



Chapter 6: Poverty Measurement

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Abstract

The fundamental concept of poverty concerns itself with having too few resources or capabilities to participate fully in a society. Social scientists need to first establish the breadth and depth of the social phenomenon called “poverty” before they can meaningfully analyze it and explore its ultimate causes and remedies. In this chapter, we examine the complexities and idiosyncrasies of poverty measurement from its origins to current practice. We begin with the various concepts of poverty and its measurement and how economists, social statisticians, public policy scholars, sociologists, and other social scientists have contributed to this literature. We then turn to a few empirical estimates of poverty across and within nations. We rely mainly on income data from rich and middle-income nations to provide perspectives on levels and trends in overall poverty, though we refer also to the World Bank’s measures of global absolute poverty. In our empirical examinations we look at comparisons of trends in relative poverty over different time periods, and comparisons of relative and anchored poverty across the Great Recession.

Keywords: Poverty measurement; Relative poverty; Absolute poverty; Anchored poverty; Great Recession

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CONCEPTS, ORIGINS, AND DEVELOPMENT OF POVERTY MEASUREMENT

The fundamental concept of poverty concerns itself with having too few resources or capabilities to participate fully in a society. As Blank (2008) reminds us, "poverty is an inherently vague concept and developing a poverty measure involves a number of relatively arbitrary assumptions." Ultimately, social scientists need to first establish the breadth and depth of this social phenomenon called "poverty" before they can meaningfully analyze it and explore its ultimate causes and remedies. Thus, we turn to measures and comparisons of poverty employed by social scientists within and across nations.

Poverty Measurement—Some History

Social science has traditionally been more interested in the explanation of poverty than in its measurement, although almost all scientists believe that poverty statistics are meaningful social indicators

of basic needs (Piachaud 1987; Townsend 1979; Ringen 1985; Brady 2003). Some interests in poverty center on the ideas of the “culture” of poverty and the effects of “place” on poverty—which are often measured differently and are therefore hard to compare. The urban/central city/ghetto aspects of this issue are well treated in the work of Wilson (1987), Massey and Denton (1993), and Massey (1996).

Harrington’s classic work, *The Other America*, covers rural deprivation as well (Harrington 1981). Most economists and social statisticians prefer strictly quantitative measures of poverty as a social indicator, with some nuanced discussion of why poverty is as it is—be it health and structural factors which limit earnings; or about how the bad “choices” that poor people make might result in poverty. We will have a lot more to say about these measures below.

Roles of culture, power, social structure, and other factors largely out of control of the individual are the main forces that sociologists and social workers use to explain poverty. In general, this school is critical of the economist’s perspective of choice models whereby individuals control their own destiny and are therefore the cause of their own poverty (Piachaud 1987). Some sociologists even feel that poverty has a functional role to play in capitalist society (e.g., Gans 1973).

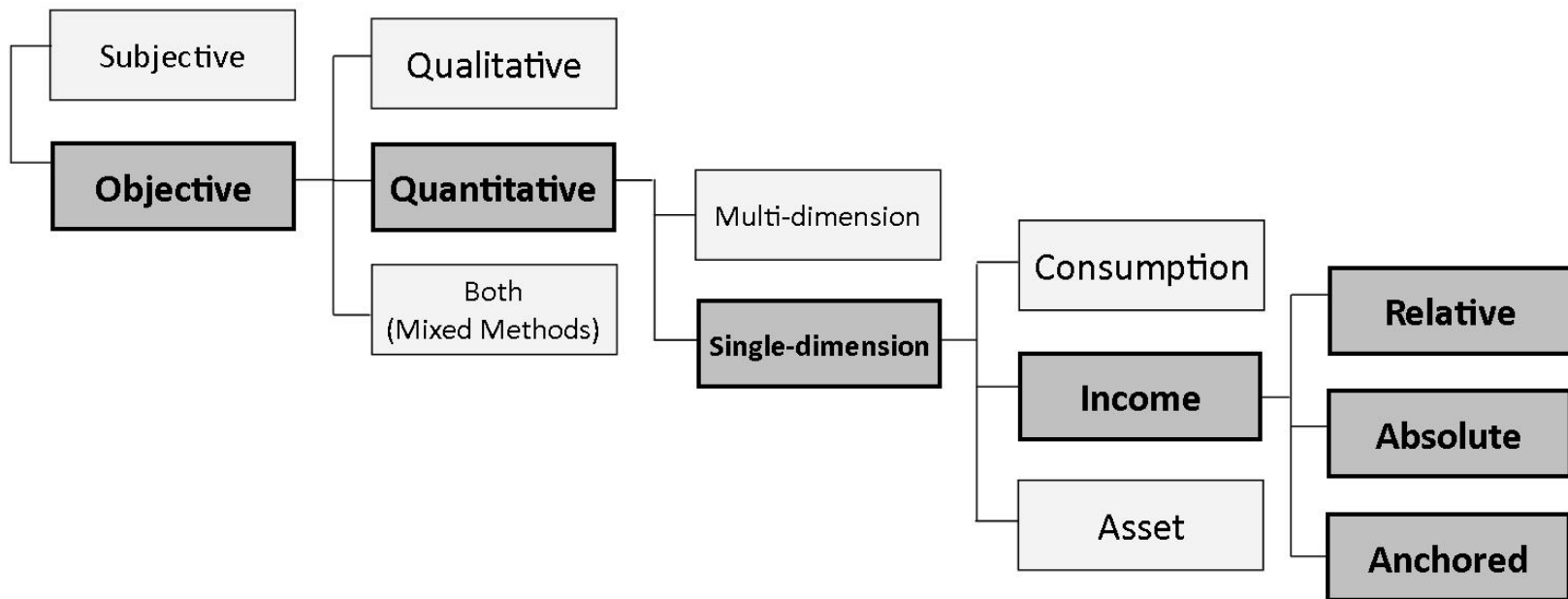
The basic working hypothesis for this window on poverty is that individuals are strongly influenced by the physical and cultural context in which they live. “Neighborhood” exerts a strong influence on behavior and concentrated poverty in central city ghettos and therefore has a strong negative effect on future life chances and long run deprivation. Indeed, in the United States, this has spawned interest in the so-called “underclass,” which goes beyond poverty alone to include all persons with dysfunctional behaviors living in “bad” neighborhoods (Mincy, Sawhill, and Wolf 1990). The European term for a similarly disaffected population is “social exclusion,” which is also beyond the narrow bounds of poverty measurement per se (Room 1999; Hills 1999; Glennerster et al. 1999). Recently several social scientists have tried to separate neighborhood from local school effects, while at the same time noting the increased social and economic segregation within cities and across schools and school districts (Sharkey 2013; Reardon 2011; Katz 2014).

Concepts of Poverty

Our discussion is framed by Figure 1, which reviews most of the possibilities of poverty concepts and measures. The conceptual underpinnings of poverty measures come from economics (Lampman 1964), sociology (Grusky and Kanbur 2006), social statistics (Orshansky 1965), and social policy (Rowntree 1901; Booth 1903). Here we are mostly interested in the concept of objective poverty measures, according to some standard definitions of means versus resources. And in this chapter we are mostly interested in objective and quantitative poverty measurement using a single dimension of “resources,” income, and several notions of “needs” standards: those that are relative, absolute, and, closely related, “anchored” poverty lines. We choose income poverty because of its domination in modern (post-1960s) poverty studies and because of its linkages to the income inequality and social mobility literatures that often closely follow from poverty measures. Other measures and concepts of poverty are also discussed below, but not empirically investigated.

Income or living-standards poverty measurement began in the Anglo Saxon countries and dates back at least to Rowntree (1901), who was the first to employ the concept of a poverty line in his empirical work on York, England. And thanks to his enterprise, and that of Booth (1903) who invented the idea of a poverty line for London, we have a meaningful social indicator of basic needs (see for instance, Townsend 1979, 1993; Piachaud 1987; Ringen 1985; Ravallion 2014a). We also note that official poverty measurement began as an Anglo-American social indicator. But since then, “official” measures of poverty (or measures of “low income”) now exist in over 100 countries and for Europe as a whole (Eurostat 2005). The United States (DeNavas-Walt et al. 2012) and the United Kingdom (Department for Work and Pensions 2012) have long standing “official” poverty series. Statistics Canada publishes the number of households with incomes below a “low-income cutoff” on an irregular basis, as does the Australian government with those below the “Henderson line.” In Northern Europe and Scandinavia the debate centers instead on the level of income at which minimum benefits for social programs should be set. In other words, their concept of insufficient “low income” is directly fed into

Figure 1: Concepts and Measures of Poverty



Source: Adapted from Dhongde (2013).

programmatic responses to social needs (Björklund and Freeman 1997; Marx and Nelson 2013; Ravallion 2014a).¹ Recent years have also seen the development of global poverty measures and global poverty reduction targets whereby a combination of micro-data and other assumptions allows the World Bank and others to estimate world poverty.

Figure 1 suggests that objective studies of poverty can be both qualitative (or ethnographic, see Harrington 1981; Leibow 1967) or quantitative (as focused upon here). Perhaps the most powerful approaches to poverty measurement are situations where both qualitative and quantitative work is combined, in both rich countries (Edin and Lien 1997; Halpern-Meekin et al. 2014; Tach and Halpern-Meekin 2013) and poor countries (Carvalho and White 1997). But these “mixed methods” studies are almost by definition difficult to compare across nations or to repeat over time on a fixed (say, annual) scale.

While poverty measurement is an exercise that is particularly popular in the English-speaking countries, most rich nations share the Anglo-Saxon concern over distributional outcomes and the well-being of the low-income population. There is no international consensus on guidelines for measuring poverty, but international bodies such as the United Nations Children’s Fund (UNICEF 2000), the United Nations Development Programme (UNDP 1999), the Organization for Economic Cooperation and Development (OECD 2008, 2013), and the European Statistical Office (Eurostat 1998, 2005), have published several cross-national studies of the incidence of poverty in rich countries. A large majority of these studies have been based on the Luxembourg Income Study (LIS) database, which can be accessed at www.lisdatacenter.org. Some examples of these studies include Brady (2003, 2005, 2009); Brady et al. (2010); Förster (1993); Jäntti and Danziger (2000); Smeeding, Rainwater, and Burtless (2000); Kenworthy (1998); Smeeding, O’Higgins, and Rainwater (1990); Rainwater and Smeeding (2003); and

¹In addition to these objective poverty measures, several economists have used subjective measures of poverty and well-being, including income sufficiency (Ravallion 2014; van Praag 1968; Groedart et al. 1977; Clark and D’Ambrosio 2014).

Smeeding (2006). More recently, the European Union (2005) and the OECD have regularized measurement of poverty but using different standards and data sources.

Today one can find poverty measures in over 100 countries, and some harmonized measures from the World Bank that use both secondary (published) data- and micro data-based measures of consumption and income to determine those living below some particular amount of income per person day (Ravallion and Chen 2011; Chen and Ravallion 2012). Much of their work centers around an absolute poverty line of \$1.25 per day (Chen and Ravallion 2010, 2013; Ferriera and Ravallion 2009). Global poverty estimates involve two sets of data: national income and consumption surveys (collated in the World Bank's PovcalNet) and international data about prices around the world, the ICP, which compares what people buy and at what local currency price they buy those things to come up with a "purchasing power parity" (or PPP) exchange rate, designed to equalize the power of, say, a renminbi to buy what Chinese buy with the power of a dollar to buy what an American buys.

One important issue here is the use of PPPs. Indeed in May of this year, a new set of PPPs was released by the International Comparison Program (2011), which appears to have halved the number of people living on \$1.25 per day, falling from 18.9 percent to between 8.9 and 11.2 percent! (Dykstra, Kenny, and Sandefur 2014). This result is largely because the PPPs for China and India rose dramatically, meaning that the same amount of local currency could buy much more than previously estimated. For instance, India's 2011 current PPP per capita from the World Bank World Development Indicators is \$3,677, but by the new ICP PPPs it has risen to \$4,735, cutting Indian poverty from almost 400 million persons to just over 100 million persons. Clearly the sensitivity of the results to PPPs is central to this argument. But surely we have made vast progress in the fight against world poverty as well (Chen and Ravallion 2013; Ravallion 2014b).

MEASURING POVERTY

Most broadly, the measurement of poverty in rich, poor, and middle-income nations involves the comparison of some index of household well-being with household needs. When command over

economic resources falls short of needs, a household (or person or family) is classified as poor. Here well-being is economic, referring to the material resources available to a household. The concern with these resources among most social scientists is generally not with material consumption alone, but also with the capabilities such resources give to household members so they can participate fully in society (Sen 1983, 1992; Brandolini, Magri, and Smeeding 2010). These capabilities are inputs to social activities, and participation in social activities in return gives rise to a particular level of well-being (Rainwater 1990; Coleman and Rainwater 1978). Methods for measuring a person's or household's capabilities differ according to the context in which one assesses them, either over time or across nations or among subpopulations within a nation, for example, rural versus urban India.

All advanced societies are highly stratified and, hence, some individuals have more resources than others. The opportunities for social participation are affected by the resources that a household disposes. These resources, the "family income package" (Rainwater and Smeeding 2003) come from personal effort (earnings), family efforts, and others outside the household, principally governments but also other third parties like nonprofits. Money income is therefore a crucial resource, as are "near-cash" benefits in-kind, which are close substitutes for money, for instance, housing allowances or food vouchers. Of course, there are other important kinds of resources, such as social capital, wealth, noncash benefits, primary education, and access to basic health care, all of which add to human capabilities (Coleman 1988). These resources may be available more or less equally to all people in some societies, regardless of their money incomes. But there are also many forces in rich societies which reduce well-being by limiting capabilities for full participation in society, including inadequacies in neighborhoods where people live, racial and ethnic discrimination, neighborhood violence, low-quality public schools and other social services, lack of good jobs, and job instability, all of which increase economic insecurity, reduce human capabilities, and increase poverty, as dozens of analysts, including those mentioned above, have established.

Because there is no single commonly accepted way to measure poverty among social scientists, there is a desire to go beyond the popularly used income poverty definition employed in this article. And

so there exists a wide variety of additional poverty measures that substitute for or complement the preponderance of income-based measures used by quantitative sociologists and economists (e.g., see Haveman 2009; Ruggles 1990; Boltvinik 2000). In principle, poverty is a multidimensional concept and should reflect several aspects of personal well-being as shown in Figure 1. Forms of deprivation other than economic hardship can certainly be relevant to poverty measurement and to antipoverty policymaking. A number of authors have suggested that separate measures of needs ought to be developed for different goods and services (Aaron 1985). Housing and health care are often mentioned in this context, though the latter is particularly of interest in medically unequal nations such as the United States, while the former is of much greater interest in the United Kingdom (U.K. 1993).

The concept of multi-dimensional poverty is also flourishing in sociology and economics. Official measures of social exclusion, material deprivation, and material hardship exist mainly in Europe, and are beyond the empirical bounds of this chapter. Europe adopted the official Laeken set of social indicators in 1995, including the at-risk-of-poverty indicator, with an explicit objective of reducing poverty and social exclusion (Marlier et al. 2007). Indeed, indicators of material deprivation now form part of the Europe 2020 target of poverty reduction (Atkinson and Marlier 2010: Chapter 6).

Both consumption poverty and asset poverty have been proposed as an alternative to income poverty in rich nations (Meyer and Sullivan 2012a, 2012b; Brandolini, Magri, and Smeeding 2010). And in a few nations, asset and income poverty can be combined into a joint measure (Gornick, Sierminska, and Smeeding 2009) as can consumption and income poverty (Meyer and Sullivan 2012a, 2012b). But consumption and asset poverty measures are not yet ready for widespread use on a cross-national basis, despite their usefulness for some types of poverty measurement (e.g., many income-poor elderly consume more than their incomes due to dissaving and spending from assets). Definitions of consumption vary widely across and within nations, and most consumption databases actually are constructed to measure weights for the Consumer Price Index, and hence measure expenditures, not actual consumption. This leaves one with the problem of how to value durables consumption, so called “imputed rent,” where one consumes housing services for below average prices, and so on (Fisher, Johnson, and Smeeding 2014).

There has been little work on cross-nationally harmonized consumption measures, making such comparisons difficult. Asset poverty creates similar challenges, as liquidity is an issue and while cash on hand is a good measure of ability to withstand a negative shock to incomes, how to value less-liquid assets, like housing, are not yet resolved (Gornick et al. 2009). But here at least there have been some attempts at cross-nationally comparable databases (e.g., the Luxembourg Wealth Study, at <http://www.lisdatacenter.org/our-data/lws-database/>).

Likewise, the study of time poverty has not yet reached prominence, though its importance is denied by no one (Vickrey 1977). These studies mainly point to those who work long and hard hours, but then have little time, in both rich (Heggeness, Flood, and Pacas 2013) and poor countries (Bardasi and Wodon 2009).

In summary, following the shaded boxes in Figure 1, we are interested primarily in objective, quantitative, comparative cross-national poverty measured in income terms. Not only because income-based poverty measures are more comparable across nations, but also because income-based poverty allows us to connect our empirical work and poverty measurement to overall inequality as well. As mentioned above, income is generally a better measure of resources than consumption in rich countries. In the rapidly growing middle-income countries, the differences in living standards between rural and urban populations cause the most angst over consumption versus income poverty. In poor nations, most find it easier to measure consumption, largely because of food produced for (or bartered for) own consumption and informal work. And indeed, the most inclusive concept of income and consumption derives from the suggestions of Haig and Simons. Haig (1921) stated that income was “the money value of the net accretion to one’s economic power between two points of time”; and Simons (1938) defined personal income as “the algebraic sum of (1) the market value of rights exercised in consumption and (2) the change in the value of the store of property rights between the beginning and end of the period in question.” Hence income and consumption differ only by net wealth or debt, which is less a problem for the poor than other income groups.

But the richer the country, the more income becomes a better and more comparable measure. At the frontier of such comparisons, LIS work on “production for own consumption” and “informal labor” income help ease the comparisons across diverse areas within nations and bring expanded income much closer to consumption as a poverty measure for middle-income countries like China and Brazil.

Absolute, Relative, and Anchored Poverty in Rich And Selected Middle-Income Countries

An absolute poverty standard is defined in terms of a level of purchasing power that is sufficient to buy a fixed bundle of basic necessities at a specific point in time. A relative standard, on the other hand, is defined relative to the typical income or consumption level in the wider society. The purchasing power of a relative poverty standard will change over time as society-wide income or consumption levels change, while an absolute poverty standard will change only with the prices of commodities it can buy and as seen above, with the currency exchange mechanism (PPP) to convert one currency’s buying power into another. Most cross-national comparisons use the relative definition of poverty, especially since purchasing power parities to convert any absolute measure to country currency are subject to fluctuation and sometimes severe measurement error (Jäntti and Danziger 2000; Dykstra et al. 2014).

And, in the broadest sense, all measures of poverty or economic need are relative, because context is important to the definition of even “absolute” needs. The World Bank uses poverty measures of \$1.25 to \$2 per person per day (in 2005 dollars)—or \$1,095 to \$2,190 per year for a family of three—for the developing nations of Africa, Central Asia, or Latin America (Chen and Ravallion 2012). The measures may make little sense for a rich country today, but might have as a post-Civil War poverty line set in the late 1860s. The concept of “extreme” poverty, living on less than \$2 in cash per day, or less than 50 percent of the U.S. absolute poverty line, has recently been studied in the United States by Shaefer and Edin (2013). But of course living rent-free with others or adding food stamps and other income in kind can radically change the real level of living in such cases.

In contrast, the 2011 U.S. “absolute” poverty threshold was about \$18,000 for a family of three—8 to 17 times the World Bank’s poverty line (depending on family size). And absolute and relative

measures may also differ substantially within and across nations. One-half of median income, the preferred relative poverty standard in the United States, is another 25 to 30 percent above the official U.S. poverty line or 10 to 21 times the poverty standard in poor countries. Moreover, as economic inequality has increased in most rich societies over the past 20 years, the study of relative deprivation and poverty has taken on a new life (Gottschalk and Smeeding 2000; Gornick and Jäntti 2013; OECD 2011, 2013).

Cross-national comparisons of poverty in rich countries therefore rely heavily on openly and directly relative concepts of poverty, which are a reflection of the fact that a poverty standard or a minimum income standard ought to reflect the overall standard of living in society. One early source of this formalization (Abel-Smith and Townsend 1965) came about in arguing that the officially defined minimum level of income in the United Kingdom, as represented by the National Assistance scale, should increase with the rising standard of living, and not just with consumer prices. It was Townsend's work in the early 1960s culminating in his famous 1979 book that really launched the relative poverty approach on a much wider scale.

As Townsend (1979: p. 31) wrote:

“Individuals, families and groups in the population can be said to be in poverty when they lack the resources to obtain the type of diet, participate in the activities and have the living conditions and the amenities which are customary, or at least widely encouraged or approved in the societies to which they belong.”

The measurement of relative poverty has more recently been generally operationalized with a definition of the poverty line as a fraction of median income. Cross-national studies typically compare the percentage of persons living with income below some fraction of the family-size-adjusted national median income.

Measurement of relative poverty in the United States also began in the 1960s and was pioneered by Fuchs (1967), who followed the thinking of Townsend and Abel-Smith and linked relative and absolute income poverty measurement. When Fuchs began his study, the absolute poverty measure in the United States begun by Lampman (1964) and then Orshansky (1965) was based on a poverty line of about

\$3,000 for four persons. Fuchs pointed out that this was half of median income at that time and that one could think differently about relative poverty compared to absolute poverty (Gilbert 2008: p. 136).²

A relative poverty measure comparison is also consistent with a well-established theoretical perspective on poverty (Sen 1983, 1992; and again, Townsend 1979). However, the fraction of income at which the poverty line ought to be set is open to debate. Most cross-national studies (LIS, OECD) focus on half of the median income, following Fuchs and others. But many feel that a 50-percent-of-median standard is too low. It implies a poverty cut-off well below half the mean in unequal societies,³ and it also affects the country rankings.⁴ The European Statistical Office Working Group on Poverty Measurement has employed 60 percent of the national median income as the common poverty threshold for European Community poverty studies in the new millennium (Eurostat 2005).

A fully relative measure of poverty changes in lock step with median income, while an absolute measure changes only with prices. The income elasticity of the poverty line is therefore between zero for the absolute measure and one for the fully relative measure. In some countries, such as the United States, the measure of poverty has become “semi-relative” or “quasi-relative” as the poverty line advances only with the living standards of the bottom part of the distribution and not the whole distribution. Ravallion and Chen (2011) refer to these as “weakly relative measures,” which have the feature that the poverty line will not rise proportionately to the median or mean, but will have income elasticity less than unity. These are also called “quasi-relative” poverty standards in the new “Supplemental Poverty Measure” for the

²Lampman’s chapter “The Problem of Poverty in America,” (Council of Economic Advisors 1964) preceded President Johnson’s declaration of the “War on Poverty” in his 1964 State of the Union Address. But while Lampman used \$3,000 of money income for his measure, it was not adjusted for family size. Orshansky (1965) produced a measure that had a similar poverty count, and a similar poverty line for a four-person family, but which differed by family size. In the late 1960s, Orshansky’s measure became the official U.S. poverty measure.

³Most relative poverty or deprivation measures rely on the median not the mean income, especially in cross-national studies, because the latter may be affected by sampling and non-sampling error in different surveys. Moreover the reference to the standard of living enjoyed by the middle or average family means the median family. See Smeeding et al. (1990).

⁴See LIS key figures for country poverty rates at 40, 50, and 60 percent of the median, at <http://www.lisdatacenter.org/data-access/key-figures/search/> and compare rankings there with European community rates from Eurostat (2012).

United States, which varies by considering expenses on basic needs for a low-income family and how they change over time (Short 2012). That is, the poverty line changes with low-income persons' expenses for food, clothing, and shelter. While these do rise and fall with median income in the United States, they change by less than does median income itself (see Johnson and Smeeding 2012).

In my opinion, it is worthwhile to consider both absolute *and* relative poverty measures because they tell different things about living standards as well as deprivation. Increasingly, the idea of “anchored” poverty measures⁵ has become important as they can be employed to indicate both relative (or weakly relative) and absolute poverty trends within a given nation. Anchored poverty measures begin with the same fully or weakly relative measure in one year (t) and then compare relative poverty in some future year (say year $t+10$) to poverty measures against a poverty line that has been changed only for prices between year t and year $t+10$. These measures are especially useful in periods of rapid expansion *or* contraction in an economy, where relative poverty may not change by a lot, but where absolute poverty does change due to economic growth or contraction (see Atkinson et al. 2002; Smeeding 2006; Brady 2009; Johnson and Smeeding 2012; Wimer et al. 2013; OECD 2013). Any absolute poverty line is also therefore an anchored poverty line. The difference is that an anchored poverty line can be updated to any period which is policy relevant, given the analysis. As suggested above, the absolute (or anchored) U.S.-Orshansky poverty line for the 1960s was about the same as a fully relative half-median-income measure at that time. The United States has anchored its “official” poverty measure at this same point since that date. Now 50 years later, the U.S. poverty line is only at about 30 percent of median income, not the 50 percent it was at its inception (Smeeding 2006). Hence, analysts prefer to anchor their U.S. poverty studies at a semi-relative line (Johnson and Smeeding 2012).

Here, for simplicity and breadth, we focus exclusively on the “headcount” measure of poverty, the share of people who fall below some definable point that indexes poverty. This approach does not

⁵The idea of an anchored poverty line was developed by Atkinson (et al.) for the European Union in 2002 and Smeeding for a wider range of countries (2006). While on some occasions, it produces difficult to explain results (Brady 2009), it does offer a glimpse at how a society is progressing compared to a given absolute living standard, which is more time-wise proximate to a fully relative measure.

measure the depth of economic need, the poverty gap, or the severity of poverty. People who are poor could become richer or poorer, with no change in a headcount measure of poverty. A pragmatic reason for using the poverty gap is that the headcount may be quite sensitive where there are spikes in the distribution, due to the payment of flat-rate social transfers such as minimum social retirement level (or changes to the minimum wage).⁶ Others, see especially Sen (1976) and Foster, Greer, and Thorbecke (1984), focus on poverty measures that examine the distribution of poverty among the poor, taking account of both the depth of poverty and its severity. Because headcount measures are more easily understood, compared, and implemented than other, more complex measures, we rely on them below.

The data we use are taken from LIS and sometimes OECD, and are limited mainly to rich and middle-income countries. The OECD includes a large number of rich nations, but also Chile, Mexico, and Turkey. Both LIS and OECD have been interested in the “BRICS” countries (Brazil, Russia, India, China, and South Africa). LIS has also expanded to include other Latin American nations and Mexico. But in order to establish trends in income poverty, one must have at least a decade or two of data, and here the number of middle-income countries we can examine is severely limited.⁷

The Unit Of Account Adjustments For Household Size and Periodicity and Persistence

Measurement of poverty also requires that one consider the unit of account where income or consumption is shared; how needs can be adjusted to take account of the size of the relevant unit; and the periodicity of poverty measurement as well as the length of time one is poor, or persistence. While the United States focuses on families (those related by blood, marriage, or adoption) and unrelated individuals (wherever they may live), this leaves couples living together outside of marriage (so called

⁶A pragmatic reason for not using the poverty gap, especially in cross-national studies, is that underreporting of incomes, the definition of incomes, and editing for item non-response may differentially affect the lowest incomes and overstate the poverty gap.

⁷Indeed, we do not use the Eurostat (2012) poverty measures for two reasons. First, both the LIS and OECD measures rely on the same European Union Survey of Low Income and Living Standards (EU-SILC) data for most of the European Union Nations and, second, because the EU-SILC data are very recent, starting only in 2005.

“cohabiting couples”) to be treated as two unrelated individuals, thus ignoring any resource sharing amongst them. The new SPM measure treats cohabiters (including those with children) as married couples and in so doing reduces measured poverty by two or more percentage points in the United States (Short 2012). Internationally, the preferred unit of account is the household, all those sharing one set of living quarters. The assumption is that while not all resources need be shared equally, the economies of scale for living together are large enough to make the household unit the most relevant for determination of poverty. Indeed even if food and clothing budgets are fully individualized, the act of sharing a common structure (heat, lights, and living spaces) is such that the economies of scale help increase the consumption of each unit enough to help them overcome poverty if sufficient total resources are available to the household.

The issue of how much economies of scale are available to households is called the equivalence scale issue. The basic point is that two can live more cheaply together than apart, because of shared resources, and then four more cheaply than two. The question is how do “needs” for food, clothing, and shelter vary as household size (and composition) changes. One of the most common scales is the single-parameter constant-elasticity equivalence scale reviewed by Buhmann et al. (1988) and Ruggles (1990), which is used most often in international comparisons of poverty (Rainwater and Smeeding 2003). In general, the constant elasticity scales are given by $(\text{family size})^\epsilon$, in which ϵ is the scale elasticity. Notice that if the elasticity equals one, then the scale equals family size, there are no assumed economies of scale in living arrangements, and the equivalent resources are simply the per-capita resources. The World Bank is often criticized because their poverty line is in terms of a given number of dollars a day per person, and hence allows for no economies of scale—the poverty line for a household of 8 is just 8 times the individual poverty line. Alternatively, if the elasticity equals zero then there is no adjustment for family size, there are complete economies of scale in living, and the marginal cost of another person is zero. Following the suggestions by Ruggles (1990) and Buhmann et al. (1988), much research uses an elasticity of 0.5. This scale indicates that the resources for a two-person family must be 41 percent more than that

of a single-person family for the two-person family to have the same standard of living as the single-person family.

Some scales adjust for more than just the number of adults and children in the family. For instance, the scales implicit in the poverty thresholds adjust for the age of the household head. And the new three-parameter scale (see Betson 1996; Short et al. 1999) used in the Census Bureau's Supplemental Poverty Measure provides more economies of scale between singles and childless couples, which are more similar to those in the poverty scale.

The choice of equivalence scale can affect the level and trend in poverty. Coulter, Cowell, and Jenkins (1992) demonstrate that the constant elasticity equivalence scale yields a U-shape relationship between poverty and the scale parameter, ϵ . Johnson (2004) compares alternative scales and shows that the choice of scale has a dramatic effect on the relative standard of living of different families. A lower equivalence scale implies that the family's resources will be adjusted upward, hence, increasing their equivalent resources. For example, single adults will have a higher standard of living relative to the reference group under the three-parameter scales (compared to the poverty scales).

But in all cases of poverty measurement, except for the World Bank, everyone agrees that a household size adjustment is necessary. Once an equivalence scale is adopted, one can either vary the poverty line by household size or mix, or adjust income for the equivalence factor and compare it to one single poverty line, be it a relative, absolute, or anchored line.

Finally, periodicity and persistence are aspects that must be mentioned. The period used by most analysts is the calendar year. That period may in fact be too long for poverty measurement, as many low-income households live month to month or even week to week. However, the survey vehicles that gather data for measurement are almost all based on the calendar year, both within and especially across countries. And so we use annual data below.

The introduction of panel data has allowed analysts to measure poverty across several periods, say, years, to see how persistent poverty is, and to assess first the events which led to persons moving into a spell of poverty, then the event associated with moving out. Some of the best studies to date on this

topic include those in the United States (Bane and Ellwood 1986; Stevens 1999, 2011; Blank and Card 2008; Cellini, McKernan, and Ratcliffe 2008), Great Britain (Jenkins 2011) and Europe (Layte and Whelan 2003; Vandecastel 2010). The topic deserves more study.

MEASURING THE LEVEL AND TREND IN POVERTY

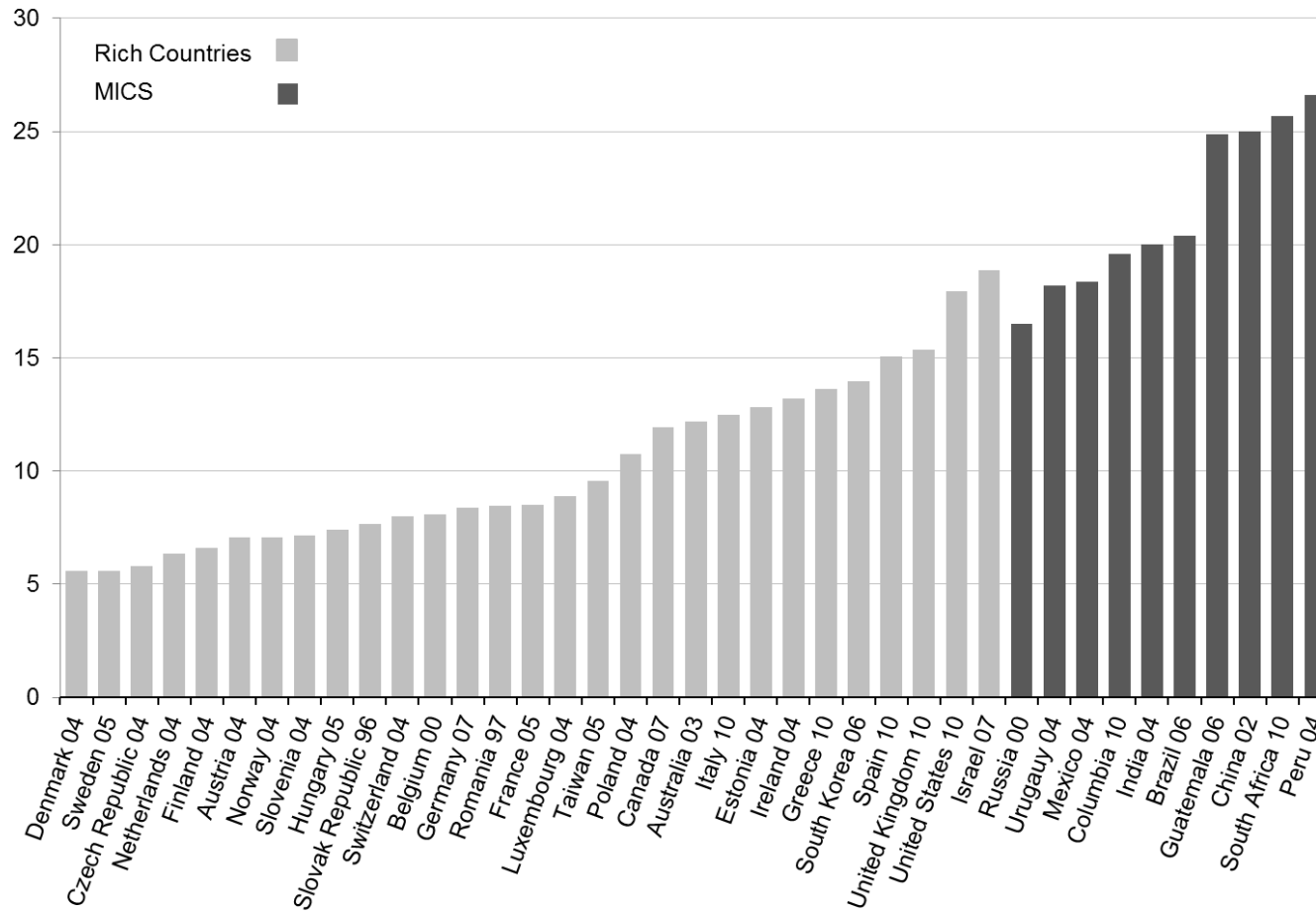
We examine the level and trends in poverty in a set of graphs and one table, all based on the LIS key figures dataset, plus some special tabulations to determine the level of anchored poverty using both LIS and OECD data. The percentage of persons living below the half-median poverty line can now be examined for 38 nations using the LIS data (Figure 2). The 28 light-shaded nations are the richest Anglo-Saxon, EU, and OECD nations; the 10 darker bars are for the MICS: Russia, the BRICS nations, and several South American nations.⁸ The measure of resources we use is “adjusted disposable income,” which includes earnings and capital income, net of direct (income and payroll) tax and gross of net transfers (both cash and near-cash benefits), income adjusted by an equivalence scale. This income measure is the current widely accepted income measure, endorsed by the Canberra Reports (2001, 2011) on income distribution statistics. The only difference is that the OECD and LIS use slightly different equivalence scales to adjust for household size and composition. But the same scales are used for all nations within each group of studies.

Levels

If a “less poor” country is one with a “single digit” poverty rate (where between 5 and 10 percent of its population is poor), 17 countries have hit that target in the mid- to late-2000s, as shown in Figure 2. The Scandinavian and Nordic nations are generally lowest, along with a number of “middle” Western, Central, and Eastern European nations who have joined the EU 27, (from Belgium and the Netherlands west to Luxembourg, Germany, France, Austria, plus Switzerland, the Czech Republic, Slovakia,

⁸The Eurostat (2005) produces poverty measures for all 27 EU nations now, including some which are not captured in either OECD or LIS data and measures of poverty depth and severity as well. But their figures are at the 60 percent of poverty level and are not comparable to the half median figures in LIS and OECD.

Figure 2: Relative Poverty Rates for Total Population (mid- to late 2000s) Using LIS Data



Note: Poverty is measured by the percentage of persons living in households with family-size-adjusted income below half the median national income.

MIC = middle-income country.

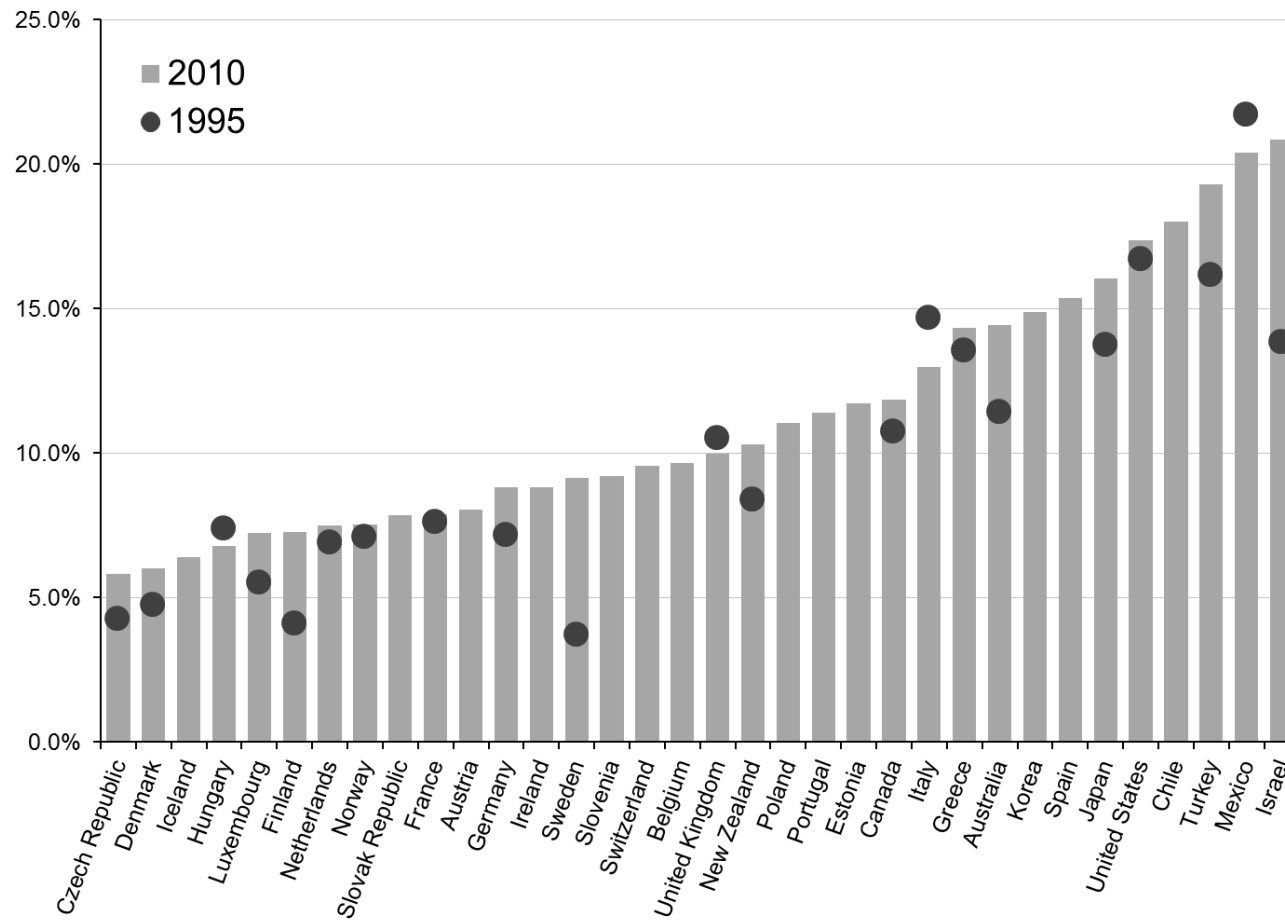
Hungary, Slovenia, and Romania). This pattern has been more or less the same since the first LIS measures appeared 20 to 25 years ago (Smeeding, Rainwater, and O’Higgins 1990; Atkinson, Rainwater, and Smeeding 1995), though the number of nations has now expanded considerably. Taiwan weighs in with the 17th lowest poverty rate—about 9.5 percent. Another nine nations have relative poverty rates from 10 to 15 percent, including Italy, Spain, Greece, Poland, Estonia, Canada, Australia, Ireland, and South Korea. Three rich nations are between 15 and 19 percent: the United Kingdom (15), the United States (18), and Israel (19). Moving to the MICs, six countries overlap the three rich nations in the 15 to 20 percent range, with Russia having a poverty rate below the United States and Israel, and Uruguay and Mexico more or less even with the United States. Finally, Colombia, India, and Brazil were all at 20 percent poverty. Poverty rates are 25 percent and above in Guatemala, China, South Africa, and Peru. In short, the range of comparable relative poverty rates from the most comparable cross-national data source varies by a factor of five.

The OECD data in Figure 3 provide essentially the same picture, but with all nations measured in 2010, compared to 2002 to 2010 in Figure 2. The OECD data are not actually harmonized, but are collected for country experts using a common formula. In general they are closer to the LIS “gold standard” rates. The OECD data also add a few nations (Iceland, Chile, and Turkey) to those in Figure 2 and also present some data on 15-year trends in poverty, where available. Here Israel leads the league in the table of poverty, with headcount rates surpassing 20 percent. The advantage of the OECD data is its rapidity of observation with 15-year trends up through 2010 and beyond. Because it is clear that relative poverty rates may change substantially over short periods of time, and especially since 2005, such timely observations are very useful.

Poverty in LIS (and in OECD data)⁹ is typically somewhat higher among children (Figure 4). Poverty averaged 13.5 percent among the countries for the total population, but 16.5 for children. The correlation between child poverty and poverty in the total population is, however, quite high at .91, as

⁹Here we look only at LIS data in Figure 4. For more on other OECD nations, see OECD (2008, 2013)

Figure 3: Levels and Trends in Relative Poverty in OECD Nations: 1995–2010



Source: OECD Income Distribution Database (via www.oecd.org/social/income-distribution-database.htm)

Note: Poverty is measured by the percentage of persons living in households with family-size-adjusted income below half the median national income.

reflected in Figure 4. The slope of the regression line in Figure 4 is 1.32, suggesting that child poverty rises about 1/3 faster than does overall poverty in these nations. The same sets of countries that are “high,” “middle,” and “low” poverty countries in Figures 2 and 3 also fall in the same relative positions for child poverty, but in some nations, like Uruguay and Brazil, child poverty is disproportionately higher than overall poverty. In South Korea, child poverty is substantially lower than overall poverty. In the others, child poverty and overall poverty track each other closely. In general, poverty among the elderly is both lower and falling compared to that among children, which is higher and rising in most nations (LIS Key Figures; OECD 2013: Figure 8).

Trends

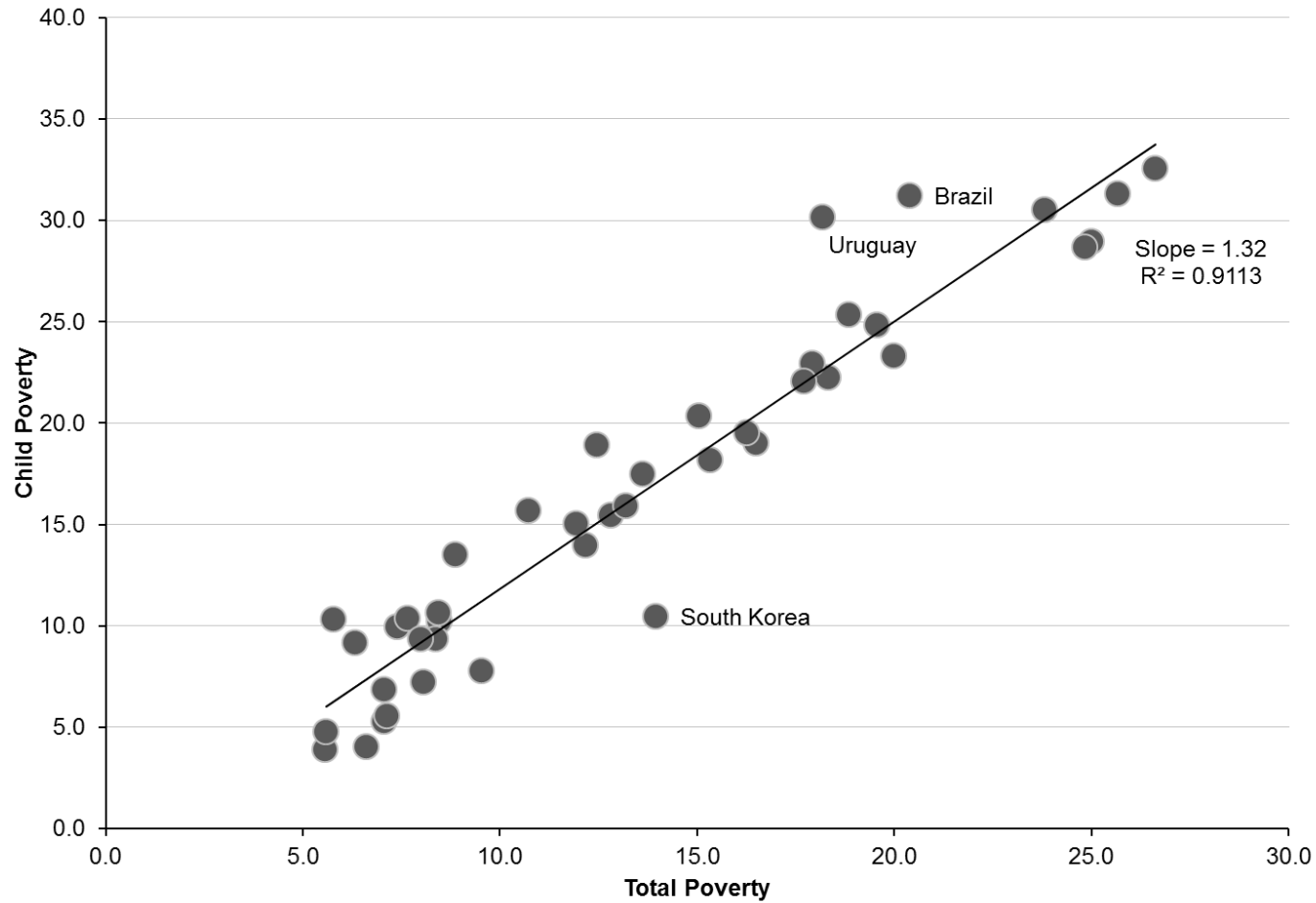
Relative poverty trends using these same measures can be evaluated using the same data. The various time series allow us to break the countries into several different groups based on the range of years over which data are available and geographic/institutional comparability. The LIS data allow trends for 14 different countries as far back as since 1979.¹⁰ Shorter term trends from 1995 to 2010 are best illustrated using the OECD data in Figure 3 where we have such data for 21 nations, but the longer term LIS trends (not shown here) are also interesting.

In analyzing trends in poverty, we are interested in both the direction of change and its magnitude. One finding from the LIS data series is that none of the 12 rich countries with the longest series of data back to 1979 have poverty that is appreciably (3 percentage points) lower in the most recent year than in the initial year of data from the late 1970s or early 1980s.¹¹ The shorter term trend data from

¹⁰These 14 are the four Anglo-Saxon nations: the United States, United Kingdom, Canada, and Australia; five central European nations: Belgium, Germany, France, Netherlands, and Switzerland; two Nordic nations, Norway and Sweden; and three other nations: Israel, Mexico, and Taiwan.

¹¹Appreciably here means a more than 3 percentage point change. Atkinson and Marlier (2010) discuss the definition of a salient change in the poverty percentage, explaining that there are both supply (sampling error and other design elements) and demand considerations (use of the figures). They end up applying a 2 percentage point change criterion. The period examined here is a much longer one, so we choose 3 percentage points as the cutoff. The lines in Figure 5 show the 3 percentage point bounds in each panel.

Figure 4. Correlation between Total Population Poverty (horizontal) and Child Poverty (vertical) in 38 Rich and Middle-Income Countries (Late 2000s Using LIS Data)



Note: Poverty is measured by the percentage of persons living in households with family-size-adjusted income below half the median national income.

the OECD (1995 to 2010 in Figure 3) suggests that relative poverty fell only in Italy and Mexico over that period, but both by less than 3 percentage points.

Each of the other rich countries with long-term trends has seen poverty rise or remain flat. Two countries stand out for particularly large increases; Israel and the United Kingdom each had poverty rates more than 6 points above their 1979 origins by the late 2000s. Poverty also rose steadily in the United States and Germany, increasing by about 3 percentage points in each, and by 4 points in Taiwan and more than 3 points in Belgium from 1979 until the late 2000s. The rest generally stayed within plus and minus 3 percentage point bands from the origin rate until the final year. The Nordic countries stand out as a cluster for seeing very little change in relative poverty according to the LIS data. In contrast, the OECD data in Figure 3 shows a massive increase in Swedish poverty, coming mostly after 2005 and almost no change from 1995 to 2010 in the United Kingdom. While relative poverty more than doubled in Sweden, appreciable increases can also be found in Australia, Finland, Israel, and Turkey over the 1995 to 2010 period (Figure 3).

While lessons can be drawn about the importance of the start and end dates in terms of volatility, as well as differences across data sources, these trends suggest that progress against relative poverty was uneven and rare in rich nations over the past 20 to 30 years. Other than in Mexico, relative poverty rates were not consistently falling over the past 25 years in any of the nations we examine here.¹²

RELATIVE VS. ANCHORED POVERTY AND THE GREAT RECESSION

A different way to examine progress against poverty is to take a set of OECD nations and examine changes in both relative and anchored poverty in 12 nations over an 8- to 15-year period using LIS (Table 1) or across the shorter period of the Great Recession (GR), from 2005 or 2007 to 2010 (Figure 5). On average, relative poverty did not change much in LIS between the mid-1990s and the mid- to late 2000s, but anchored poverty fell by about a third from 11.7 to 8.0 percent in Table 1, suggesting

¹²Ferreira de Souza (2012) also suggests that both poverty and inequality are falling in Brazil over the 1995 to 2009 period.

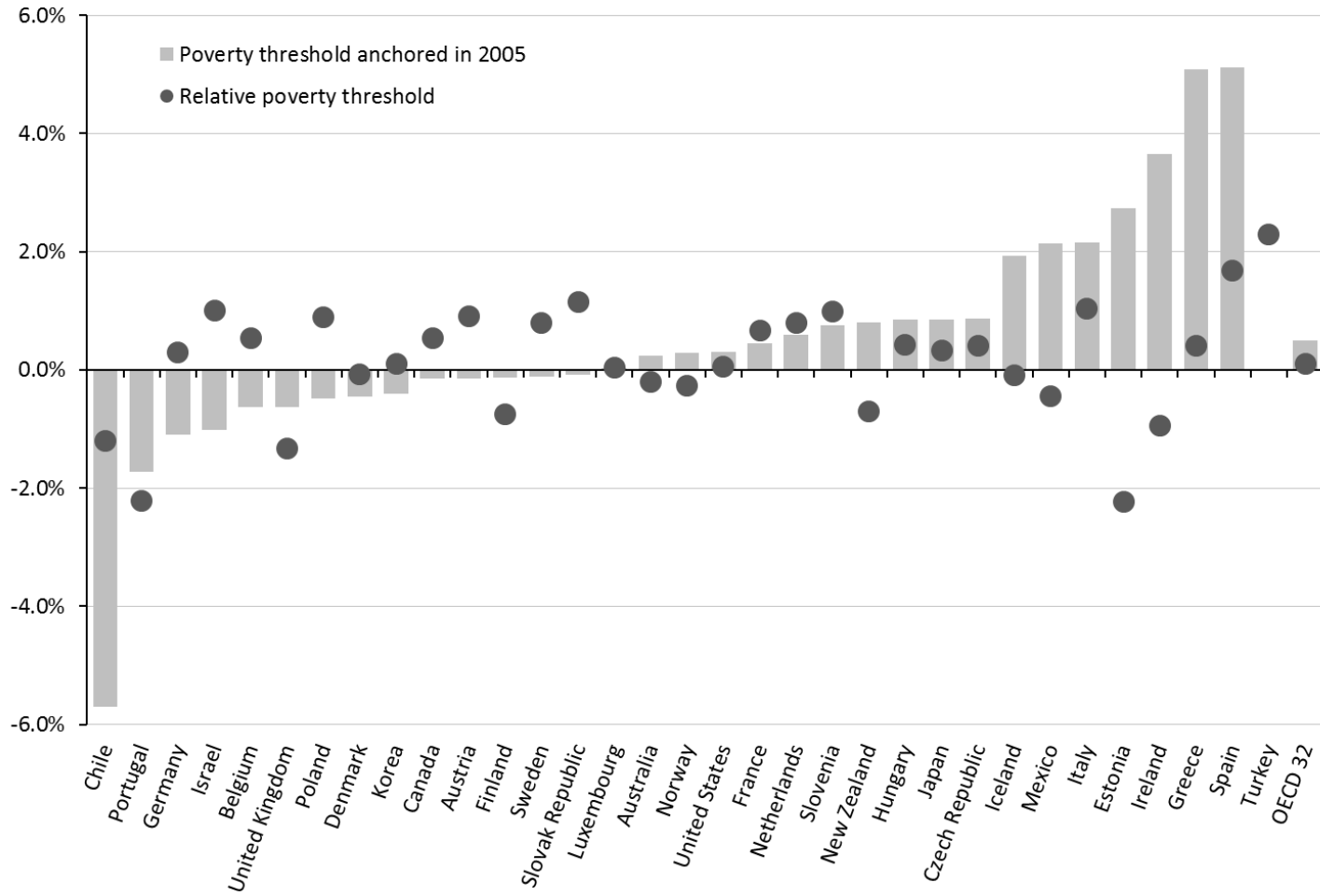
Table 1
Trends in Relative and Anchored Poverty

	Poverty Rates					
	Years	Initial Year	End Year		Percentage Point Change from Initial Year	
		Relative	Relative	Anchored	Relative	Anchored
Czech Republic	1996–2004	5.1	5.8	3.4	0.7	-1.7
Germany	1994–2007	7.7	8.4	7.3	0.7	-0.4
France	1994–2005	8.0	8.5	7.2	0.5	-0.8
Netherlands	1993–2004	8.1	6.3	4.4	-1.8	-3.7
Hungary	1994–2005	9.9	7.4	4.8	-2.5	-5.1
United Kingdom	1994–2010	10.8	15.4	7.2	4.6	-3.6
Canada	1994–2007	11.3	11.9	7.6	0.6	-3.7
Australia	1995–2003	11.4	12.2	7.8	0.8	-3.6
Italy	1995–2010	14.1	12.5	9.5	-1.6	-4.6
Greece	1995–2010	15.4	13.6	6.4	-1.8	-9.0
United States	1994–2010	17.6	17.9	14.5	0.3	-3.1
Mexico	1994–2004	20.8	18.3	16.5	-2.5	-4.3
Average		11.7	11.5	8.0	-0.2	-3.6

Source: Author's calculations with LIS files.

Note: Poverty is measured by the percentage of persons living in households with family-size-adjusted income below half the median national income.

Figure 5: Anchored Poverty in OECD Countries: 2007–2010



Note: Poverty is measured by the percentage of persons living in households with family-size-adjusted income below half the median national income.

rising living standards among those near the poverty line, as people with incomes that would have been considered poor in the initial period are now higher than in the original period. Indeed, anchored poverty fell in every nation, reflecting rising living standards in Europe and elsewhere in the rich and MIC world, up until the Great Recession. In contrast, the changes in relative poverty over this same period were small on average in the LIS data but ranged from an increase of 4.6 percentage points in the United Kingdom to a fall of 2.5 percentage points in Hungary and Mexico. All other relative poverty rates changed by less than 2 percentage points over this period.

The effects of the Great Recession (GR) are included in the four LIS datasets in bold for the United States, United Kingdom, Italy, and Greece in Table 1. In each nation a data point is also available for 2007 (or 2008, for Italy only) but is not shown in Table 1. In each nation, relative poverty rose by 0.2 to 2.2 percentage points through 2010, suggesting greater relative income losses for the poor than the rich in each nation during the GR. And despite the overall downward trends in each nation, anchored poverty *rose* between 2007/08 and 2010 in each of these four nations. Over the GR period, it increased by 1.2 points in the United States, 1.9 points in Italy, 2.6 points in Greece, and by 3.0 percentage points in the United Kingdom. Hence, in each nation, despite the overall reductions in anchored poverty over the 10- to 15-year period shown in Table 1, the poor lost ground in both relative and real terms over the course of the GR.

The OECD data (Figure 5) suggest much the same pattern in these four nations, but add many others as well. Iceland, Mexico, Spain, Estonia, and Ireland join the list above, where living standards fell during the GR and anchored poverty rose much faster than relative poverty. Indeed, relative poverty did not increase much at all during the GR except for in Spain (and even fell by 2.0 percentage points in 5 years in Portugal and Ireland). In Belgium and Germany, anchored poverty fell but relative poverty did not change as much. In Portugal and Chile, both anchored and relative poverty fell during the GR. The changes in other nations were smaller.

In summary, we conclude that there was little progress in reducing relative poverty in almost all the rich nations examined here over the past two or three decades. Anchored poverty did decline in almost

all rich nations from the 1990s up until the Great Recession in 2007. But since the onset of the GR, anchored poverty trends have been upward, with increases in anchored poverty in a majority of nations reducing some of the progress in real living standards for low-income households over the past 20 years, especially in the nations hardest hit by the GR. Relative poverty rates changed much less during the GR.

SUMMARY AND CONCLUSIONS

This chapter is devoted to the intricacies of measuring poverty using objective quantitative, income-based measures, as is common in the vast majority of the published data in high- and middle-income as well as developing countries. Additional poverty concepts and measurement techniques abound. But the vast majority of poverty measures that are comparable across nations and across time are based on household-size-adjusted disposable income (or some combination of consumption and income for global poverty measures).

Three main ways of setting a poverty line have emerged: absolute, relative, and anchored poverty measures. In many nations, poverty lines are set in some absolute way and perpetuated over time with change only for the cost of purchasing a given bundle of goods. But cross-national comparisons then demand translation of the same basket of goods across many nations, despite the fact that these baskets may differ substantially. The recent changes in the number of persons living below \$1.25 per capita in 2005 dollars due to the change in PPPs makes one wary of the stability of such widespread price adjustments. Progress in reducing poverty means an increase in the real standard of living for those who cross the line and the opposite when real incomes fall, as in many nations during the Great Recession. Relative measures of poverty are most often used in cross-national comparisons, as they are easily administered and represent the idea that the poverty line varies with the living standards of other households in a given nation, so poverty ought to be measured relative to the median or middle person in a society, whether the median income is rising or falling. Both absolute and relative measures tell us something about changes in living standards for low-income people. In order to measure both relative and absolute progress in countries where one has a long and consistent measure of income, analysts

increasingly use the idea of anchored poverty, whereby one fixes a poverty line within a country at the relative value in a given year and prices that forward to the most recent year. In this way falling or rising anchored poverty is similar to absolute poverty in terms of what it tells you about how standards of living are changing at the bottom of the income distribution.

When one uses these concepts across a range of nations, one can trace out both changes in real or absolute living standards for low-income people, as well as relative progress or regress compared to the middle person in a society. When we do so, we find that some of the progress against absolute poverty in rich countries between 1980 or 1990 and 2005 was undone by the GR, whose effects in most nations stretch beyond the 2010 period that we observe above. Longer term periods of rising inequality met with shorter term stagnant or falling real incomes in many nations over the course of the GR. These trends bear watching as we try to ensure adequate real standards of living for the poor in the face of rising economic inequality in most rich nations.

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