Poverty Lines Across the World

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Abstract: National poverty lines vary greatly across the world, from under $1 per person per day to over $40 (at 2005 purchasing power parity). What might account for these huge differences? Can they be understood within a common global definition of poverty? For all except the poorest countries, the absolute, nutrition-based, poverty lines found in practice tend to behave more like relative lines, in that they are higher for richer countries. Prevailing methods of setting absolute lines allow ample scope for such relativity, even when nutritional norms are common across countries. Both macro data on poverty lines across the world and micro data on subjective perceptions of poverty are consistent with a weak form of relativity that combines absolute consumption needs with social-inclusion needs that are positive for the poorest but rise with a country's mean consumption. The strong form of relativism favored by some developed countries—whereby the line is set at a fixed proportion of the mean—emerges as the limiting case for very rich countries.

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JEL classifications: I32, O10

"Our dream is a world free of poverty." (Motto of the World Bank)

"The poor you will always have with you." (The Bible, Matthew 26:11)

1.   Introduction

People coming from different backgrounds define "poverty" differently even when in each individual's eyes it is unmistakable in reality. This chapter aims to describe the range of poverty lines found across the world, to review the methods used to set those lines, and to provide a common framework for interpreting the differences.

Standard measures of poverty combine a monetary measure of household "economic welfare" with a poverty line in the same space; all those people, and only those people, for whom the welfare measure is below that line are deemed to be "poor." The most widely used measures of economic welfare are current income and expenditure on consumption, both of which are derived from sample surveys of households. Consumption is more commonly used in developing countries where income is often harder to measure, and probably a less reliable welfare indicator, given a degree of (predictable) income variability over time, notably (but not only) from agriculture.[2] In the compilation of national poverty lines for developing countries provided by Ravallion, Chen and Sangraula (2009), consumption was used as the welfare indicator in the poorest half of countries ranked by consumption per capita, with income-based measures only emerging above the median. Income is typically the preferred indicator in OECD countries.

The poverty line is probably the more important reason in practice why definitions of poverty vary. Figure 1 gives the densities of both national poverty lines and private consumption per capita for 95 countries (developed and developing). These are either official national poverty lines or (when these could not be found) they are the lines set by Eurostat and the World Bank.[3] Both the poverty lines and consumption are converted to $US's using purchasing power parity (PPP) exchange rates.[4] The range of poverty lines in Figure 1 is huge, from $0.62 to $43 per day,

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[2]   It has also been argued that consumption is the more relevant indicator for developed countries; see Slesnick (1993) and the Meyer and Sullivan chapter in this Handbook on measuring poverty in the US.

[3]   One can question whether the Eurostat lines are national lines, but this is less of a concern for the World Bank's national lines. These are from the latest available country-specific "Poverty Assessments" (PA), which are official Bank documents. The process of producing a PA entails (often extensive) consultation with the government of that country, including discussion about the most appropriate poverty line.

[4]   I have used the PPP exchange rates for consumption from World Bank (2008). All poverty lines are for specific years (often tied to specific survey dates) and consumption data are for that year or as close as possible; both poverty lines and consumption were then converted to 2005 prices using the country's consumer price index, and then converted to PPP $'s using the 2005 PPP for consumption.

though there is a pronounced lower mode of about $2 a day (and a less pronounced upper mode just under $30 a day). Even so, mean consumption is more dispersed (with a range from $1.03 to $93.85 a day). In Figure 2(a) the poverty lines are plotted against log consumption per capita. Comparing expected values conditional on mean consumption (as estimated by the non-parametric regression in Figure 2(a)), the range is from $1.25 to $30 per day. The mean line for the poorest 15 countries in terms of consumption per capita is $1.25 while the mean for the richest 15 is $25 a day. One sees that national lines rise with mean consumption, which can be called their relativist gradient, though the relationship is clearly quite flat at low per capita consumption levels.

One might be tempted to conclude from these data that there is no imaginable common definition of what "poverty" means across the world. Before jumping to that conclusion we need to look more closely at how different countries go about setting their poverty lines and what bearing the differences have on Figure 1. An important distinction is between absolute and relative lines. Absolute lines aim to measure the cost of certain "basic needs," which are often interpreted as physiological minima for human survival; nutritional requirements for good health and normal activity levels are widely used to anchor absolute lines. The monetary lines are intended to have constant "real value" (after deflating by a price index). By contrast, relative lines do not claim to represent physiological minima and are instead (typically) set at a constant proportion of current average (mean or median) income or consumption. Absolute lines are common in developing countries while relative lines tend to dominate in developed countries.

The strengths and weaknesses of the absolute versus relative approaches to setting poverty lines have been much debated. The position one takes in that debate carries weight for how one thinks about economic development. Absolute poverty can probably be eliminated with sufficient economic growth, which is a key element of the World Bank's strategy for attaining its "dream of a world free of poverty." Outcomes for relative poverty depend more on how income distribution changes; indeed, it is sometimes argued that relative poverty will always be with us and one often hears the Biblical quote above in defense of that view.[5] Given that developed countries use relative lines, the gradient in Figure 2(a) is no surprise. Yet we also see a marked

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[5] This is questionable, both as a theoretical proposition—for it is possible to have a distribution of income in which no one lives below (say) half the mean—and as an interpretation of Christian scriptures; the quote at the beginning of this chapter is ascribed to Jesus of Nazareth by the gospels, and the context does not suggest that he was making a claim about poverty being an unsolvable problem; see, for example, Myers (2003).

relativist gradient in the absolute lines of developing countries, for all except the poorest countries; see Figure 2(b), which gives the scatter plot for the 75 developing countries only.

The following discussion will return to the question of why we see the range of lines in Figure 1, and how one might interpret their relativist gradient in Figure 2 using a global definition of poverty. After laying out the theoretical definitions of a poverty line (section 2), the chapter reviews approaches to setting absolute lines (section 3), relative lines (section 4), and lines that are based on how survey respondents define poverty (section 5). Section 6 concludes.

2.   Drawing the line in theory

A poverty line can be defined as the money an individual needs to achieve the minimum level of "welfare" to not be deemed "poor." But what concept of welfare should anchor the poverty line? For most economists the answer is a utility function defined on "own consumption." Then poverty lines can be readily interpreted within the economic theory of true cost-of-living indices.[6] After outlining this approach, the following discussion extends it to embrace relative deprivation and multiple functionings relevant to welfare.

A benchmark definition of the poverty line

Consider individual i with characteristics x_i. The inter-personally comparable utility function is $u(q_i, x_i)$ where the quantity vector q_i is utility maximizing, giving demand functions $q(p_i, y_i, x_i)$ at price vector p_i (which may be constant across all i, depending on the application) and total expenditure on consumption y_i. The corresponding utility maximum is $v(p_i, y_i, x_i)$ (the indirect utility function). The consumer's expenditure function is $e(p_i, x_i, u)$, which is the minimum cost of utility u for person i when facing prices p_i.

The minimum utility that is deemed necessary to escape poverty is denoted u_z. In the benchmark model, this is taken to be constant, i.e., poverty is absolute in the utility space. The utility-consistent poverty lines are given by:

$$z_i^u = e(p_i, x_i, u_z) \text{ for all } i = 1,..n \tag{1}$$

This is the solution to:

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[6]   The theory of true cost-of-living indices was originally due to Konüs (1939). For more recent treatments see Deaton and Muellbauer (1980, Chapter 7) and Diewert (2008). Blackorby and Donaldson (1987) define a poverty line as a point on the consumer's expenditure function at the poverty level of utility.

$$u_z = v(p_i, z_i^u, x_i) \tag{2}$$

On exploiting the standard properties of the expenditure function, the poverty line can also be written as:

$$z_i^u = p_i q(p_i, x_i, u_z) \tag{3}$$

Thus we see that the poverty line is the cost of a bundle of goods.[7] But it is very specific bundle, namely the vector of utility-compensated demands, $q(p_i, x_i, u_z)$, at the reference level of utility used to define who is poor in the welfare space. This bundle can be interpreted as "basic consumption needs." For a given household type (captured by x), the bundle should only vary with relative prices, consistent with attaining the poverty level of welfare.

The measure of aggregate poverty can then be defined as an appropriate function of the vector of welfare ratios, { y_i / z_i^u, $i=1,..n$}.[8] For example, the headcount index of poverty is the proportion of the population with $y_i / z_i^u \leq 1$.[9]

Extensions to the benchmark model

How might we extend this benchmark definition to allow for a relative poverty line, which is an increasing function of mean income? While one might conjecture that u_z varies with the mean—such that richer countries use a higher reference utility level in deciding who is poor—this does not get us very far, as it simply transfers the question form one space to another. We can, however, rationalize relative lines even if there is a common reference utility level for defining poverty in the welfare space. If people derive utility from relative position then an absolute poverty line in the space of welfare will translate into a relative line in the space of commodities.

To see this more formally, suppose that utility depends (positively) on both "own income" and income relative to others in some reference group, reflecting "relative deprivation." In other words, the indirect utility function takes the form $v(p_i, y_i, y_i / \bar{y}_i, x_i)$ where $\bar{y}_i$ is the

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[7]   When normalized by its value at reference prices for some date and/or location, r, one obtains a true cost-of-living index, $z_i^u / e(p_r, x_i, u_z)$. The way the poverty lines vary with x gives the equivalence scales, which normalize for differences in household size and composition.

[8]   The term "welfare ratios" is due to Blackorby and Donaldson (1987) who discuss the advantages of this welfare metric over money-metric utility or "equivalent income functions."

[9]   A well-known problem with this measure is that it ignores distribution below the line; for example, if the poorest person becomes worse off or an inequality-increasing transfer is made amongst the poor then the headcount index is unchanged. There is a large literature on alternative measures; for a survey see Zheng (1997).

mean consumption expenditure of i's reference group. The welfare-consistent poverty line then takes the form:

$$z_i^u = e(p_i, \bar{y}_i, x_i, u_z) \tag{4}$$

This is the solution to:

$$u_z = v(p_i, z_i^u, z_i^u / \bar{y}_i, x_i) \tag{5}$$

The poverty line will then be an increasing function of $\bar{y}_i$ as long as both own income and relative income are valued positively ($\partial v / \partial y > 0$ and $\partial v / \partial(y / \bar{y}) > 0$). Thus we can rationalize relative lines even if we postulate a common global u_z. However, it will not be the case that the line is directly proportional to the mean; I return to this point in section 4.

A further extension builds on Sen's (1985) argument that welfare should be thought of in terms of a person's capabilities—the functionings ("beings and doings") that a person is able to achieve. By this view, poverty means not having an income sufficient to support specific normative functionings. For example, following Atkinson and Bourguignon (2001) , one can think of these normative functionings as comprising both "survival needs" and minimum "social inclusion costs" for participating in social and economic activity.

This argument can be interpreted as either a generalization of the benchmark definition or a deeper, structural, form of that definition. By the first interpretation, utility can be viewed as one welfare-relevant functioning—the attainment of personal satisfaction. (This interpretation is found in Sen, 1992, chapter 3.) By the second, one can think of functionings as generators of utility; for example, social inclusion is the "comfort of belonging," as Scitovsky (1978, p.114) puts it. However, one might want to allow for social preferences over functionings that differ from individual valuations.

Here I would like to propose a more general theoretical definition of a poverty line, which encompasses both the benchmark approach and the functionings approach.[10] Let a person's functionings be determined by the goods she consumes and her characteristics, giving the vector of functionings:

$$f_i = f(q_i, x_i) \tag{6}$$

where f is a vector-valued function. Functionings may also vary with the mean consumption of an appropriate reference group. To keep the notation simple we can fold this relativism into the

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[10]   The following discussion builds on Ravallion (1998, 2008b).

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definition of *x* in the following discussion. One can further postulate that a person derives utility directly from her functionings, as represented by a primal utility function $\tilde{u}(f_i)$. We can then interpret $u(q_i, x_i)$ as a derived utility function, obtained by substituting (6) into $\tilde{u}(f_i)$. Again, individual choices of q_i maximize utility, representing individual preferences over functionings. Thus one can also postulate solution functions for functionings, which show how they depend on income, prices and characteristics (including mean income of the reference group).

Poverty lines can be anchored to multiple norms. "Functioning consistency" for a set of poverty lines requires that certain normative functionings are reached at the poverty line. Let f_z denote the vector of critical functionings needed to be not poor, which are treated as absolute normative judgments, similarly to u_z. We may or may not want to impose what can be thought of as the strong form of utility consistency: $\tilde{u}(f_z) = u_z$. However, it would seem hard to argue against at least the weaker assumption that f_z includes all functionings that yield utility, i.e., no valued functioning is ignored. I shall call this "weak utility-consistency."

It is reasonable to assume that f_z is attainable, in that there is at least one bundle q_i^c such that no functioning is below its critical value:

$$f_z \leq f(q_i^c, x_i) \tag{7}$$

This yields the functioning-consistent poverty lines:

$$z_i^c = p_i q_i^c \tag{8}$$

However, there may well be multiple solutions for q_i^c and hence z_i^c. Two ways of picking a unique line can be identified. The first defines z_i^c as the minimum *y* such that:

$$f_z \leq f_j[q_j(p_{ij}, y, x_{ij}), x_{ij}] \tag{9}$$

Notice that the functioning that is the last to reach its critical value as *y* rises—presumably the lowest priority—will be decisive in determining z_i^c. The second, alternative, approach is to treat attainments as a random variable (that is, with a probability distribution) and take a mean conditional on income and other welfare covariates, possibly including group membership. Then poverty lines are deemed to be functioning consistent if f_z is reached in expectation.

Implementation

Putting these concepts into practice requires that we address two classic problems, often encountered in applied welfare economics. The first can be called the <u>referencing problem</u>: what is the reference level of utility (or other functionings) that anchors the poverty line? (This is an instance of a general problem of reference-dependence, including in welfare measurement.) It is tempting to say this choice is arbitrary, and to hope that it is innocuous. But the choice of the reference is far from arbitrary, and (in general) it affects the resulting poverty measure. This speaks to the importance of testing the sensitivity of poverty comparisons to the choice of reference, as it determines the level of the poverty line. This idea is made explicit and formalized in the use of stochastic dominance criteria for ordinal poverty comparisons; this approach asks whether the qualitative ordering of poverty measures is robust to the choice of poverty lines (within some range) and also to the choice of poverty measures (within a broad class).[11]

The second problem is the <u>identification problem</u>. Even if we agree on the poverty line in the welfare space, we also need to know the expenditure function. Standard practice is to calibrate its parameters from data on consumer demands. The problem is that individuals vary in characteristics, such as their household size and demographic composition, which influence welfare in ways that may not be evident in consumer demand behavior.[12] (This too is a pervasive problem in applied economics, certainly not confined to poverty measurement.)

As we will see in the following sections, the methods found in practice address the referencing and identification problems by expanding the traditional information set used by economists in assessing welfare.

3.   Nutrition-based absolute poverty lines

The main methods found in practice in developing countries are the food-energy-intake (FEI) method and the cost-of-basic needs (CBN) method. It is known that these methods can give radically different results even for the same country and date; using data for Indonesia, Ravallion and Bidani (1994) found virtually zero correlation between the geographic poverty profiles (given the poverty rates across geographic areas) produced by these two methods. Since

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[11]   See Atkinson (1987) and Foster and Shorrocks (1988); also see the exposition in Ravallion (1994).

[12]   If demands $q(p_i, y_i, x_i)$ can be integrated back to a utility function $u(q_i, x_i)$ then the same demands also maximize $w[u(q_i, x_i), x_i]$. Thus there is no unique utility function that can be inferred from market demands alone. This is a well-understood problem; see Pollak and Wales (1979), Pollak (1991) and Browning (1992).

policy choices (such as in geographic targeting) could depend critically on which method is used, it is important to probe carefully into the choice.

The food-energy intake method

The FEI method can be interpreted as a special case of the functioning-based approach described above. The specialization is to focus on just one functioning, namely nutritional status as measured by food-energy intake relative to caloric norms. The method finds the consumption expenditure or income level at which food-energy intake is just sufficient to meet predetermined food-energy requirements for good health and normal activity levels.[13] To deal with the fact that food-energy intakes naturally vary at a given income level, the FEI method typically calculates an expected value of intake at given income (or the regression of food energy intake on income).

To see what this method entails in more formal terms, let k denote food-energy (calorie) expenditure, which is distributed across individuals in some known way (as inferred from a sample survey), and let y denote income (or total consumption expenditure) while x denotes other individual characteristics. The conditional mean is the sample estimate of $E[k|y,x]$. By simply inverting this function, one finds the income $z(x)$ at which a person typically attains the food-energy requirement, $k_z(x)$, which can vary with x, i.e., the FEI poverty line solves:

$$E[k|z(x),x] = k_z(x) \tag{10}$$

This method, or something similar, has been used by (*inter alia*) Dandekar and Rath (1971), Osmani (1982), Greer and Thorbecke (1986), Paul (1989) and a number of governments.

One concern about this method is that the resulting poverty lines need not be consistent in terms of utility or capabilities more generally (Ravallion, 1994; Ravallion and Lokshin, 2006). Consider first how FEI poverty lines respond to differences in relative prices, which can of course differ across the subgroups (such as regions) being compared in the poverty profile and over time. For example, the prices of many non-food goods relative to food are likely to be lower in urban than in rural areas. This will probably mean that the demand for food and (hence) food-energy intake will be lower in urban than in rural areas, at any given real income. But this does not, of course, mean that urban households are poorer.

The key point is that the relationship between food-energy intake and income will shift according to differences in tastes, activity levels and publicly provided goods. And there is

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[13]   A widely used source for caloric requirements is World Health Organization (1985).

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nothing in the FEI method to guarantee that these differences are relevant to assessing welfare. Indeed, it is quite possible to find that the richer country or sector (by the agreed metric of utility) tends to spend so much more on each calorie that it is perversely deemed to be the poorer country. That has been found to be the case in studies of the properties of regional poverty profiles for Indonesia using the FEI method (Ravallion and Bidani, 1994) and Bangladesh (Ravallion and Sen, 1996; Wodon, 1997). The results of Ravallion and Bidani (1994) suggest that Indonesia's FEI poverty lines behave more like the relative poverty lines (considered further below) in that the poverty lines across provinces (split into urban and rural areas) have a seemingly high elasticity with respect to mean consumption—indeed an elasticity close to unity, similar to the relative lines used in many rich countries (as discussed in section 4). Clearly the same problem can be expected when comparing FEI-type poverty lines across countries.

A similar issue arises in comparisons over time. Suppose that all prices increase, so the cost of a given utility level must rise. There is nothing to guarantee that the FEI poverty line will increase. That will depend on how relative prices and tastes change; the price changes may well encourage people to consume cheaper calories, and so the FEI poverty line will fall.[14] The potential utility inconsistencies in FEI poverty lines are also worrying when there is mobility across the subgroups of the poverty profile, such as due to inter-regional migration. For example, Ravallion (1994) notes that it is possible that a process of economic development through urban sector enlargement, in which none of the poor are any worse off and at least some are better off, would result in a measured *increase* in poverty.

These problems can be seen to stem from the fact that the FEI poverty lines are anchored to attainments of only a sub-set of the functionings that we would normally identify as relevant to defining poverty, even in poor countries. Nor is it likely that calorific requirements would be the last valued functioning to be met as incomes rise. So this method is unlikely to be even weakly utility-consistent either within or between countries.

The cost-of-basic needs method

The CBN method stipulates a consumption bundle deemed to be adequate for certain basic consumption needs, and then estimates its cost for each of the subgroups being compared in the poverty profile. This is essentially the approach of Rowntree (1901) in his seminal study

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[14] Wodon (1997) gives an example of this problem in data for Bangladesh. The FEI poverty line fell over time even though prices generally increased.

of poverty in York England in 1899, and there have been numerous examples since, including the official poverty lines for the United States (Orshansky, 1965; Citro and Michael, 1995). As noted in section 2, the poverty bundle of goods can be interpreted in theory as the utility-compensated demand vector at the reference level of utility needed to not be considered poor. In practice, however, the food bundle is chosen to be consistent with another functioning, namely adequate nutritional status. In particular, it is anchored to pre-determined food-energy requirements consistent with common diets in the specific context. However, allowances for non-food goods are also included, to assure that basic non-nutritional functionings are assured. Most lines in Figure 2(b) use some version of the CBN method.

In principle, this method can deliver utility consistent absolute poverty lines, but this will only be true in practice if the commodity bundle is the utility-compensated demand vector. As with the FEI method, consistency with nutritional norms alone does not assure utility consistency, since there are multiple commodity bundles that can attain any given nutritional level, and some of these bundles will undoubtedly be preferred to others. Thus it is useful to have some way of assessing a proposed set of CBN poverty bundles. Ravallion and Lokshin (2006) test the utility consistency of CBN poverty lines across households using the theory of revealed preference. This can be applied within subgroups deemed to have common preferences though in practice utility functions may vary, due to differences in climate, for example.

In some cases a complete vector of normative (food and non-food) goods is set and valued, as in Russia's poverty lines (Ravallion and Loskhin, 2006). However, it is often the case that only food needs are set, based on nutritional requirements. (This may reflect a data limitation, namely a lack of data on non-food prices.[15]) Some method is needed to derive a non-food component of the poverty line. Here the most common practice is to divide the food poverty line by some budget share for food. For example, the US poverty line assumes a food share of one third, so the total poverty line is three times the food line. However, the basis for setting a food share is rarely transparent. Why use the average share, as in the US line? Whose food share should be used? Arguably, a more appealing approach is to set an allowance for non-food goods that is consistent with demand behavior near the food poverty line. Ravallion (1994) proposes two such methods. The first divides the food component of the poverty line by the mean food

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[15] The unit values—survey-reported expenditures divided by quantities at the commodity level—often used for valuation typically exclude most non-food goods, for which only expenditures are feasible to measure in surveys.

share of households whose actual food spending is in a neighborhood of the food poverty line. The second method uses the mean non-food spending of households whose total spending is in a neighborhood of the food poverty line. Ravallion argues the first method gives a reasonable upper bound to the allowance for non-food needs while the second gives a lower bound.

However, these methods of setting the non-food component are vulnerable to essentially the same problem encountered in the FEI method: the food demand function can shift in ways that have nothing to do with differences in welfare (or are even perversely related to welfare). For example, many non-food goods will be cheaper (relative to food) in richer countries (and in urban areas within countries), such that demand for food is lower at any given real income. In the end, a judgment is invariably required as to whether the implied lines seem reasonable in the specific setting. Consistency across different countries in terms of a utility function defined solely on own consumption would seem highly unlikely, although consistency in terms of a broader welfare concept, embracing social needs, cannot be ruled out.

Why do absolute lines vary systematically with mean consumption?

It is obvious why we see the relativist gradient in poverty lines amongst developed countries, given that they use lines that have this feature built in. Possibly more surprising is that absolute lines also vary this way amongst developing countries. The range is from $0.63 to $9.06 per day and the positive gradient is quite pronounced amongst middle-income developing countries, even though they are all using absolute poverty lines.[16]

Why might we see this marked relativist gradient in <u>absolute</u> poverty lines amongst all but the poorest fifth of countries? A number of possible explanations can be suggested, based on the discussion above. In the benchmark definition (section 2), average poverty lines consistent with a common utility function defined on "own consumption" will only vary with relative prices and household characteristics. The prices of non-traded goods vary with mean income (as wages are higher in richer countries). However, this effect is already embodied in the PPP exchange rates used to convert poverty lines to a common currency, so this cannot easily explain the gradient in poverty lines seen in Figure 2.

Systematic differences in household size will play a role if there are economies of scale in consumption, such that larger households can attain the same utility with a lower *per capita*

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[16]   The gradient of national lines is still evident if one focuses solely on CBN poverty lines for developing countries (as can be verified from the data in Ravallion et al., 2009).

consumption. Then the gradient can arise from the fact that average household size tends to be larger in poorer countries. This true in theory, but in practice the poverty lines found in developing countries rarely incorporate an allowance for economies of scale in consumption, which is not considered important for poor people, given their consumption patterns.[17]

A more plausible explanation is to recognize that all national poverty lines must be considered socially relevant in the specific country. If a proposed poverty line is widely seen as too frugal by the standards of society then it will surely be rejected. Nor will a line that is too generous be easily accepted. We might then expect richer countries to use a higher reference utility level for defining poverty. This point has long been recognized. For example, Scitovsky (1978, p.116) noted that, amongst developed countries in the 1960s, richer countries tended to have higher poverty lines and he explained this as follows:

> "…in the advanced countries, the poverty norm has long ago ceased to reflect a physiological minimum necessary for survival and has become instead a 'minimum social standard of decency,' the life-style that a particular society considers the minimum qualification for membership."

The new insight here is that Scitovsky's observation does not only apply to the "advanced countries" today, but in fact applies to all except the poorest countries. As is clear from the preceding discussion of the main methods used to set absolute lines, there are many free parameters that can be brought into the analysis to influence the line obtained. The stipulated food-energy requirements are similar across countries, but the food bundles that yield a given nutritional intake can vary enormously (such as in the share of calories from coarse starchy staples rather than more processed foodgrains, and the share from meat and fish). The nonfood components also vary, either explicitly or implicitly (through shifts in the food demand functions). Ravallion et al. (2009) find that there are relativist gradients in both the food and non-food components of the national poverty lines for developing countries, though the elasticity with respect to mean consumption is higher for the non-food component.

The judgments made in setting the various parameters of a poverty line are likely to reflect prevailing notions of what poverty means in each country. And those norms clearly go well beyond the "physiological minimum necessary for survival." The basal metabolic rate implies a positive lower bound to the cost of nutritional requirements (for all positive food prices). The cost of the (food and non-food) goods required for social needs must also be

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[17] For further discussion see Lanjouw and Ravallion (1995) who also point to reasons why there may well be economies of scale in consumption even for poor people.

bounded below. The poverty lines found in many poor countries are certainly frugal. For example, World Bank (1997) gives the average daily food bundle consumed by someone living in a neighborhood of India's national poverty in 1993. The daily food bundle per person comprised 400 grams of course rice and wheat, 200 grams of vegetables, pulses (edible seeds) and fruit, plus modest amounts of milk, eggs, edible oil, spices and tea. After buying such a food bundle, one would have left with about $0.30 per day (at 1993 PPP) for non-food items.

Such a frugal line is clearly too low to be acceptable in middle-income (and certainly in rich) countries, where higher overall living standards naturally mean that higher standards are used for identifying the poor. Consider instead the daily food bundle used by Bidani and Ravallion (1993) for constructing Indonesia's poverty line for 1990. This comprised 300 grams of rice, 100 grams of tubers and similar amounts of vegetables, fruits and spices as in the India example; but it also included fish and meat (about 140 grams in all per day), and the overall diet was more varied and probably preferable by the tastes of most consumers.[18] This bundle would in turn be considered too frugal for defining poverty standards in many middle-income countries.

So there is ample scope for (implicit) relativism to emerge via the methods used to set absolute poverty lines in practice.[19] As noted in section 2, in principle it could be either the welfare norms (for utility or other functionings) that are relative or it could be welfare itself, while the norms remain absolute in the welfare space. This difference is not identifiable by looking at aggregate data on national poverty lines, although sections 4 and 5 will point to evidence from micro data that provides some support for the idea that relative position matters directly to welfare, though probably less so for very poor people.

What happens over time? While the (explicitly) relative poverty lines used by *Eurostat* are automatically adjusted over time in line with the changes in the median, the process of adjustment is slower for absolute lines. It appears to be the case that a (positive) minimum aggregate income gain to a low-income country is needed before upward pressure on the poverty line emerges—that is in fact implied by the non-linearity evident in Figure 2(b). And there can be strong political resistance to revising the line. The official poverty line in the US—at $13 per person per day for a family of four—has not been updated in real terms for many decades,

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[18]   Vegetarians would presumably need to be compensated for the meat and fish by similarly protein-rich foods, and would then prefer this version of the Indonesian bundle over the Indian bundle described above.
[19]   This is true within countries as well as between them. Though it is not a topic for this chapter, this implicit relativism can considerably distort national efforts to reduce aggregate poverty, as discussed in Ravallion (1994).

despite some dissatisfaction with the old line.[20] Similarly, the poverty line in China had not been revised upwards in real terms for over 20 years, despite a four-fold increase in mean income; this has led some observers to question the relevance of the old poverty line to current conditions.[21]

Upward revisions to the real values of national poverty lines in growing developing countries cannot be expected to happen quickly, and nor would downward revisions at times of economic contraction be likely. But an upward adjustment to a new (sustained) equilibrium level of average consumption can be expected. The governments of China and India are in the process of revising upwards their official poverty lines, after many decades.[22]

4.   Relative poverty lines

Psychologists, sociologists and others have argued that the circumstances of the individual relative to others influence welfare at any given level of individual command over commodities.[23] Survey questions on how respondents think about poverty also suggest that there is a degree of relativism even in low and middle income countries.[24] However, while there is probably wide agreement that relative position matters to welfare (and hence welfare-based poverty measures), the challenge has been how to put this into practice in a credible way.

Arguments for relative poverty lines

While most developing countries use the absolute lines described in the last section, most OECD countries have taken a very different approach, whereby poverty lines have often been set as a constant proportion—typically 40-60%—of the mean or median.[25] For reasons that will soon be clear, I shall call these <u>strongly relative</u> poverty lines.

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[20]   See the interesting discussion in Blank (2008).
[21]   See, for example, Osberg and Xu (2008)
[22]   Although in India's case it is not clear how much this is an upward revision to reflect changing perceptions of poverty versus dissatisfaction with past price indices; see Planning Commission (2009).
[23]   Runciman (1966) provided an influential exposition, and supportive evidence. Also see the discussions in Easterlin (1974), Scitovsky (1978), Clark and Oswald (1996), Oswald (1997), Solnick and Hemenway (1998), Walker and Smith (2001), and Ravallion and Lokshin (2010) amongst others.
[24]   See Corazzini et al. (2010) who asked about 2,000 university students in eight countries about whether they saw poverty as absolute or relative, or a mixture.
[25]   Examples for OECD countries include Smeeding et al. (1990), Atkinson (1998), Saunders and Smeeding (2002), Fouarge and Layte (2005), Eurostat (2005), Nolan (2007) and OECD (2008, Chapter 5). There has been some debate about whether the poverty measure should be anchored to the mean or the median (Saunders and Smeeding, 2002; Easton, 2002; de Mesnard, 2007). Poverty lines set as a constant proportion of the median can have perverse properties when the Lorenz curve shifts, as shown by de Mesnard (2007).

Two main arguments have been made in support of relative lines. The first views the poverty line as the cost of the poverty level of utility (as discussed in section 2) and argues that people attach value to their income relative to the mean in their country of residence. While the idea that utility anchors poverty lines is not common in applied work, it is consistent with a strand of the literature on welfare measurement in economics whereby cost-of-living indices and equivalence scales are anchored to some reference level of utility (as discussed above).

The second argument says that poverty lines should allow for differences in the <u>cost of social inclusion</u>, which can be defined as the expenditure needed to cover certain commodities that are deemed to have a role in assuring that a person can participate with dignity in customary social and economic activities.[26] This argument does not require that social inclusion is a (direct or indirect) source of utility. But it is seen as a desired capability for not being deemed "poor" in a specific context. So this can be thought of as a further example of the functionings approach discussed in section 2. Relative poverty in the income space is then seen as the logical implication of absolute poverty in the capability space.

The idea that certain socially-specific expenditures can be deemed essential for social inclusion is long-standing. Famously, Adam Smith (1776, Book 5, Chapter 2, Article 4) pointed to the social-inclusion role of a linen shirt in eighteenth century Europe:

> "A linen shirt, for example, is, strictly speaking, not a necessary of life. The Greeks and Romans lived, I suppose, very comfortably though they had no linen. But in the present times, through the greater part of Europe, a creditable day-labourer would be ashamed to appear in public without a linen shirt, the want of which would be supposed to denote that disgraceful degree of poverty which, it is presumed, nobody can well fall into without extreme bad conduct."

This idea of social exclusion has long been echoed in arguments for relative poverty lines. In a recent example, a commentator on Japan's (recently introduced) national poverty line (of around $15 a day) argued that:[27]

> "Poverty in a prosperous society usually does not mean living in rags on a dirt floor. These are people with cellphones and cars, but they are cut off from the rest of society."

The social roles of certain forms of consumption have long been noted by anthropologists, who have pointed to the social roles played by festivals, celebrations and communal feasts in poor countries; see, for example, Geertz (1976) and Fuller (1999, Chapter 6). Rao (2002) documents

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[26]   It can be granted that "social inclusion" is a broader concept than this definition allows, and may well require more than commodities, including, for example, freedom from discrimination according to gender or ethnicity. However, the concern here is with the measurement of poverty in terms of command over commodities.

[27]   The commentator is Masami Iwata, as quoted by Fackler (2010, p.A6).

the importance of celebrations to maintaining the social networks that are crucial to coping with poverty in rural India. Banerjee and Duflo (2007) report seemingly high expenditures on celebrations and festivals by very poor people in survey data for a number of developing countries. In Yemen, participants at "qat sessions" discuss local economic and social affairs while chewing this mild stimulant; these sessions serve an important social role—and no less so for poor people—such that "refusing to take qat is tantamount to accepting ostracisation" (Milanovic, 2008, p.684). Clothing can also serve a social role. Friedman (1990) describes how poor Congolese acquired clothing with a conspicuous "designer label," which he interpreted as status-seeking behavior. A field experiment by van Kempen (2004) revealed that poor people in Bolivia were willing to pay a premium for a designer label, which (he argues) serves as a symbolic expression of social identity for the poor (van Kempen, 2004, p.222).[28]

However, neither the relative deprivation nor the social inclusion arguments tell us that the poverty line should be a constant proportion of the mean—implying that the elasticity of the poverty line to the mean is unity. Consider the relative deprivation argument discussed in section 2. It is obvious from equation (3) that only if own income has no utility value independently of relative income will it be the case that the poverty line can be written in the special form:

$$z_i = \psi(p_i, x_i, u_z)\bar{y}_i \tag{11}$$

In other words, strongly relative lines require that utility (at given *x*) depends solely on relative income. While we might agree that relative considerations matter, at least above some level of income, it is hard to accept that absolute levels do not matter independently of relative position.

What about the second argument—that strongly relative lines allow for "costs of social inclusion"?[29] It can be agreed that certain private expenditures assure participation in customary social activities.[30] However, one can question the (implicit) assumption that the cost of inclusion is a constant proportion of mean income. The social-inclusion needs of very poor people may well be low, but it is hard to see why they would go to zero in the limit. Very poor people may be highly constrained in their spending on things that facilitate their inclusion, and so be more socially excluded; but that does not mean that their social inclusion needs are negligible. The

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[28]   For a more general discussion of the social-symbolic roles that consumption can play see Khalil (2000).

[29]   Another common defense is that such poverty lines are more "comparable"; for example, UNDP (2005, p.334) writes that "To ensure comparability across high-income countries, most comparative databases…measure poverty on a relative basis." The sense of the term "comparable" is unclear when the poverty line's real value (by any agreed cost-of-living index) can be orders of magnitude larger in one date or country than another.

[30]   Probably the most influential exponent of this view has been Townsend (1979).

cost of a socially-acceptable linen shirt (in Adam Smith's famous example) will be positive for the poorest person. Ironically, allowing for non-negligible social inclusion needs for the poorest leads us away from strongly relative poverty measures.

When the poverty line is a constant proportion of the mean or median, an equi-proportionate increase in all levels of consumption will leave the poverty rate unchanged.[31] This is a questionable, even perverse, feature of such poverty lines; it is hard to accept that a process of economic growth that leaves inequality unchanged does not reduce poverty. By the same token, it is hard to accept that the incidence of poverty rises when someone at the poverty line gains (say) 5% of her income, but the overall mean increases by more than 5%.

Seemingly perverse poverty trends have been found using strongly relative measures. For example, the UNDP (2005, Box 3) (based on Nolan et al., 2005) shows how relative poverty measures for Ireland were rising despite higher absolute living standards for the poor. Another example can be found in Easton (2002), who argued that relative poverty measures for New Zealand were deceptive in showing falling poverty despite lower absolute levels of living for the poor. The UNDP (2005, p. 334) writes: "It is clear that when economic conditions change rapidly, relative poverty measures do not always present a complete picture of the ways that economic change affects people's lives."

Strongly relative lines are no less problematic in cross-section comparisons, such as between countries or urban and rural areas. For example, OECD (2008, Chapter 5) reports the same poverty rate for the US as for Mexico. In another example, the urban poverty line proposed by Osberg and Xu (2008) for China (set at half the median) is 2.4 times their rural line, or 1.7 times when deflated by the differential in absolute lines, anchored to cost-of-living differences facing the poor, as used by Ravallion and Chen (2007). The Osberg-Xu method suggests little difference in poverty incidence between urban and rural China, while the Ravallion-Chen method indicates far higher poverty measures in rural China.

There are other possible methods of setting explicitly relative lines that do not have the strong-relativity property of being proportional to the overall mean. An example is found in the

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[31]   This stems from the fact that the headcount index (in common with most other poverty measures) is homogeneous of degree zero between the mean and the poverty line for any given Lorenz curve. Note also that, for a given Lorenz curve, the median is directly proportional to the mean (the constant of proportionality is $L'(0.5)$ where $L(p)$ is the Lorenz curve). Thus the strong relativity property also holds when the poverty line is a fixed proportion of the median.

debates on the official poverty line for the US. It will be recalled that this is an absolute line, which is only updated over time for inflation and that this has been questioned by many observers (as reviewed by Blank, 2008). A number of proposals have been made for new lines that build in concerns about relativity, by (implicitly or explicitly) adjusting the line for rising overall living standards. The most developed proposal was made by an expert panel of the National Research Council (Citro and Michael, 1995). The panel recommended that US poverty lines should be anchored to the current median of expenditures on food, clothing and shelter. This would clearly generate poverty lines with a positive elasticity to the mean, but the elasticity will be less than unity given that these goods tend to be necessities. However, one concern with this proposal is that it is unclear why concerns about relative poverty would apply only to necessities; it would seem more natural to assume that the income gradient in a poverty line stems from social inclusion needs that go beyond necessities in a country such as the US.

Weakly relative poverty lines

Ravallion and Chen (2011) propose a concept of <u>weakly relative poverty</u> in which the elasticity of the poverty line to the mean is positive above some critical value, rises with higher mean consumption, but only reaches unity as mean consumption goes to infinity. This places a natural upper bound on the weight attached to relative deprivation, namely that it cannot matter so much that measured poverty does not fall when all incomes increase by the same proportion.

The Ravallion-Chen proposal generalizes the synthesis of absolute and relative lines proposed by Atkinson and Bourguignon (2002) who postulated two key capabilities: physical survival and social inclusion. The former is the capability of being adequately nourished and clothed for meeting the physical needs of survival and normal activities. On top of this, a person must also satisfy certain social inclusion needs, which are assumed to be directly proportional to mean consumption in the country of residence. The Atkinson and Bourguignon proposal is that one should only be deemed "not poor" if one is neither absolutely poor nor relatively poor. The generalization proposed by Ravallion and Chen is to allow for a cost of social inclusion that can be non-negligible for very poor people, i.e., that cost does not go to zero in the limit as

consumption or income goes to zero, as in strongly relative measures and in the Atrkinson-Bourguignon proposal.[32]

Figure 3 illustrates the difference between weakly and strongly relative poverty lines. Notice that the strongly relative line has an intercept of zero, implying that the costs of social inclusion goes to zero as income goes to zero. The weakly relative line avoids this property. (The Atkinson and Bourguignon proposal is the absolute poverty line up to income y^* and the strongly-relative line above y^*.)

In setting weakly relative lines, Ravallion and Chen (2010) calibrate them to the observed empirical relationship across countries between national poverty lines and mean consumption (as in Figure 2(b)). Their schedule starts at an absolute line of $1.25 a day and then rises with a gradient of 1/3 when consumption per capita exceeds about $2 a day; the line for country i is:[33]

$$z_i \equiv \max[\$1.25, \$0.60 + \bar{y}_i / 3] \tag{12}$$

(where $\bar{y}_i$ is consumption per capita). The intercept of $0.60 a day can be interpreted as the minimum cost of social inclusion. The schedule of poverty lines in (12) can also be given a welfarist interpretation in which the utility function is given by own consumption in countries with a mean below $2 a day (strictly $1.95) but this is discounted proportionately for the degree of relative deprivation above this level.

This provides an excellent fit to the data on national lines; indeed, (12) fits better than the non-parametric regression in Figure 2(b) at the chosen bandwidth (though a sufficiently less smooth non-parametric function would of course fit better).

Using data from almost 700 household surveys for 116 countries to measure relative poverty in the developing world Ravallion and Chen found that 47% of the population was poor in 2005, though the proportion has fallen over time, from 63% in 1981 to 53% in 1990. By contrast, Chen and Ravallion (2010a) estimate an absolute measure using an international line of $1.25 a day—the lower bound of the Ravallion and Chen schedule of weakly relative lines—and find that 25% of the population lived below $1.25 a day in 2005. Twenty-five years earlier (in 1981) the percentage was 52%. Ravallion and Chen find that with sustained economic growth,

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[32]   Foster (1998) also proposed a "hybrid line" given by the weighted geometric mean of an absolute and a (strongly) relative line. While this is also "weakly relative," it has a constant elasticity, whereas the elasticity rises from zero to unity in the Ravallion and Chen (2010) proposal—consistently with the data on national lines.

[33]   In calibrating their schedule of weakly relative lines, Ravallion and Chen use a suitably constrained version of Hansen's (2000) method for estimating a piece-wise linear ("threshold") model. The variation is that, in their application, the slope of the lower linear segment is zero and there is no potential discontinuity at the threshold.

the incidence of relative poverty became less responsive to further growth. Thus the number of relatively poor rose in the developing world, just as the numbers of absolutely poor fell.

Equation (9) was calibrated to poverty lines for developing countries (Ravallion and Chen, 2010). If one extrapolates to rich countries it implies a poverty line with an elasticity close to unity; for example, for the richest country in Figure 1 (the US) the implied elasticity of the poverty line to mean consumption is 0.98.[34] Strongly relative lines only emerge as the limiting case for very rich countries.

5.   Subjective poverty lines

Just as richer countries tend to adopt more generous definitions of what it means to be "poor," richer people within a given country tend to have higher personal "poverty lines." Recognizing this fact explicitly leads to an interesting, and radically different, way of setting a national poverty line. This approach recognizes the inherent subjectivity and social specificity to any notion of "basic needs." It also recognizes that there are many non-market goods that can influence individual welfare, but the value of which is not evident in demand behavior.

The essential idea is to ask individuals to rate their own welfare, or identify money metrics for pre-defined welfare levels. This provides new information for identifying a metric of welfare, including setting poverty lines. Typically, it is <u>not</u> one's stated perception of own-welfare that is taken to be the relevant metric, as this is bound to contain many idiosyncratic, psychological factors that one would not deem relevant. Rather, the subjective questions are used to calibrate an inter-personally comparable welfare function based on observed covariates deemed to be relevant on a priori grounds. In other words, subjective data are used to address the identification problem described in section 2. There is a large literature on subjective welfare. Here the focus is solely on their use in calibrating poverty lines.[35]

How does this method derive a poverty line? There are essentially two approaches. The first uses money-metric responses to subjective welfare questions while the second derives a money-metric of specific qualitative labels. I consider these in turn.

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[34]   One could re-estimate the model using the full data set in Figure 1, but given that so many of the extra observations (for OECD countries) are strongly relative measures by design an elasticity close to one would no doubt re-surface mechanically.

[35]   Subjective data also offer a test of objective poverty lines, by regressing self-rated welfare on income normalized by the poverty line *plus* the variables that went into the construction of the poverty line, which should be jointly insignificant if those lines accord with subjective welfare. This approach is outlined in Ravallion and Lokshin (2002) and illustrated using Russia's poverty lines.

The main way that subjective poverty lines have been derived in practice is based on the "minimum income question" (MIQ): "What income level do you personally consider to be absolutely minimal? That is to say that with less you could not make ends meet."[36] One might define as poor all those for whom actual income is less than the amount they give as an answer to this question. However, this would almost certainly lead to inconsistencies in the resulting poverty measures, in that people with the same income, or some other agreed measure of economic welfare, will be treated differently. Clearly an allowance must be made for heterogeneity, such that people at the same standard of living give different answers to the MIQ. It is recognized in the literature that there are other determinants of economic welfare which should shift the subjective poverty line, such as family size and demographic composition. Indeed, the answers to the MIQ are interpretable as points on the consumer's expenditure function at a point of minimum utility (Kapteyn, 1994). Under this interpretation, subjective welfare assessments provide a means of overcoming the problem of identifying utility from demand behavior alone when household attributes vary, as discussed in section 2.

To see what this method does in more formal terms, let $y^{\min}$ denote the answers given to the MIQ and let $E(y^{\min}|y,x)$ denote the conditional mean, given actual income y, which lies in the interval $[y_0, y_1]$, and other relevant characteristics x; in practice $E(y^{\min}|y,x)$ is estimated using a regression. Past empirical work has found that the expected value of the answer to the MIQ conditional on actual income tends to be an increasing function of actual income.[37] Following this I assume that $E(y^{\min}|y,x)$ is strictly increasing in y. Furthermore, and also consistently with past empirical studies, I assume that $E(y^{\min}|y_0,x) > y_0$ and $E(y^{\min}|y_1,x) < y_1$. Under these assumptions it is plain that there exists a unique fixed point such that:

$$E[y^{\min}|z(x),x] = z(x) \tag{13}$$

The solution for z is an obvious candidate for a poverty line; people with income above z tend to feel that their income is adequate, while those below z tend to feel that it is not. We can call z the social subjective poverty line (SSPL).

[36]   This can be thought of as a special case of Van Praag's (1968, 1994) "income evaluation question," which asks what income is considered "very bad," "bad," "not good," "not bad," "good," "very good."
[37]   See, for example, Groedhart et al. (1977), Danziger et al. (1984), and Kapteyn, Kooreman and Willemse (1988), De Vos and Garner (1991).

The specification of the *x* vector raises a difficult but poorly understood issue. Should this include all the observable covariates of subjective welfare, or only those things that one would deem relevant to poverty lines on *a priori* grounds? Consider, for example, the common finding in the literature for developed economies that unemployment reduces subjective welfare at a given level of income.[38] If one included this variable in the vector *x* then one would probably conclude that the unemployed should have a higher poverty line than the employed, *ceteris paribus*. Yet most other approaches to setting a poverty line would probably argue that, if anything, the unemployed need less income to attain the same level of welfare. In the end, one cannot escape the need for normative judgments about what should be considered in a measure of poverty, though once the set of relevant variables is decided, subjective welfare data can guide how those variables are weighted.

A further issue is that the income concept respondents to the MIQ have in mind need not correspond to that used by the analyst in estimating the SSPL. This will bias the SSPL, though there are correctives (Kapteyn et al., 1988; Tummers, 1994). In applying the MIQ in many developing countries, one will also find that "income" is not a well-defined concept, particularly (but not only) in rural areas. It is not at all clear whether one could get sensible answers to the MIQ. This suggests that the second approach to deriving a SSPL might be more relevant. Pradhan and Ravallion (2000) propose a method for estimating the SSPL based on qualitative data on consumption adequacy, as given by responses to appropriate survey questions. Instead of asking respondents what the precise minimum consumption is that they need, one simply asks whether their current consumptions are adequate. This provides a multidimensional extension to the one-dimensional MIQ. The SSPL is the level of total spending above which respondents say (on average) that their expenditures are adequate for their needs. For empirical implementation, the probability that a sampled household will respond that its actual consumption of each type of commodity is adequate can be modeled as a probit regression. Under certain technical conditions, a unique solution for the subjective poverty line can then be obtained from the estimated parameters of the probit regressions for consumption adequacy.

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[38]   Examples include Clark and Oswald (1994), Theodossiou (1998), Winkelmann and Winkelmann (1998) and Ravallion and Lokshin (2001). Note that this is not what the simplest economic models of work-leisure choice would suggest. There is clearly an independent disutility of unemployment that counteracts the gain in leisure, probably associated with the quantity constraints on choice that involuntary unemployment entails.

Interestingly, the literature to date on estimating SSPL's does not suggest that they differ greatly from prevailing poverty lines estimated by other means, including absolute lines in developing countries.[39] Indeed, the overall poverty rate (headcount index) based on the SSPL is roughly similar to that implied by pre-existing objective poverty lines.[40] It may well be that the choice of parameters in the "objective" absolute lines already approximated the expected SSPL in the specific context. But the structure of the poverty profile has turned out to be different in some respects; for example, while objective poverty lines often imply that larger households are poorer, this is not typically the case with the subjective approach (Pradhan and Ravallion, 2000).

Do subjective poverty lines more like absolute lines or relative lines in the income space? (They clearly aim to be absolute in the space of perceived welfare.) While there have been only a few empirical studies that can address this question, they have offered some support for the idea that social subjective poverty lines behave more like the weakly relative lines discussed in section 4. Poverty lines calibrated to subjective welfare data have tended to rise with mean-income but with elasticities less than unity. Hagenaars and van Praag (1985) estimated an elasticity of 0.51 for eight European countries. Some studies have also identified a weakly relativist gradient within a given country. For the US, Kilpatrick (1973) estimated an elasticity of about 0.6 for subjective poverty lines and De Vos and Garner (1991) found an own-income elasticity of the subjective poverty line in the US of 0.43.[41] For one of the poorest (and most unequal) developing countries, Malawi, Ravallion and Lokshin (2010) found evidence of relative deprivation effects in respondents' "satisfaction with life" but only amongst relatively well-off people, notably in urban areas; this was not evident amongst the poor, for whom the positive external effects of having better off social comparators (friends and neighbors) dominated. Ravallion (2008b) calculates the implied (iso-welfare) poverty lines for Malawi, and shows that they exhibit a weakly relativist gradient, whereby higher own-economic welfare is needed to compensate people for having richer social comparators. These findings are echoed in the

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[39]   The applications to date for developing countries include Pradhan and Ravallion (2000) using data for Jamaica and Nepal, Taddesse and Shimeles (2005) for Ethiopia, Gustafsson (2004) for urban China and Lokshin et al. (2006) for Madagascar.

[40]   An exception to this finding is reported for the US by de Vos and Garner (1991), where the SSPL is well above the prevailing (absolute) line, though (as already noted) the US line has not been updated in real terms since the 1960s; a more current absolute line for the US would probably be closer to the SSPL.

[41]   By contrast, Luttmer (2005) reports regressions for subjective welfare in the US that imply strong relativism. However, Ravallion (2008b) argues that the tests used (in common with other papers in the literature) are likely to over-estimate the income elasticity of the poverty line.

responses to survey questions on whether poverty is perceived as absolute or relative reported by Corazzini et al. (2010), which suggest that respondents coming from richer backgrounds see poverty as more relative, though not to the point that absolute poverty is seen as unimportant.

6.   Conclusions

National poverty lines vary enormously across the world, and they reveal a marked economic gradient. The poorest 15 countries (in terms of private consumption per capita) have an average line of $1.25 per person per day, while the average is $25 a day for the richest 15 countries. A relativist gradient—whereby the poverty line rises with mean consumption—is not surprising amongst developed countries, which have generally favored (explicitly) relative lines that are set at a fixed proportion of the mean or median. More surprisingly, the absolute lines that are more common in developing countries also show a pronounced gradient amongst all but the poorest countries. Evidently, the set of commodities that are deemed to be necessary to attain basic (personal and social) needs varies systematically with the level of economic development, entailing lines with higher purchasing power in developing countries with higher mean consumption. This holds for both food and non-food needs, though the relativist gradient in absolute lines is stronger for non-food goods.

Some clues as to how absolute lines come to accord with prevailing, country-specific, commodity norms for escaping poverty can be found when one looks more closely at how the lines are set in practice. There are a number of parameters in any objective poverty line, including the precise composition of the bundle of food goods used—even when anchored to fixed nutritional requirements, there are infinitely many food bundles that can assure that those requirements are met—and how one adds an allowance for non-food needs. It is very likely that those parameters are chosen (explicitly or otherwise) to accord with perceptions of what "poverty" means in a given country, such that people living below the line in that country will typically perceive themselves to be poor, while those above it will not. To the extent that there is a reasonably well-defined concept of what "poverty" means in a given country, the parameters of the objective poverty line can be chosen appropriately. Arguably then, what one is doing in setting an objective poverty line in a given country is attempting to estimate the country's underlying social subjective poverty line. A reasonably close correspondence between subjective and objective poverty lines can then be expected—and this is confirmed by evidence—though

arguably it is the subjective poverty line that can claim to be the more fundamental concept for poverty analysis.

There are undoubtedly differences in underlying welfare norms and other country-specific factors that cloud comparisons of national poverty lines. Nonetheless, the chapter has shown that an extended version of the standard theory of true cost-of-living indices can rationalize the relativist gradient found in national poverty lines, without recourse to (seemingly *ad hoc*) differences in the underlying welfare norms for defining poverty. By recognizing that both personal consumption and social (and inherently relative) consumption needs matter to welfare one can understand the relativist gradient in how poverty lines vary across the world in terms of a <u>globally consistent</u> definition of poverty, anchored to a common level of welfare.

That definition does not, however, conform to the relative lines found in developed countries. These lines have been defended in the past on one of two grounds. The first argues that welfare depends on own income relative to the mean income of the country of residence, and (hence) that the poverty line should vary with the mean income of that reference group. The second defense argues that there are social inclusion needs that rise with mean income of the country of residence. The chapter has contended that neither of these arguments is compelling as a justification for strongly relative lines, at least for developing countries. While we can agree that relative deprivation is a welfare-relevant issue, it is very hard to accept that absolute levels of living do not matter independently of relative income. And the social inclusion argument does not imply that the cost of inclusion falls to zero when one is sufficiently poor. It is not surprising that these lines have seemingly perverse properties in practice, for both comparing poverty across countries and monitoring progress against poverty over time.

However, the chapter has argued that the pattern in how poverty lines vary across the world can then be interpreted in a welfare-consistent way, in which welfare depends on <u>both</u> personal consumption and consumption relative to the mean. The weight on relative consumption increases with mean consumption—though the weight is never so high as to make welfare depend solely on relative consumption. This yields a schedule of <u>weakly-relative</u> poverty lines that unify the treatment of "absolute poverty" found in developing countries and "relative poverty" found in developed countries. In the proposed empirical implementation, to be not considered poor in the world as a whole, a person needs to have attained both a minimum level of consumption—around $1.25 a day at 2005 purchasing power parity—and have enough to

cover certain socially-determined needs, which are always positive but rise by $1 for every extra $3 of mean consumption. This fits very well with how poverty lines vary across the developing world. About half the population of the developing world in 2005 was poor by this definition and about half of these lived under $1.25 a day.

Acceptance of the global poverty measures derived from this approach depends on whether one believes that these weakly-relative lines are in fact welfare consistent (albeit for a concept of welfare that embodies social effects). A hard-line "absolutist" might respond that it is really the underlying welfare norms that vary across countries, making their poverty lines an unreliable basis for setting global (weakly) relative poverty lines. That argument cannot be accepted or refuted based solely on the "macro" data on average poverty lines across countries. However, the chapter has also noted that there is a mounting body of micro evidence, including from subjective welfare data, suggesting that relative deprivation does have welfare significance, at least amongst all but the poorest. And the implied relativist gradients from this micro evidence seem to be in rough accord with that implied by comparing poverty lines across the world. Existing data may not prove the case, but they are at least consistent with this global definition of poverty.

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**Figure 1: Density of poverty lines and mean consumption across the world**
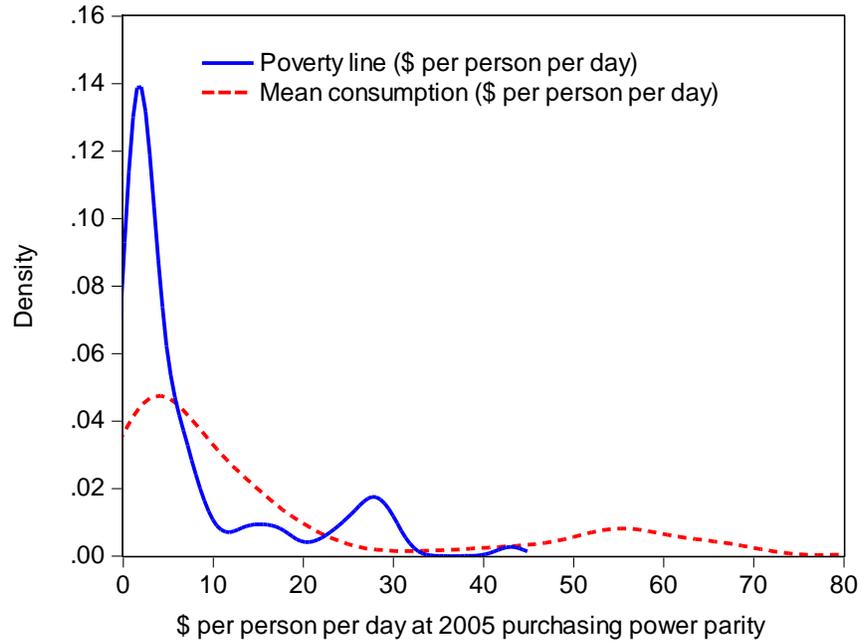
Source: Ravallion et al. (2009) (for developing countries) augmented for this chapter by the author to included OECD countries (Eurostat lines plus official lines for Australia, Canada, Finland, USA).

Figure 2: Poverty lines across countries of the world

(a) All countries (n=95)
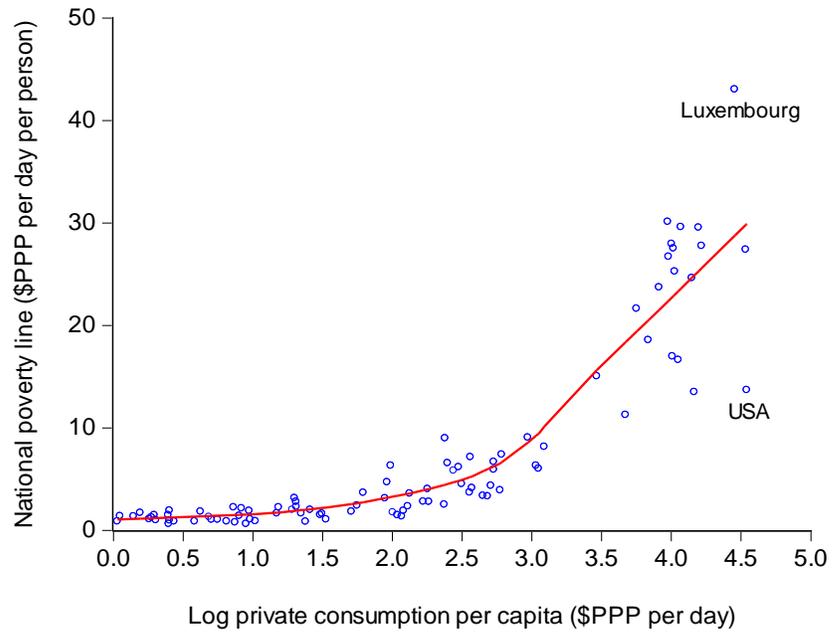
(b) Developing countries only (n=75)
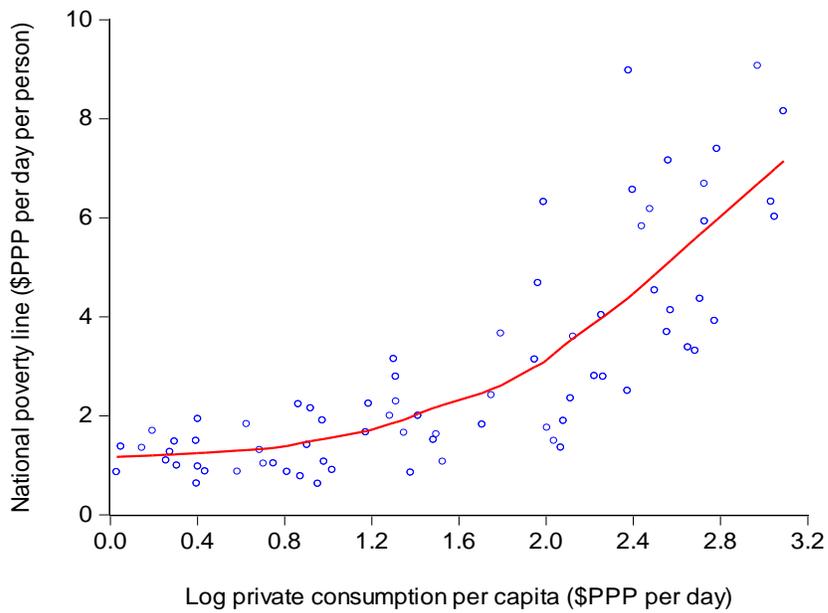
Note: The fitted lines are locally-weighted smoothed scatter plots (bandwidth=0.5)

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Figure 3: Strongly and weakly relative poverty lines

Poverty line

Weakly relative

Strongly relative

Absolute line

0

$y*$

Income