≤19	1.4	9.6	3.1	85.9	87.3	−46.2
≤24	3.4	7.5	8.5	80.6	84.0	+22.3
≤29	5.6	5.3	16.7	72.4	78.0	−52.5
≤34	7.8	3.2	29.2	59.9	67.6	−167.4
≤39	9.0	2.0	40.1	49.0	57.9	−267.3
≤44	9.7	1.2	52.2	36.9	46.6	−378.0
≤49	10.2	0.7	61.8	27.2	37.5	−466.1
≤54	10.6	0.4	69.8	19.3	29.8	−539.2
≤59	10.7	0.2	77.5	11.6	22.3	−609.6
≤64	10.9	0.0	82.3	6.7	17.6	−654.0
≤69	10.9	0.0	85.4	3.7	14.6	−681.9
≤74	10.9	0.0	87.5	1.5	12.4	−701.6
≤79	10.9	0.0	88.6	0.5	11.4	−710.9
≤84	10.9	0.0	89.0	0.0	11.0	−715.1
≤89	10.9	0.0	89.1	0.0	10.9	−715.5
≤94	10.9	0.0	89.1	0.0	10.9	−715.5
≤100	10.9	0.0	89.1	0.0	10.9	−715.5

Inclusion, undercoverage, leakage, and exclusion normalized to sum to 100.

Table 11 (Line marking poorest half of people below 100% of the national line): Share of all households who are targeted (that is, score at or below a cut-off), the share of targeted households who are poor (that is, have consumption below the poverty line), the share of poor households who are targeted, and the number of poor households who are successfully targeted (inclusion) per non-poor household mistakenly targeted (leakage), 2010/11 scorecard applied to the 2010/11 validation sample

Targeting cut-off	% all HHs who are targeted	% targeted HHs who are poor	% poor HHs who are targeted	Poor HHs targeted per non-poor HH targeted
≤4	0.0	52.1	0.0	1.1:1
≤9	0.2	74.6	1.3	2.9:1
≤14	1.3	42.2	5.0	0.7:1
≤19	4.5	30.3	12.5	0.4:1
≤24	11.9	28.7	31.3	0.4:1
≤29	22.3	25.2	51.5	0.3:1
≤34	37.0	21.0	71.0	0.3:1
≤39	49.1	18.3	82.1	0.2:1
≤44	62.0	15.7	89.2	0.2:1
≤49	72.0	14.2	93.5	0.2:1
≤54	80.4	13.1	96.7	0.2:1
≤59	88.2	12.2	98.3	0.1:1
≤64	93.2	11.7	99.6	0.1:1
≤69	96.3	11.3	99.9	0.1:1
≤74	98.5	11.1	100.0	0.1:1
≤79	99.5	11.0	100.0	0.1:1
≤84	100.0	10.9	100.0	0.1:1
≤89	100.0	10.9	100.0	0.1:1
≤94	100.0	10.9	100.0	0.1:1
≤100	100.0	10.9	100.0	0.1:1

Tables for
the First-Quintile (20th-Percentile) Poverty Line

Table 4 (First-quintile (20th-percentile) line): Estimated poverty likelihoods associated with scores

If a household's score is . . .	. . . then the likelihood (%) of being below the poverty line is:
0–4	58.6
5–9	58.6
10–14	43.7
15–19	38.4
20–24	35.4
25–29	25.3
30–34	21.0
35–39	16.5
40–44	8.3
45–49	6.1
50–54	5.9
55–59	4.1
60–64	2.2
65–69	1.6
70–74	1.5
75–79	1.2
80–84	0.5
85–89	0.0
90–94	0.0
95–100	0.0

Table 6 (First-quintile (20th-percentile) line): Average errors (differences between estimated and true poverty likelihoods) for households by score range, with confidence intervals, from 1,000 bootstraps of n = 16,384, 2010/11 scorecard applied to the 2010/11 validation sample

Score	Diff.	Difference between estimate and true value		
		Confidence interval (±percentage points)		
		90-percent	95-percent	99-percent
0–4	−18.8	50.0	50.0	50.0
5–9	−34.1	19.7	20.2	20.4
10–14	−1.8	7.2	8.3	10.7
15–19	+3.5	4.0	4.7	6.3
20–24	−0.6	2.5	3.1	4.2
25–29	−1.2	1.9	2.2	2.8
30–34	+3.3	1.3	1.6	2.1
35–39	+3.1	1.3	1.6	2.0
40–44	−1.1	1.2	1.4	1.9
45–49	−3.6	2.6	2.7	3.0
50–54	+1.0	1.0	1.2	1.5
55–59	+0.5	1.1	1.3	1.7
60–64	−1.5	1.5	1.8	2.2
65–69	+1.4	0.2	0.2	0.3
70–74	+1.4	0.1	0.1	0.2
75–79	+1.2	0.1	0.1	0.1
80–84	−1.5	2.2	2.4	2.8
85–89	0.0	0.0	0.0	0.0
90–94	0.0	0.0	0.0	0.0
95–100	0.0	0.0	0.0	0.0

Table 7 (First-quintile (20th-percentile) line): Errors (average differences between estimated poverty rates and true values) for a group at a point in time by sample size, with confidence intervals, for 1,000 bootstraps of various sample sizes, 2010/11 scorecard applied to the 2010/11 validation sample

Sample Size n	Difference between estimate and true value			
	Diff.	Confidence interval (±percentage points)		
		90-percent	95-percent	99-percent
1	−0.9	59.5	63.5	66.3
4	+0.9	31.3	39.0	48.4
8	+1.1	21.2	25.0	32.1
16	+0.3	16.3	19.1	23.6
32	+0.3	11.5	13.6	18.1
64	+0.4	8.2	9.6	12.5
128	+0.4	5.7	6.8	9.4
256	+0.4	4.1	4.7	6.2
512	+0.4	2.8	3.6	4.6
1,024	+0.4	2.0	2.4	3.3
2,048	+0.4	1.5	1.7	2.3
4,096	+0.4	1.0	1.2	1.8
8,192	+0.4	0.7	0.8	1.2
16,384	+0.4	0.5	0.6	0.8

Table 10 (First-quintile (20th-percentile) line): Percentages of households by cut-off score and targeting classification, along with the hit rate and BPAC, 2010/11 scorecard applied to the 2010/11 validation sample

Score	Inclusion: < poverty line correctly targeted	Undercoverage: < poverty line mistakenly non-targeted	Leakage: ≥ poverty line mistakenly targeted	Exclusion: ≥ poverty line correctly non-targeted	Hit rate Inclusion + Exclusion	BPAC See text
≤4	0.0	15.3	0.0	84.6	84.7	−100.0
≤9	0.1	15.2	0.0	84.6	84.8	−97.9
≤14	0.7	14.7	0.6	84.0	84.7	−87.4
≤19	1.9	13.4	2.6	82.0	84.0	−58.0
≤24	4.6	10.8	7.3	77.3	81.9	+7.5
≤29	7.3	8.0	14.9	69.7	77.1	+2.6
≤34	10.2	5.2	26.8	57.8	68.0	−74.6
≤39	12.0	3.4	37.1	47.5	59.5	−141.7
≤44	13.4	2.0	48.6	36.0	49.4	−216.6
≤49	14.2	1.1	57.8	26.8	41.1	−276.6
≤54	14.8	0.6	65.6	19.1	33.8	−327.3
≤59	15.1	0.2	73.1	11.5	26.6	−376.4
≤64	15.3	0.1	77.9	6.7	22.0	−407.8
≤69	15.3	0.0	81.0	3.7	19.0	−427.7
≤74	15.3	0.0	83.1	1.5	16.8	−441.7
≤79	15.3	0.0	84.2	0.5	15.8	−448.3
≤84	15.3	0.0	84.6	0.0	15.4	−451.2
≤89	15.3	0.0	84.7	0.0	15.3	−451.5
≤94	15.3	0.0	84.7	0.0	15.3	−451.5
≤100	15.3	0.0	84.7	0.0	15.3	−451.5

Inclusion, undercoverage, leakage, and exclusion normalized to sum to 100.

Table 11 (First-quintile (20th-percentile) line): Share of all households who are targeted (that is, score at or below a cut-off), the share of targeted households who are poor (that is, have consumption below the poverty line), the share of poor households who are targeted, and the number of poor households who are successfully targeted (inclusion) per non-poor household mistakenly targeted (leakage), 2010/11 scorecard applied to the 2010/11 validation sample

Targeting cut-off	% all HHs who are targeted	% targeted HHs who are poor	% poor HHs who are targeted	Poor HHs targeted per non-poor HH targeted
≤4	0.0	52.1	0.0	1.1:1
≤9	0.2	77.9	0.9	3.5:1
≤14	1.3	50.9	4.3	1.0:1
≤19	4.5	42.5	12.5	0.7:1
≤24	11.9	38.5	29.9	0.6:1
≤29	22.3	33.0	47.9	0.5:1
≤34	37.0	27.5	66.2	0.4:1
≤39	49.1	24.4	78.1	0.3:1
≤44	62.0	21.6	87.0	0.3:1
≤49	72.0	19.8	92.7	0.2:1
≤54	80.4	18.4	96.4	0.2:1
≤59	88.2	17.1	98.5	0.2:1
≤64	93.2	16.4	99.6	0.2:1
≤69	96.3	15.9	99.8	0.2:1
≤74	98.5	15.6	99.9	0.2:1
≤79	99.5	15.4	99.9	0.2:1
≤84	100.0	15.4	100.0	0.2:1
≤89	100.0	15.3	100.0	0.2:1
≤94	100.0	15.3	100.0	0.2:1
≤100	100.0	15.3	100.0	0.2:1

Tables for
the Second-Quintile (40$^{\text{th}}$-Percentile) Poverty Line

Table 4 (Second-quintile (40th-percentile) line): Estimated poverty likelihoods associated with scores

If a household's score is . . .	. . . then the likelihood (%) of being below the poverty line is:
0–4	96.4
5–9	96.4
10–14	72.8
15–19	64.0
20–24	59.6
25–29	48.9
30–34	44.6
35–39	37.2
40–44	26.0
45–49	20.5
50–54	17.6
55–59	12.4
60–64	6.9
65–69	4.6
70–74	3.6
75–79	1.7
80–84	0.7
85–89	0.7
90–94	0.0
95–100	0.0

Table 6 (Second-quintile (40th-percentile) line): Average errors (differences between estimated and true poverty likelihoods) for households by score range, with confidence intervals, from 1,000 bootstraps of n = 16,384, 2010/11 scorecard applied to the 2010/11 validation sample

Score	Diff.	Difference between estimate and true value		
		Confidence interval (±percentage points)		
		90-percent	95-percent	99-percent
0–4	+8.7	50.0	50.0	50.0
5–9	+3.6	6.0	8.0	10.1
10–14	+3.5	6.8	8.0	10.3
15–19	−1.6	3.2	3.9	4.9
20–24	+3.6	2.6	3.3	4.2
25–29	−4.4	3.3	3.5	4.0
30–34	+2.7	1.8	2.2	2.8
35–39	+5.5	1.9	2.2	3.2
40–44	−0.5	1.7	2.1	2.9
45–49	−2.7	2.4	2.6	3.4
50–54	+2.8	1.7	2.1	2.8
55–59	+4.2	1.4	1.7	2.1
60–64	−3.8	3.1	3.3	3.5
65–69	+1.8	1.4	1.7	2.3
70–74	−1.8	2.8	3.4	4.1
75–79	+1.3	0.5	0.6	0.7
80–84	−1.2	2.2	2.4	2.8
85–89	+0.7	0.0	0.0	0.0
90–94	0.0	0.0	0.0	0.0
95–100	0.0	0.0	0.0	0.0

Table 7 (Second-quintile (40th-percentile) line): Errors (average differences between estimated poverty rates and true values) for a group at a point in time by sample size, with confidence intervals, for 1,000 bootstraps of various sample sizes, 2010/11 scorecard applied to the 2010/11 validation sample

Sample Size	Difference between estimate and true value			
		Confidence interval (±percentage points)		
n	Diff.	90-percent	95-percent	99-percent
1	−0.4	64.2	71.0	78.6
4	+1.4	41.1	47.3	58.4
8	+1.9	28.4	33.4	43.3
16	+1.2	19.9	24.8	32.9
32	+1.1	14.2	17.1	23.2
64	+1.1	9.8	11.8	15.5
128	+1.0	7.5	8.6	10.7
256	+0.9	5.1	5.9	7.8
512	+1.0	3.6	4.4	5.6
1,024	+1.0	2.6	3.1	4.0
2,048	+1.0	1.8	2.2	2.8
4,096	+1.0	1.2	1.5	1.9
8,192	+1.0	0.9	1.0	1.5
16,384	+1.0	0.6	0.7	1.0

Table 10 (Second-quintile (40ᵗʰ-percentile) line): Percentages of households by cut-off score and targeting classification, along with the hit rate and BPAC, 2010/11 scorecard applied to the 2010/11 validation sample

Score	Inclusion: < poverty line correctly targeted	Undercoverage: < poverty line mistakenly non-targeted	Leakage: ≥ poverty line mistakenly targeted	Exclusion: ≥ poverty line correctly non-targeted	Hit rate Inclusion + Exclusion	BPAC See text
≤4	0.0	32.5	0.0	67.4	67.4	−100.0
≤9	0.1	32.3	0.0	67.4	67.5	−99.0
≤14	0.9	31.6	0.4	67.0	68.0	−93.2
≤19	3.0	29.4	1.4	66.0	69.1	−77.0
≤24	7.3	25.2	4.5	62.9	70.2	−41.2
≤29	12.7	19.8	9.5	57.9	70.5	+7.3
≤34	19.1	13.4	17.8	49.6	68.8	+45.3
≤39	23.3	9.2	25.7	41.7	65.0	+20.9
≤44	27.0	5.5	34.9	32.5	59.5	−7.3
≤49	29.4	3.1	42.6	24.8	54.2	−31.1
≤54	30.9	1.6	49.4	18.0	48.9	−52.0
≤59	31.7	0.8	56.4	11.0	42.7	−73.6
≤64	32.2	0.3	60.9	6.5	38.7	−87.5
≤69	32.4	0.1	63.8	3.6	35.9	−96.5
≤74	32.5	0.0	65.9	1.5	34.0	−102.9
≤79	32.5	0.0	66.9	0.5	33.0	−105.9
≤84	32.5	0.0	67.4	0.0	32.5	−107.3
≤89	32.5	0.0	67.4	0.0	32.5	−107.5
≤94	32.5	0.0	67.4	0.0	32.5	−107.5
≤100	32.5	0.0	67.4	0.0	32.5	−107.5

Inclusion, undercoverage, leakage, and exclusion normalized to sum to 100.

Table 11 (Second-quintile (40th-percentile) line): Share of all households who are targeted (that is, score at or below a cut-off), the share of targeted households who are poor (that is, have consumption below the poverty line), the share of poor households who are targeted, and the number of poor households who are successfully targeted (inclusion) per non-poor household mistakenly targeted (leakage), 2010/11 scorecard applied to the 2010/11 validation sample

Targeting cut-off	% all HHs who are targeted	% targeted HHs who are poor	% poor HHs who are targeted	Poor HHs targeted per non-poor HH targeted
≤4	0.0	70.5	0.0	2.4:1
≤9	0.2	80.9	0.5	4.2:1
≤14	1.3	72.3	2.9	2.6:1
≤19	4.5	67.2	9.4	2.1:1
≤24	11.9	61.2	22.4	1.6:1
≤29	22.3	56.8	39.0	1.3:1
≤34	37.0	51.7	58.8	1.1:1
≤39	49.1	47.4	71.7	0.9:1
≤44	62.0	43.6	83.1	0.8:1
≤49	72.0	40.7	90.3	0.7:1
≤54	80.4	38.4	95.1	0.6:1
≤59	88.2	36.0	97.6	0.6:1
≤64	93.2	34.6	99.2	0.5:1
≤69	96.3	33.6	99.6	0.5:1
≤74	98.5	33.0	99.9	0.5:1
≤79	99.5	32.6	100.0	0.5:1
≤84	100.0	32.5	100.0	0.5:1
≤89	100.0	32.5	100.0	0.5:1
≤94	100.0	32.5	100.0	0.5:1
≤100	100.0	32.5	100.0	0.5:1

Tables for
the Median (50$^{\text{th}}$-Percentile) Poverty Line

Table 4 (Median (50th-percentile) line): Estimated poverty likelihoods associated with scores

If a household's score is . . .	. . . then the likelihood (%) of being below the poverty line is:
0–4	98.0
5–9	98.0
10–14	79.0
15–19	72.6
20–24	68.1
25–29	62.9
30–34	54.2
35–39	49.1
40–44	34.6
45–49	29.0
50–54	25.4
55–59	19.1
60–64	12.6
65–69	6.7
70–74	5.2
75–79	2.1
80–84	1.3
85–89	1.2
90–94	0.0
95–100	0.0

Table 6 (Median (50th-percentile) line): Average errors (differences between estimated and true poverty likelihoods) for households by score range, with confidence intervals, from 1,000 bootstraps of $n = 16,384$, 2010/11 scorecard applied to the 2010/11 validation sample

Score	Diff.	Difference between estimate and true value		
		Confidence interval (±percentage points)		
		90-percent	95-percent	99-percent
0–4	+10.3	50.0	50.0	50.0
5–9	−1.3	1.0	1.2	1.7
10–14	+6.6	6.6	7.9	9.9
15–19	−10.4	6.6	6.8	7.3
20–24	+0.9	2.5	3.0	3.9
25–29	−1.6	2.1	2.4	3.3
30–34	+0.6	1.8	2.2	2.9
35–39	+5.9	2.0	2.4	3.3
40–44	−3.1	2.6	2.8	3.1
45–49	−1.0	2.1	2.6	3.7
50–54	+1.0	2.2	2.6	3.5
55–59	+5.1	1.8	2.2	2.8
60–64	−3.2	2.9	3.1	4.0
65–69	+3.2	1.5	1.8	2.4
70–74	−0.4	2.8	3.3	4.1
75–79	+1.6	0.5	0.6	0.7
80–84	−0.7	2.2	2.4	2.8
85–89	+1.2	0.0	0.0	0.0
90–94	0.0	0.0	0.0	0.0
95–100	0.0	0.0	0.0	0.0

Table 7 (Median (50th-percentile) line): Errors (average differences between estimated poverty rates and true values) for a group at a point in time by sample size, with confidence intervals, for 1,000 bootstraps of various sample sizes, 2010/11 scorecard applied to the 2010/11 validation sample

Sample Size	Difference between estimate and true value			
		Confidence interval (±percentage points)		
n	Diff.	90-percent	95-percent	99-percent
1	−1.3	67.0	72.9	80.0
4	+0.8	42.5	48.3	58.9
8	+1.2	30.9	36.0	45.2
16	+0.6	21.2	25.3	32.9
32	+0.2	14.8	17.8	22.7
64	+0.2	10.0	12.6	16.0
128	+0.2	7.6	9.2	12.0
256	+0.2	5.3	6.1	8.1
512	+0.3	3.7	4.4	5.9
1,024	+0.3	2.7	3.2	4.4
2,048	+0.3	1.9	2.2	3.1
4,096	+0.3	1.4	1.7	2.2
8,192	+0.3	1.0	1.1	1.4
16,384	+0.3	0.7	0.8	1.0

Table 10 (Median (50th-percentile) line): Percentages of households by cut-off score and targeting classification, along with the hit rate and BPAC, 2010/11 scorecard applied to the 2010/11 validation sample

Score	Inclusion:< poverty line correctly targeted	Undercoverage:< poverty line mistakenly non-targeted	Leakage:≥ poverty line mistakenly targeted	Exclusion:≥ poverty line correctly non-targeted	Hit rateInclusion+Exclusion	BPACSee text
≤4	0.0	41.8	0.0	58.2	58.2	−100.0
≤9	0.2	41.6	0.0	58.2	58.4	−99.1
≤14	1.0	40.8	0.3	57.9	58.9	−94.5
≤19	3.6	38.2	0.9	57.3	60.9	−80.6
≤24	8.6	33.2	3.3	54.9	63.5	−50.9
≤29	15.1	26.6	7.1	51.1	66.2	−10.4
≤34	23.3	18.4	13.6	44.6	67.9	+44.4
≤39	28.9	12.9	20.2	38.0	66.9	+51.6
≤44	34.1	7.7	27.9	30.3	64.4	+33.2
≤49	37.2	4.6	34.9	23.3	60.5	+16.5
≤54	39.4	2.4	41.0	17.2	56.7	+1.9
≤59	40.7	1.1	47.5	10.7	51.4	−13.8
≤64	41.5	0.3	51.8	6.4	47.9	−23.9
≤69	41.6	0.1	54.7	3.6	45.2	−30.9
≤74	41.7	0.0	56.7	1.5	43.2	−35.8
≤79	41.8	0.0	57.7	0.5	42.3	−38.2
≤84	41.8	0.0	58.2	0.0	41.8	−39.2
≤89	41.8	0.0	58.2	0.0	41.8	−39.4
≤94	41.8	0.0	58.2	0.0	41.8	−39.4
≤100	41.8	0.0	58.2	0.0	41.8	−39.4

Inclusion, undercoverage, leakage, and exclusion normalized to sum to 100.

Table 11 (Median (50th-percentile) line): Share of all households who are targeted (that is, score at or below a cut-off), the share of targeted households who are poor (that is, have consumption below the poverty line), the share of poor households who are targeted, and the number of poor households who are successfully targeted (inclusion) per non-poor household mistakenly targeted (leakage), 2010/11 scorecard applied to the 2010/11 validation sample

Targeting cut-off	% all HHs who are targeted	% targeted HHs who are poor	% poor HHs who are targeted	Poor HHs targeted per non-poor HH targeted
≤4	0.0	70.5	0.0	2.4:1
≤9	0.2	95.5	0.4	21.4:1
≤14	1.3	78.1	2.4	3.6:1
≤19	4.5	79.3	8.6	3.8:1
≤24	11.9	72.3	20.6	2.6:1
≤29	22.3	68.0	36.3	2.1:1
≤34	37.0	63.2	55.9	1.7:1
≤39	49.1	58.8	69.1	1.4:1
≤44	62.0	55.0	81.5	1.2:1
≤49	72.0	51.6	88.9	1.1:1
≤54	80.4	49.0	94.3	1.0:1
≤59	88.2	46.1	97.4	0.9:1
≤64	93.2	44.5	99.2	0.8:1
≤69	96.3	43.2	99.7	0.8:1
≤74	98.5	42.4	99.9	0.7:1
≤79	99.5	42.0	100.0	0.7:1
≤84	100.0	41.8	100.0	0.7:1
≤89	100.0	41.8	100.0	0.7:1
≤94	100.0	41.8	100.0	0.7:1
≤100	100.0	41.8	100.0	0.7:1

Tables for
the Third-Quintile (60th-Percentile) Poverty Line

Table 4 (Third-quintile (60th-percentile) line): Estimated poverty likelihoods associated with scores

If a household's score is . . .	. . . then the likelihood (%) of being below the poverty line is:
0–4	98.0
5–9	98.0
10–14	86.5
15–19	81.1
20–24	76.4
25–29	73.0
30–34	65.7
35–39	61.4
40–44	47.6
45–49	40.6
50–54	34.7
55–59	27.7
60–64	18.5
65–69	11.0
70–74	7.6
75–79	2.5
80–84	1.8
85–89	1.7
90–94	0.0
95–100	0.0

Table 6 (Third-quintile (60th-percentile) line): Average errors (differences between estimated and true poverty likelihoods) for households by score range, with confidence intervals, from 1,000 bootstraps of n = 16,384, 2010/11 scorecard applied to the 2010/11 validation sample

Score	Diff.	Difference between estimate and true value		
		Confidence interval (±percentage points)		
		90-percent	95-percent	99-percent
0–4	+10.3	50.0	50.0	50.0
5–9	–1.9	1.0	1.0	1.0
10–14	+12.1	6.4	7.4	10.1
15–19	–5.3	4.0	4.1	4.6
20–24	+1.3	2.3	2.8	3.5
25–29	–1.1	1.8	2.3	3.0
30–34	+1.0	1.8	2.2	2.9
35–39	+9.9	2.0	2.4	3.4
40–44	–3.2	2.7	2.9	3.5
45–49	–4.1	3.2	3.5	4.1
50–54	–2.8	2.8	3.5	4.7
55–59	+5.9	2.1	2.5	3.4
60–64	–2.8	2.9	3.4	4.2
65–69	–2.3	3.5	4.1	5.5
70–74	+1.9	2.9	3.4	4.1
75–79	–2.0	3.0	3.5	4.7
80–84	–0.2	2.2	2.4	2.9
85–89	+1.7	0.0	0.0	0.0
90–94	0.0	0.0	0.0	0.0
95–100	0.0	0.0	0.0	0.0

Table 7 (Third-quintile (60th-percentile) line): Errors (average differences between estimated poverty rates and true values) for a group at a point in time by sample size, with confidence intervals, for 1,000 bootstraps of various sample sizes, 2010/11 scorecard applied to the 2010/11 validation sample

Sample Size	Difference between estimate and true value			
		Confidence interval (±percentage points)		
n	Diff.	90-percent	95-percent	99-percent
1	−1.2	69.2	74.3	85.1
4	+0.7	43.3	49.5	59.2
8	+1.3	32.2	37.0	46.5
16	+0.9	22.0	24.9	33.0
32	+0.8	15.4	18.3	23.3
64	+0.6	11.1	13.0	16.8
128	+0.5	8.0	9.5	12.7
256	+0.4	5.6	6.9	8.3
512	+0.5	4.0	4.7	6.1
1,024	+0.5	2.9	3.4	4.7
2,048	+0.5	2.0	2.3	3.1
4,096	+0.5	1.4	1.6	2.3
8,192	+0.5	1.0	1.2	1.6
16,384	+0.5	0.7	0.8	1.0

Table 10 (Third-quintile (60th-percentile) line): Percentages of households by cut-off score and targeting classification, along with the hit rate and BPAC, 2010/11 scorecard applied to the 2010/11 validation sample

Score	Inclusion: < poverty line correctly targeted	Undercoverage: < poverty line mistakenly non-targeted	Leakage: ≥ poverty line mistakenly targeted	Exclusion: ≥ poverty line correctly non-targeted	Hit rate Inclusion + Exclusion	BPAC See text
≤4	0.0	51.1	0.0	48.8	48.8	−100.0
≤9	0.2	51.0	0.0	48.8	49.0	−99.3
≤14	1.0	50.1	0.2	48.6	49.6	−95.4
≤19	3.8	47.4	0.7	48.1	51.9	−83.8
≤24	9.4	41.7	2.5	46.3	55.7	−58.3
≤29	17.0	34.2	5.3	43.5	60.5	−23.2
≤34	26.7	24.4	10.3	38.6	65.3	+24.5
≤39	33.4	17.8	15.7	33.1	66.5	+61.2
≤44	40.0	11.1	21.9	26.9	67.0	+57.2
≤49	44.4	6.7	27.6	21.2	65.6	+46.0
≤54	47.4	3.7	32.9	15.9	63.3	+35.6
≤59	49.4	1.7	38.8	10.0	59.5	+24.1
≤64	50.5	0.6	42.7	6.2	56.7	+16.6
≤69	50.9	0.2	45.3	3.5	54.4	+11.3
≤74	51.1	0.1	47.4	1.5	52.5	+7.3
≤79	51.1	0.0	48.3	0.5	51.6	+5.5
≤84	51.1	0.0	48.8	0.0	51.2	+4.6
≤89	51.1	0.0	48.8	0.0	51.1	+4.5
≤94	51.1	0.0	48.8	0.0	51.1	+4.5
≤100	51.1	0.0	48.8	0.0	51.1	+4.5

Inclusion, undercoverage, leakage, and exclusion normalized to sum to 100.

Table 11 (Third-quintile (60th-percentile) line): Share of all households who are targeted (that is, score at or below a cut-off), the share of targeted households who are poor (that is, have consumption below the poverty line), the share of poor households who are targeted, and the number of poor households who are successfully targeted (inclusion) per non-poor household mistakenly targeted (leakage), 2010/11 scorecard applied to the 2010/11 validation sample

Targeting cut-off	% all HHs who are targeted	% targeted HHs who are poor	% poor HHs who are targeted	Poor HHs targeted per non-poor HH targeted
≤4	0.0	70.5	0.0	2.4:1
≤9	0.2	98.5	0.4	67.2:1
≤14	1.3	81.4	2.0	4.4:1
≤19	4.5	83.5	7.4	5.1:1
≤24	11.9	78.9	18.4	3.7:1
≤29	22.3	76.2	33.2	3.2:1
≤34	37.0	72.2	52.2	2.6:1
≤39	49.1	67.9	65.2	2.1:1
≤44	62.0	64.6	78.3	1.8:1
≤49	72.0	61.6	86.8	1.6:1
≤54	80.4	59.0	92.7	1.4:1
≤59	88.2	56.0	96.7	1.3:1
≤64	93.2	54.2	98.8	1.2:1
≤69	96.3	52.9	99.6	1.1:1
≤74	98.5	51.9	99.9	1.1:1
≤79	99.5	51.4	100.0	1.1:1
≤84	100.0	51.2	100.0	1.0:1
≤89	100.0	51.1	100.0	1.0:1
≤94	100.0	51.1	100.0	1.0:1
≤100	100.0	51.1	100.0	1.0:1

Tables for
the Fourth-Quintile (80th-Percentile) Poverty Line

Table 4 (Fourth-quintile (80th-percentile) line): Estimated poverty likelihoods associated with scores

If a household's score is . . .	. . . then the likelihood (%) of being below the poverty line is:
0–4	100.0
5–9	98.8
10–14	95.0
15–19	93.1
20–24	91.5
25–29	88.9
30–34	86.5
35–39	81.9
40–44	73.6
45–49	65.5
50–54	60.8
55–59	55.6
60–64	41.0
65–69	27.2
70–74	20.3
75–79	13.3
80–84	8.1
85–89	2.0
90–94	0.0
95–100	0.0

Table 6 (Fourth-quintile (80th-percentile) line): Average errors (differences between estimated and true poverty likelihoods) for households by score range, with confidence intervals, from 1,000 bootstraps of n = 16,384, 2010/11 scorecard applied to the 2010/11 validation sample

Score	Diff.	Difference between estimate and true value		
		Confidence interval (±percentage points)		
		90-percent	95-percent	99-percent
0–4	0.0	0.0	0.0	0.0
5–9	−1.2	0.6	0.6	0.6
10–14	+12.2	5.9	7.1	9.1
15–19	−1.1	1.7	2.1	2.6
20–24	−0.6	1.4	1.6	2.2
25–29	−0.9	1.4	1.6	2.0
30–34	+0.2	1.3	1.5	1.9
35–39	+2.2	1.7	2.0	2.7
40–44	−3.4	2.6	2.8	3.0
45–49	−6.7	4.4	4.6	4.9
50–54	−3.0	2.9	3.4	4.5
55–59	+6.8	2.8	3.5	4.6
60–64	−7.9	5.8	6.2	6.9
65–69	+2.1	4.1	5.0	7.1
70–74	−0.7	5.1	6.2	8.5
75–79	−10.1	8.7	9.3	12.2
80–84	+5.6	2.3	2.6	3.3
85–89	+0.5	3.6	4.3	6.6
90–94	0.0	0.0	0.0	0.0
95–100	0.0	0.0	0.0	0.0

Table 7 (Fourth-quintile (80th-percentile) line): Errors (average differences between estimated poverty rates and true values) for a group at a point in time by sample size, with confidence intervals, for 1,000 bootstraps of various sample sizes, 2010/11 scorecard applied to the 2010/11 validation sample

Sample Size n	Difference between estimate and true value			
	Diff.	Confidence interval (±percentage points)		
		90-percent	95-percent	99-percent
1	−2.9	63.1	72.7	86.4
4	−0.5	36.0	41.2	56.4
8	−0.5	25.3	30.4	41.5
16	−0.9	18.6	22.0	29.0
32	−0.7	13.0	16.1	21.9
64	−0.9	9.5	11.3	15.5
128	−0.9	6.8	8.0	10.3
256	−0.8	4.8	6.0	7.8
512	−0.9	3.4	3.9	5.1
1,024	−0.9	2.4	2.8	3.6
2,048	−0.9	1.7	2.0	2.6
4,096	−0.9	1.2	1.4	1.9
8,192	−0.9	0.9	1.0	1.3
16,384	−0.9	0.6	0.7	0.9

Table 10 (Fourth-quintile (80th-percentile) line): Percentages of households by cut-off score and targeting classification, along with the hit rate and BPAC, 2010/11 scorecard applied to the 2010/11 validation sample

Score	Inclusion: < poverty line correctly targeted	Undercoverage: < poverty line mistakenly non-targeted	Leakage: ≥ poverty line mistakenly targeted	Exclusion: ≥ poverty line correctly non-targeted	Hit rate Inclusion + Exclusion	BPAC See text
≤4	0.0	72.4	0.0	27.6	27.6	−100.0
≤9	0.2	72.2	0.0	27.6	27.8	−99.5
≤14	1.1	71.2	0.1	27.5	28.6	−96.6
≤19	4.2	68.2	0.4	27.2	31.4	−88.0
≤24	11.0	61.4	1.0	26.6	37.6	−68.4
≤29	20.3	52.1	2.0	25.6	45.9	−41.2
≤34	32.9	39.5	4.1	23.5	56.4	−3.5
≤39	42.7	29.7	6.4	21.2	63.9	+26.8
≤44	52.5	19.9	9.4	18.2	70.7	+58.1
≤49	59.6	12.7	12.4	15.2	74.9	+81.9
≤54	64.8	7.6	15.6	12.0	76.8	+78.5
≤59	68.8	3.6	19.4	8.2	76.9	+73.1
≤64	71.0	1.3	22.2	5.4	76.4	+69.4
≤69	71.8	0.6	24.5	3.1	74.9	+66.2
≤74	72.2	0.2	26.3	1.3	73.5	+63.7
≤79	72.3	0.0	27.1	0.5	72.8	+62.5
≤84	72.4	0.0	27.5	0.0	72.4	+61.9
≤89	72.4	0.0	27.6	0.0	72.4	+61.9
≤94	72.4	0.0	27.6	0.0	72.4	+61.9
≤100	72.4	0.0	27.6	0.0	72.4	+61.9

Inclusion, undercoverage, leakage, and exclusion normalized to sum to 100.

Table 11 (Fourth-quintile (80th-percentile) line): Share of all households who are targeted (that is, score at or below a cut-off), the share of targeted households who are poor (that is, have consumption below the poverty line), the share of poor households who are targeted, and the number of poor households who are successfully targeted (inclusion) per non-poor household mistakenly targeted (leakage), 2010/11 scorecard applied to the 2010/11 validation sample

Targeting cut-off	% all HHs who are targeted	% targeted HHs who are poor	% poor HHs who are targeted	Poor HHs targeted per non-poor HH targeted
≤4	0.0	100.0	0.0	Only poor targeted
≤9	0.2	100.0	0.3	Only poor targeted
≤14	1.3	89.6	1.6	8.6:1
≤19	4.5	91.9	5.7	11.4:1
≤24	11.9	92.0	15.1	11.5:1
≤29	22.3	91.0	28.0	10.1:1
≤34	37.0	89.0	45.4	8.1:1
≤39	49.1	87.0	59.0	6.7:1
≤44	62.0	84.7	72.5	5.5:1
≤49	72.0	82.8	82.4	4.8:1
≤54	80.4	80.6	89.5	4.1:1
≤59	88.2	77.9	95.0	3.5:1
≤64	93.2	76.2	98.1	3.2:1
≤69	96.3	74.5	99.2	2.9:1
≤74	98.5	73.3	99.7	2.7:1
≤79	99.5	72.7	100.0	2.7:1
≤84	100.0	72.4	100.0	2.6:1
≤89	100.0	72.4	100.0	2.6:1
≤94	100.0	72.4	100.0	2.6:1
≤100	100.0	72.4	100.0	2.6:1