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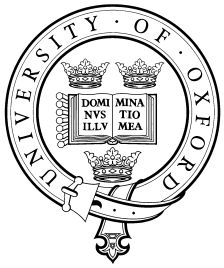

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Measuring destitution in developing countries: An ordinal approach for identifying linked subset of multidimensionally poor

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Abstract

Overall poverty reduction may leave the poorest behind and thus it is a fair question to ask if the poverty reduction has taken place among the poorest of the poor. A typical approach is to set a more stringent poverty cutoff and assess the situation of those that are the poorest or destitute. In income poverty measurement, they are often referred as ultra poor. This paper instead pursues a multidimensional counting methodology, building on Alkire and Foster (2011), and presuming that most of the variables assessing deprivations are ordinal. A person in this framework is identified as poor if the person's *intensity of deprivation* or the *joint deprivation score* is equal to or larger than a particular poverty cutoff. There are two ways to assess the situations of the poorest in this framework. The first – which has already been implemented – is to use a higher poverty cutoff to identify those with *higher intensity of deprivation* across the same indicators. The second

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– developed in this paper – is to apply a second vector of *extreme* deprivation cutoffs for key indicators, and assess who is poor by these cutoffs. We call those who are poor according to these *deeper* deprivation cutoffs as 'destitute'. If the indicators, weights and poverty cutoff remain unchanged, then we can undertake certain rigorous comparisons between the destitute and the poor – identified by less extreme deprivation cutoffs. We apply these two approaches to understand the extent of destitution in 49 developing countries across the world using the same set of dimensions and indicators used for constructing the MPI (Alkire and Santos 2010), which has been reported in the *Human Development Reports* since 2010. We find surprisingly widespread destitution across these 49 countries housing 1.2 billion poor people – indeed around half of the MPI poor people are destitute by this measure. The paper also reports results sub-nationally for 41 countries, and illustrates how the overall change in poverty may be decomposed into changes affecting those that are destitute and those that are not using strictly harmonized variables.

Keywords: Ultra poverty, Destitution, Extreme poverty, Multidimensional poverty, Dynamics, Rural poverty, Urban poverty, South Asia, Sub-Saharan Africa

JEL classification: I3, I32, D63, O1

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1. Introduction

Gradations of poverty have been an ongoing topic of study. Understanding different degrees and kinds of poverty contributes to their removal. Early pioneers of poverty measurement observed that poverty measures such as the headcount ratio – that overlooks all differences among poor people – are at once inaccurate and unethical. They completely overlook gradations among poverty that are vitally important. Being unable to distinguish the poor from the destitute, neither do they provide additional incentives for addressing the poorest among the poor, as might seem appropriate to do in some circumstances (Sen 1976, FGT 1984).

These discussions surfaced first, naturally, with respect to unidimensional measures of poverty such as income and consumption and expenditure. They have often been addressed using multiple poverty lines. For example the World Bank's measure of global income poverty reports headcounts for the $1.25/day and the $2/day and the $10/day poverty lines. National governments often also report poverty for two or three lines – for example a food poverty line, a basic needs line, and perhaps a middle class line. Lipton (1988) identified the ultra poor based on a more stringent threshold of calorie intake. Emran, Shilpi, and Stiglitz (2008) identified those as ultra poor who lacked effective labour endowment such as bad health and low work capacity. Kakwani (1993), Aliber (2003), and IFPRI (2007) identified the ultra poor based on a more stringent income threshold.

Multidimensional poverty measures in which some variables are ordinal in scale have two ways of examining the poorest among the poor. The first, which has often been implemented in measures based on the counting tradition, is to apply multiple poverty cutoffs or lines. For example, the Multidimensional Poverty Index (MPI) reported in the UNDP *Human Development Reports* uses three poverty cutoffs to report 'severe' poverty (afflicting those whose are deprived in 50% or more of the dimensions), 'acute' poverty (1/3), and 'vulnerability' (20%). These multidimensional poverty cutoffs use the same definitions of deprivation; what changes is the numbers of deprivations people experience. Such analyses are tremendously useful in pointing out inequalities among the poor.[1] However, in some cases, we might want to explore *different* gradations of deprivation within at least some indicators. For example, rather than defining deprivation in child malnutrition to be 2 standard

[1] These are extensively examined in Seth and Alkire 2014.

deviations below the median we may wish to example those who are severely malnourished, having 3 or more standard deviations. To do so is straightforward, but it requires the second methodological approach, which is to use second vector of deprivation cutoffs for each dimension, to identify who are deprived according to more severe dimension-specific standards in at least some variables. Such a methodology, which is presented in this paper, can be used alone, or can be combined with changes in the poverty cutoff.

This paper presents a multidimensional measure of 'destitution' using the Alkire-Foster methodology for ordinal variables (the Adjusted Headcount Ratio M_0). The destitution measure uses the second approach mentioned above. That is, it applies a vector of deprivation cutoffs which are more stringent for at least some of the original indicators and otherwise the same. When this deprivation cutoff vector is used with the same indicators and weights as a poverty measure, it identifies a *subset* of the multidimensionally poor who are *additionally* deprived in some dimensions to a greater extent. Comparisons between the poor and the destitute (across varying poverty cutoffs) bring into sharp focus the differing gradations and kinds of poverty that continue to beset the poor.

We construct a measure of destitution that is linked to the global Multidimensional Poverty Index (MPI) 2014. We implemented this measure for 49 countries covering xxx billion persons. We examine the findings in detail – analyzing the proportion of MPI poor who are destitute in different countries, the composition of poverty among the destitute, the relationship between the destitute and the poor, the relationship between the destitute and those who are poor when higher poverty cutoffs are applied using the original MPI indicators and deprivation cutoffs, and the robustness of our results. The concluding section observes that this methodology could be extended to address the need for alternative subsets in society – for example of the vulnerable and the poor, or the middle class and the poor.

The value-added of this paper is both methodological and empirical. Methodologically, it describes the construction and analysis of subsets of multidimensional poverty measures using ordinal data, in a way that rigorously respects the ordinal scale of measurement, yet permits analysts to take advantage of more information than is possible using one vector of deprivation cutoffs alone. It also describes the correct analysis of these findings both for H and M_0, thus providing a step ahead for ordinal measures of multidimensional poverty. This could be useful in the move towards 'universal' indicators which partition societies into gradients of absolute poverty which are appropriate in all countries from the poorest to the richest.

Empirically, the results show first that the methodology is feasible, and second that it is essential. The results are sobering: among the 1.2 billion MPI poor people in the 49 countries under study, roughly 50% are destitute. Furthermore, the proportion of MPI poor who are destitute varies widely across countries – which suggests that it is possible to control destitution even if there is poverty.

This paper is structured as follows. Section 2 presents the methodology. Section 3 presents the global and national results. Section 4 presents results on destitution at the sub-national level. Section 5 presents an example on how the overall change in poverty over time may be broken down into change in destitution and change in non-destitution. Section 6 outlines the composition of destitution. Finally, Section 6 provides concluding remarks.

2. Methodology: AF Dual Cutoff Counting-based Constructions Subsets of the Poor using Ordinal Data

We begin with an $n \times d$ *achievement* matrix X in $\mathbb{R}_{+}^{n \times d}$, where $i = 1 \ldots n$ is the population and $j = 1 \ldots d$ are the variables under consideration. For each variable or indicator of poverty, we select a deprivation cutoff z_d, such that a person whose achievement falls strictly below the cutoff ($x_{ij} < z_j$) is deprived in that indicator. We indicate the vector of deprivation cutoffs by z. From the achievement matrix, we obtain the deprivation matrix g^0 such that $g_{ij}^0 = 1$ if person i is deprived in dimension j; and $g_{ij}^0 = 0$ otherwise. To obtain deprivation scores across indicators, we must apply deprivation values. Thus, we create a vector of relative weights or deprivation values w such that $w_j > 0$ and $\sum_{j=1}^{d} w_j = 1$. Applying this vector to each row of the g^0 matrix, we obtain the weighted deprivation score of each person: $c_i = \sum_{j=1}^{d} w_j g_{ij}^0$. The column vector of deprivation scores across the population is denoted by c.

To identify who is poor, we select a further single cross-dimensional poverty cut-off k and identify a person as multidimensionally poor if $c_i \geq k$. We denote the number of poor persons q and the set of all poor persons by Z.Censoring the g^0 matrix to include only deprivations of poor persons – which we indicate by $c_i(k)$ in the case of the vector, and $g^0(k)$ in the case of the matrix – we can compute the Adjusted Headcount ratio M_0 as the mean of the matrix: $M_0 = \mu(g^0(k))$. Similarly, the headcount ratio of poor persons is $H = q/n$; the intensity or average share of deprivations among the poor is $A = \left(\frac{1}{q}\right) \sum_{i=1}^{n} c_i(k)$. The uncensored (or raw) headcount ratio or total

deprivations in each indicator across society is $h_j = \frac{1}{n}\sum_{i=1}^{n} x_j$ and the censored headcount ratio – showing deprivations only among the poor uses the censored matrix $g^0(k)$ and can be written is $h_j(k) = \frac{1}{n}\sum_{i=1}^{n} x_j(k)$, where (k) denotes the censoring of all deprivations pertaining to non-poor persons.

Identifying a Linked Subset of Poor

Three sets of parameters play a crucial role in identifying the set of multidimensionally poor Z. These parameters also play an important role in identifying a subset of poor in Z. A subset can be identified by altering the deprivation cutoffs and the poverty cutoff. In order to identify a subset of Z, it is important that the weight vector remains unchanged. If the subset of poor is identified by choosing a more stringent poverty cutoff $k' \geq k$, then we refer this approach as the *intensity approach* to identify a subset of poor. If one wants to identify a proper or strict subset of Z, then we require $k' > k$. Thus, in the intensity approach, the subset of poor are identified from the same achievement matrix X, using the same weight vector w and the same deprivation cutoff vector z, but a different poverty cutoff. If the subset of poor is identified by choosing a set of more stringent deprivation cutoffs z' such that $z_j' \leq z_j$ for all j, then we refer this approach as the *depth approach*. If one wants to identify a proper or strict subset of Z, then we require $z_j' \leq z_j$ for all j and $z_j' < z_j$ for at some j. A subset of poor in Z can also be identified by combining these two approaches. Thus, in the depth approach, the subset of poor is identified from the same achievement matrix X, using the same weight vector w and the same poverty cutoff k, but by a set of different deprivation cutoffs $\boldsymbol{z'}$. In this paper, we pursue the depth approach to compute destitution.

Computing Destitution with ordinal variables: the Destitution deprivation cutoff vector

In order to identify the set of multidimensionally poor that are destitute, , the same weighting vector and the same poverty cutoff However we employ a vector of destitution deprivation cutoffs summarized in a destitution deprivation vector and refer it as z^Dvector . We use these deprivation cutoffs to identify the destitution deprivations among the population and the use the same poverty cutoff k to identify a proper of strict subset of the MPI poor as destitute. We denote the set of destitute by Z^D. Note that to achieve this, at least one element in z^D must be strictly lower than its corresponding cutoff z_j and the remaining elements are no higher than z_j. As before, we apply the

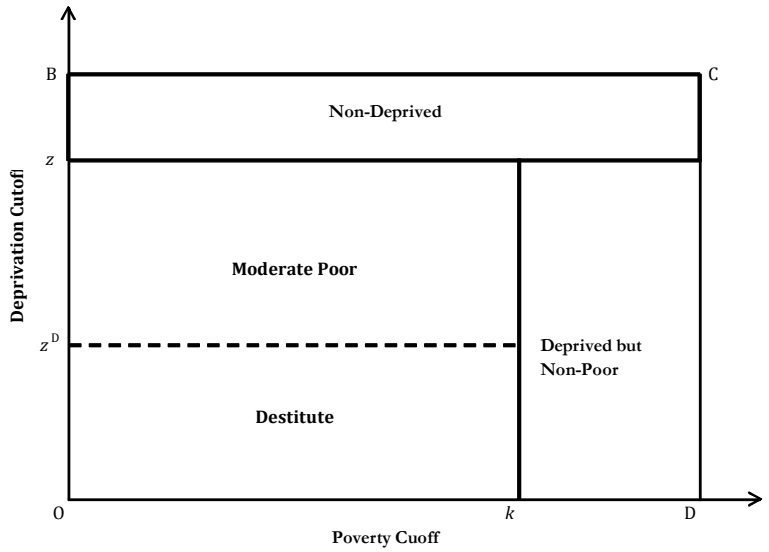
deprivation cutoffs to the achievement matrix and obtain $g^{0,D}$ such that $g_{ij}^{0,D} = 1$ if person i is deprived in dimension j according to the vector z_D, and applying the weight vector w as before, we obtain $c_i^D = \sum_{j=1}^{d} w_j g_{ij}^{0,D}$ and. We denote the corresponding uncensored headcount ratio of dimension j by h_j^D, which is the proportion of population deprived according to the destitution indicator z_j^D. Using the poverty cut-off k, we identify a person as destitute if $c_i^D \geq k$, and construct the censored deprivation matrix $g^{0,D}(k)$ accordingly. From this censored deprivation matrix we obtain the set of consistent indicators as before: M_0^D, H^D, A^D, and $h_j^D(k)$.

Relevant Partial Indices and Relationships

There are rigorous and direct comparisons between poverty and destitution. In our subsequent analysis, we will exploit the following additional partial indices and relationships between them.

The relationship between H and H^D is intuitive. Note that all of those identified as destitute are poor already: thus the destitution measure H^D identifies a subset of the poor who additionally experience more extreme deprivations in k dimensions. This permits elementary but nonetheless powerful comparisons to be made, which respect the properties of ordinal data. The ratio H^D/H is the share of poor that are identified as destitute. We explain this relationship in Figure 1. In the vertical axis, we present the deprivation cutoff and in the horizontal axis, we present the poverty cutoff. Suppose that Area OBCD represents the overall population. Deprivation cutoff z divides the country into two groups: those that are non-deprived and those that are deprived in at least one indicator. The poverty cutoff k in the horizontal axis divides those that are deprived in two groups: those that are poor or suffer deprivation scores of k or more and those that are deprived but with deprivation scores of k or less. The deprived cutoff z and the poverty cutoff k together identifies those that are multidimensionally poor, which is given by the area bounded from above by the horizontal line z and from right by the vertical line at k. The proportion of this area to the overall are OBCD is the multidimensional headcount ratio H.

Figure 1: Decomposition of Multidimensional Headcount Ratio into Destitute and Moderately Poor



The destitution deprivation cutoff z^D then identifies those that are destitute among the multidimensionally poor. Thus the destitute are defined by the area bounded above by the horizontal line at z^D and the area bounded from the right by the vertical line at k. Share of this area to the overall area is the proportion of destitute H^D. We term the rest of the multidimensionally poor as *moderate poor*. Thus, the moderate poor are those that are multidimensionally poor but are not destitute. We refer the proportion of moderate poor by H^M. We will show in a subsequent section that this type of breakdown is very helpful for inter-temporal analysis. The change in the overall poverty can be broken down into two components: the change in the proportion of moderate poor and the change in the proportion of destitute. Technically, $\Delta H = \Delta H^M + \Delta H^D$ where Δ presents the absolute change. The change may be annualized in order to make the change across different length of period comparable such that $\overline{\Delta} H = \overline{\Delta} H^M + \overline{\Delta} H^D$, where $\overline{\Delta}$ presents the absolute annualized change.

Important information may be obtained just by focusing on those who are destitute. It may be of interest to understand the indicators in which the destitute are deprived $\bar{h}_j^D(k)$. In other words, $\bar{h}_j^D(k)$ is the proportion of destitute who are deprived in indicator j and is computed as $\bar{h}_j^D(k) = h_j^D(k)/H^D$.

3. Application: The Global Multidimensional Poverty Index using Destitution cutoffs

The MPI is a measure of acute global poverty developed by the Oxford Poverty and Human Development Initiative (OPHI) with the United Nations Development Programme's *Human Development Report* (see for details, Alkire and Santos 2010, 2014; Alkire et al. 2011, 2013, 2014; UNDP 2010). The index belongs to the family of measures developed by Alkire and Foster (2007, 2011) and is a particular application of the adjusted headcount ratio, M_0.

As Table 1 shows, the MPI uses information from 10 indicators which are conceptually framed within three dimensions:[2] health, education and living standards, following the same dimensions and weights as the Human Development Index (HDI) and Human Poverty Index (HPI). Each person is identified as deprived or non-deprived in each indicator based on a deprivation cutoff (more details in Alkire and Santos 2010). Health and Education indicators reflect achievements of all household members. Then, each person's deprivation score is constructed based on a weighted average of the deprivations they experience using a nested weight structure: equal weight across dimension and equal weight for each indicator within dimensions. Finally, a poverty cutoff of 33.33% identifies as multidimensionally poor those people whose deprivation score meets or exceeds this threshold.

Table 1: The dimensions, indicators, deprivation cutoffs and weights of the MPI

Dimensions of poverty	Indicator	Deprived if…	Weight
Education	Years of Schooling	No household member has completed five years of schooling.	1/6
	Child School Attendance	Any school-aged child is not attending school up to class 8.	1/6
Health	Child Mortality	Any child has died in the family.	1/6
	Nutrition	Any adult or child for whom there is nutritional information is malnourished.	1/6
Living Standard	Electricity	The household has no electricity.	1/18
	Improved Sanitation	The household's sanitation facility is not improved (according to MDG guidelines), or it is improved but shared with other households.	1/18
	Improved Drinking Water	The household does not have access to improved drinking water (according to MDG guidelines) or safe drinking water is more than a 30-minute walk from home, roundtrip.	1/18
	Flooring	The household has a dirt, sand or dung floor.	1/18
	Cooking Fuel	The household cooks with dung, wood or charcoal.	1/18
	Assets ownership	The household does not own more than one radio, TV, telephone, bike, motorbike or refrigerator and does not own a car or truck.	1/18

[2] For a more detailed description of the indicator definitions, see Alkire and Santos (2010) and Alkire et al. (2011).

Criteria of selection of countries for Destitution measure

Data on destitution is available for 49 of the 108 countries analysed in the MPI 2014. These are countries that were updated in 2013 or 2014, plus India. In South Asia these countries in Afghanistan, Bangladesh, India, Nepal and Pakistan. In Sub-Saharan Africa, we include Burkina Faso, Burundi, Cameroon, Central African Republic, Congo, Cote d'Ivoire, DR Congo, Ethiopia, Gabon, Ghana, Guinea-Bissau, Malawi, Mozambique, Niger, Nigeria, Rwanda, Senegal, Sierra Leone, South Africa, Swaziland, Tanzania, Togo, Uganda and Zimbabwe. Two Arab countries are covered (Iraq and Tunisia), plus four countries in East Asia and the Pacific (Cambodia, Indonesia, Lao and Vietnam), six from Europe and Central Asia (Armenia, Bosnia and Herzegovina, Kazakhstan, Macedonia, Serbia and Tajikistan) and eight from Latin America and the Caribbean (Belize, Guyana, Haiti, Honduras, Mexico, Nicaragua, Peru and Suriname).

In 2014, to illustrate the ability of the MPI to consider the 'depth' of deprivations rigorously although data may be ordinal, we estimate a new poverty measure which we call **destitution**. This destitution measure has precisely the same dimensions, indicators, weights, and poverty cutoff as the MPI. Only one set of parameters changes: the deprivation cutoffs. The cutoffs for 8 of the 10 indicators now reflect more extreme deprivations. As a result, the destitution measure identifies a strict subset of the MPI poor who are also deprived in at least one-third of the indicators according to the destitution cutoffs.

Those identified as 'Destitute' are deprived in at least one third or more of the same weighted indicators with more extreme deprivation cutoffs (as described in Table 2); for example, two or more children in the household have died, no one in the household has more than one year of schooling, a household member is severely malnourished, or the household practises open defecation.

One key value of this measure is to illustrate the methodology described here of using multiple deprivation cutoffs to create linked subsets of the poor. A second is to investigate the situation of the poorest of the poor. However before continuing some limitations of this study must be noted. First, in two of the eight indicators, the deprivation does not change, yet the weighting structure from the MPI is retained. So the effective contribution of electricity and flooring to destitution may increase. Second, the destitution deprivation cutoffs can be ordinally ranked as 'worse' than the MPI deprivation cutoffs, but 'how much worse' one cutoff is than another cannot be ascertained. Normally, the weights could be adjusted to create cardinal comparability across deprivations, but because the MPI weights are used (in order to create strict subsets of the poor), this may create a

situation in which some deprivations may seem normatively more burdensome than others, but the weights do not reflect this. Third, the structure of linking indicators obviates the possibility of introducing a new indicator that might directly reflect a pertinent deprivation. For these reasons we present this measure for discussion, but would commend discussion and consideration before proceeding in this direction. Finally it might be noted that while in this paper we have chosen to use more extreme deprivation cutoffs, it could also be feasible to extend this methodology to situations in which less extreme deprivation cutoffs are used to identify the middle class or the vulnerable population.

Table 2: The dimensions, indicators, deprivation cutoffs and weights of the Destitute

Dimensions of poverty (same as for global MPI)	Indicator (same as for global MPI)	Deprived if…
Education	Years of Schooling	No household member has completed **at least one** year of schooling.
	Child School Attendance	**No children** are attending school up to the age at which they should finish **class 6.**
Health	Child Mortality	**2 or more children have died** in the household.
	Nutrition	**Severe undernourishment** of any adult (**BMI<17kg/m²**) or any child (**-3 standard deviations** from the median).
Living Standard	Electricity	The household has no electricity (**no change**).
	Improved Sanitation	There is **no sanitation facility (open defecation).**
	Improved Drinking Water	The household does not have access to safe drinking water, or safe water is more than a **45-minute** walk (round trip).
	Flooring	The household has a dirt, sand, or dung floor (**no change**).
	Cooking Fuel	The household cooks with dung or wood (**coal/lignite/charcoal are now non-deprived**).
	Assets ownership	The household has **no assets (radio, mobile phone, refrigerator, etc.)** and no car.

Destitution and the Global Multidimensional Poverty Index (MPI); Results

As can be seen in Table 3, the 49 countries in our study cover 2,8 billion people, 45% of which are MPI poor – that is, they are deprived in at least one third of the weighted global MPI indicators. In turn, half of the MPI poor (or 22.5% of the total population in these countries) are destitute. This represents roughly 638 million people who are in a situation of extreme deprivation.

Table 3: Global Distribution of MPI Poor and Destitute across 49 Countries

	Number of countries	2010 Population‡ (million)	Total MPI Poor (%)	Total MPI Poor (million)	Total Destitute (%)	Total Destitute (million)	% of MPI Poor Destitute
Total	**49**	**2,836.1**	**45.0**	**1,276.5**	**22.5**	**638.9**	**50.0%**
Geographic Region							
Arab States	2	41.6	9.0	3.7	1.1	0.5	12.3%
East Asia and the Pacific	4	350.5	14.2	49.8	3.7	13.1	26.4%
Europe and Central Asia	6	42.1	2.6	1.1	0.5	0.2	18.7%
Latin America and Caribbean	8	172.1	7.9	13.5	2.0	3.4	25.3%
South Asia	5	1,585.1	52.5	832.6	26.6	421.4	50.6%
Sub-Saharan Africa	24	644.6	58.3	375.8	31.1	200.3	53.3%
Income Group							
Low income	21	588.1	64.9	381.8	31.6	185.9	48.7%
Lower middle income	16	1,9739	44.5	878.6	22.8	450.7	51.3%
Upper middle income	12	274.1	5.9	16.1	0.8	2.3	14.4%

‡ All population aggregates use 2010 population data from UNDESA (2013).

As expected, when considering aggregations by geographical regions disparities arise: levels of destitution are very low in the Europe and Central Asia, as well as in the Arab region, Latin America and the Caribbean and East Asia and the Pacific excluding China (less than 4% of the population in all of these regions). However, over a quarter of the population in South Asia are destitute and this proportion rises to over 31% in Sub-Saharan Africa. The latter two regions are also those with highest incidence of multidimensional poverty. In addition, while these regions have more than half of the MPI poor being destitute, this fractions falls significantly for the other regions of the world.

Disparities are also found when figures are broken down by income groups. Most of the population analyzed in this paper, as well as most of the MPI poor and almost all destitute live in low income and lower-middle income countries contain. In fact, less than 1% of the population in upper-middle income countries is identified as destitute, while this proportion is nearly 23% and 32% for lower-middle income and low income countries, respectively.

Table 4: Multidimensional Poverty and Destitution in 49 Developing Countries

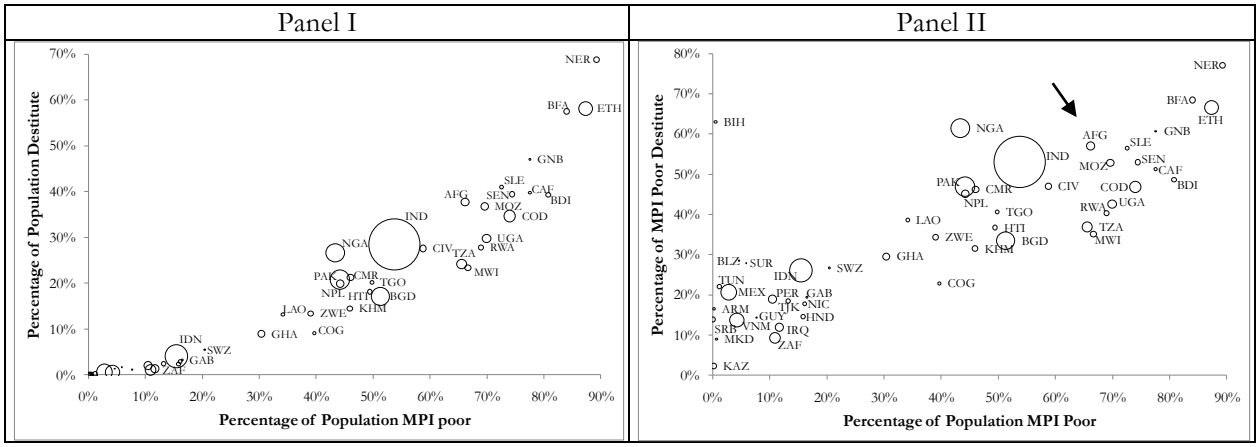
Country	Year	MPI	H	A	Destitute MPI^D	Destitute H^D	Destitute A^D	% of MPI Poor Destitute
Afghanistan	2010/11	0.353	66.2%	53.4%	0.182	37.7%	48.3%	57.0%
Armenia	2010	0.001	0.3%	35.2%	0.000	0.0%	38.9%	16.6%
Bangladesh	2011	0.253	51.3%	49.4%	0.068	17.2%	39.4%	33.5%
Belize	2011	0.018	4.6%	39.6%	0.005	1.3%	37.1%	28.5%
Bosnia and Herzegovina	2011/12	0.002	0.5%	37.3%	0.001	0.3%	36.8%	63.0%
Burkina Faso	2010	0.535	84.0%	63.7%	0.294	57.5%	51.1%	68.5%
Burundi	2010	0.454	80.8%	56.2%	0.166	39.2%	42.4%	48.6%
Cambodia	2010	0.212	45.9%	46.1%	0.057	14.5%	39.7%	31.5%
Cameroon	2011	0.248	46.0%	53.8%	0.095	21.3%	44.5%	46.2%

Central African Republic	2010	0.430	77.6%	55.5%	0.176	39.8%	44.3%	51.3%
Congo, Republic of	2011/12	0.181	39.7%	45.7%	0.037	9.1%	40.4%	22.9%
Cote d'Ivoire	2011/12	0.310	58.7%	52.8%	0.123	27.6%	44.5%	47.0%
DR Congo	2010	0.392	74.0%	53.0%	0.151	34.7%	43.6%	46.9%
Ethiopia	2011	0.564	87.3%	64.6%	0.284	58.1%	48.9%	66.5%
Gabon	2012	0.070	16.5%	42.5%	0.012	3.2%	38.1%	19.5%
Ghana	2011	0.139	30.4%	45.8%	0.037	9.0%	41.0%	29.5%
Guinea-Bissau	2006	0.462	77.5%	59.6%	0.221	47.0%	47.0%	60.7%
Guyana	2009	0.030	7.7%	39.2%	0.004	1.1%	36.5%	14.4%
Haiti	2012	0.248	49.4%	50.3%	0.078	18.1%	42.8%	36.7%
Honduras	2011/12	0.072	15.8%	45.7%	0.010	2.3%	41.7%	14.6%
India	2005/06	0.283	53.7%	52.7%	0.128	28.5%	44.9%	53.0%
Indonesia	2012	0.066	15.5%	42.9%	0.016	4.0%	40.6%	26.1%
Iraq	2011	0.045	11.6%	38.5%	0.005	1.4%	37.8%	11.9%
Kazakhstan	2010/11	0.001	0.2%	36.2%	0.000	0.0%	33.3%	2.3%
Lao PDR	2011/12	0.174	34.1%	50.9%	0.056	13.2%	42.7%	38.6%
Macedonia, TFYR of	2011	0.002	0.7%	35.7%	0.000	0.1%	34.0%	9.0%
Malawi	2010	0.334	66.7%	50.1%	0.094	23.4%	40.1%	35.1%
Mexico	2012	0.011	2.8%	38.8%	0.002	0.6%	37.3%	20.6%
Mozambique	2011	0.389	69.6%	55.9%	0.166	36.8%	45.3%	52.8%
Nepal	2011	0.217	44.2%	49.0%	0.083	19.9%	41.7%	45.1%
Nicaragua	2011/12	0.072	16.1%	45.0%	0.011	2.9%	39.1%	17.8%
Niger	2012	0.605	89.3%	67.7%	0.369	68.8%	53.6%	77.1%
Nigeria	2011	0.240	43.3%	55.3%	0.135	26.6%	50.5%	61.5%
Pakistan	2012/13	0.230	44.2%	52.1%	0.095	20.7%	45.8%	46.9%
Peru	2012	0.043	10.5%	41.0%	0.008	2.0%	37.8%	19.0%
Rwanda	2010	0.350	69.0%	50.8%	0.112	27.8%	40.2%	40.3%
Senegal	2010/11	0.439	74.4%	58.9%	0.196	39.4%	49.7%	53.0%
Serbia	2010	0.000	0.1%	40.2%	0.000	0.0%	33.3%	13.9%
Sierra Leone	2010	0.388	72.5%	53.5%	0.185	40.9%	45.3%	56.4%
South Africa	2012	0.043	10.9%	39.4%	0.004	1.0%	36.7%	9.3%
Suriname	2010	0.024	5.9%	40.8%	0.006	1.6%	38.7%	27.8%
Swaziland	2010	0.086	20.4%	41.9%	0.021	5.5%	38.0%	26.7%
Tajikistan	2012	0.054	13.2%	40.8%	0.010	2.4%	39.1%	18.4%
Tanzania	2010	0.332	65.6%	50.7%	0.103	24.2%	42.6%	36.9%
Togo	2010	0.250	49.8%	50.3%	0.084	20.2%	41.7%	40.6%
Tunisia	2011/12	0.004	1.2%	38.5%	0.001	0.3%	35.8%	22.1%
Uganda	2011	0.367	69.9%	52.5%	0.122	29.8%	41.0%	42.6%
Viet Nam	2011	0.017	4.2%	39.5%	0.002	0.6%	36.5%	13.7%
Zimbabwe	2010/11	0.172	39.1%	44.0%	0.052	13.4%	38.8%	34.3%

Table 4 presents findings for the 49 countries covered in this paper. As can be seen in the table, the incidence of multidimensional poverty ranges from 0.1% in Serbia (MPI = 0.000) to 89.3% in Niger (MPI = 0.605). The proportion of people who are MPI poor is higher than 50% in 18 out of the 49 countries. In turn, the proportion of destitute in these countries ranges from 0% in Serbia, Kazakhstan and Armenia, to 68.8% in Niger. Over 77% of the MPI poor in Niger are destitute. The share of MPI poor who are also destitute is above 50% in 12 of the analyzed countries, which

contain 1.6 billion people, over 870 million MPI poor and nearly 480 million destitute.[3] India is the country with the largest number of destitute – over 340 million people or 28.5% of the population.

Figure 2: The Relationship between the Percentage of Population MPI Poor and the Percentage of Population Destitute across Countries



Panel I of Figure 2 depicts the relation between the percentage of MPI poor and the proportion of destitute in each of the 49 countries considered in this paper. As can be seen from the graph, there is positive relation between these proportions, indicating that on average countries with higher levels of multidimensional poverty are also experiencing higher levels of destitution. Given that destitution is a subset of multidimensional poverty, the level of destitution can never exceed that of poverty, obviously. Panel II depicts the proportion of MPI poor against the share of destitute to MPI poor (that is, the percentage of MPI poor who are also destitute). As can be noted in the figure, there is considerable diversity in the percentage of MPI poor people who are destitute, indicating that some countries are better able to control destitution for a given poverty level. For example, Afghanistan shows a much higher headcount of destitution (nearly 38%) than Tanzania and Malawi (approximately, 24%), even though the three countries have similar proportions of MPI poor (around 66%).

How similar is the headcount of destitution to the percentage of people living with less than $1.25 a day, and how much information does the new measure add? Figure 3 provides a scatterplot of these two indicators for the 44 countries in our sample with data on both indicators.[4] As can be seen from the picture, while there is some positive relation between these two measures, there is a tremendous

[3] Nine of these 12 countries are in Sub-Saharan Africa, plus India, Afghanistan and Bosnia and Herzegovina.
[4] The $1.25/day figures plotted are those that are the closest available figures to the year of the survey, and derive from data that was fielded within 3 years of the MPI survey. The $1.25/day figures were not available for 3 countries.

amount of variation, so levels of multidimensional poverty are not closely proxied by monetary poverty. Countries with relatively similar headcounts of income poverty such as Niger and Swaziland (44% and 41%, respectively), have extremely different percentages of people living in destitution (68.8% and 5.5%, respectively). Ethiopia and Ghana provide another one of many examples of this situation: nearly 30% of the population in these countries is identified as monetary poor, but proportion of destitute is again strikingly different – 58% in Ethiopia and only 9% in Ghana. Figure 4 also clearly shows the mismatches between a monetary measure of poverty and that of multidimensional destitution in identifying the poorest of the poor. This mismatch indicates that neither indicator is a sufficient proxy for the other – and very certainly, as cases like Niger and Ethiopia show – the destitute are not necessarily $1.25/day poor, yet experience very serious deprivations.

Figure 3: The Incidence of $1.25/Day Poverty and Destitution across Countries

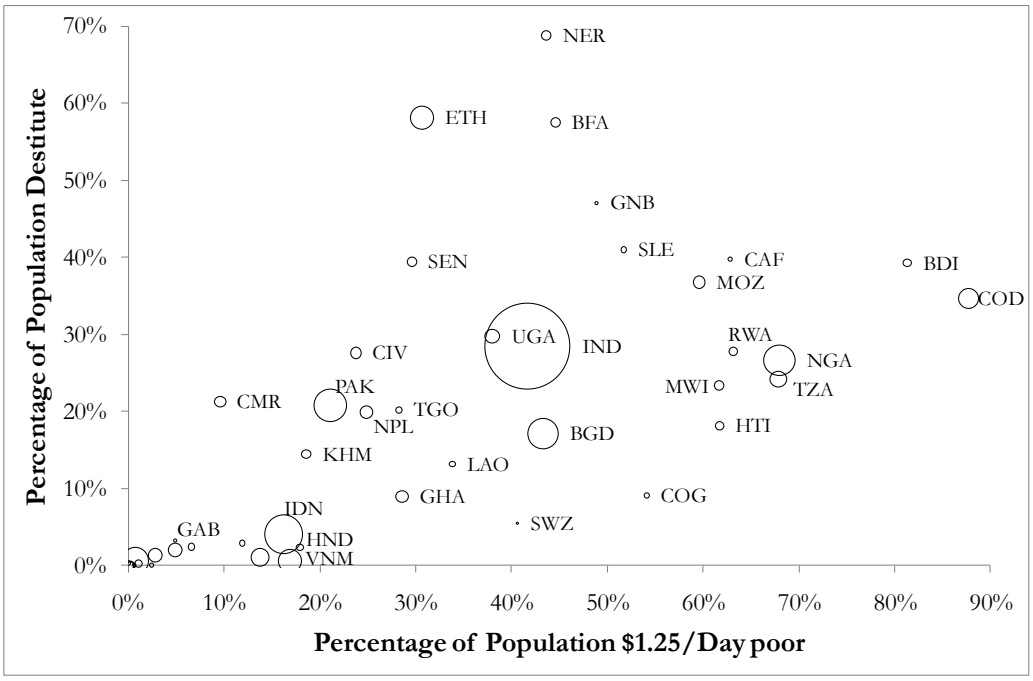
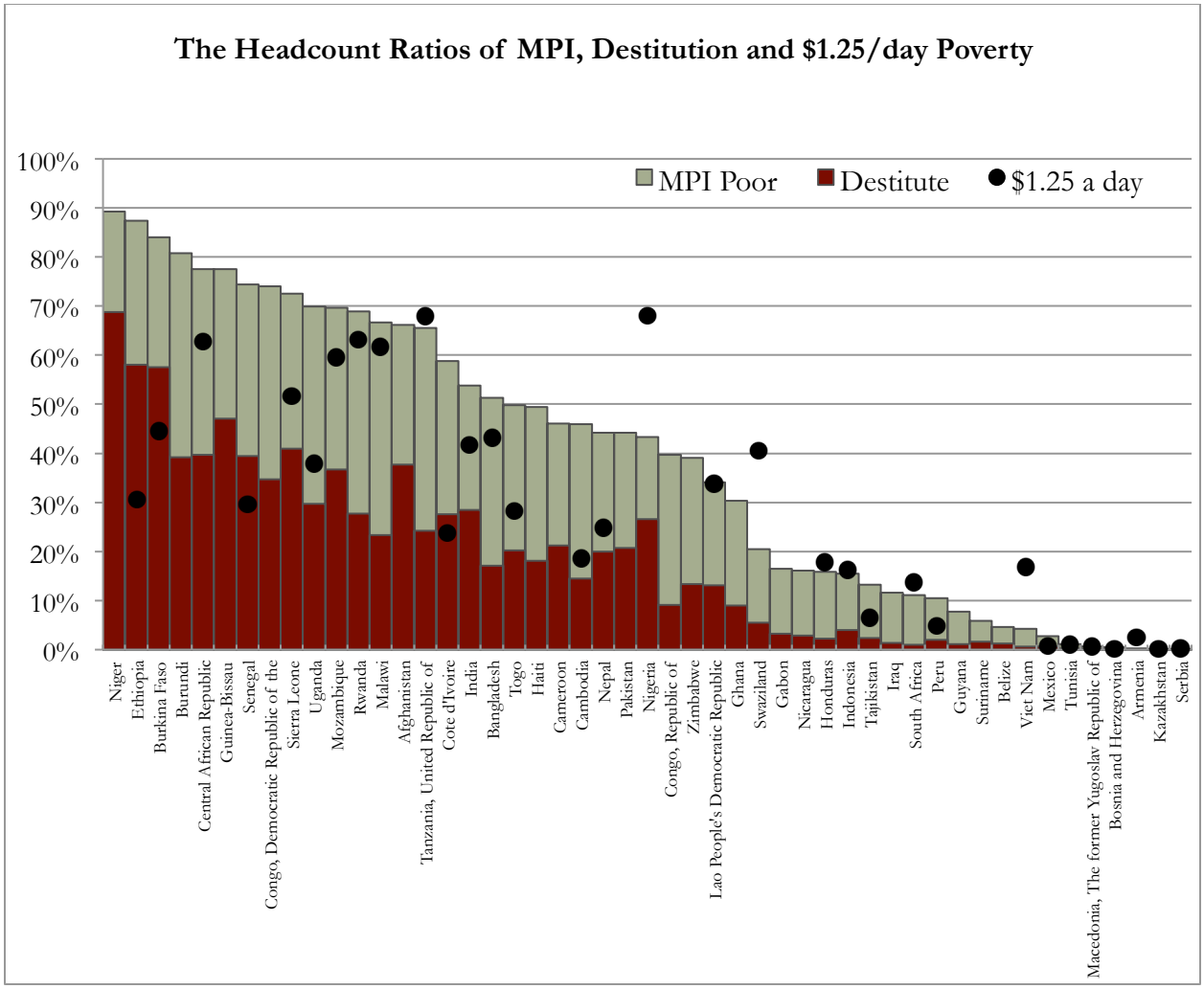


Figure 4 below provides the comparisons between MPI, Destitution, and $1.25/day income poverty. Again, we can see that in some countries like Ethiopia, Burkina Faso, and Senegal, the percentage of people who are destitute is higher than the percentage of people in income poverty, whereas in the others it is lower.[5]

[5] Standard errors for the incidence of destitution can be provided upon request.

Figure 4: Comparing the Headcount Ratios of MPI Poor, Destitute and $1.25/day Poor



4. Decompositions

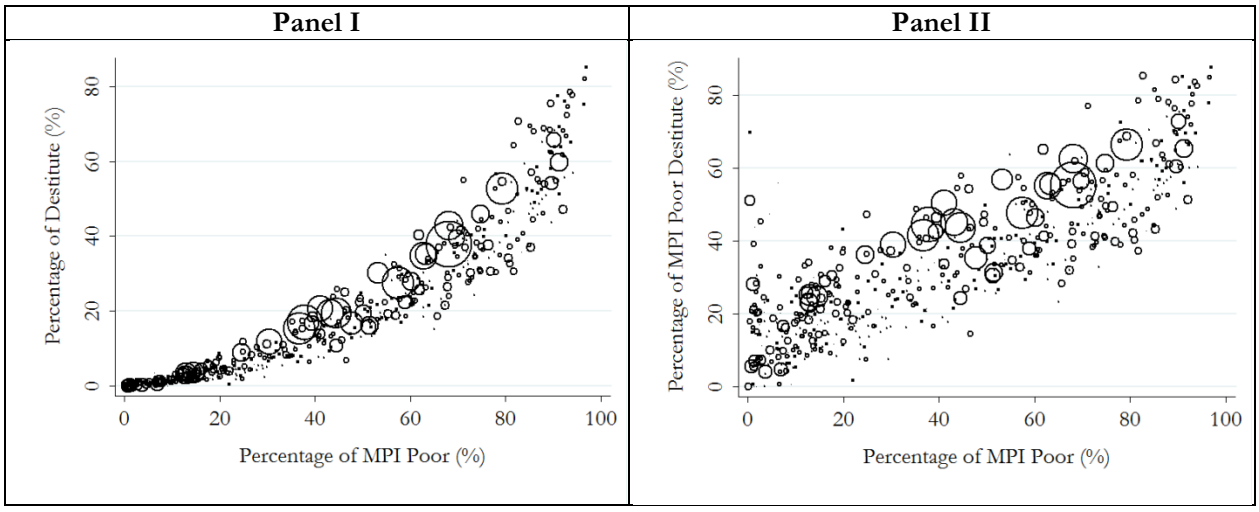
Decompositions by 523 subnational regions were computed for 41 of the countries covered in this paper.[6] The proportion of MPI poor in these 41 countries ranges from 2.3% in Mexico to 89.3% in Niger, while the percentage of destitute falls between 0.4% in Vietnam and 68.8% in Niger. Similarly, the incidence of multidimensional poverty in the 523 subnational regions ranges from 0% in Callao (Peru) to 96.5%, 96.7% and 97% in Karamoja (Uganda), and Est and Sahel (Burkina Faso), respectively. In 123 of the subnational regions more than 70% of people are multidimensionally

[6] We follow the guidelines from Alkire, Roche and Seth 2011 regarding when to compute subnational decompositions. In the cases of Armenia, Bosnia and Herzegovina, Kazakhstan, Macedonia, Serbia and Tunisia the MPI is lower than the threshold suggested by the authors as reliable; South Africa's survey is only representative at national level given its sample design; Guinea-Bissau is not included in this analysis since it does not pass the bias analysis.

poor. In turn, the incidence of destitution in these 523 regions ranges from 0% in Stann Creek and Belize City (Belize), Nuevo Leon and Tlaxcala (Mexico), Callao (Peru), Coronie (Suriname), Yaounde (Cameroon) and Red River Delta in (Vietnam), to 82.1% and 85.1% in Est and Sahel (Burkina Faso), respectively.

Like Figure 2 above, Figure 5 shows the relationship between the incidence of multidimensional poverty and destitution, but now at the subnational level. Naturally, a positive relationship is found between these indicators, though there are still clear heterogeneities in the incidence of destitution between regions – even those experiencing similar incidences of multidimensional poverty. This becomes clearer in Panel II. Panel II presents the percentage of MPI poor who are destitute on the vertical axis – thus spreading out the information in the low-poverty edge of the graphic to show the tremendous variation in experiences.

Figure 5: The Incidence of MPI (H) and Destitution (H_D) across Sub-national Regions

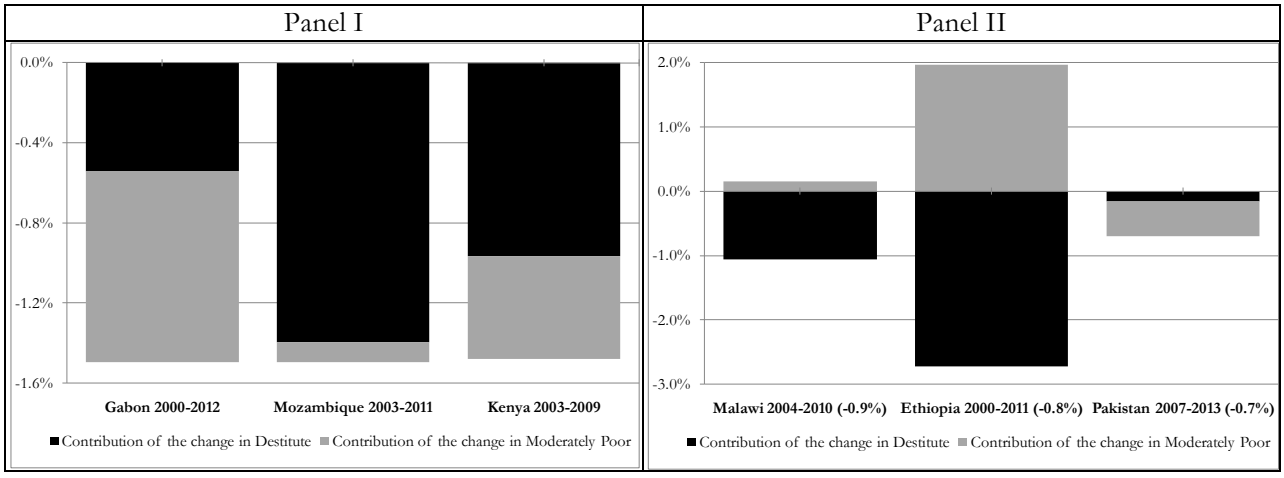


5. Destitution over time

Changes in multidimensional poverty and destitution have been computed and analysed for 34 countries (Alkire, Roche and Vaz 2014). Alkire Roche and Vaz find that most countries have reduced multidimensional poverty and destitution over time, and that in many cases destitution went down faster than multidimensional poverty. But countries' relative successes in reducing destitution and poverty varied a lot.

Figure 6 provides information to understand the rates of change in the incidence of deprivation and MPI in some of these countries.[7] Panel I depicts Gabon, Mozambique and Kenya, three countries with the same absolute annual reduction in overall multidimensional poverty (-1.5%), but with different stories explaining this improvement. As can be seen in this panel, both a reduction in the proportion of destitute and a drop in the percentage of moderately poor helped these countries to reduce multidimensional poverty. However, in the case of Mozambique the contribution of the change in destitution explains almost all of the trend – showing that in Mozambique the poorest benefitted most – while in Gabon it is the drop in the share of moderately poor that contributed the most to the reduction in the proportion of MPI poor. This would be quite worrying if the initial levels of destitution were similar, but Gabon had much lower initial levels of poverty and destitution so in relative terms it still made progress. Kenya's reduction of destitution was also strong, although not as strong as in Mozambique. Similarly, Panel II presents these figures for Malawi, Ethiopia and Pakistan. In these countries the reduction of overall poverty was more modest (i.e. absolute annual reduction of approximately between 0.7% and 0.9%). However, once again the drivers of this improvement vary across countries. Ethiopia significantly reduced the incidence of destitution while the proportion of moderately poor actually increased in the period under analysis. What this means is that, in effect, many of Ethiopia's destitute people graduated into the less extreme form of MPI poverty, which is positive In turn, in the case of Malawi most of the reduction in the proportion of MPI poor can be found in a drop of the incidence of destitution, while in Pakistan the change in proportion of moderately poor is main contributor to the observed trend.

Figure 6: Decomposing the Change in Multidimensional Headcount Ratio into Change in Moderate Poverty and Change in Destitute



[7] Results for the full set of countries are available upon request, or in Alkire, Roche and Vaz (2014).

6. Composition of destitution

Table 5 shows the destitution censored headcounts – the percentage of people who 1) have been identified as destitute, and 2) are deprived in each of the destitution indicators. As can be seen in the table, each indicator contributes to destitution in some way. Naturally, electricity and flooring did not change the deprivation cutoffs. Otherwise the highest headcount ratios are often found in child mortality (the loss of two or more children), sanitation (open defecation), and cooking fuel (wood or dung). Recalling that the weights on health and education indicators are higher than those on living standard indicators, we can see that in many cases nutrition and education indicators do contribute powerfully to destitution. Table 5 presents the censored headcount ratios of destitution deprivations among the destitute.

Table 5: Percentage of People Who are Destitute and Deprived by Destitution Cutoffs

Country	Year	MPI^D	Destitution Censored Headcount Ratios: Percentage of people who are destitute and deprived in…									
			YS	SA	CM	N	E	IS	DW	F	CF	AO
Afghanistan	2010/11	0.182	21.4	22.8	15.5	-	27.9	10.5	20.7	1.6	35.1	6.8
Armenia	2010	0.000	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Bangladesh	2011	0.068	3.7	2.8	4.0	11.1	14.4	1.9	0.7	16.8	16.9	6.2
Belize	2011	0.005	1.0	0.9	0.2	0.1	0.6	0.2	0.1	0.5	0.6	0.3
Bosnia and Herzegovina	2011/12	0.001	0.1	0.1	-	0.2	0.0	0.0	0.0	0.0	0.2	0.0
Burkina Faso	2010	0.294	30.4	26.9	28.3	14.5	57.0	48.1	20.9	42.6	56.9	3.2
Burundi	2010	0.166	9.3	7.2	20.6	11.5	39.1	2.3	18.7	38.5	38.8	16.4
Cambodia	2010	0.057	1.9	2.7	5.0	6.8	13.7	13.0	9.1	1.4	14.1	2.7
Cameroon	2011	0.095	5.6	6.1	11.0	6.1	19.7	4.7	13.9	18.4	20.9	6.2
Central African Republic	2010	0.176	7.0	14.2	17.6	6.6	39.6	17.4	25.1	38.0	39.6	21.2
Congo, Republic of	2011/12	0.037	1.2	1.1	3.2	2.9	9.0	3.5	7.2	8.4	8.4	4.2
Cote d'Ivoire	2011/12	0.123	11.8	11.3	15.5	4.4	21.4	18.3	11.6	11.8	25.6	3.3
DR Congo	2010	0.151	3.3	9.7	17.6	7.3	34.4	10.5	27.3	33.8	31.5	21.3
Ethiopia	2011	0.284	16.0	16.1	19.2	24.4	55.7	30.5	45.2	56.7	57.7	38.7
Gabon	2012	0.012	0.8	0.5	1.7	0.9	2.2	0.5	1.9	2.3	2.3	1.0
Ghana	2011	0.037	3.4	2.4	3.8	1.3	7.9	6.2	5.4	3.4	8.7	1.7
Guinea-Bissau	2006	0.221	15.1	17.4	27.8	7.4	45.9	22.2	27.2	43.7	45.7	10.4
Guyana	2009	0.004	0.1	0.2	0.5	0.6	0.7	0.2	0.4	0.3	0.6	0.6
Haiti	2012	0.078	4.4	2.3	8.9	3.8	17.5	10.8	14.4	14.2	16.5	8.2
Honduras	2011/12	0.010	0.6	0.9	0.8	0.5	-	1.5	1.3	1.9	2.3	0.7
India	2005/06	0.128	7.4	6.5	7.5	17.3	18.2	25.3	7.1	24.1	27.7	11.5
Indonesia	2012	0.016	0.5	0.4	3.2	-	0.7	0.8	1.8	0.7	2.7	0.9
Iraq	2011	0.005	0.7	1.0	0.5	0.4	0.3	0.2	0.5	0.6	0.3	0.1
Kazakhstan	2010/11	0.000	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Lao PDR	2011/12	0.056	2.6	3.6	7.8	3.5	9.3	11.7	7.8	3.4	12.9	3.5
Macedonia, TFYR of	2011	0.000	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Malawi	2010	0.094	2.3	4.8	14.8	3.7	23.1	5.1	10.2	22.5	23.1	8.0
Mexico	2012	0.002	0.2	0.2	0.1	0.3	0.1	0.2	0.3	0.2	0.5	0.3
Mozambique	2011	0.166	9.0	13.3	14.3	5.4	36.1	23.0	28.7	34.8	36.3	14.8
Nepal	2011	0.083	6.9	2.3	5.4	9.1	11.7	17.1	4.5	19.5	19.7	6.1
Nicaragua	2011/12	0.011	0.8	2.0	0.6	0.2	2.5	1.5	2.6	2.6	0.0	0.4
Niger	2012	0.369	33.4	26.4	34.0	21.1	65.5	57.2	41.1	64.5	68.6	22.3
Nigeria	2011	0.135	14.0	11.5	13.7	7.2	22.4	12.0	18.7	19.3	26.2	4.7
Pakistan	2012/13	0.095	8.0	10.6	8.2	9.1	5.2	13.1	4.0	18.3	19.1	3.4
Peru	2012	0.008	0.6	0.4	0.7	0.2	1.3	1.0	1.2	1.8	2.0	0.6

Rwanda	2010	0.112	3.0	2.7	17.1	9.1	27.5	0.9	13.9	26.2	27.6	9.0
Senegal	2010/11	0.196	16.8	20.3	21.5	21.6	28.9	11.9	15.0	22.3	32.3	1.8
Serbia	2010	0.000	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sierra Leone	2010	0.185	13.4	10.6	20.3	5.8	40.7	20.0	26.6	34.2	40.4	21.6
South Africa	2012	0.004	0.2	0.0	0.5	0.5	0.7	0.3	0.6	0.6	0.9	0.1
Suriname	2010	0.006	0.9	0.2	-	0.6	0.6	1.0	0.8	0.7	1.0	0.4
Swaziland	2010	0.021	1.2	0.5	3.2	0.5	5.4	2.7	4.5	1.8	5.4	1.3
Tajikistan	2012	0.010	0.1	0.8	1.2	1.6	0.3	0.0	1.8	1.9	1.6	0.3
Tanzania	2010	0.103	3.7	6.2	10.7	6.1	24.2	8.0	19.2	22.8	23.4	8.0
Togo	2010	0.084	4.9	3.1	11.0	3.0	19.8	18.5	15.0	7.7	18.8	6.0
Tunisia	2011/12	0.001	0.2	0.1	0.0	0.1	0.1	0.1	0.1	0.0	0.0	0.1
Uganda	2011	0.122	2.0	3.0	19.3	9.6	29.5	5.7	18.8	28.2	28.8	7.1
Viet Nam	2011	0.002	0.1	0.1	0.2	0.2	0.1	0.4	0.3	0.3	0.6	0.1
Zimbabwe	2010/11	0.052	0.5	1.6	3.8	4.4	13.1	9.3	9.4	9.8	13.3	8.1

YS: Years of Schooling, **SA**: School Attendance, **CM**: Child Mortality, **N**: Nutrition, **E**: Electricity, **IS**: Improved Sanitation, **DW**: Drinking Water, **F**: Flooring, **CF**: Cooking Fuel, **AO**: Assets Ownership.

In a new measure such as destitution it can also be informative to present the above information somewhat differently – as illustrating the percentage of destitute people who are deprived in each particular indicator in a country. Table 6 presents this information – which is simply the censored headcount ratios of Table 5 divided by the incidence of destitution (H_D) in that country. Thus we see in Afghanistan, that 56.6% of destitute people are deprived in years of schooling, 60.4% of destitute people live in households where all primary school aged children are out of school, 41.1% of destitute people live in households that have lost two children; 74% of destitutes lack electricity, 27.7% of destitutes use open defecation and so on. Looking across countries we can also see some patterns. For example, in all South Asian countries with nutritional information except Pakistan, the nutritional deprivations are much higher than the other health and educational deprivations. In fact, in India and Bangladesh over 60% of destitute people have someone at home with severe malnutrition and in Nepal and Pakistan it's 45 and 44%. But in the country with the highest destitution (Niger) only 30% of destitute people have someone with severe malnutrition at home, and this; that is 25% in Burkina Faso and 42% in Ethiopia – also high destitution countries – indicating that severe malnutrition is less of a contributory factor in these contexts.

Table 6: Deprivations among Destitute by Destitution Deprivation Cutoffs

Country	Year	MPI^D	Indicators									
			YS	**SA**	**CM**	**N**	**E**	**IS**	**DW**	**F**	**CF**	**AO**
Afghanistan	2010/11	0.182	56.6	60.4	41.1	-	74.0	27.7	54.8	4.1	93.0	18.1
Armenia	2010	0.000	0.0	0.0	100.0	100.0	0.0	0.0	100.0	0.0	0.0	0.0
Bangladesh	2011	0.068	9.9	16.0	23.5	64.8	84.1	10.8	4.4	97.7	98.7	36.1
Belize	2011	0.005	2.6	67.5	16.9	4.6	44.6	15.6	5.7	37.8	48.0	24.5
Bosnia and Herzegovina	2011/12	0.001	0.2	27.4	-	73.0	4.6	0.0	0.0	3.2	61.2	1.5
Burkina Faso	2010	0.294	80.5	46.9	49.3	25.2	99.1	83.6	36.4	74.2	99.0	5.6
Burundi	2010	0.166	24.5	18.4	52.4	29.3	99.8	5.8	47.6	98.1	98.9	41.9
Cambodia	2010	0.057	5.1	18.7	34.7	47.2	94.7	89.9	62.8	9.9	97.2	18.6
Cameroon	2011	0.095	14.7	28.6	51.9	28.6	92.7	22.1	65.6	86.5	98.5	29.4

Central African Republic	2010	0.176	18.6	35.8	44.2	16.7	99.6	43.8	63.1	95.5	99.5	53.3
Congo, Republic of	2011/12	0.037	3.3	12.0	35.5	32.3	98.7	38.7	79.0	92.5	92.1	46.4
Cote d'Ivoire	2011/12	0.123	31.4	41.0	56.1	16.1	77.4	66.2	42.1	42.9	92.9	12.0
DR Congo	2010	0.151	8.6	27.9	50.9	20.9	99.2	30.2	78.7	97.6	90.8	61.3
Ethiopia	2011	0.284	42.5	27.7	33.0	42.1	95.8	52.6	77.9	97.6	99.3	66.6
Gabon	2012	0.012	2.1	14.7	53.7	29.1	67.4	15.2	60.3	72.5	72.8	29.9
Ghana	2011	0.037	9.0	27.1	42.0	14.9	88.4	69.6	60.4	38.3	97.1	19.3
Guinea-Bissau	2006	0.221	40.0	37.1	59.2	15.7	97.6	47.2	57.9	92.9	97.2	22.2
Guyana	2009	0.004	0.4	18.9	47.8	54.2	61.3	21.0	33.3	29.4	58.1	51.2
Haiti	2012	0.078	11.6	12.7	49.1	21.0	96.4	59.6	79.2	78.4	90.8	45.0
Honduras	2011/12	0.010	1.5	38.8	33.7	20.7	-	67.0	56.0	81.6	97.3	30.6
India	2005/06	0.128	19.6	22.8	26.2	60.8	64.0	88.8	25.1	84.6	97.3	40.5
Indonesia	2012	0.016	1.4	9.5	78.9	-	18.0	18.8	45.5	17.8	67.1	21.7
Iraq	2011	0.005	1.7	69.7	34.7	25.9	21.2	16.2	38.5	44.1	22.5	4.6
Kazakhstan	2010/11	0.000	0.0	0.0	56.1	0.0	100.0	0.0	0.0	56.1	100.0	43.9
Lao PDR	2011/12	0.056	6.9	27.1	59.3	27.0	70.7	88.6	59.3	25.8	98.0	27.0
Macedonia, TFYR of	2011	0.000	0.0	26.5	-	68.0	20.7	0.0	0.0	15.2	32.0	5.5
Malawi	2010	0.094	6.1	20.7	63.1	15.9	99.0	21.8	43.5	96.0	98.8	34.0
Mexico	2012	0.002	0.5	34.1	10.4	48.1	23.6	42.8	60.4	40.9	81.7	44.4
Mozambique	2011	0.166	24.0	36.2	38.8	14.7	98.1	62.7	78.0	94.7	98.7	40.3
Nepal	2011	0.083	18.2	11.4	27.2	45.4	58.7	85.7	22.6	97.7	98.9	30.7
Nicaragua	2011/12	0.011	2.0	70.1	19.3	5.4	87.0	53.7	91.3	91.5	0.0	14.9
Niger	2012	0.369	88.6	38.4	49.4	30.6	95.3	83.2	59.8	93.8	99.8	32.5
Nigeria	2011	0.135	37.0	43.0	51.2	26.9	84.1	45.2	70.2	72.5	98.4	17.6
Pakistan	2012/13	0.095	21.2	51.1	39.7	44.1	25.0	63.5	19.4	88.3	92.0	16.3
Peru	2012	0.008	1.7	18.2	36.8	9.6	62.9	51.6	60.4	90.3	98.2	29.1
Rwanda	2010	0.112	7.9	9.9	61.5	33.0	99.1	3.1	50.0	94.3	99.2	32.3
Senegal	2010/11	0.196	44.6	51.4	54.6	54.9	73.2	30.2	38.1	56.5	81.9	4.5
Serbia	2010	0.000	0.0	0.0	0.0	0.0	0.0	0.0	0.0	100.0	100.0	100.0
Sierra Leone	2010	0.185	35.4	25.9	49.6	14.3	99.4	48.8	65.0	83.6	98.6	52.9
South Africa	2012	0.004	0.4	3.2	45.1	52.5	68.1	25.8	60.7	59.7	83.7	10.7
Suriname	2010	0.006	2.5	11.8	-	36.0	38.2	59.5	48.6	44.5	59.9	23.8
Swaziland	2010	0.021	3.2	8.7	59.5	9.3	98.3	50.3	81.9	33.0	98.2	23.7
Tajikistan	2012	0.010	0.3	31.8	50.5	66.8	13.3	1.5	74.1	76.6	65.5	12.6
Tanzania	2010	0.103	9.8	25.6	44.4	25.1	99.8	33.1	79.3	94.2	96.5	32.9
Togo	2010	0.084	12.9	15.3	54.5	14.9	98.0	91.6	74.3	37.9	92.7	29.8
Tunisia	2011/12	0.001	0.5	37.3	16.7	27.2	25.6	49.6	46.5	11.3	16.9	46.5
Uganda	2011	0.122	5.4	10.1	64.8	32.3	99.1	19.0	63.3	94.8	96.7	23.8
Viet Nam	2011	0.002	0.3	22.9	31.1	39.2	18.1	69.4	54.3	50.3	96.4	20.9
Zimbabwe	2010/11	0.052	1.3	12.2	28.2	32.7	97.5	69.1	69.9	73.1	99.0	60.4

YS: Years of Schooling, **SA**: School Attendance, **CM**: Child Mortality, **N**: Nutrition, **E**: Electricity, **IS**: Improved Sanitation, **DW**: Drinking Water, **F**: Flooring, **CF**: Cooking Fuel, **AO**: Assets Ownership.

Another fascinating insight can be gained by studying the percentage of destitute people who do – and do not – experience destitution-level deprivations in different indicators. Table 5 effectively compares the deprivation profiles of the destitute with the MPI deprivation profiles of this same group of persons – it divides the censored headcount ratio of the destitution indicators by what the censored headcount ratio of MPI would have been if only destitute people had been considered to be poor. As all destitute people are MPI poor, naturally they were already identified as deprived in their destitution deprivations by the MPI. However it might be that destitute people also have other deprivations which are not so severe as to trigger a 'destitution' level deprivation.

Table 7 presents this information. We see that in the Column E on electricity and F on flooring, all entries are 100%, signifying that all destitutes who are deprived in electricity in MPI are also so deprived in destitution. This is because the deprivation cutoffs for both indicators are identical. However look at the case of Bangladesh. We find that 46.1% of destitute people who were deprived in years of schooling by the MPI were *also* deprived by the destitution cutoffs – in that they did not have a person who had completed more than one year of schooling at home. And half of the destitutes who were deprived in child school attendance in the MPI actually experienced a situation in which *all* primary school-aged children were out of school. And sadly 50% of the destitutes who had lost a child had actually lost two children. More disturbingly, 83.7% of destitutes who had some malnourished person at home actually had a person with severe malnutrition at home. But much more positively, of those destitutes who lacked adequate sanitation by MPI cutoffs, only 13.5% resorted to open defecation. Table 7 thus presents, at a glance, a sense of the relevance or otherwise of applying the second more extreme destitution cutoffs. It also illuminates regions and countries where most deprivations in a particular indicator are not of the 'destitution' level.

Table 7: The Percentage of Destitute who are Deprived by Destitution Deprivation Cutoff out of Those Who are Deprived by the MPI Deprivation Cutoff.

Country	Year	MPI^D	Indicators									
			YS	SA	CM	N	E	IS	DW	F	CF	AO
Afghanistan	2010/11	0.182	87.5	78.8	84.2	-	100.0	56.4	98.7	100.0	99.2	46.0
Armenia	2010	0.000	-	-	100.0	100.0	-	0.0	100.0	-	-	-
Bangladesh	2011	0.068	46.1	50.1	58.4	83.7	100.0	13.5	86.3	100.0	99.9	46.3
Belize	2011	0.005	100.0	93.3	56.1	64.5	100.0	93.4	68.9	100.0	100.0	39.2
Bosnia and Herzegovina	2011/12	0.001	100.0	100.0	-	100.0	100.0	0.0	-	100.0	100.0	100.0
Burkina Faso	2010	0.294	68.9	62.1	74.7	50.2	100.0	88.7	84.0	100.0	99.0	23.0
Burundi	2010	0.166	47.2	47.9	79.4	56.7	100.0	8.6	90.1	100.0	98.9	55.5
Cambodia	2010	0.057	33.0	60.6	73.5	76.0	100.0	94.7	99.7	100.0	98.1	47.9
Cameroon	2011	0.095	51.1	55.5	77.6	57.3	100.0	29.7	97.6	100.0	98.6	52.3
Central African Republic	2010	0.176	38.2	67.3	72.8	53.8	100.0	44.1	92.0	100.0	99.5	67.4
Congo, Republic of	2011/12	0.037	54.2	63.3	71.5	65.4	100.0	41.1	98.1	100.0	93.3	60.1
Cote d'Ivoire	2011/12	0.123	67.4	66.3	80.6	47.1	100.0	69.6	93.9	100.0	94.2	40.2
DR Congo	2010	0.151	35.5	59.8	80.1	58.5	100.0	30.8	97.6	100.0	90.8	73.9
Ethiopia	2011	0.284	45.0	52.5	65.0	61.6	100.0	55.6	97.1	100.0	99.3	72.2
Gabon	2012	0.012	70.6	75.7	89.2	79.6	100.0	15.5	96.8	100.0	90.5	49.6
Ghana	2011	0.037	67.7	68.2	74.5	56.6	100.0	73.3	89.2	100.0	97.1	48.6
Guinea-Bissau	2006	0.221	44.6	58.6	80.5	47.9	100.0	74.4	95.6	100.0	97.2	39.9
Guyana	2009	0.004	49.0	67.9	92.5	98.9	100.0	52.4	100.0	100.0	100.0	81.4
Haiti	2012	0.078	41.5	64.3	78.1	56.4	100.0	65.4	97.1	100.0	90.8	59.0
Honduras	2011/12	0.010	42.5	76.4	81.6	69.7	-	78.5	98.7	100.0	100.0	55.7
India	2005/06	0.128	62.3	55.3	59.0	79.6	100.0	93.9	96.6	100.0	99.0	53.3
Indonesia	2012	0.016	73.5	60.2	96.9	-	100.0	32.6	99.9	100.0	99.0	64.1
Iraq	2011	0.005	79.4	88.1	73.9	80.0	100.0	65.1	95.8	100.0	98.9	35.9
Kazakhstan	2010/11	0.000	100.0	-	100.0	-	100.0	-	-	100.0	100.0	100.0
Lao PDR	2011/12	0.056	36.4	50.8	84.0	62.1	100.0	97.4	99.5	100.0	98.0	54.9
Macedonia, TFYR of	2011	0.000	100.0	100.0	-	100.0	100.0	-	-	100.0	100.0	26.5
Malawi	2010	0.094	24.6	63.6	86.3	54.7	100.0	23.3	91.5	100.0	98.8	55.6

Mexico	2012	0.002	72.3	86.2	92.4	98.5	100.0	58.7	100.0	100.0	100.0	75.6
Mozambique	2011	0.166	38.9	69.6	76.4	51.0	100.0	67.7	96.7	100.0	98.7	59.2
Nepal	2011	0.083	64.2	44.0	64.9	67.5	100.0	92.7	98.9	100.0	100.0	57.6
Nicaragua	2011/12	0.011	45.1	94.6	71.3	54.1	100.0	100.0	99.9	100.0	0.0	21.8
Niger	2012	0.369	68.2	56.5	75.8	55.1	100.0	87.8	95.6	100.0	99.9	52.3
Nigeria	2011	0.135	87.2	77.1	80.4	59.3	100.0	55.1	97.6	100.0	99.0	43.5
Pakistan	2012/13	0.095	77.6	71.6	66.3	67.1	100.0	83.2	93.2	100.0	98.4	32.1
Peru	2012	0.008	75.5	76.1	87.1	64.3	100.0	57.7	100.0	100.0	99.8	49.0
Rwanda	2010	0.112	27.1	50.1	84.8	66.4	100.0	7.8	89.4	100.0	99.2	49.7
Senegal	2010/11	0.196	73.6	65.9	73.0	69.0	100.0	41.2	97.4	100.0	89.1	18.9
Serbia	2010	0.000	100.0	-	-	-	-	-	-	100.0	100.0	100.0
Sierra Leone	2010	0.185	63.7	58.6	81.9	56.2	100.0	51.2	99.1	100.0	98.6	67.5
South Africa	2012	0.004	78.4	91.7	68.8	91.3	100.0	34.0	100.0	100.0	99.5	29.0
Suriname	2010	0.006	87.4	62.3	-	95.7	100.0	86.6	100.0	100.0	100.0	44.9
Swaziland	2010	0.021	70.7	55.5	86.6	51.3	100.0	72.4	98.8	100.0	99.9	42.8
Tajikistan	2012	0.010	58.5	68.3	87.5	88.0	100.0	13.9	100.0	100.0	100.0	54.2
Tanzania	2010	0.103	58.5	54.0	76.0	58.5	100.0	34.8	97.7	100.0	96.6	56.5
Togo	2010	0.084	45.8	41.4	83.1	51.1	100.0	92.8	97.0	100.0	92.7	57.3
Tunisia	2011/12	0.001	86.0	100.0	86.4	100.0	100.0	83.8	100.0	100.0	100.0	81.7
Uganda	2011	0.122	23.0	36.8	86.6	57.2	100.0	21.9	92.8	100.0	96.7	50.7
Viet Nam	2011	0.002	68.4	68.2	85.6	92.3	100.0	79.4	100.0	100.0	100.0	66.8
Zimbabwe	2010/11	0.052	43.4	52.0	67.1	68.7	100.0	78.1	96.6	100.0	99.4	76.2

YS: Years of Schooling, **SA**: School Attendance, **CM**: Child Mortality, **N**: Nutrition, **E**: Electricity, **IS**: Improved Sanitation, **DW**: Drinking Water, **F**: Flooring, **CF**: Cooking Fuel, **AO**: Assets Ownership.

7. Concluding Remarks

This paper has extended the Alkire Foster methodology of multidimensional poverty measurement to consider a form of ultra-poverty that we call destitution. We do so by proposing a 'depth approach' to measuring ultra-poverty, in which the deprivation cutoff vector of a given poverty measure is changed, while retaining the remaining parameters. This methodology creates a strict subset of the poor – in this case that we term 'destitute'. The destitution measure enjoys the same properties and set of consistent partial indices as the AF class. In addition, certain interesting operations can be performed, and certain new relationships in the headcount ratio and composition of poverty can be cross-analysed both in one period and across time, because the destitute are a subset of the poor. The tables and their presentation in this paper illustrate relevant avenues of analysis.

This paper then applied the proposed methodology to 49 countries covering 2.8 billion people, and containing 1.2 billion MPI poor people, which is three-quarters of the MPI poor people covered in the global MPI2014 estimations. We used more extreme destitution deprivation cutoffs for eight of the ten MPI indicators. We found that nearly half of the MPI poor people were also destitute, and that each of the ten destitution indicators played a clear role in the construction and reduction of destitution. The insights that emerged from this limited empirical study suggest that it is feasible to

identify the poorest of the poor using ordinal data, and that it may be important to apply a 'depth approach' so as to make visible deeper levels of multidimensional poverty that even 'acute' deprivation cutoffs may not uncover.

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