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Estimating International Poverty Lines from Comparable National Thresholds

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Abstract

The World Bank's international poverty line of $1.90/day, at 2011 purchasing power parity, is based on a collection of national poverty lines, which were originally used to set the international poverty line of $1.25/day at 2005 purchasing power parity. This paper proposes an approach for estimating a more recent, complete, and comparable collection of national poverty thresholds from reported national poverty rates. The paper presents a set of international poverty lines based on this new database of national poverty lines. In contrast to the lines used to estimate the $1.90 international poverty line, this approach produces national poverty lines that are (1) consistent with national poverty rates, (2) expressed in common units, and (3) provide greater support to the estimated international poverty line. These national poverty lines are used to estimate an extreme international poverty line, and three higher lines that are more relevant for higher-income countries. A key finding provides evidence of the robustness and relevance of the $1.90 international poverty line as a measure of extreme poverty for low-income countries.

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Estimating International Poverty Lines from Comparable National Thresholds

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1. Introduction

The share of people living in extreme poverty, as assessed by the international poverty line (IPL) estimated by the World Bank, has become one of the most prominent indicators for assessing progress in global economic development. It has been a central indicator for the Millennium Development Goals and is now an important indicator among the Sustainable Development Goals. The most recent World Bank IPL of $1.90 per day described by Ferreira et al. (2016) is the simple average of national poverty lines from the 15 poorest countries from a sample of 74 national poverty lines constructed by Ravallion, Chen and Sangraula (RCS, 2009).[1]

The 15-country approach based on the RCS data has been critiqued for several reasons. One criticism of this approach is that the 15 national poverty lines provide weak support for the IPL and result in a line that is sensitive to small changes in the underlying data (Deaton 2010, Reddy and Pogge 2008, Klasen *et al.* 2016). Deaton (2010) provides an example where changes in the composition of the 15-country reference group can result in changing the poverty status of millions of people. He further notes that the 15 countries represent only about 11 percent of the total poor in 2005.[2] In this paper, we offer two additional issues of concern for the current approach of basing the poverty estimate on 15 countries from RCS – the age of the lines and incomparability of the lines (resulting in a conceptually incoherent average value for the IPL). A second strand of criticism of the IPL itself is less linked to the methodology and more linked to the suggestion that the threshold is too miserly for all countries, but in particular for many developing countries (e.g. Pritchett 2006).

This paper aims to address these critiques by proposing both a new data set of national poverty lines and then an approach for estimating a new set of IPLs that addresses the issue of the official line as being too frugal or irrelevant. The next section elaborates on the critiques of the current 15-country approach, and then describes how we estimate a new set of national poverty lines that has greater temporal and spatial coverage, and is more comparable than the RCS sample. The subsequent section first follows an approach similar to RCS for finding the set of countries that use extreme, absolute poverty thresholds, argues that the data do not support

[1] The national poverty lines, expressed in local currency units, are inflated based on national temporal deflators and converted into US dollars based on the 2011 Purchasing Power Parity conversion factors. See Ferreira *et al*. (2016) for a more detailed discussion of the details of the $1.90 line, and see Jolliffe *et al.* (2014) for more details on the history of the IPL along with some of the measurement challenges.
[2] We estimate this to be about 13 percent in 2011 based on the official $1.90-line estimates.

this approach, and then offers an alternative method for setting a poverty line relevant for the poorest countries. A key finding discussed in the concluding section is that the new set of national poverty lines proposed in this paper provides evidence in support of the robustness and relevance of the $1.90 IPL as a measure of extreme poverty. The paper also offers supplemental poverty lines that may be more relevant for higher income countries.

2. A new data set on national poverty lines

Ever since the dollar-a-day poverty line was first introduced in 1990 (World Bank 1990), the guiding concept for how to estimate the IPL has been to collect a set of national poverty lines and then to base the IPL on a *typical* value of a sub-sample of the *lowest* of these national poverty lines. The details have differed with each revision, where sometimes *typical* would mean average, median or mode; and the selection of the sub-sample of poverty lines has sometimes been based on the lowest of poverty lines and in other cases, the sub-sample has been selected based on the poorest countries (as assessed by measures of per capita consumption from national accounts).

In the case of the original dollar-a-day line, Ravallion, Datt and van de Walle (RDV 1991) compiled a database of 33 national poverty lines and suggested that six of the lower lines were near a common value – one US dollar (when using the 1985 Purchasing Power Parity, PPP, conversion factors). The same database of 33 national poverty lines was used by Chen and Ravallion (2001) to update the dollar-a-day line based on the 1993 PPP conversion factors, although this time the median value of the 10 lowest lines became the revised IPL.

For the next revision of the IPL, Ravallion, Chen and Sangraula (2009) compiled a new sample of 74 national poverty lines, typically drawing these lines from World Bank reports or from national government poverty reports. To select the sub-sample of national poverty lines from the 74 lines, they fitted various parametric regressions of national poverty lines on a measure of average national household consumption. Unsurprisingly, over most of the range, the fitted line indicated that richer countries have higher national poverty lines. They argue though that this positive relationship did not hold for the poorest 15 of the 74 countries. For these 15 poorest countries, they observed essentially no correlation between the value of the national

poverty line and the average wealth of the country.[3] RCS interpreted this flat part of the fitted line as reflecting a threshold of absolute minimum needs because they argued that among the poorest 15 countries, lower average national household consumption did not result in lower lines.[4] The average value of the national poverty lines for these 15 countries was $1.25 in 2005 PPP terms and this became the IPL used by the World Bank in its poverty updates from 2008 to 2014, and by the United Nations in tracking the MDG of 'halving extreme poverty' by 2015. The latest update to the IPL, takes the simple average of these same national poverty lines, but now the average rounds to $1.90 when updated to 2011 values (through 2011 PPP conversion factors and national deflators, as explained in Jolliffe and Prydz (2015) and Ferreira *et al.(2016)*.

An important element of the criticism of this approach is linked to the sensitivity of the estimates to the method for selecting the sub-sample of national poverty lines which serves as the reference group for the international line. Deaton (2010) provides an example where the growth in India's national income meant that it graduated out of the low-income countries used to identify the sub-sample of poor countries, but its graduation out of this sub-sample had the effect of increasing the value of the IPL (because the national poverty line in India was relatively low) and thereby increasing the number of poor in India as assessed by the global poverty headcount. Economic growth for India led to an increase in estimated poverty in India.

Another concern, not discussed in the literature, is that the average poverty line estimated from these 15 countries is quite sensitive to the quality of the inflation data for these countries. The approach used for setting the IPL in PPP terms requires deflating the value of the national poverty lines to the reference year of the International Comparison Program. The current $1.90 line is set in 2011 PPP terms, so this means that each of the 15 national lines used by Ferreira *et al.* need to be updated from the reference period of the national poverty line (typically the period of survey fieldwork) to 2011 values. On average, the 15 national poverty lines date from 1997, requiring 14 years of inflation data; with Mali having the oldest line from 1988-89 and requiring 22 years of CPI data to update it to a 2011 value. Given that many of these 15 countries have limited capacity for the production of national statistics, and some have experienced very high

[3] More specifically, they use the Hansen (2000) threshold estimator to identify a break between a flat and upward sloping part from a regression of national poverty lines on the log of per capita consumption.
[4] This idea of viewing poverty lines from the poorest of countries as reflecting minimum absolute needs was also articulated in RDV (1991) and World Bank (1990).

levels of inflation, a reasonable concern is that even small errors in CPI data, when compounded over decades, can have potentially large effects on the estimated value of the IPL.[5]

One might assume that national CPI data are used to update the values of the national poverty lines from the time of fieldwork to 2011, but this is not the case for three of the 15 countries. Ferreira *et al*. note that in the case of Ghana, Malawi, and Tajikistan, there were significant concerns about the CPI data, and for this reason, household survey data are instead used to construct a temporal deflator (typically from unit values). While the decision to doubt the quality of the CPI as a measure of inflation for the poor may be justified, it is important to recognize that it has a nontrivial effect on the global count of poor. For example, if using national CPI reported in World Development Indicators (WDI) instead of alternative measures of inflation for Ghana, Malawi and Tajikistan when converting the RCS lines from 2005 to 2011 PPPs, the IPL would drop by 20 cents, which would result in more than 200 million people being reclassified as not poor.[6]

Basing the IPL on more recent national lines would reduce the demands placed on inflation data and reduce this sensitivity. While this discussion of inflation is linked to the 15 countries that support the IPL, the need for inflation data holds for all countries in the global poverty count. Household survey data values need to be updated from the time of survey field work to the reference year for the global poverty count. For seven of the 133 countries in the global poverty count, concerns about the quality of CPI data result in the use of alternate temporal deflators. It just happens that the 15-country sub-sample that is used for the IPL disproportionately comes from countries where CPI data are a concern. An implication of this is that increasing the sub-sample of countries for the estimation of the IPL, as our approach allows, will also reduce the sensitivity of the estimated line to this particular concern.

Another concern, not yet noted in the global poverty literature, with any IPL estimated from the set of national poverty lines in RCS, is linked to the heterogeneity in methods used in constructing and reporting national poverty lines. National poverty lines are expressed in many different ways. Some countries report a single national line, others report urban and rural lines,

[5] Gimenez and Jolliffe (2014) document significant discrepancies in Bangladesh between the official CPI and alternative measures of inflation.

[6] A poverty line of $1.70, which was an early estimate of the updated IPL by Jolliffe and Prydz (2015), produces a global headcount for 2012 of 692 million, compared to 897 million for the $1.90.

and some report regional lines. When there are multiple regional lines, RCS note that they estimate the national poverty line for each country as an average (in most cases, weighted by consumption shares; in other cases, unweighted; and in one case, population weighted) of the official reported lines.

The differing choices about the appropriate weights has significant implications for the interpretation of the average poverty lines, and also for whether the average line corresponds in any way with official poverty headcount for that country. One way to consider this is to view the regional poverty lines as reflecting variation in the cost of obtaining basic needs in each region. The regional poverty lines can then be used as deflators to construct a consumption vector expressed in "real" terms, or one that has been adjusted for the varying cost of needs. When applying the various weighted-average poverty lines to this real consumption vector, only the population-weighted poverty line will correctly produce the same official national headcount as the regional poverty lines applied separately to the nominal consumption vector. In this sense, we view the population weights as the correct weights for averaging the regional lines, and the other weighted averages as estimating the national line with error. Neither the consumption-share-weighted nor simple-average lines will result in an estimated national poverty line that corresponds to the official national poverty rate. In other words, many of the estimated national poverty lines used in RCS which have been estimated from regional lines drawn from country reports, will not produce national poverty estimates that match the official poverty rates provided in these reports. We view this inconsistency between the estimated national poverty line and the reported national poverty rate to be an undesirable attribute of the approach followed by RCS.

There is also a lack of comparability across the RCS national poverty lines used to estimate both the $1.90 and $1.25 lines. Some of the lines define a minimum-needs threshold for adults, and some define a minimum-needs threshold for the average person. One-third of the 15 poverty lines used to define the IPL are expressed in terms of adult-equivalents,[7] while the remaining 10 lines are expressed in terms of the average person. Given the demographic composition of these 10 countries at the time when the lines were defined, the average person means an adolescent. Van de Boom, Halsema, and Molini (2015) note that per-capita based food poverty lines are on average seven-tenths the value of the corresponding adult-equivalent version of this line.[8] An

[7] These five countries are Uganda, Tanzania, Sierra Leone, Rwanda, and Ghana.
[8] They also refer to James and Shofield (1990) manual for nutritionists.

adult-equivalent poverty line represents the same needs as a per capita poverty line, but these needs are expressed in different units. In the same way that it does not make sense to take an average of lines expressed in different currencies without first converting them to a common currency, it similarly does not make sense to take an average of lines expressed in terms of different reference people.[9] To bolster this point, the World Bank's online tool for counting the poor, PovcalNet,[10] provides all consumption and income data in *per capita* terms and expresses the IPL in *per capita* terms. For setting IPLs, it is therefore also desirable that the national poverty lines on which it is based are expressed in per capita terms.

We propose an approach for constructing a set of national poverty lines that addresses in significant ways each of the concerns discussed above. The approach yields a significantly larger set of national poverty lines, with greater temporal and country coverage. The approach also yields national poverty lines that are all expressed in per-capita units and that result in poverty estimates that match the official poverty estimates. Our approach is based on estimating implicit national poverty lines by combining national poverty headcounts from national sources, reported in the World Bank's databases, with corresponding consumption and income distributions from PovcalNet used for international poverty estimates.[11]

By directly inferring the national poverty line from the poverty rate, we ensure that our estimated national poverty line directly corresponds to the reported national poverty rate when used with the PovcalNet version of the survey data.[12] Further, because the consumption and income distributions we use are all expressed in per capita PPP terms, the estimated national poverty lines are all expressed in comparable per capita PPP dollars. Following this approach allows us to substantially increase the set of countries for which we have national poverty thresholds (thereby allowing for increased support for the estimated IPL) and also produces a

[9] It is again the case that the adult-equivalent national poverty lines used in RCS will not produce national poverty estimates that match official estimates when applied to the data in PovcalNet. This is because PovcalNet archives consumption and income measures in per capita (not adult equivalent) terms.
[10] PovcalNet is perhaps the most commonly used data tool for estimating global poverty counts. It is an online tool, maintained by the World Bank, which allows analysts to specify parameter values such as the global poverty line, and then estimate the number of poor people in the world based on their assumptions. For more details, see: http://iresearch.worldbank.org/PovcalNet/index.htm.
[11] For the purposes of our analysis, we use a set of fitted distributions, similar to those used in Jolliffe and Prydz (2015), and described in their annex.
[12] Another useful attribute of this approach is that it allows us to identify the national average poverty line even in those countries where no national line exists, but only regional lines or lines for household types.

series of poverty lines that are closer to the ICP reference year (thereby reducing the sensitivity of the estimate to errors and updates in inflation data).

Specifically, we implement our approach using 1,376 income and consumption distributions from 154 countries and territories available in PovcalNet. For 1,158 of these distributions, PovcalNet uses microdata when estimating poverty and inequality, and reports 100 points from the corresponding Lorenz curve (percentiles and percentile shares) for each distribution in the online detailed output. For the remaining 218 of the distributions, grouped data are used for the estimation, and in these cases, only 20 (or sometimes fewer) points of the Lorenz curve are available in the detailed output. For each publicly available Lorenz curve, we generate synthetic distributions with 1,000 points, using the ungroup command included in the DASP Stata Package (Abdelkrim and Duclos, 2007). We apply the adjustment proposed by Shorrocks and Wan (2008), which ensures that the fitted distribution matches the observed shares in the grouped data. This approach and adjustment produces synthetic distributions with a high degree of precision, particularly in the cases where PovcalNet reports Lorenz curves with percentiles. In Appendix 1, we provide an assessment of the precision of our method, which suggest that the errors are small with a mean absolute error of 1.0 percent of the value of the poverty line, and a standard deviation of 1.1 percent.[13]

The vast majority of national poverty headcounts we use to estimate the implicit national lines come from the World Bank's series of poverty headcount ratios at national poverty lines, available in its Poverty and Inequality Database.[14] This data set contains 800 poverty rates at national poverty lines. Of these, we are able to match 699 observations from 107 countries with surveys available in PovcalNet. The World Bank's series of national poverty headcounts does not include estimates for most high-income countries. We therefore supplement the sample with

[13] The method of fitting distributions on the most granular data available in PovcalNet taken by this paper is in contrast to the fitted distributions using decile shares, as was done by Jolliffe and Prydz (2015).
[14] The series is called *Poverty headcount ratio at national poverty lines (% of population), including noncomparable values (SI.POV.NAHC.NC)*. We use a version downloaded on November 12, 2015. The national poverty headcount ratio is the percentage of the population living below the national poverty threshold. The source for this data is the World Bank's Global Poverty Working Group. Data are compiled from official government sources or are computed by World Bank staff using national poverty lines. Since China only defines a rural poverty line, for 2005 and the following years we use the rural poverty headcount rate. We treat the resulting poverty line as our implicit national line since the rural consumption vector for China in PovcalNet has been spatially adjusted to national price levels. The data are available at http://databank.worldbank.org/data/views/variableselection/selectvariables.aspx?source=Poverty-and-Inequality-Database.

national poverty estimates from OECD based on relative poverty lines.[15] For the U.S., one of the few rich countries using absolute poverty lines, we include official national poverty headcounts.[16] For Canada, we use the nationally reported prevalence of *low-income status*.[17] We end up deriving 864 'implicit' national poverty lines for 129 countries which correspond to officially reported national poverty rates when applied to the PovcalNet per capita welfare measure. This is more than a tenfold increase over the number of observations used by RCS.

Figure 1 (panel A) plots the distribution of these 864 implicit national poverty lines from our method, all of which are expressed in per capita PPP terms and uniquely correspond to the reported poverty headcounts. On this figure, we also overlay a weighted density function of the lines, where each country has an equal weight. The majority of national poverty lines, and the majority of countries, are bunched together at relatively low values. Thirty-seven percent of all the poverty lines are less than $3/day and 52 percent are less than $5/day. Panel B of this figure zooms in on the distribution of poverty lines that are less than $5/day and reveals that there is a significant mass of national poverty lines right around $1.90, the poverty line chosen by the World Bank to monitor extreme poverty. This is the first piece of evidence that despite the documented concerns, the official $1.90 appears to be robust to potential CPI issues and seems quite relevant for a large number of poor countries.

3. International poverty lines drawn from the range of national lines

For most countries, national poverty lines are increasing with national per capita consumption (and income); that is to say, richer (poorer) countries have higher (lower) definitions of what poverty means. RDV (1991) and RCS (2009) present evidence that this relationship largely does not exist for countries at very low levels of mean consumption, and this was the basis for identifying the 15 countries which have been used to estimate both the $1.25 and $1.90 IPLs.

[15] The OECD poverty rates are estimated after taxes and transfers, using a relative poverty line set at 60 percent of median income drawn from the (PVT6A) series, accessed June 12, 2015. These are explicitly relative poverty lines and comparable to the Eurostat lines used by Ravallion (2010) for rich countries. We include OECD poverty rates for Australia, Austria, Belgium, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Israel, Italy, Luxembourg, Mexico, Netherlands, Norway, Poland, Portugal, Slovak Republic, Spain, Sweden, Switzerland, Turkey and United Kingdom

[16] U.S. estimates are from U.S. Bureau of the Census, Current Population Survey.

[17] Canada does not measure poverty, but rather refers to the prevalence of low-income status. The source for the low-income estimates is Statistics Canada, CANSIM table 202-0802 and Catalogue no. 75-202-X.

Our initial interest in constructing the national poverty lines was to re-assess this relationship between national poverty lines and mean consumption based on the 2011 PPP conversion factors and a more recent and complete sample of national lines. Our expectation was that we would identify a different set of countries than found by RCS for which there is no significant correlation at low levels of consumption, and we would then use the new set of countries as the reference group for estimating an IPL. We follow RDV and RCS in using household final consumption expenditure (HFCE) per capita from the national accounts as the key measure of economic welfare of each country. [18] For our analysis, we use a sample of our estimated national poverty lines from 115 countries, where we use the closest line to the PPP reference year of 2011. The full set of lines is available in Appendix 2.[19]

Panel A of figure 2 plots the log of the poverty lines for these 115 countries on the log of HFCE at 2011 PPPs for private consumption and shows that there continues to be a strong, positive economic gradient in national poverty lines. Panel B focuses this plot on the poverty lines from the poorest quartile of countries, as assessed by HFCE. In contrast to RDV and RCS, this plot appears to indicate a strong positive gradient in the national lines for even the poorest of countries. In order to examine this more carefully, we regress the national lines on HFCE using a variety of specifications to assess whether the apparent finding in figure 2 is robust.

We report (see, Table 1) estimates from two general specifications of models – one that regresses logs on logs, and the other that regresses levels on levels. For each of these, we examine four models. The first model is an unweighted OLS regression based on the sample of 115 lines in panel A of Figure 2, while the second model is the same except for the bottom quartile of countries in panel B. Model 3 is a weighted regression of 796 poverty lines (all for which we have HFCE and 2011 PPP conversion factors), where the weights are set to ensure each of the 115 countries is equally weighted. If country i has *Ni* poverty lines in the sample, then each of country i's lines are weighted by 1/*Ni*. This model allows us to examine if the results qualitatively change when we change from considering recent lines (those closest to the

[18] We use HFCE data available from the World Development Indicators and the ICP (series code NE.CON.PRVT.PP.KD in the World Bank's public databases). The series is available in constant 2011 PPPs, and we convert it to per capita amounts using WDI population figures for the same year and country (series name SP.POP.TOTL).

[19] We drop 14 countries from our full sample in this analysis. Three countries in our sample with national poverty lines use imputed PPPs rather than benchmark PPPs and we therefore choose to exclude them, while the remainder (11) are missing data for HFCE at 2011 PPPs.

2011 reference year for each country) to considering in addition a much larger set of older lines. The last column repeats model 3, but drops relative poverty lines from OECD countries.[20]

For all models over both the log-log and level-level specifications, the data indicate that there is a positive and statistically significant relationship between national poverty lines and national income (as measured by HFCE). For both the log-log and level-level specifications, the slope coefficients for the unweighted, all-lines model are statistically the same as the coefficients from the weighted regressions. Similarly, across both specifications, the model that excludes the OECD relative poverty lines exhibits a decline in the magnitude of the slope coefficient. This suggests that these high-income countries where the national poverty line is parametrically linked to (median) income (except for the US and Canada), do positively influence the slope coefficient. As further evidence of this, the fitted lowess (locally weighted scatterplot smoothing) regression line in Figure 2 indicates a steepening of the slope over the range of rich countries, and the cluster of hollow markers indicating OECD countries are influencing this.

The findings from Model 2, which is where the regressions are restricted to the 29 poverty lines from the poorest quartile of countries, are perhaps the most important findings for this analysis. Here again we find evidence that is in contrast to RDV and RCS. The regression coefficients indicate that there is a positive and statistically significant economic gradient in the national poverty lines of the poorest of countries. It is important to recognize that the sample of lines on which this regression is based are much more recent than those in RCS and RDV, so this finding could simply reflect the fact that now countries have grown past the identified threshold in RCS, below which there appeared to be no relationship.[21]

Regardless of the relative magnitude of the slope coefficients, both specifications indicate that poverty lines are increasing over the entire range of national consumption. This positive economic gradient across all levels of consumption is also robust to alternative measures of economic development, including household survey mean and, importantly, constant GNI per capita at Atlas exchange rates. Ravallion raises the concern that the positive slope we find when

[20] We consider a model where OECD poverty lines are dropped because it is not obvious that a harmonized definition across several countries of relative poverty is relevant within each country in the same way that a national poverty line is. This is similar to a point noted in Ravallion (2010) in questioning the national relevance of explicitly relative Eurostat poverty lines.

[21] Klasen et al. (2016) find that the flat segment observed by RCS holds at 2011 PPPs, using the original RCS sample.

regressing national poverty lines on mean per capita consumption, even among poor countries, is caused by measurement error induced by our methodology for estimating implicit poverty lines. This concern would be valid if there is evidence, or reason to believe, the error in the estimated national poverty line is positively correlated with measurement error in HFCE, and if the measurement error is sufficiently large. However, our assessment suggest that our method-induced measurement error is minimal and that there is little reason to believe that measurement errors should be correlated. Indeed, one reason why we use HFCE is to reduce the potential for correlated errors. A more thorough discussion of this issue is described in Appendix 1.

With no evidence that there exists a set of very poor countries for which increases in mean consumption do not also coincide with increases in national poverty lines, we are not able to follow the approach of RCS for estimation of an IPL. Given that we have no data-driven basis on which to select national poverty lines from our sample of 864 lines, we examine a series of lines derived from differing sub-samples of the set of poverty lines. Our first selection criterion is to use the line for each country that is closest to the 2011 PPP reference period. This gives us the sample of 115 lines displayed in Figure 2. One motivation for this selection is to base the IPL on lines that are reflective of current social norms. The lines that underpin the official $1.90/day are nearly 20 years old on average. Just as we expect national lines to be higher for richer countries, so too do we expect poverty lines to increase in value as countries grow. Another motivation for this selection, the one that is more linked to the focus of this paper, is that the 15 national lines that underpin the $1.90 estimate need on average 14 years of national CPI data. In contrast, the sample of 115 poverty lines closest to 2011 require on average just over one year of CPI data. More than half the lines are from 2011 and require no CPI, while fewer than 15 percent of the lines require more than 2 years of CPI data.

From this sample of 115 national poverty lines, we consider two very different ways to select a reference set of national poverty lines upon which to base the estimated IPL. The first approach cuts the sample of national lines into quartiles based on HFCE. Given that we have no income threshold to define countries whose poverty lines reflect absolute extreme poverty, we view the bottom quartile as being a reference group for the poorest countries of the world, similar to the interpretation of the 15 poorest countries supporting the $1.90/day line. However, these 29 countries (representing about 25 percent of the population of poor people in 2005) approximately double the coverage of the poor relative to the 15-country approach. This

doubling of the number of countries and of the coverage of poor people, in part addresses one of the critiques levied by Deaton (2010) questioning the support of the World Bank's IPL. Panel A of Table 2 lists both the mean and median of the national poverty lines within each quartile. For the poorest 25 percent of countries, the median of their national poverty lines is $1.86 and the mean is $2.11. Given that our focus is on enhancing the robustness of the estimated IPL to the sort of shifts in the composition of countries described by Deaton (2010), and potential outliers caused by measurement errors in poverty lines or CPI, our preferred estimates are medians for each sub-sample.

The other approach we consider for selecting a reference set of national poverty lines upon which to estimate the IPL, is to use the World Bank's income classification scheme. The World Bank income classifications separate countries into four categories based on per capita gross national income (GNI). These categories are low-income, lower-middle, upper-middle, and high-income countries. To sort and rank countries, GNI at local currencies are converted into a common currency using exchange rates averaged over a three-year time period (i.e. the *Atlas* method). The classification scheme was established in 1989, and is updated on an annual basis to adjust for international inflation.[22] The cut-off points for the classification are somewhat arbitrary, as with many typologies, but the classifications are well established and quite widely used in policy discussions within and outside of the World Bank.[23]

Taking the median values of national poverty lines within each of the four income classifications results in values that are quite close to the medians from the quartile sub-samples of the distribution of national poverty lines. Comparing panels A and B in Table 2 reveals that the median values of national poverty lines within each quartile matches (with a difference of less than 5 percent for all cases) the median value for the corresponding income-classification category. In particular, the median poverty line observed over the set of low-income countries is $1.91, which is within five cents of the median value from the bottom quartile of poverty lines

[22] As of 1 July 2014, low-income economies are defined as those with a GNI per capita, calculated using the World Bank Atlas method, of $1,045 or less in 2013; middle-income economies are those with a GNI per capita of more than $1,045 but less than $12,746; high-income economies are those with a GNI per capita of $12,746 or more. Lower-middle-income and upper-middle-income economies are separated at a GNI per capita of $4,125. For more details, see datahelpdesk.worldbank.org/knowledgebase/articles/378833-how-are-the-income-group-thresholds-determined

[23] As one example, the classifications are part of the widely used WDI database. See Fantom and Serajuddin (2016) for more details on the classifications and on their use.

and similarly within a cent of the World Bank $1.90 IPL. As a check on the stability of this straight-forward approach over time, we estimate the median LIC lines using 2005 PPP conversion factors and find that the median poverty line is $1.21 in 2005.[24] That this procedure results in an estimate that is close in value to the previous $1.25 IPL is a desirable attribute both in terms of avoiding major revisions to historical global poverty headcounts denominated in 2005 PPPs, and in terms of ensuring conceptual comparability with the previous IPL.

4. Concluding comments

This paper offers two main contributions to the literature on measuring global poverty. The first is that we offer an improved database of national poverty lines. This database is not only much larger in terms of country and temporal coverage, but it also based on a methodological approach that allows for easy updating and creates a set of lines that have greater comparability than the set offered in RCS. Most importantly, the approach proposed in this paper for estimating national poverty lines has the desirable attribute that when the estimated national poverty lines are applied to the consumption or income vector from PovcalNet, the resulting poverty headcount will match the poverty headcount for that country (as reported in the WDI).

The other main contribution of this paper is to show that the World Bank's IPL of $1.90 for extreme poverty corresponds very closely with alternative methods for estimating the IPL. In particular, we show that the median national poverty line of the poorest 25 percent of countries (as defined by per capita HFCE) in our sample of lines is $1.86 almost identical in value to the estimate of $1.88 reported in Ferreira *et al.* (2016), which both round to $1.90. Similarly, we show that the median value of our estimated national poverty lines from all low-income countries (as defined by per capita GNI) is equal to $1.91. Despite using different measures for sorting countries, following different approaches for selecting the reference sample, and using much more recent poverty lines, both estimates result in an IPL that directly corresponds to the World Bank definition of extreme poverty. We interpret this as evidence of the robustness of the $1.90 estimate to variations in how one selects the reference set of poverty lines and some of the measurement issues linked to its estimation. We also interpret the findings as providing evidence of the relevance of $1.90 line for the poorest of countries.

[24] The median value of the bottom quartile of poverty lines is $1.20 in 2005 PPP values.

While it is well recognized that the IPL for measuring extreme poverty does result in a line that is too miserly for middle-income countries, and largely irrelevant for high-income countries, this paper offers lines to supplement the extreme line for better-off countries. In particular, when we examine median values of lines for countries that are grouped into income categories, these values largely mirror the values obtained when sub-sampling the national lines into quartiles. For example, the median national poverty line for the quartile of the population below the median but above the 25th percentile rounds to $3.30. The corresponding value for lower-middle income countries is $3.20. Similarly, when examining countries above the median but below the 75th percentile, their median line rounds to $5.60, while the corresponding line for upper-middle income countries is $5.50.[25]

While this convergence of median lines from the income classification system and quartiles of the distribution of national poverty lines is lacking in a conceptual foundation, it is nonetheless a useful and simple result to show that these values both match a common definition of economic wellbeing of countries and the empirical density of poverty lines, reflecting in principle social norms of each country. The advantage of simplicity may be particularly important for estimating an IPL which should be attentive to the need for clearly communicating how the lines are estimated in order to build up public consensus around these values which ultimately are measures of social norms.

[25] The median value for the highest quartile is $22.20. While the U.S. is in this quartile, the value of its line is less than this. The U.S. is a country that has a grid of 61 lines for different types of families (DeNavas-Walt, Proctor, and Smith, 2012). As one example though, a single-adult family with two children has an annual poverty threshold in 2011 of $18,123 (or roughly $16.55 per person per day).

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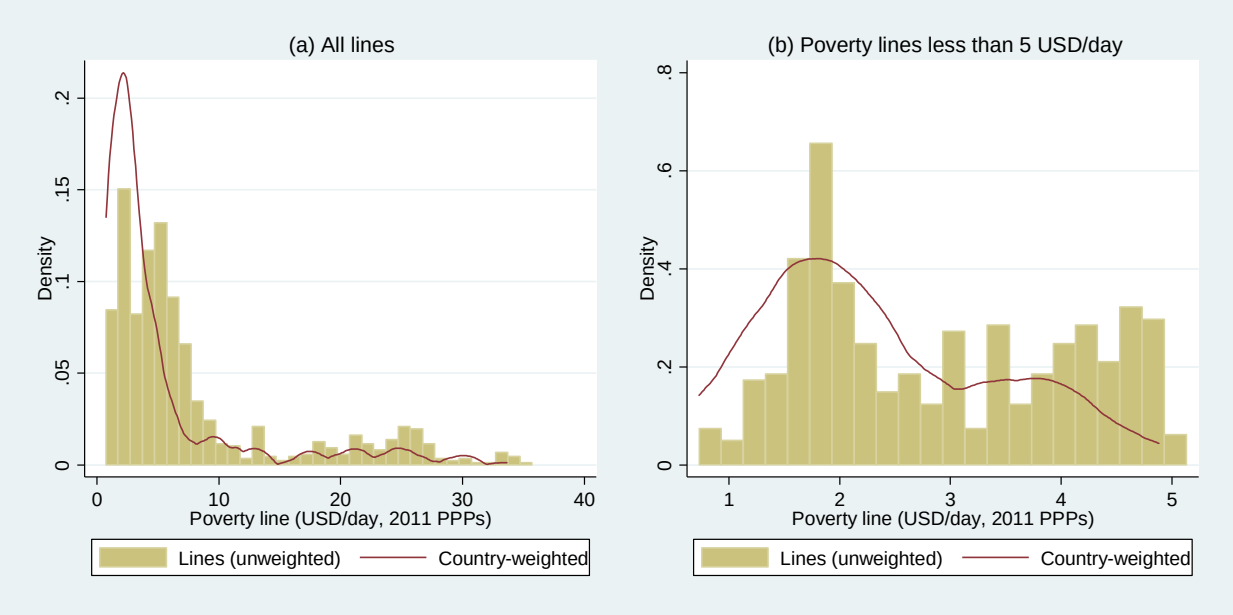
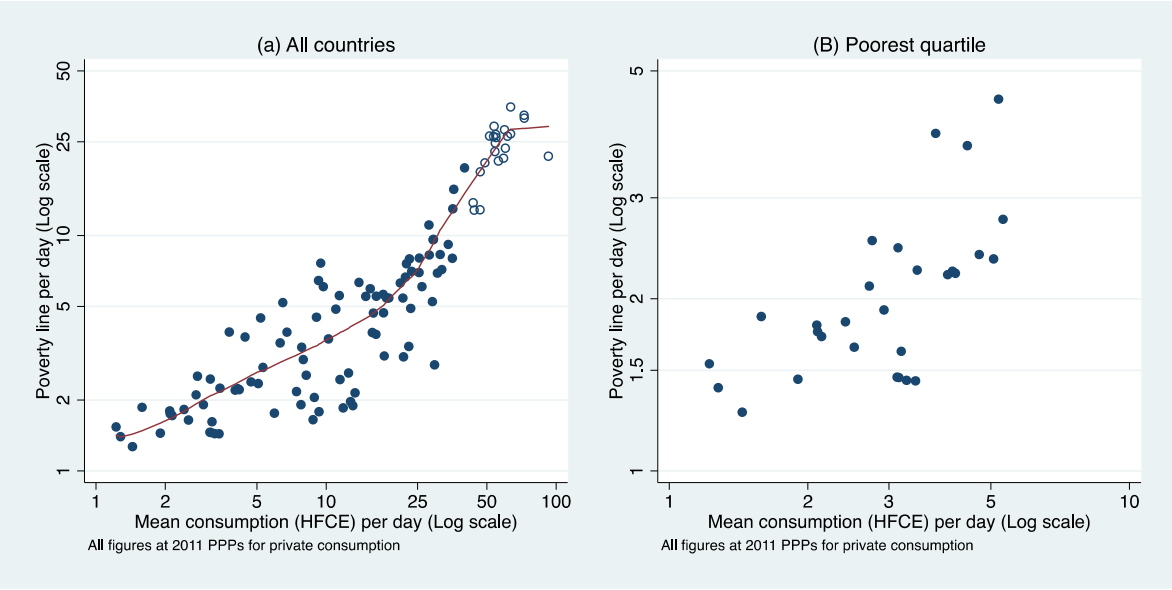
Figure 1: Distribution of estimated national poverty lines



Note: The sample consists of 864 national poverty lines which we obtain from our method of matching national headcount rates with internationally comparable distributions in PovcalNet. Panel (a) shows the full range of lines, while panel (b) zooms in on the distribution of poverty lines with value less than 5 USD/day. In the histogram, each poverty line is equally weighted; in the density function, each country is equally weighted. For a country that has only one poverty line in the sample, this line receives a weight of one. For a country that has 10 poverty lines in the sample, each line receives a weight of 1/10.
Source: Authors' calculations based on Poverty headcount ratio at national poverty lines (% of population), including noncom parable values (SI.POV.NAHC.NC), available at databank.worldbank.org/data/views/variableselection/selectvariables.aspx? source=Poverty-and-Inequality-Database and OECD relative poverty lines.

Figure 2: Economic gradient in poverty lines – even among poorest countries.



Note: In panel (a) relative OECD and rich country lines are indicated with hollow markers. Panel (b) zooms in on the 29 poorest countries (bottom quartile).

Table 1: National poverty lines regressed on mean consumption

Panel A. Log-Log Model

Sample	(1) 2011 lines	(2) 2011 lines (1st quartile)	(3) All lines [weighted]	(4) Without OECD lines [weighted]
Log (HFCE)	0.76***	0.51***	0.79***	0.59***
	(21.74)	(5.13)	(36.06)	(25.69)
Constant	-0.32***	0.15	-0.41***	-0.06
	(-3.38)	(1.68)	(-6.12)	(-1.05)
R-squared	0.78	0.43	0.79	0.62
N	115	29	796	635

Panel B. Linear-Linear Model

Sample:	(1) 2011 lines	(2) 2011 lines (1st quartile)	(3) All lines [weighted]	(4) Without OECD lines [weighted]
HFCE	0.39***	0.44***	0.40***	0.27***
	(14.22)	(4.18)	(44.87)	(22.30)
Constant	-0.47	0.74**	-0.36*	0.98***
	(-1.02)	(2.80)	(-2.31)	(7.45)
R-squared	0.86	0.44	0.89	0.67
N	115	29	796	635

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Note: Panel (A) is a log-log specification of national poverty lines regressed on HFCE (Household final consumption expenditure), and (B) is the levels on levels specification. Column (1) constrains the sample to the poverty line closest to 2011 for each country, giving a total of 115 lines. Column (2) constrains the sample to the bottom quartile of these lines. Column (3) lists the estimates from the full sample of 796 national poverty lines from a weighted regression. The weight for each observation (i.e. poverty line) is 1/Ni, where Ni is the number of poverty lines we observe for country i. Column (4) is similar to Column (3), but excludes explicit relative lines from OECD countries. The absolute value of t-statistics, based on robust standard errors, are in parentheses.

Table 2: International Poverty Lines: Median and mean national lines, by group

A. Country quartiles	Median	Mean	*B. Income Classifications*	Median	Mean
Lowest 25% (29)	1.86	2.11	Low Income (33)	1.91	2.23
25-50% (29)	3.34	3.65	Lower Middle (32)	3.21	3.87
50-75% (29)	5.62	6.17	Upper middle (32)	5.48	5.61
Highest 25% (28)	22.20	21.45	High Income (29)	21.70	21.19

Note: Countries are grouped based on per capita HFCE quartile in panel A and categorized based on World Bank official income classification, which uses per capita GNI, in panel B. Number of countries in each group in parentheses.

Appendix 1: On the precision of our implicit national lines and bias

PovcalNet does not release the primary data sources underlying the consumption and income vectors that are used to estimate global poverty. It does though report points on the corresponding Lorenz curve for each of the 1,158 consumption and income vectors based on household-level micro data. For these vectors, we extract the available points on the Lorenz curve for each vector and construct a (1,000-point) synthetic consumption or income distribution for each country using the ungroup command included in the DASP Stata Package (Abdelkrim and Duclos, 2007). In this process, we apply the adjustment proposed by Shorrocks and Wan (2008) to ensure that the fitted distribution matches the observed shares in the grouped data.[26] We assert in the text that the synthetic distributions match the actual PovcalNet distributions very closely, particularly when PovcalNet has the household-level, micro data and 100 points of the Lorenz curve available. In this appendix, we provide two pieces of evidence to support this assertion.

While the synthetic distributions match the actual PovcalNet data very closely over the vast majority of the range of each distribution, the key concern for the purposes of this paper is to ensure that the synthetic distributions approximate well the PovcalNet data in the neighborhood of the national poverty line. (Our approach estimates implicit national poverty lines based on locating the point on our synthetic distributions where the cumulative density of the distribution is equal to the official poverty rate.) In order to assess this, we first examine the synthetic distributions at fixed points on the distribution – one selected point is at the 1.90 international poverty line and the other point is at 3.10 which is the 2011-PPP analogue to the $2.00 line (Ferreira et al, 2015, footnote 6). For a large proportion of the countries, these two values lie below the median of each distribution and can be viewed as assessing the fit of the bottom portion of the distributions.

More specifically, using the $1.90 and $3.10 lines, we obtain benchmark poverty headcount rates from WDI for every country (based on the *actual* PovcalNet income/consumption distributions, estimated using microdata in most cases). We then pass these reported headcounts

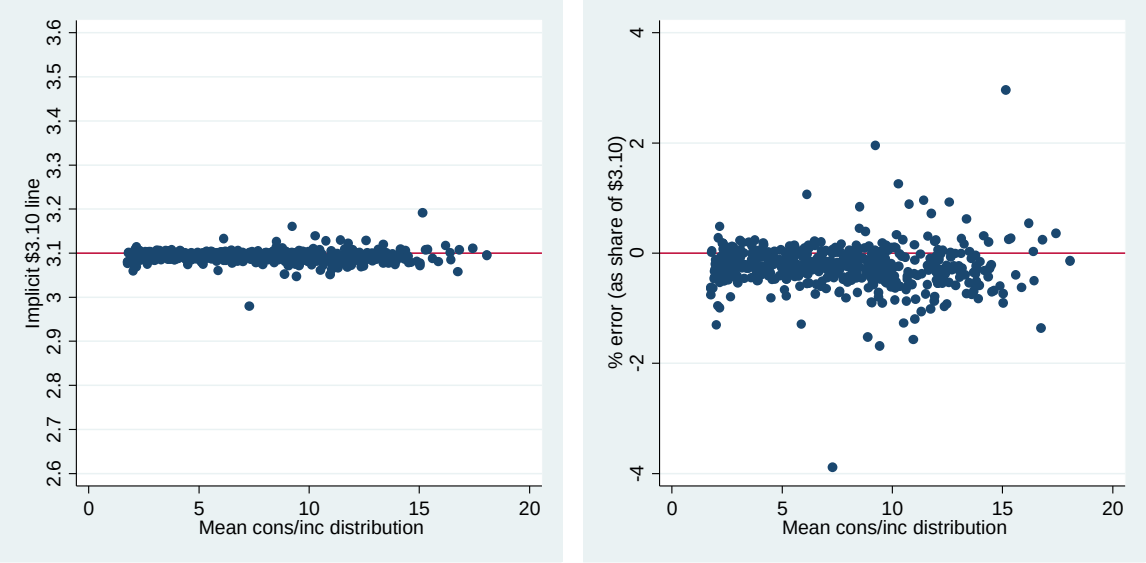
[26] There are 218 consumption and income distributions for which PovcalNet does not have micro data, but only grouped data. In these cases, only 20 (or sometimes fewer) points of the Lorenz curve are available in the detailed output, and we use this information to construct our synthetic distributions.

to our *fitted* distributions to obtain implicit poverty lines. If the fitted distributions approximate well the actual PovcalNet distributions, the implicit lines will match the benchmark poverty lines closely. The extent to which our estimated implicit lines differ from $1.90 and $3.10 can be viewed as measurement error induced by our methodology. Ultimately though, we are interested in assessing the amount of measurement error induced by our approach at values near the national poverty line for each country. In very high- (low-) income countries, the $3.10 line is significantly lower (higher) than the national poverty line, and ultimately we are not as interested in how the fit of our synthetic distributions performs at the tails. For this reason, we first focus on the sub-sample of countries where the headcount is between 10 and 90 percent at the $3.10 line.

In those cases (511) where PovcalNet uses microdata, 99 percent of the estimated implicit poverty lines are within +/-5 cents of $3.10 (between $3.05 to $3.15), and 90 percent are within +/-2 cents of $3.10. For the $1.90 line, 95 percent of the estimated implicit lines are within 1 percent (i.e. two cents), and the largest error is 3.3 percent of the value. Differences with PovcalNet are larger for the 5 percent of our implicit lines which are estimated using ventiles (or deciles), rather than percentiles of the Lorenz curve. But, these differences should not be considered as "errors" in the synthetic distributions as PovcalNet also uses fitted distributions in these cases (both distributions are approximations of the underlying actual data).

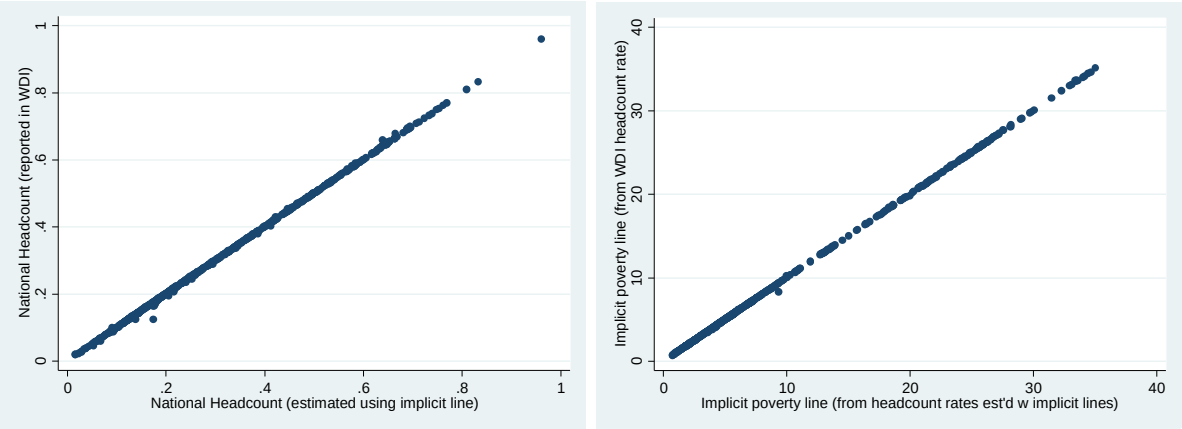
Figure A1 shows our estimates of the $3.10 line and the estimated errors as percent of the poverty line. (We limit the sample to those distributions where PovcalNet has microdata, and where the $3.10 poverty headcount is between 10 percent and 90 percent of the population.) The estimates indicate a mean absolute error of 1 percent of the value of the poverty line, and the distribution of errors has a standard deviation of 1.1 percent. While there is no apparent relationship between the errors and the mean consumption of the distributions, there does appear to be a very slight downward bias in our implicit lines – on average, they are about half a cent less (-0.23 percent) than $3.10.

Figure A1: Evidence of estimation error, evaluated at $3.10 poverty line



Note: Left panel shows the results of estimating the $3.10 international poverty line using our method. The right-hand panel shows the errors as share of the poverty line. The estimates are limited to those distributions where PovcalNet has microdata, and where the $3.10 poverty headcount is between 10 percent and 90 percent of the population. Errors are likely somewhat larger for the 41 (5 percent) of our implicit lines for which we do not have percentiles, but rather ventiles or other grouped data from the Lorenz curve. We are however unable to estimate errors in these cases as we do not have estimates of headcount rates using microdata for comparison.

Figure A2: Evidence of estimation error, evaluated at estimated national poverty lines



Note: Left panel shows that the approximation methodology backs out an estimated poverty rate that is nearly identical to the reported headcount in WDI, when evaluated at the implicit national poverty lines. The right hand panel demonstrates that the (second) implied national poverty line from the estimated national headcount (corresponding to the x-axis from the left-hand panel) maps back to the initial implied national poverty line.

The exercise of examining how our approach performs at a fixed point on each distribution (e.g. $3.10) is informative and relatively easy to communicate. But, it has the disadvantage that we are not examining performance over all of our countries (we subsample on countries with headcounts between 10 and 90 percent at the $3.10 line). And, just as importantly, in those cases where $3.10 differs significantly from the national poverty line, the findings are less informative on the issue of how close our implicit lines are to the actual national poverty lines. Therefore, to supplement this example, we also consider an exercise where we assess the extent of measurement error induced by our methods when examining our synthetic distributions at values near the national poverty line for each country.

Given that this paper is about the implicit national poverty lines, the central measurement concern then is how well the methodology performs at values near the national lines. To assess this, we start with our implicit national poverty lines, which are derived from WDI poverty estimates and our synthetic consumption and income distributions which are *approximations* of the PovcalNet distributions. We pass the value of these implicit national poverty lines to PovcalNet, which reports to us the resulting headcount based on the implicit lines and the *actual* consumption (income) distributions. If our synthetic distributions approximate well the actual distributions, the reported headcount from PovcalNet should match the headcount reported in WDI, when evaluated at our implicit national poverty lines. The left-hand panel in Figure 2A plots these two headcounts and demonstrates that the points line up closely to the 45 degree line (indicating equality of the headcounts). Ninety-nine percent of the headcounts are within a percentage point of each other, 98 percent of the paired headcounts differ by less than 0.7 of a percentage point.

The left-hand panel reveals that the estimation approach produces poverty headcounts that correspond very closely to the WDI headcounts. The right-hand panel illustrates that the implied poverty line from the estimated headcount in the left-hand panel closely matches the initial implied national poverty line. This last step essentially shows that if we start with the implicit national poverty lines, pass these to PovcalNet to estimate headcounts for each country at these lines, and then use our method to derive implied national poverty lines from the PovcalNet headcounts, we return values that are very close to our initial lines. For 98 percent of the lines, the difference between the two is less than two percent of the value of the initial poverty line.

One reason it is important to document the precision of the methodology is that Ravallion (2016) argues that the slope of the fitted line in Figure 2 is upward biased for poor countries due to measurement error in our approach for estimating national poverty.

He asserts that our implied national poverty lines are estimated with error and this error is both correlated with the regressor in our figure and large enough to induce statistically significant upward bias. We believe this assertion is incorrect for two reasons. First, the magnitude of the measurement error in our approach is very small and is not systematically correlated with mean consumption. Second, following the guidance of RCS, our regressor is not the survey mean of consumption but rather a measure of consumption from national accounts data. We elaborate on both of these points below.

To place the issue of measurement error in context, we believe both the RCS estimated national poverty lines and our implicit national poverty lines suffer from measurement error, though we argue that the concern about bias induced by measurement error is less of an issue with our implicit lines. For a given vector of national per capita consumption (or income), there exists a unique national poverty line which corresponds to the reported number of people that are poor in the country (i.e. the poverty headcount). If we had the exact vector of consumption (assuming the measure is continuous) as used by each government for estimating their poverty headcount, we would be able to derive the national poverty line corresponding to the official headcount. Because we are estimating the consumption (or income) vector using percentiles from PovcalNet, there will be some small estimation error in the consumption vector and this indeed will flow through to our implicit poverty lines.

We argue though that this error is small – as explained above and illustrated in Figures A1 and A2. More importantly though, the measurement error induced by this approach is not systematically linked with the mean value of the consumption vector as required in Ravallion's example, but rather is independent of the measures of mean consumption. The lack of correlation between our estimated errors of our method and actual distribution (survey) means in Figure A1 shows this clearly.[27]

[27] This would suggest that if there is bias, it is the more "classic" case of attenuation bias (assuming that the error in measured consumption is increasing in levels of consumption).

By this same standard though, the 15 national lines in RCS that are used to estimate the $1.25 and $1.90 IPLs will also suffer from measurement error. Four of the 15 estimated RCS lines are weighted averages of sub-national lines where the weights are chosen in such a way that the estimated national poverty line does not correspond to the national headcount. Another five of the 15 lines are expressed in adult-equivalent values and when these lines are applied to the per capita income vectors, they too will result in headcounts that are significantly different (greater) than the reported headcounts. In each of these cases, the RCS national poverty lines approximate with significant error the national poverty line that corresponds to the national headcount. Again, there is no clear reason a priori to assume that the RCS measurement error is systematically correlated with the error in measuring consumption, but the scope for measurement-error induced bias exists here as well.

The concern that measurement error in the estimated national poverty line might be correlated with measurement error in the survey mean of consumption is a point articulated well in RCS (2005). To address this concern, they regress poverty lines on consumption as measured in national accounts data, suggesting that this should temper whatever positive bias there may be since measurement error in national accounts should largely be independent of the value of the mean consumption level found in household surveys. In part for this reason, and in part simply to replicate RCS, we similarly regress our national poverty lines on household final consumption expenditure from national accounts data. This is in contrast to the example used by Ravallion (appendix 1, 2016) to critique our approach which uses household survey means to illustrate the potential for correlated measurement error inducing an upward bias in the slope coefficient.[28]

In order to provide empirical support to his assertion that our implicit national poverty lines contain measurement error that is systematically correlated with national consumption, he replicates our regressions in Table 1, but includes country fixed effects in the specification. Even after absorbing country effects, the slope coefficient is positive. He argues that with country fixed effects, the slope can only be positive if it is biased. The basis for this inference is his assertion that "… World Bank's *Poverty Assessments*, from which the WDI derives almost all its national poverty measures, invariably use fixed absolute lines over time. Thus, if one regresses the log of the poverty line on the log of the mean (or national income or consumption) with

[28] Though he does later note that we do not use household survey data means.

country fixed effects then the regression coefficient should be close to zero." (Appendix 1). If correct, this would indeed be useful evidence in critique of our approach. Our experience though, is contrary to Ravallion's assertion that countries fix invariably in real terms the value of the poverty line over time.

There are at least three reasons why the real value of the national poverty line will change over time, leading to a positive correlation even with fixed effects. As one example, Ravallion (1998) notes that there are two ways in which countries typically update poverty lines. One is to base the updates on a temporal price index, typically a consumer price index, and the other way is to re-estimate the poverty line. This latter approach is typically done when there are concerns about the quality of temporal consumer price index. Under some restrictive conditions described in Lanjouw and Lanjouw (2001), this latter method may fix the utility level obtained by the national poverty line, but it will not generally maintain the real currency value of the poverty line. Bangladesh is an example of a country that re-estimated their national poverty line with the aim of maintaining a fixed level of wellbeing, but Gimenez and Jolliffe (2014) note that the real monetary value of these lines increased over time.

A related reason for a changing real value in national poverty lines is that when household questionnaires change, the distribution of the welfare aggregate will also change. National poverty lines are defined in terms of welfare aggregates derived from their national household surveys; when these aggregates change, it is natural for countries to change their national poverty lines. For example, if the poverty line was constructed based on asking about a limited number of food items, and then the questionnaire is expanded to ask about more food items, everyone will look richer because the aggregate will increase in value. But, a change in the questionnaire should not be a causal source for a change in the poverty headcount. To avoid this, countries typically change the real value of the national poverty line when the survey instrument changes. For evidence of how relatively small changes in questionnaire design can have substantial impact on the distribution of the welfare aggregate, see Bamberger et al. (2006); Beegle et al. (2012); Biemer and Lyberg (2003); Browning et al. (2014); Jolliffe (2001); Jolliffe et al. (2015), Pradhan (2009), United Nations Statistics Division (2005), and Winter (2004). Brandt et al. (2013) discuss the case of Vietnam, which increased the real value of their national poverty line for 2010 due to an updating of the definition of the consumption aggregate (as well as other changes in the frame, measure and design of the survey).

Another reason, the last discussed in this appendix, for updating national poverty lines is that over time, countries simply update their views on what constitutes minimum needs. Indeed, Ravallion (1998) states “It can be agreed that a sustained increase in average living standards is likely to lead eventually to more generous perceptions of what ‘poverty’ means in a given society”. (p. 29). Nepal is an example where the country explicitly decided to increase the real value of the national poverty line in 2011 after a period of significant growth and having tried to keep the real value fixed for 15 years (Government of Nepal, 2012). Similarly, the Government of Jordan updated the real value of their national poverty line. In 2010, their poverty line was 813.7 JD per person per year (Jolliffe and Serajuddin, 2015). Backcasting this value to 2008, the value is 777 JD per person per year, which reflects an increase in real value of about 10 percent over the national poverty line of 660 JD in 2008 (World Bank, 2009). Given that on average, our implicit poverty lines span 11 years in time for each country (for more than 25 percent of countries the span is 16 years or more), many countries have changed the real value of their national poverty lines for one of the above reasons. And, for this reason, it is also expected that absorbing country fixed effects will not change the estimated slope coefficient to zero.

Appendix 2: Poverty lines and economic variables used in main specifications

Country /territory	Year	National poverty line (2011 PPPs)	Household survey mean (2011 PPPs)	HFCE (2011 PPPs)	GNI (2011 USD, Atlas)	Source of national poverty rate
Albania	2012	3.80	7.41	16.46	11.81	World Bank
Angola	2009	2.17	3.97	7.44	..	World Bank
Armenia	2011	3.87	5.67	15.88	9.37	World Bank
Australia	2010	28.14	54.49	59.63	129.55	OECD
Austria	2011	27.02	54.99	63.41	137.84	OECD
Azerbaijan	2001	5.19	6.88	6.48	2.45	World Bank
Belarus	2011	7.59	17.23	22.36	16.79	World Bank
Belgium	2010	26.85	47.73	54.64	132.80	OECD
Benin	2011	1.44	2.71	3.28	2.11	World Bank
Bhutan	2012	2.97	8.00	7.96	6.28	World Bank
Bolivia	2011	7.63	11.92	9.47	5.51	World Bank
Bosnia and Herzegovina	2007	9.79	20.23	..	11.24	World Bank
Botswana	2009	1.97	9.55	12.76	14.52	World Bank
Brazil	2011	3.05	16.18	21.72	30.16	World Bank
Bulgaria	2011	7.95	14.96	23.03	19.40	World Bank
Burkina Faso	2009	1.64	2.39	2.52	1.54	World Bank
Burundi	2006	1.54	1.57	1.22	0.43	World Bank
Cameroon	2007	2.35	4.08	5.06	2.95	World Bank
Canada	2010	23.48	55.91	60.13	123.76	Country
Central African Republic	2008	1.72	2.42	2.14	1.20	World Bank
Chad	2011	2.24	3.23	3.46	2.44	World Bank
Chile	2011	7.17	20.86	31.85	33.84	World Bank
China	2011	1.78	4.71	9.32	13.70	World Bank
Colombia	2011	5.42	13.62	18.72	16.93	World Bank
Comoros	2004	3.89	8.12	3.79	1.83	World Bank
Congo, Dem. Rep.	2012	1.40	1.50	1.28	0.95	World Bank
Congo, Rep.	2011	2.75	3.81	5.31	6.11	World Bank
Costa Rica	2011	7.04	20.90	23.55	21.86	World Bank
Cote d'Ivoire	2008	2.41	3.92	..	3.13	World Bank
Croatia	2011	9.62	18.18	29.28	38.49	World Bank
Czech Republic	2011	12.98	26.76	35.52	53.15	World Bank
Denmark	2011	26.44	48.91	51.35	168.47	OECD
Dominican Republic	2011	6.66	12.45	22.12	14.88	World Bank
Ecuador	2011	4.68	10.73	16.05	13.42	World Bank

Country /territory	Year	National poverty line (2011 PPPs)	Household survey mean (2011 PPPs)	HFCE (2011 PPPs)	GNI (2011 USD, Atlas)	Source of national poverty rate
El Salvador	2011	5.42	8.89	18.40	9.86	World Bank
Estonia	2011	11.07	21.83	27.98	43.51	World Bank
Ethiopia	2011	1.80	2.88	2.09	1.07	World Bank
Fiji	2009	4.49	8.12	..	10.84	World Bank
Finland	2011	26.06	49.23	54.76	136.74	Country
France	2011	24.69	52.95	54.45	121.15	OECD
Gabon	2005	3.63	6.91	10.24	17.78	World Bank
Gambia, The	2003	2.45	3.19	3.14	1.53	World Bank
Georgia	2011	1.89	5.22	13.08	7.81	World Bank
Germany	2011	26.39	52.79	61.40	127.34	OECD
Ghana	2006	2.23	4.32	4.12	1.87	World Bank
Greece	2011	12.85	25.62	46.70	68.44	OECD
Guatemala	2011	5.51	8.60	14.88	7.75	World Bank
Guinea	2012	2.53	2.87	2.76	1.16	World Bank
Guinea-Bissau	2010	2.01	2.27	..	1.50	World Bank
Haiti	2012	2.15	3.44	..	2.03	World Bank
Honduras	2011	6.43	8.87	9.28	5.73	World Bank
Hungary	2011	9.59	19.65	29.18	35.75	World Bank
Iceland	2011	22.70	45.51	54.18	102.99	OECD
India	2012	1.91	3.68	7.78	4.06	World Bank
Indonesia	2011	1.85	4.84	11.87	8.25	World Bank
Ireland	2011	20.33	41.05	49.03	118.08	OECD
Israel	2010	13.76	30.80	43.60	82.02	OECD
Italy	2011	20.72	41.59	56.12	103.26	OECD
Jamaica	2004	4.07	12.07	..	12.80	World Bank
Kazakhstan	2011	4.90	11.20	23.34	22.44	World Bank
Kenya	2005	2.39	4.09	4.72	1.69	World Bank
Kyrgyz Republic	2011	3.88	5.30	6.76	2.41	World Bank
Latvia	2011	8.26	17.45	28.10	36.00	World Bank
Lesotho	2010	1.76	2.49	5.96	3.23	World Bank
Liberia	2007	1.75	1.79	2.10	0.48	World Bank
Lithuania	2011	9.16	18.36	33.95	35.67	World Bank
Luxembourg	2011	32.39	69.99	72.59	207.26	OECD
Macedonia, FYR	2006	4.69	12.41	17.76	10.26	World Bank
Madagascar	2010	1.62	1.45	3.19	1.17	World Bank
Malawi	2010	1.27	1.90	1.44	0.97	World Bank
Malaysia	2009	3.38	20.62	22.88	21.35	World Bank

Country /territory	Year	National poverty line (2011 PPPs)	Household survey mean (2011 PPPs)	HFCE (2011 PPPs)	GNI (2011 USD, Atlas)	Source of national poverty rate
Mali	2006	1.82	2.55	2.41	1.35	World Bank
Mauritania	2008	3.70	5.47	4.44	3.04	World Bank
Mexico	2012	8.02	12.16	25.40	25.90	World Bank
Moldova	2011	4.86	9.19	11.03	5.45	World Bank
Mongolia	2011	5.56	8.78	11.41	7.12	World Bank
Montenegro	2011	6.06	14.36	26.12	19.84	World Bank
Morocco	2007	2.55	7.83	8.19	6.80	World Bank
Mozambique	2009	1.45	1.96	1.90	1.35	World Bank
Namibia	2010	2.14	7.79	13.36	12.14	World Bank
Nepal	2010	2.20	3.91	4.03	1.50	World Bank
Netherlands	2012	26.31	49.21	53.41	142.21	OECD
Nicaragua	2009	4.49	7.54	9.08	3.95	World Bank
Niger	2011	1.86	2.35	1.58	0.99	World Bank
Nigeria	2010	1.65	2.49	8.78	4.06	World Bank
Norway	2011	35.12	64.27	63.41	247.32	OECD
Pakistan	2006	2.05	3.66	8.89	2.52	World Bank
Panama	2011	6.96	19.50	25.36	22.58	World Bank
Papua New Guinea	2010	1.92	3.21	..	3.54	World Bank
Paraguay	2011	6.32	15.64	13.90	8.90	World Bank
Peru	2011	5.52	12.92	16.53	13.34	World Bank
Philippines	2012	2.44	5.72	11.50	8.13	World Bank
Poland	2011	8.00	16.44	35.40	35.45	World Bank
Portugal	2011	12.81	26.67	44.03	62.08	OECD
Romania	2011	5.24	8.54	28.99	23.59	World Bank
Russian Federation	2011	8.30	24.55	31.34	29.64	World Bank
Rwanda	2011	1.46	2.76	3.15	1.62	World Bank
Sao Tome and Principe	2001	2.73	3.13	..	..	World Bank
Senegal	2011	2.21	3.16	4.19	2.82	World Bank
Serbia	2010	5.42	12.84	21.57	16.29	World Bank
Seychelles	2006	10.08	17.45	..	38.66	World Bank
Sierra Leone	2011	1.91	2.33	2.93	1.37	World Bank
Slovak Republic	2011	15.69	30.49	35.90	47.15	World Bank
Slovenia	2011	19.37	34.39	39.98	67.37	World Bank
South Africa	2009	5.62	11.83	17.70	16.53	World Bank
Spain	2011	18.63	38.07	46.80	85.32	OECD
Sri Lanka	2010	2.60	6.69	12.52	6.57	World Bank
Sudan	2009	3.50	4.57	6.31	3.17	World Bank

Country /territory	Year	National poverty line (2011 PPPs)	Household survey mean (2011 PPPs)	HFCE (2011 PPPs)	GNI (2011 USD, Atlas)	Source of national poverty rate
Swaziland	2009	3.08	3.85	17.91	7.48	World Bank
Sweden	2011	29.09	49.24	53.71	153.67	OECD
Switzerland	2011	31.51	64.58	72.69	217.23	OECD
Tajikistan	2009	4.46	5.41	5.20	1.85	World Bank
Tanzania	2012	1.44	2.67	3.43	2.11	World Bank
Thailand	2011	5.43	13.48	18.31	13.70	World Bank
Togo	2011	2.10	2.63	2.72	1.26	World Bank
Tunisia	2010	3.97	9.48	..	11.55	World Bank
Turkey	2011	2.82	15.73	29.61	28.74	World Bank
Uganda	2012	1.46	3.55	3.13	1.71	World Bank
Ukraine	2011	5.94	11.90	15.55	8.52	World Bank
United Kingdom	2011	21.29	44.99	59.10	110.11	OECD
United States	2010	21.70	62.38	92.57	136.28	Country
Uruguay	2011	6.92	23.09	30.49	32.90	World Bank
Venezuela, RB	2006	6.28	11.63	20.99	18.59	World Bank
Vietnam	2012	3.35	8.07	7.83	4.23	World Bank
West Bank and Gaza	2009	6.06	10.76	9.72	5.91	World Bank
Zambia	2007	1.83	2.66	..	2.62	World Bank

Note: All values are expressed in per capita terms, per day.
Source: Authors' estimates and compilation from sources provided in main text.