PIECING TOGETHER
THE POVERTY PUZZLE

WORLD BANK GROUP

Cover design: Patricia Hord.Graphik Design

Contents

Beyond Monetary Poverty

4

This chapter reports on the results of the World Bank's first exercise of multidimensional global poverty measurement. Information on consumption or income is the traditional basis for the World Bank's poverty estimates, including the estimates reported in chapters 1–3. However, in many settings, important aspects of well-being, such as access to quality health care or a secure community, are not captured by standard monetary measures. To address this concern, an established tradition of multidimensional poverty measurement measures these nonmonetary dimensions directly and aggregates them into an index. The United Nations Development Programme's Multidimensional Poverty Index (Global MPI), produced in conjunction with the Oxford Poverty and Human Development Initiative, is a foremost example of such a multidimensional poverty measure. The analysis in this chapter complements the Global MPI by placing the monetary measure of well-being alongside nonmonetary dimensions. By doing so, this chapter explores the share of the deprived population that is missed by a sole reliance on monetary poverty as well as the extent to which monetary and nonmonetary deprivations are jointly presented across different contexts.

The first exercise provides a global picture using comparable data across 119 economies for circa 2013 (representing 45 percent of the world's population) combining consumption or income with measures of education and access to basic infrastructure services. Accounting for these aspects of well-being alters the perception of global poverty. The share of poor increases by 50 percent—from 12 percent living below the international poverty line to 18 percent deprived in at least one of the three dimensions of well-being. Across this sample, only a small minority of the poor is deprived in only one dimension: more than a third of the poor suffer simultaneous deprivations in all three dimensions. More than in any other region of the world, in Sub-Saharan Africa shortfalls in one dimension occur alongside deprivations in other dimensions. In South Asia, the relatively high incidence of deprivations in education and sanitation imply that poverty rates could be more than twice as high when these nonmonetary dimensions are added.

A second complementary exercise for a smaller set of countries (six) explores the inclusion of two additional nonmonetary dimensions. When measures of health and household security (the risk of experiencing crime or a natural disaster) are included alongside the previous three dimensions, the profile of the poor changes. In most countries, the share of the poor living in female-headed households is greater than when the nonmonetary dimensions are excluded and, in some countries, the poor also have a significantly higher presence in urban areas.

Why look beyond monetary poverty?

Consider the following hypothetical example. Two families have the same income, say US$3.00 per person per day. However, only one family has access to adequate water, sanitation, and electricity, whereas the other lives in an area lacking the necessary infrastructure for basic services, such as a power grid or water mains. Members of this second family will still consume water and use energy for lighting and cooking, but they may have to spend hours per week fetching water from a well, or pay higher prices to obtain lower-quality water from a truck. For sanitation, they may use a private or communal latrine, without the convenience or hygiene benefits of a sewerage connection. And with no access to an electricity grid, the second family's choice set for lighting and power options is severely reduced. Both households will spend some of their US$3.00 per person per day to meet their energy and water needs. Yet, because their choice sets (including the prices they face) are so different, the differences in their living standards arising from the access that the first family enjoys are not captured by a monetary measure of poverty alone. The first family clearly enjoys a higher standard of living than the second, but a welfare judgment that considers only their incomes will pronounce them equally well-off. This is an example of when public action—or lack thereof—can directly affect the well-being of households by expanding—or not—their choice sets in ways that incomes and prices fail to fully internalize. It is possible that, under a broader assessment of poverty, the second family might be considered poor or deprived, even though its daily income is above the international poverty line of US$1.90 per day.

To be clear: Income (or consumption expenditures valued at prevailing market prices) is hugely important for human well-being. Indeed, income and consumption are the workhorse metrics of individual welfare in economic analysis. They summarize a household's capacity to purchase multiple goods and services that are crucial for well-being, such as food, clothing, and shelter. And they do so with one remarkable property: because consumers choose the quantities they consume of various goods taking their relative prices into account, these relative prices serve as natural weights with which to aggregate those quantities consumed.[1] That is why they form the basis for the first three chapters in this report. It is why poverty has typically been defined in terms of whether a household's income reaches or surpasses a monetary threshold, the poverty line, which represents the minimum amount needed to purchase a sufficient quantity of essential goods and services.

Yet the point of the example is that monetary-based measures do not encompass *all* aspects of human well-being. One reason for this is that not all goods and services that matter to people are obtained exclusively through markets. Consequently, the prices necessary to cost these goods and services either do not exist or do not accurately reflect their true consumption value (World Bank 2017b). Common examples of nonmarket goods without prices are public goods such as a clean environment and a secure community. Examples of goods with prices that often do not reflect true consumption value include those that require large public investments to make them available—the provision of a power grid is often necessary before a household can access electricity. Other core services at least partially provided through systems supported by direct government spending include health care and education. General government health expenditure accounts for more than half of total global health expenditure. Likewise, governments on average spend the equivalent of nearly 5 percent of the gross domestic product (GDP) of their economies on education. The presence of such goods renders the traditional monetary welfare measure incomplete with respect to a variety of core aspects of well-being.

This chapter presents a broader picture of well-being than that found in chapters 1–3, by considering a notion of poverty that recognizes the centrality of the monetary measure, but looks to complement it by explicitly treating access to key nonmarket goods as separate dimensions of well-being. Specifically, the chapter previews a multidimensional poverty measure derived from standardized data for 119 economies that provide a global picture for circa 2013. The multidimensional measure is anchored on consump-

tion or income as one dimension of welfare, and includes several direct measures of access to education and utilities (such as electricity, water, and sanitation) as additional dimensions. Although this multidimensional measure has wide country coverage, it still lacks information on other important dimensions of well-being including health care and nutrition, as well as security from crime and natural disasters. Consequently, in a more exploratory manner, the chapter extends the analysis by adding these dimensions for a smaller subset of countries for which information for all these dimensions can be captured within the same household survey.

The two exercises—one with broad country coverage, but fewer dimensions than one would ideally like, and the other with a relatively extensive set of dimensions, but available only as a pilot for a few countries—represent the World Bank's first steps toward including multidimensional poverty indicators in the set of complementary indicators of global poverty, as suggested by the Commission on Global Poverty (World Bank 2017b). Going forward, the World Bank will monitor progress on multidimensional poverty at the global level using the three-dimensional measures presented in this chapter, while continuing its efforts to incorporate the dimensions missing from the global analysis for future rounds.

This approach adopts a living standards perspective, in that each dimension is valued instrumentally, that is, each dimension represents the ability to command goods and services that households value for other ends (in other words, consuming or owning these commodities allows for the satisfaction of different needs and wants). But it is also consistent with the capability framework, which calls for expanding the evaluative space for assessing welfare (Sen 1987). The capability approach advocates for a broader perspective to capture the "plurality of different features of our lives and concerns" (Sen 2009, 233). In this approach people have varying abilities to convert resources into the opportunity to be and do what they most value—that is, into what Sen terms "capabilities."

Of course, measuring poverty multidimensionally is not a new endeavor. Indeed, multidimensional poverty measures have become widespread both at the global

and national level (box 4.1). The capability framework inspired the development of the first global efforts to measure poverty multidimensionally. These were carried out by the United Nations Development Programme (UNDP), through the Human Poverty Index in the late 1990s (UNDP 1997) and, more recently, through the Global Multidimensional Poverty Index (Global MPI), introduced in the 2010 Human Development Report (UNDP 2010), developed with the Oxford Poverty and Human Development Initiative (OPHI), and reported annually for over 100 countries. At the country level, an increasing number of governments are choosing to expand or complement their poverty measures with multidimensional indicators (see spotlight 4.1 at the end of this chapter). The efforts of the UNDP, OPHI, and most governments build on influential research by Sabina Alkire and James Foster (see, for example, Alkire and Foster 2011).

The efforts here are also indebted to these previous efforts by other researchers, governments, and international institutions. In addition, they follow on the World Development Report (WDR) 2000/01 *Attacking Poverty* (World Bank 2001), which recognized the many dimensions of poverty and considered deprivations in education and health alongside income in its analysis of the evolution of poverty. The present report goes beyond the WDR 2000/01 by taking advantage of richer household-level data that combine monetary and nonmonetary indicators to present deprivation in each domain as well as measures that aggregate these different deprivations. This proposal follows from the recommendations of the Commission on Global Poverty, led by Professor Sir A. B. Atkinson, to consider complementary indicators to monetary poverty "where a dashboard approach is proposed as part of the Complementary Indicators, . . . together with a measure of the extent of overlapping deprivations" (World Bank 2017b, 100).

The present exercise is also related to the Sustainable Development Goals (SDGs) established by the United Nations in 2015, which include a call for governments to report on their progress in improving the national multidimensional poverty indicator (Indicator 1.2.2 of SDG 1, end poverty in all its forms everywhere).[2] The focus of this

chapter, on steps to develop a useful global multidimensional poverty measure, should not be taken as a preference for such a global measure over possibly richer country-level measures when assessing national progress. The requirement of a global multidimensional poverty measure for standardized household indicators across many countries necessarily limits indicator choice to the relatively few that are consistently measured. Nonetheless, despite this constraint of data

harmonization, several key insights emerge from the analysis.

Considerations for constructing multidimensional poverty measures

This is the initial step by the World Bank to expand the space of assessment beyond the monetary to explicitly include access to non-

market goods and services that are essential for well-being. In addition to a measure based on economic resources, it incorporates a core set of indicators for nonmonetary dimensions and presents results on the extent to which these deprivations arise and overlap. Furthermore, it presents summary measures that combine the information into a single index, the multidimensional poverty headcount ratio.

Broadening the poverty measure to incorporate additional directly measured components involves two steps. First, one must select the dimensions, the indicators, and the respective sufficiency thresholds for each indicator. For example, in the case of the educational dimension, one possible indicator could be school enrollment for the school-age children in the household, and the sufficiency threshold is that all children are in school (and therefore every household member is considered deprived if at least one child is not enrolled). To consider the existence of multiple deprivations occurring in the case of a same individual, all indicators need to be observed or inferred for the same individual, typically from the same data source. Second, the information on each dimension is then aggregated into one index. Summary indexes can be applied to generate rankings across population groups and countries, while acknowledging the multiplicity of deprivations. This section briefly discusses the proposed choices in each of these two stages.

Selected dimensions and indicators

The selection of the dimensions and indicators relevant to the measurement of standards of living is never simple. Possessing a clear conceptual framework to advise this process is therefore fundamental. The approach to the selection of the nonmonetary indicators is guided by the idea that poverty, at least in part, represents an inability to reach a minimum standard of material well-being comprising both market and nonmarket goods.

The choice of dimensions is informed by the following core principles:

- **Centrality of private consumption.** Private consumption (or income, when the former is not available) captures people's access to certain crucial goods and services, including food, clothing, and shelter. The consumption measure uses market prices to aggregate across the various consumption goods.[3] Market prices reflect the ability of people to purchase goods and services, while allowing for variation in individual preferences. Other aspects of well-being on which prices are not available or are arguably not a good representation of value should therefore complement monetary poverty. Public goods as well as private goods that are heavily subsidized are cases in which prices either do not exist or, if they do exist, do not closely represent the household's valuation of the good.

- **Relevance.** The indicators included should be relevant in that they are widely acknowledged to represent essential aspects of well-being. Indicator thresholds should reflect minimum basic needs, comparable with the US$1.90 per person per day poverty lines. The SDGs and other similar initiatives provide useful guidance.

- **Data availability.** Indicators should ideally be derived from the same data source (typically a household survey). One of the key features of the multidimensional approach is that it can be used to assess the extent to which deprivation in one dimension is related to deprivation in other dimensions for the same individual. However, because of the requirement about data sources, the choice of the dimensions and indicators to be included will ultimately be shaped by the availability of meaningful data.

- **Parsimony.** The multidimensional measure should be parsimonious. It should involve only a small number of judiciously selected dimensions to lend prominence to multidimensionality, while ensuring sufficient population coverage.

Because of data limitations, there exists a trade-off between the number of dimensions (measured by harmonized indicators) that can be included in the multidimensional poverty measure and the number of countries that can be included in the analysis. For example, comprehensive assessments of health

services and health outcomes are rarely available in the same household survey that also contains the lengthy questionnaires typically necessary to measure consumption poverty.

For this reason, the chapter conducts two complementary exercises. To get a global picture, the next section presents an analysis including a large number of economies (119, covering 45 percent of the world's population) and includes three dimensions, including consumption, represented by six indicators. The second exercise uses data for a much smaller set of countries (six) to explore the impact of adding two additional dimensions. The analysis that follows should be understood as an initial exploration to generate a consistent, conceptually robust, and practical proposal for expanding current poverty measurement methods to include other nonmonetary dimensions of well-being.

The five well-being dimensions considered in this chapter are the following:

1. **Monetary well-being.** The first dimension is the monetary measure of well-being that the World Bank uses as its principal poverty measure: the consumption or income per person per day, valued at 2011 purchasing power parity (PPP) U.S. dollars, that is available to the individuals in the household (SDG target 1.1). This is the well-being measure and threshold featured in chapter 1 of this report. The dimension encompasses the range of goods and services that can be purchased at market prices. The sufficiency threshold is the international poverty line, currently set at US$1.90 per person per day. Individuals living in households in which per capita income falls below this cutoff are considered deprived in the monetary dimension of well-being.

2. **Education.** Although education may be available through private or public institutions, provision among a large share of the population is fully or partially subsidized in most countries. The price that families must pay therefore does not adequately represent the value of the service. Indexes of multidimensional poverty typically include at least one indicator of access to formal education (related to SDG 4).

Most often, this is a measure of school enrollment (among children and youth of school age) or educational attainment (among adults). The education dimension here similarly has these two components. These indicators are available for many countries and are standardized in recent surveys across 119 economies.

3. **Access to basic infrastructure.** The third dimension encompasses access to key services that often require large-scale public investments to make them widely available. Access to electricity and a certain standard of drinking water and sanitation are critical for economic activity and survival (related to SDGs 6 and 7). Although many individuals pay for the provision of these services (through utility bills or otherwise), the choice set available to users (and their prices) depends to a large extent on the initial investments that governments have made on electricity grids and water and sewer networks. This public action often determines the price and quality of the service provided.[4] For the 119-economy sample, indicators can be standardized across multipurpose household surveys to reflect wider definitions of "at least limited" drinking water and "at least limited" sanitation used in the SDG monitoring, whereas, for the smaller six-country sample, the chosen indicator applies a more stringent definition also used under the SDG framework of access to "at least basic" water and sanitation.[5]

4. **Health and nutrition.** Health is widely considered a core dimension of well-being. It is the focus of SDG 3: ensure healthy lives and promote well-being for all at all ages. As in other cases, health care is typically not supplied entirely through the market or valued entirely at market prices. The empirical challenge of including this dimension for a large set of countries limits the feasibility of investigating health and nutrition meaningfully in the 119-economy sample. However, for a smaller selection of countries, one may analyze indicators of access to formal health care services as well as direct individual assessments of nutrition. Four indicators are included in the health and

nutrition dimension: facility-based birth delivery, vaccination among children, the incidence of child stunting, and undernourishment among adult women. Whereas nutrition is intimately linked to food consumption—and thus can be argued to be already indirectly included in monetary poverty—stunting and malnutrition are also reflective of exposure to illness and lack of nutritional knowledge as well as possible unequal access of resources within households.

5. **Household security.** A final dimension considers the risks to which households are exposed and for which insurance or mitigation programs, where they exist, are often partially or fully supplied by the government. One of the basic functions of government is to ensure that the daily lives of the population are free of the fear of exposure to violence and crime. Although few living standard–type surveys adequately cover the relevant issues, some do contain questions designed to measure the incidence of crime at the household level as well as the threat of crime, often defined by the incidence of crime in the community. The six-country study includes this indicator. In addition, this dimension incorporates a measure of the prevalence of natural disasters that severely affected households' well-being beyond short-term losses in consumption. Although information on the incidence of natural disasters is sometimes captured in shock modules in household surveys—such as in the six-country study analyzed in this chapter—other environmental qualities essential for a good life, such as air free of pollution, are most often not included and thus cannot be incorporated at this stage.[6]

Table 4.1 illustrates the individual indicators. Appendix A contains technical details on indicator definitions.

One limitation of the approach followed in this chapter is that it relies on indicators that are readily available in standard household surveys. For many of the dimensions

TABLE 4.1 Dimensions of Well-Being and Indicators of Deprivation

Dimensions	Three dimensions (119 economies)	Five dimensions (6 countries)
Monetary poverty	Daily consumption or income is less than US$1.90 per person	Daily consumption or income is less than US$1.90 per person
Education	At least one school-age child up to the age of grade 8 is not enrolled in school	At least one school-age child up to the age of grade 8 is not enrolled in school
	No adult in the household (age of grade 9 or above) has completed primary education	No adult in the household (age of grade 9 or above) has completed primary education
Access to basic infrastructure	The household lacks access to limited-standard drinking water	The household lacks access to a basic-standard drinking water ("limited-standard" with an added criterion of the source being within a round trip time of 30 minutes)
	The household lacks access to limited-standard sanitation	The household lacks access to basic-standard sanitation ("limited-standard" with an added criterion of the facility for the exclusive use of the household)
	The household has no access to electricity	The household has no access to electricity
Health and nutrition		Any woman age 15–49 with a live birth in the last 36 months did not deliver at a health facility[a]
		Any child age 12–59 months did not receive DPT3 vaccination[a]
		Any child age 0–59 months is stunted (HAZ < –2)
		Any woman age 15–49 is undernourished (BMI < 18.5)
Security		The household has been subject to crime in the previous 12 months or lives in a community in which crime is prevalent
		The household has been affected by a natural disaster (including flooding, drought, earthquake) in the previous 12 months

Note: BMI < 18.5 = body mass index below 18.5 (underweight); DPT3 = diphtheria-pertussis-tetanus vaccine; HAZ < –2 = the height-for-age Z-score is below –2, that is, more than two standard deviations below the reference population mean. "Limited-standard" drinking water is drinking water that comes from an improved source (for example, piped, borehole, protected dug well, rainwater, or delivered water). "Limited-standard" sanitation means using improved sanitation facilities (for example, flush/pour flush to piped sewer system, septic tank, or a composting latrine).
a. If the indicator is not applicable, for example if the household includes no women who gave birth in the previous 36 months, the household is classified as deprived if the relevant deprivation rates in the subregion of residence are sufficiently high. Specifically, the deprivation threshold is set such that the share of individuals in nonapplicable households that are classified as deprived equals the national share of deprived individuals in applicable households who actually experienced a recent birth or have a child under age 6.

considered, relevant information on the important aspect of service quality is sometimes available in specialized surveys, but not in standard household surveys that also record other data on well-being. Essential information on quality thus cannot be used for various indicators here (box 4.2). If this information becomes available through multipurpose household surveys in the future or if a method can be developed to apply relevant administrative data at a sufficiently granular level, then subsequent measures of multidimensional well-being may reflect quality more accurately.

One dimension often featured in multidimensional well-being indexes, but not considered here, is employment in a stable, dignified job. Employment may matter beyond the monetary benefits individuals derive from it because jobs can give people a sense of self-esteem and help them stay connected with society. An unstable employment contract could be detrimental to well-being because of the financial and other risks associated with such jobs. Employment is not part of the multidimensional poverty measure presented here for two reasons. First, many of the frequently used indicators of employment in high-income countries, such as unemployment and wage employment, are not as relevant in low-income countries, which have very different labor market structures (Lugo 2007). Second, whatever relevant indicators of employment exist, these indicators are not available or not sufficiently harmonized in the different surveys considered here.

Aggregating multiple indicators into a single index

Each of the five dimensions discussed above is considered fundamental to well-being, even if other, equally important aspects of living standards are missing. They are important not only separately but also in the way they are often present or absent together. The chapter therefore examines the share of people deprived according to each separate indicator, along with measures that capture the degree to which these deprivations arise together by counting the number of deprivations that individuals experience. In addition, the chapter presents summary indicators that combine household information on well-being across dimensions into a single number. Such indicators facilitate comparisons across countries and time, especially if the extent of deprivation within countries varies across dimensions under consideration.

Any aggregation of indicators into a single index invariably involves a decision on how each of the indicators is to be weighted. There are various approaches to the selection of weights, including those stipulated by policy makers and those that are based on a poll of the preferences among the target population (Decancq and Lugo 2013). Although there are advantages and disadvantages to each of the methods, the approach chosen here follows standard practice in the field. Dimensions are weighted equally, and within each dimension each indicator is also equally weighted. The result is that each indicator has a different weight depending on the number of elements within its dimension. Weights must also adjust as the number of considered dimensions changes, as illustrated in tables 4.2 and 4.3, where the number of dimensions rises from three to five.[7]

The main summary measure presented in the chapter is the multidimensional poverty headcount ratio, denoted by H. This index describes the share of people who are considered multidimensionally deprived and parallels the headcount measure used for global poverty monitoring (the poverty rate). Individuals are considered multidimensionally deprived if they fall short of the threshold in at least one dimension or in a combination of indicators equivalent in weight to a full dimension. In other words, in the three-dimension exercise, households will be considered poor if they are deprived in indicators whose weight adds up to 1/3 or more. Analogously, in the five-dimension exercise, the weights on all deprivations must add up to 1/5 or more for a household to be classified as poor. For example, in the three-dimension case, every person who lives in a household without access to water and sanitation and with a child who does not attend school is considered multidimensionally deprived, whereas members of another household may be deprived because the household income does not meet basic needs. The index is thus a simple expression of an approach

BOX 4.2 **Incorporating Aspects of Quality into Multidimensional Poverty Measures**

The measure of multidimensional poverty considered in this chapter does not contain sufficient information to thoroughly assess household well-being in all major dimensions, especially as it relates to the quality of services utilized. Although such information sometimes becomes available through specialized surveys, these specialized surveys often do not include all relevant dimensions of poverty. Therefore, the data requirement is too large for multidimensional poverty indicators to be accurately and consistently estimated across countries. In practice, this means that the indicators of multidimensional poverty considered here are restricted to reporting on the access of households to services, but not the quality of these services. Going forward, additional efforts are needed to collect richer data that include both access and quality of services.

Ensuring inclusive, equitable education of high quality is one of the core SDGs. Access to education is considered a fundamental right, but it needs to lead to "relevant and effective learning outcomes" (SDG target 4.1). An ideal indicator of education in a multidimensional poverty index ought to be the attainment by individuals of a basic level of learning capability (World Bank 2018d). Although indicators that account for learning outcomes are rare and might prove difficult to calculate through questions

that could be included in standard household surveys, a possible solution may involve national or subnational indicators of learning outcomes. Recently, the World Bank has harmonized data gathered through international educational testing programs—such as the Latin American Laboratory for Assessment of the Quality of Education, the Program for the Analysis of Education Systems of Confemen, the Program for International Student Assessment, the Southern and Eastern Africa Consortium for Monitoring Educational Quality, and the Trends in International Mathematics and Science Study—to allow for comparable indicators of learning to be computed across countries.[a] These data are core to the newly designed Human Capital Index (HCI) that the World Bank is presenting as part of the Human Capital Project (World Bank 2019). The HCI is a measure of human capital, designed as an indicator of each country's future labor productivity, going beyond years of schooling. Specifically, the HCI combines, for each country, information on the level of education adjusted for quality and indicators of health status (stunting and mortality) (Kraay 2018).

The core drinking water and sanitation indicators of SDG 6.1 and 6.2 focus on the concept of safely managed, which contains a quality dimension that is not captured in the indicators described in this chapter. The World Health

Organization–United Nations Children's Fund Joint Monitoring Programme for Water Supply, Sanitation and Hygiene (JMP) developed an operational model for monitoring SDG 6, on safely managed drinking water, sanitation, and hygiene.[b] Safely managed drinking water sources are basic drinking water sources located in the household, available as needed, and compliant with standards on fecal and chemical content. Similarly, safely managed sanitation services are basic sanitation facilities that are not shared and through which excreta are safely disposed in situ or transported and treated off-site.

Measures of quality could improve the indicator on electricity. In many countries, households may have access to electricity, but, because of frequent power outages, the service is unreliable. This ought to be incorporated so the indicator captures the benefits derived from the electricity rather than only a binary measure of access. Likewise, the quality of maternal care could be incorporated into the indicator on the births at health facilities. Many pregnant women may deliver at facilities, but the conditions of the facilities and the expertise of the people assisting the delivery can vary greatly. Accurate data on the quality of the facilities and the skills of the staff assisting in the deliveries would improve the accuracy of the health service indicator.

a. See LLECE (Latin American Laboratory for Assessment of the Quality of Education), Regional Bureau for Education in Latin America and the Caribbean, United Nations Educational, Scientific and Cultural Organization, Santiago, Chile; http://www.unesco.org/new/en/santiago/education/education-assessment-llece/;PASEC (Program for the Analysis of Education Systems of Confemen) (database), PASEC and Conference of the Ministers of Education of French-Speaking Countries, Dakar, Senegal, http://www.pasec.confemen.org/donnees/; PISA (Programme for International Student Assessment) (database), Organisation for Economic Co-operation and Development, Paris, http://www.oecd.org/pisa/pisaproducts/; SACMEQ (Southern and Eastern Africa Consortium for Monitoring Educational Quality) (database), SACMEQ, Gaborone, Botswana, http://www.sacmeq.org/ReadingMathScores; TIMSS (Trends in International Mathematics and Science Study) (database), International Association for the Evaluation of Educational Achievement, Amsterdam, http://www.iea.nl/timss.
b. See JMP (WHO/UNICEF Joint Monitoring Programme for Water Supply, Sanitation and Hygiene) (database), United Nations Children's Fund, New York; World Health Organization, Geneva, https://washdata.org/data.

TABLE 4.2 Indicator Weights: Analysis of Three Dimensions

Three dimensions	Weights
Income per capita	1/3
Child school enrollment	1/6
Adult school attainment	1/6
Limited-standard drinking water	1/9
Limited-standard sanitation	1/9
Electricity	1/9

TABLE 4.3 Indicator Weights: Analysis of Five Dimensions

Five dimensions	Weights
Income per capita	1/5
Child school enrollment	1/10
Adult school attainment	1/10
Basic-standard drinking water	1/15
Basic-standard sanitation	1/15
Electricity	1/15
Coverage of key health services	1/10
Malnourishment (child and adult)	1/10
Incidence of crime	1/10
Incidence of natural disaster	1/10

whereby the number of deprivations that people suffer are counted (Atkinson 2003).

The chapter also presents two alternative multidimensional poverty indexes (see annex 4B for a formalization of the measures). The first one, the adjusted headcount measure M, combines the incidence of poverty H with the average breadth of deprivation suffered by each poor person, as proposed by Alkire and Foster (2011). In addition, the chapter uses a measure that penalizes for the compounding effect of multiple deprivations experienced by the same household (Chakravarty and D'Ambrosio 2006; Datt, forthcoming). As a result, if a household is deprived in any two indicators, its deprivation will be considered greater than the sum of the deprivations of two other households each only deprived on a single indicator. The measure is referred to as the distribution-sensitive multidimensional measure, denoted by D. By incorporating information of the extent of deprivation suffered by individuals, both these measures bring valuable elements to the analysis. Although the three measures (H, M, and D) are presented in the chapter, precedence is given to the multidimensional poverty headcount ratio H because it is the closest analogue to the monetary poverty headcount ratio, used to monitor the first of the World Bank's twin goals (see chapter 1 of this report).

A first global picture

Expanding a poverty measure to include nonmonetary aspects brings into focus deprivations that may otherwise remain hidden. For example, consider a slight extension of the monetary poverty measure: the addition of only two of the indicators described in table 4.1, namely educational attainment among adults and access to limited-standard sanitation. Considering these two indicators alongside monetary poverty and using a sample of 119 economies for circa 2013 (on data, see box 4.3.), the exercise finds 12 percent of the people to be monetarily poor, but, among them, only one individual in five is deprived only in the monetary dimension.[8] The rest of the 12 percent are deprived at least in either educational attainment or access to limited-standard drinking water, with 5 percent of individuals experiencing deprivations in all three dimensions. At the same time, many individuals are not monetarily poor but are deprived in other aspects of well-being.

This observation raises several questions: How does our view of global poverty change if poverty is defined as insufficiency not only in monetary resources but also in a range of nonmonetary attributes that directly affect people's well-being? Who are the new poor? In how many ways are they deprived? How do different regions fare if a wide-angle view of poverty is considered? Insights into the differential prevalence, nature, and distribution of multidimensional poverty in contrast to monetary poverty can be important for the formulation of effective poverty reduction policies. Highlighting the additional deprivations experienced by the extreme poor sensitizes policy makers to the importance of improving those aspects of human welfare not captured by the monetary measure alone. This is even more important as more people leave extreme poverty behind because a sizable share of the non-income-poor population experiences other deprivations.

Table 4.4 describes the share of people who are poor because of either monetary deprivation or multidimensional poverty as defined by the three dimensions and six indicators illustrated in table 4.1. The indicators cover the dimensions of monetary poverty, education (two indicators), and access to basic infrastructure (three indicators). Approximately one individual in eight (11.8 percent) in the 119-economy sample in circa 2013 lives in a household experiencing monetary poverty, whereas almost one person in five (18.3 percent) lives in a multidimensionally deprived household.[9] The multidimensional measure yields a more expansive view of poverty by counting as poor any individual with a cumulative deprivation above the critical threshold of 1/3.

The monetary poverty measure presented in chapter 1 outlines a bipolar world, with Africa on one end (a high poverty rate) and all the other regions, South Asia included, on the other end (a relatively low poverty rate). The separation of Sub-Saharan Africa from the other regions is seen more clearly when looking at the poverty trends over the last 25 years. East Asia and Pacific, South Asia, and Sub-Saharan Africa all started with a relatively high poverty rate in 1990; however, while poverty declined rapidly in the first two regions, the decline was much slower in Sub-Saharan Africa. Consequently, Sub-Saharan Africa today comprises most of the world's poor. If the trend continues, by 2030 the extreme poor will almost exclusively be in this region.

BOX 4.3 **Chapter 4: Data Overview**

This chapter relies on information from the harmonized household surveys in the Global Monitoring Database (GMD) for circa 2013. Surveys have been included in the multidimensional poverty analysis if they satisfy the following criteria:

- They include a monetary welfare measure (income or expenditure) and indicators on education and basic infrastructure access that may be used to construct a multidimensional poverty measure.
- The surveys were conducted within three years of 2013, that is, from 2010 to 2016.

The extreme poverty rate (headcount ratio) reported in this chapter cannot be compared to the information presented in chapter 1 for practical and methodological reasons. For more details, see appendix A.

A different image of the world emerges through the multidimensional lens. The poverty rate in Sub-Saharan Africa continues to be worryingly high, with almost two in three individuals (64.3 percent) living in multidimensional poverty in circa 2013. This is an increase of 40 percent from an already high monetary poverty rate of 44.9 percent. South Asia, however, changes even more dramatically. In South Asia, more than twice as many people are multidimensionally poor as monetarily poor (table 4.4).

This raises important questions about the success of poverty reduction in South Asia. The challenge in securing higher living

TABLE 4.4 **People Living in Monetary or Multidimensional Poverty, 119 Economies, circa 2013**

Region	Monetary		Multidimensional		Number of economies	Population coverage (%)
	Headcount ratio	Share of the poor (%)	Headcount ratio (H)	Share of the poor (%)		
East Asia and Pacific	5.3	8.1	7.5	7.3	13	28.9
Europe and Central Asia	0.3	0.4	1.1	0.8	17	90.0
Latin America and the Caribbean	3.9	5.7	6.1	5.8	17	91.5
Middle East and North Africa	3.2	2.2	5.9	2.6	9	72.1
South Asia	11.9	12.3	26.6	17.7	5	23.0
Sub-Saharan Africa	44.9	70.9	64.3	65.4	29	60.7
Rest of the world	0.5	0.5	0.5	0.3	29	39.6
Total	11.8	100.0	18.3	100.0	119	45.0

Source: Estimates based on the harmonized household surveys in 119 economies, circa 2013, GMD (Global Monitoring Database), Global Solution Group on Welfare Measurement and Capacity Building, Poverty and Equity Global Practice, World Bank, Washington, DC.
Note: The reported multidimensional headcount ratio is estimated on the basis of three dimensions—monetary, education, and basic infrastructure access, as defined in table 4.1—and an overall poverty cutoff of one-third of the weighted deprivations. The data are derived from household surveys conducted in about 2013 (+/–3 years). Because of the unavailability or incomparability of data, analysis does not include all countries. The last column shows the percentage of regional or global populations covered by the surveys. Percentages may not sum to 100 because of rounding.

standards for the population of South Asia is more daunting when poverty in all its forms is considered. Although South Asia is expected to meet the goal of reducing extreme poverty below 3 percent by 2030, many people will still be living in unsatisfactory conditions if no progress is made in the other components of well-being.

It is apparent from table 4.4 that the multidimensional poverty headcount is always higher than the monetary poverty headcount. This regularity arises because of the relative importance assigned to each component and the stipulated overall poverty threshold that determines if a household is considered multidimensionally poor. If a household is deprived in at least one dimension, then the members are considered multidimensionally poor. Because the monetary dimension is measured using only one indicator, anyone who is income poor is automatically also poor under the broader poverty concept. The difference between the headcounts therefore hinges on those individuals among whom the privation is a result of a shortfall in the nonmonetary dimensions of life despite their ability to command sufficient financial resources to cross the monetary poverty threshold. These households would be deemed nonpoor under the narrower poverty concept on the basis of insufficiency in monetary resources, leaving policy makers with an unduly optimistic assessment of poverty from a multidimensional perspective.

The underlying structure of the deprivation experienced by the multidimensionally poor is depicted in figure 4.1. There is a large degree of overlap between dimensions. Only a small minority of the multidimensionally poor are deprived in only one dimension, whereas more than a third are simultaneously deprived in all three dimensions. The overlap is highest in Sub-Saharan Africa (annex 4C, figure 4C.1). A larger overlap between dimensions indicates a larger extent of interdependence, which implies that policy interventions targeted exclusively toward one dimension may not reduce multidimensional poverty and therefore a multipronged approach might be required.

Going from monetary to multidimensional poverty, the poverty rate more than doubles in the five South Asian countries be-

FIGURE 4.1 Share of Individuals in Multidimensional Poverty, 119 Economies, circa 2013
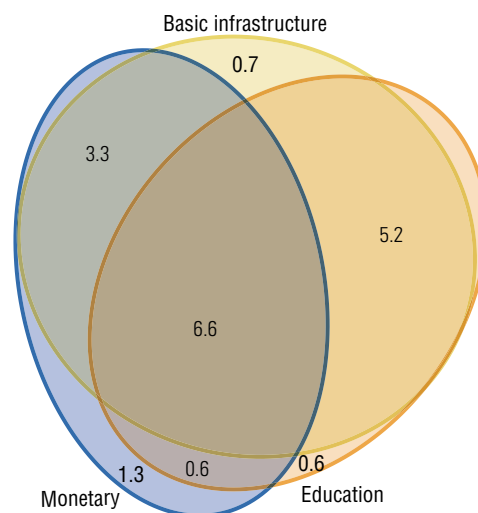
Source: Estimates based on the harmonized household surveys in 119 economies, circa 2013, GMD (Global Monitoring Database), Global Solution Group on Welfare Measurement and Capacity Building, Poverty and Equity Global Practice, World Bank, Washington, DC.
Note: The diagram shows the share of population that is multidimensionally poor, and the dimensions they are deprived in. For example, the numbers in the blue oval add up to 11.8 percent, which is the monetary headcount. Adding up all numbers in the figure results in 18.3 percent, which is the proportion of people that are multidimensionally deprived.

cause of the relatively low correlation in deprivations across dimensions. In these countries, a household that is deprived in education attainment has a high probability of being deprived in school enrollment as well, making its members multidimensionally poor. But the correlation between the monetary dimension and the education indicators is weak, which means the same households are not deprived in the monetary dimension. This adds new households to the count of the poor.

Because the difference in poverty incidence according to the two measures is the result of cumulative nonmonetary deprivations, it is natural to inquire about the components most responsible for the difference. Table 4.5 presents the poverty headcount ratio at US$1.90 a day as well as the deprivation rate associated with each of the five nonmonetary indicators. Despite having made progress in poverty reduction, the countries included in the sample for South Asia still are highly deprived in the education dimension. An issue

TABLE 4.5 Individuals in Households Deprived in Each Indicator, 119 Economies, circa 2013

Region	Monetary (%)	Educational attainment (%)	Educational enrollment (%)	Electricity (%)	Sanitation (%)	Drinking water (%)
East Asia and Pacific	5.3	7.5	3.2	4.5	14.0	11.3
Europe and Central Asia	0.3	0.9	5.6	0.5	6.8	2.6
Latin America and the Caribbean	3.9	12.2	2.7	3.3	15.6	6.4
Middle East and North Africa	3.2	11.1	7.9	3.8	14.6	4.2
South Asia	11.9	31.6	22.6	23.8	39.5	7.0
Sub-Saharan Africa	44.9	46.2	20.8	64.8	61.9	33.9
Rest of the world	0.5	1.2	0.0	0.0	0.6	0.0
Total	11.8	17.0	9.0	15.9	23.8	10.9

Source: Estimates based on the harmonized household surveys in 119 economies, circa 2013, GMD (Global Monitoring Database), Global Solution Group on Welfare Measurement and Capacity Building, Poverty and Equity Global Practice, World Bank, Washington, DC.
Note: The definition of the indicators and the deprivation thresholds are as follows: Monetary poverty: a household is deprived if income or expenditure, in 2011 purchasing power parity U.S. dollars, is less than US$1.90 per person per day. Educational attainment: a household is deprived if no adult (grade 9 equivalent age or above) has completed primary education. Educational enrollment: a household is deprived if at least one child (grade 8 equivalent age or below) is not enrolled in school. Electricity: a household is deprived if it does not have access to electricity. Sanitation: a household is deprived if it does not have access to even a limited standard of sanitation. Drinking water: a household is deprived if it does not have access to even a limited standard of drinking water. The data reported refer to the share of people living in households deprived according to each indicator.

of apparent global concern is poor sanitation: approximately a quarter of the population in the 119-economy sample lives in households lacking access to even a limited standard of sanitation. The populations in regions with low monetary poverty like East Asia and Pacific, Latin America and the Caribbean, and the Middle East and North Africa suffer a sanitation deprivation rate several times as high as that in the monetary dimension. Globally, almost one individual in six is not connected to electricity. Yet this is overwhelmingly a South Asian and Sub-Saharan African phenomenon: approximately one South Asian in four and two Sub-Saharan Africans in three lack electricity at home.

An examination of deprivation rates, one indicator at a time, generally confirms that the regional ranking for any one indicator is consistent with the others. Regions more deprived in one indicator are highly likely to be more deprived in other indicators. However, there are anomalies. For example, the Europe and Central Asia region shows the lowest incidence of monetary poverty; however, the share of people deprived in school enrollment in the region is higher than in both the East Asia and Pacific and the Latin America and Caribbean regions.

Important insights on the pattern of development can be gleaned from country outcomes as well. For example, Pakistan and Vietnam both have a low absolute poverty rate, but Pakistan's level of deprivation in education attainment and enrollment is far higher than that of Vietnam (Table 4C.4). These countries typify the development experience of the two regions. Expansion in access to education preceded or was contemporaneous with the growth in income in East Asia, whereas despite rising incomes human development has lagged in South Asia (World Bank 2018d). Iraq experiences the highest deprivation in the education dimension, and it is one of the few countries where school enrollment outcome is worse than education attainment. Over the last 15 years, access to schooling in Iraq has been disrupted because of conflict, which is a reminder that progress cannot be taken for granted, especially in fragile and conflict-affected situations.

The examination of indicator deprivation rates does not reveal information about the simultaneity of deprivations. To consider this aspect, other tools are needed. One of the simplest approaches involves counting the number of indicators in which people are deprived contemporaneously. Figure 4.2 shows the shares of individuals deprived according to the maximum of six indicators. Approximately 60 percent of people in the 119 economies are not deprived in any of the six indicators. More than 80 percent of Sub-Saharan Africans exhibit at least one deprivation, but a smaller share of South Asians (65.6 percent) experience at least one deprivation; as
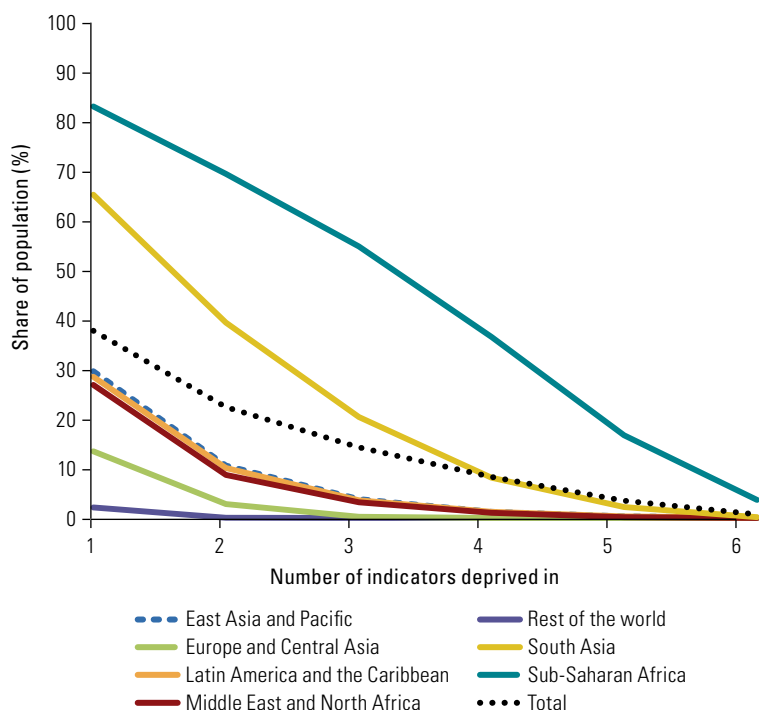
Source: Estimates based on the harmonized household surveys in 119 economies, circa 2013, GMD (Global Monitoring Database), Global Solution Group on Welfare Measurement and Capacity Building, Poverty and Equity Global Practice, World Bank, Washington, DC.

the number of deprivations rises, a large gap opens between South Asia and Sub-Saharan Africa. Whereas 20.5 percent of South Asia's population is deprived in three or more indicators, 55.1 percent of Africans are so deprived. On the shares experiencing four or more deprivations, South Asia catches up to the world at large. Thus, in addition to the relatively larger share of Sub-Saharan Africans who are deprived in each dimension, Sub-Saharan Africans suffer from a greater average number of deprivations than people elsewhere.

Incorporating breadth of poverty into the measurement

Summarizing the information on the number of deprivations into a single index proves useful in making comparisons across populations and across time. Aggregate multidimensional poverty measures provide an easy way to rank countries and monitor their progress.

The adjusted headcount measure M defined in the previous section is sensitive to both the incidence and breadth of multidimensional poverty. If a poor household becomes deprived in additional elements, the changes are registered by the measure—something that will not be captured by the headcount H. The adjusted headcount measure, however, does not take into account the deprivations of households deemed to be multidimensionally nonpoor. This can ignore a substantial portion of deprivation. Of the total population in the sample, 15.5 percent is deprived in only one indicator and another 8.2 percent deprived in two indicators (table 4.6). A subset of these households is not identified as multidimensionally poor because their total weighted deprivation does not cross the poverty threshold of one-third. In fact, most individuals experiencing one deprivation and two-thirds of individuals experiencing two deprivations are not multidimensionally poor. They face an average of 0.13 and 0.25 weighted deprivations, respectively, which is missed by the intensity-sensitive measure.

The picture of poverty can shift yet again under the distribution-sensitive measure D, the third measure, because it differs from the adjusted headcount measure in two crucial ways. Unlike the adjusted headcount measure, the distribution-sensitive measure is not associated with a prespecified poverty threshold so it counts deprivations experienced by all households. Second, it penalizes compounding deprivations such that poverty is higher when one household experiences two deprivations than when two households experience one deprivation each.

The regional estimates for multidimensional headcount, adjusted headcount, and distribution-sensitive measures are presented in table 4.7. Because the scales of the two measures do not lend themselves to easy comparison, the focus is on the regional contribution to global poverty under each approach. Moving from multidimensional poverty headcount (H) to the intensity-sensitive measure (M), the concentration of poverty shifts further to Africa. This shift is driven by the breadth of deprivation in Sub-Saharan Africa, which is twice as high as in South Asia and several times higher than in other regions of the world (table 4.7).

TABLE 4.6 The Multidimensionally Poor and the Breadth of Deprivation, by Number of Deprivations, 119 Economies, circa 2013

Number of deprivations	Share of the population (%)	Multidimensional poverty status		Breadth of deprivation	
		Nonpoor (%)	Poor (%)	Nonpoor	Poor
0	62.0	62.0	0.0	0.00	n.a.
1	15.5	14.1	1.4	0.13	0.33
2	8.2	5.7	2.5	0.25	0.43
3	6.0	0.0	6.0	n.a.	0.48
4	4.8	0.0	4.8	n.a.	0.65
5	2.8	0.0	2.8	n.a.	0.83
6	0.7	0.0	0.7	n.a.	1.00
Total	100.0	81.7	18.3	0.04	0.58

Source: Estimates based on the harmonized household surveys in 119 economies, circa 2013, GMD (Global Monitoring Database), Global Solution Group on Welfare Measurement and Capacity Building, Poverty and Equity Global Practice, World Bank, Washington, DC.
Note: A household is multidimensionally poor if it is deprived in more than a third of weighted deprivations. Breadth of deprivation refers to the average number of deprivations relative to the total number of indicators. It varies from 0 to 1, where 1 represents a person deprived in all six indicators. The shares may not sum to 100 because of rounding. n.a. = not applicable.

TABLE 4.7 Regional Contributions to Multidimensional Poverty, 119 Economies, circa 2013

Region	Breadth of deprivation	Share of the population (%)	Multidimensional headcount (H)		Adjusted headcount measure (M)		Distribution-sensitive measure (D)	
			H	Contribution (%)	M	Contribution (%)	D	Contribution (%)
East Asia and Pacific	0.07	17.8	7.5	7.3	0.03	5.8	0.02	5.5
Europe and Central Asia	0.02	13.3	1.1	0.8	0.00	0.5	0.01	0.9
Latin America and the Caribbean	0.07	17.4	6.1	5.8	0.03	4.7	0.02	5.1
Middle East and North Africa	0.06	8.1	5.9	2.6	0.03	2.1	0.02	2.2
South Asia	0.21	12.1	26.6	17.7	0.14	15.9	0.09	15.2
Sub-Saharan Africa	0.44	18.6	64.3	65.4	0.40	70.8	0.29	70.9
Rest of the world	0.00	12.7	0.5	0.3	0.00	0.2	0.00	0.2
Total	0.14	100.0	18.3	100.0	0.11	100.0	0.07	100.0

Source: Estimates based on the harmonized household surveys in 119 economies, circa 2013, GMD (Global Monitoring Database), Global Solution Group on Welfare Measurement and Capacity Building, Poverty and Equity Global Practice, World Bank, Washington, DC.
Note: Breadth of deprivation refers to the average number of deprivations relative to the total number of indicators. It varies from 0 to 1, where 1 represents a person deprived in all six indicators.

The distribution of global poverty is subject to two countervailing effects when going from the intensity-sensitive measure (*M*) to the distribution-sensitive measure (*D*). Counting all deprivations pushes the distribution of poverty to regions that have few multidimensionally poor but many who suffer from at least one deprivation. At the same time, assigning more importance to compounding deprivations pulls it toward regions with high breadth of deprivation. The first effect more than offsets the second in Europe and Central Asia, Latin America and the Caribbean, and the Middle East and North Africa, resulting in a slightly higher contribution of these regions to global poverty under *D* than under *M* (table 4.7).

An appealing feature of the adjusted headcount measure *M* is that the overall measure can be easily decomposed into the relative contribution of each indicator. Such decompositions matter for understanding the drivers of multidimensional poverty, and the sectors that ought to be given priority in the design of poverty-alleviating policies. If the poverty rate is high because of income insufficiency, a focus on economic growth or income support is appropriate; but, if education or access to utilities plays a dominant role in multidimensional poverty, investments in the corresponding sectors may yield the highest returns to poverty reduction.

In high-income countries, multidimensional poverty, though extremely low, almost

FIGURE 4.3 Contribution of Indicators to the Adjusted Headcount Measure (M), 119 Economies, circa 2013

Source: Estimates based on the harmonized household surveys in 119 economies, circa 2013, GMD (Global Monitoring Database), Global Solution Group on Welfare Measurement and Capacity Building, Poverty and Equity Global Practice, World Bank, Washington, DC.
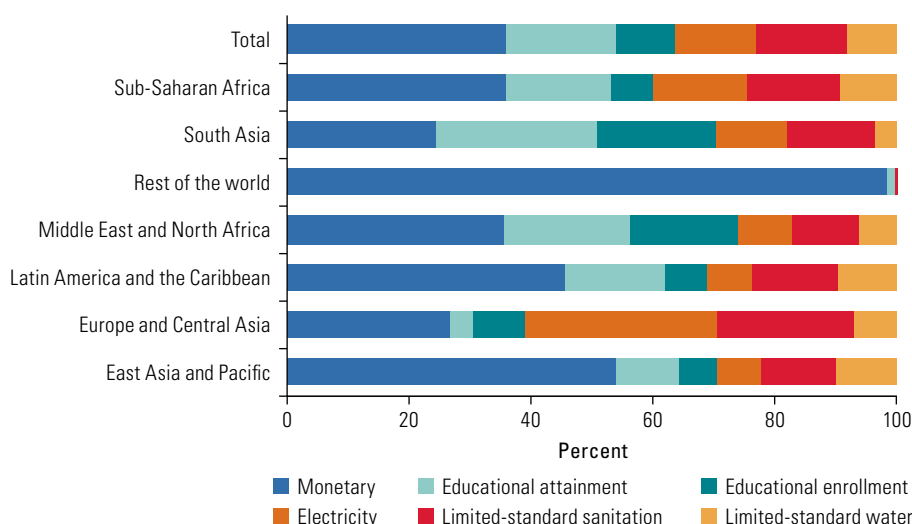
exclusively arises because of insufficient income given the near-universal access to education and infrastructure services (figure 4.3). For the multidimensionally poor in Europe and Central Asia, access to electricity is a much more important driver of poverty than elsewhere. The comparison across Sub-Saharan Africa and South Asia reveals how the underlying structure of deprivations differs across the two regions. In South Asia, the education dimension has a disproportionate contribution to poverty (46 percent), whereas the contribution of monetary poverty is relatively low (24.6 percent). In Sub-Saharan Africa, the services (39.7) and the monetary (36.1) dimensions contribute the most to multidimensional poverty, and the education dimension contributes the least (24.2 percent). This may suggest a different policy focus in the two regions. The priority in these South Asian countries should be wider access to education whereas expansion of basic infrastructure services will have the strongest impact in Sub-Saharan Africa.

Who are the monetarily and multidimensionally poor?

As the definition of poverty broadens to include additional aspects of deprivation, the composition of the poor changes. Monetary poverty is predominantly a rural phenomenon: 45.8 percent of the total sample population is rural, but 81.3 percent of the monetary poor are living in rural areas (annex 4C, table 4C.1). If poverty is considered more broadly with the multidimensional lens, the distribution of poverty tilts even more toward rural areas. Thus, 83.5 percent of the multidimensionally poor are rural dwellers, implying that, relative to urban households, rural households suffer cumulatively more deprivations in access to education and essential utilities. The most pronounced shifts of poverty toward rural areas are observed in East Asia and Pacific and in Latin America and the Caribbean (figure 4.4). In these regions, the shift in the composition is largely driven by deprivations in limited-standard sanitation and adult educational attainment. In contrast, poverty becomes more urban in the Middle East and North Africa and South Asia, suggesting that urban residents in these regions, although not monetarily poor, experience deprivations in some of these additional aspects of life.

With respect to household composition, households with children are overrepresented among both the monetary poor and the multidimensionally poor, regardless of the gender or number of adults in the household (figure 4.5; also annex 4C, table 4C.2).[10] The shift

from an exclusively monetary approach to a multidimensional account of poverty does not substantially change the demographic composition of the poor, though households with only one adult woman (with or without children) represent a slightly larger share in the latter case (8.8 percent compared with 8.1 percent). All indicators included in this chapter are measured at the household level and thus do not distinguish differences within households. The estimates also assume that resources are distributed equally within a household, that all household members have similar needs, and that there are no scale economies in larger households. Assessing individual well-being requires measuring intrahousehold resource allocation and the needs of each household member. Chapter 5 investigates methods that estimate individual well-being from underlying household data.[11]

A deeper look

Extending monetary poverty by including measures of access to education and basic infrastructure services changes the understanding of poverty. However, even this extension to three dimensions fails to capture other key dimensions of well-being. This section augments multidimensional poverty by also including measures of access to health care services and lack of security. The analysis is carried out on six countries for which information on households from a single data source is available. This exercise is exploratory in nature and the numbers presented might diverge from recent official sources (and even from the analysis performed in the previous section) because in all but one country the analysis is based on different household surveys than the one used for calculating monetary poverty. Instead, it uses surveys that are comprehensive enough to include the additional dimensions. The purpose of the exercise is to illustrate the gains and insights that could emerge if this information was available for a larger set of countries.

Accounting for the two extra dimensions of well-being further enhances the understanding of poverty. The proportion of people identified as poor under the expanded definition is higher than with the three-dimensional measure, suggesting that the

FIGURE 4.4 Difference in the Share of the Poor in Rural Areas, Multidimensional Headcount vs. Monetary Headcount, 119 Economies, circa 2013
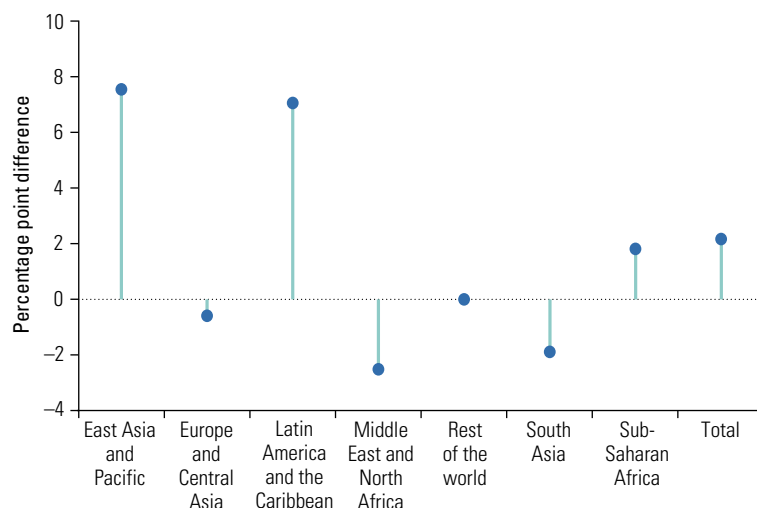
Source: Estimates based on the harmonized household surveys in 119 economies, circa 2013, GMD (Global Monitoring Database), Global Solution Group on Welfare Measurement and Capacity Building, Poverty and Equity Global Practice, World Bank, Washington, DC.
Note: The lines indicate the difference in percentage points of the rural share of the poor when comparing multidimensional and monetary poverty. A positive value indicates that the rural share of the poor is greater with the multidimensional measure.

FIGURE 4.5 Contribution to Monetary and Multidimensional Poverty, by Household Type, 119 Economies, circa 2013
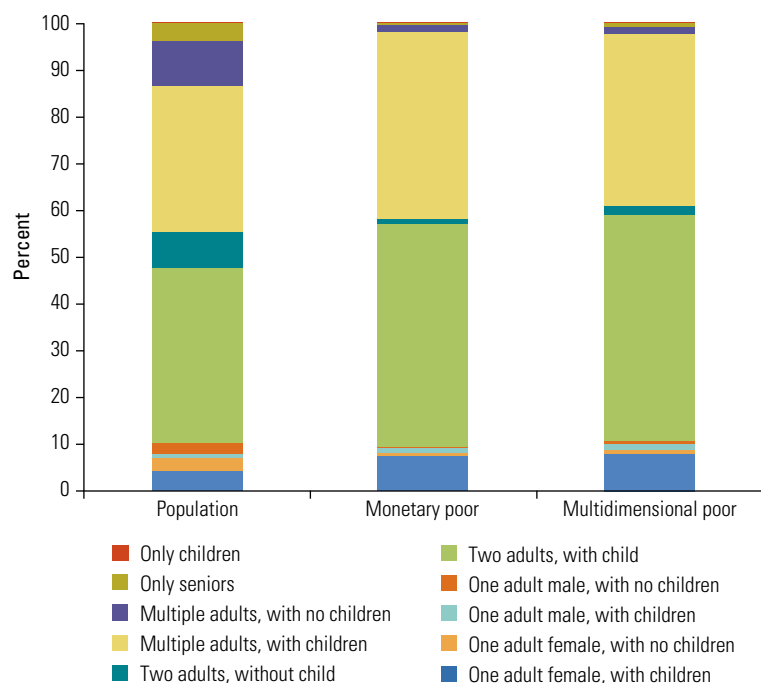
- Only children
- Only seniors
- Multiple adults, with no children
- Multiple adults, with children
- Two adults, without child
- Two adults, with child
- One adult male, with no children
- One adult male, with children
- One adult female, with no children
- One adult female, with children

Source: Estimates based on the harmonized household surveys in 119 economies, circa 2013, GMD (Global Monitoring Database), Global Solution Group on Welfare Measurement and Capacity Building, Poverty and Equity Global Practice, World Bank, Washington, DC.

share of individuals who are unnoticed by monetary poverty measures could be even higher than reported in the previous section. Including health and security can also shift the common understanding of who the poor are and where they are located. Specifically, acknowledging deprivations along these two dimensions reveals that a larger share of the poor live in female-headed households and, in several cases, shifts poverty back toward urban areas.

The six-country sample

The extended measure of poverty is computed for six countries—Ecuador, Indonesia, Iraq, Mexico, Tanzania, and Uganda—and covers the years 2009–14 (see appendix A for details on the surveys used). These countries have primarily been chosen on the basis of data availability. In each of these countries, a household survey has been conducted recently that collected information relevant to the five dimensions of poverty in a comparable manner. The six countries include low-income, lower-middle-income, and upper-middle-income countries, as well as all World Bank regions except Europe and Central Asia and South Asia. They therefore offer a rela-tively balanced view of how countries might fare after the multidimensional poverty measure is extended.[12]

Summary analysis of the data reveals that deprivation rates vary greatly by country (table 4.8). Monetary poverty ranges from 2 percent in Ecuador to 44 percent in Tanzania.[13] Only 1 percent of the population does not have access to electricity in Ecuador, Indonesia, and Iraq, whereas the same measure is as high as 87 percent in Uganda. The countries also exhibit different deprivation rates in the newly added dimensions. More than 43 percent of individuals in Tanzania live in households where at least one child is stunted, whereas the same deprivation rate for Mexico is 15 percent. The country ranking on the crime indicator is nearly the reverse of the rankings on the other indicators. The upper-middle-income countries in the sample—Ecuador, Iraq, and Mexico—suffer from high crime rates and substantial insecurity in comparison with the low-income countries, Tanzania and Uganda. The share of individuals affected by a natural disaster also differs markedly across the six countries. Uganda stands out as the least well performing country; there, nearly a third of the population was affected by a drought in the year leading up to the survey.

TABLE 4.8 **Share of Individuals Deprived, by Indicator, Selected Countries**

Percent

Dimension	Indicator	Ecuador	Indonesia	Iraq	Mexico	Tanzania	Uganda
Monetary poverty	Daily consumption < $1.9	2.0	3.5	2.5	9.2	43.6	35.8
Education	Any school-aged child is not enrolled in school	2.2	3.6	26.0	10.4	32.2	15.4
	No adult has completed primary education	4.8	5.3	12.6	5.3	13.9	26.1
Access to basic infrastructure	No access to basic-standard drinking water	11.3	19.0	13.4	3.7	54.6	54.0
	No access to basic-standard sanitation	14.1	26.6	13.5	19.4	74.5	77.0
	No access to electricity	1.2	0.8	0.7	4.3	79.7	87.2
Health	No facility delivery	6.8	16.6	11.7	4.6	36.7	30.8
	No DPT3 vaccination	3.6	33.6	—	11.9	—	8.4
	Any child is stunted	25.7	41.8	40.5	15.0	43.4	40.7
	Any female is malnourished	3.5	10.5	6.0	5.3	13.6	—
Security	Experienced or in threat of crime	33.0	6.9	21.1	16.4	1.8	5.1
	Affected by natural disaster	2.9	0.9	3.0	0.1	5.6	32.3

Source: Calculations based on Ecuador's Encuesta de Condiciones de Vida 2013–14; Indonesian Family Life Survey, 2014; Iraq Household Socio-Economic Survey, 2012; Mexican Family Life Survey, 2009–12; Tanzania's National Panel Survey, 2012–13; Uganda National Panel Survey 2013–14. See appendix A for details.
Note: Monetary poverty rates might differ from recent official estimates because, in all cases except for Iraq, this exploratory analysis is based on different household surveys than the ones used to calculate official monetary poverty, as reported in chapter 1 and earlier in this chapter. When an indicator is not available for the particular country, weights are shifted to the other indicators in the dimension. A household has access to a basic-standard drinking water if its drinking water comes from an improved source (for example, piped, borehole, protected dug well, rainwater, or delivered water) within a round trip time of 30 minutes. A household has access to basic-standard sanitation if it is using improved sanitation facilities (for example, flush/pour flush to piped sewer system, septic tank, or a composting latrine) and the facility is for the exclusive use of the household. — = not available; DPT3 = diphtheria-pertussis-tetanus vaccine.

With the addition of health and security indicators, the share of individuals deprived in at least one indicator is troublingly high (figure 4.6). In Tanzania and Uganda, as many as 95 percent of the population is deprived in at least one indicator. Even in the top-performing countries, Ecuador and Mexico, more than half the population is deprived in at least 1 of the 12 indicators. If a household is considered worthy of attention when it is deprived in any of the relevant indicators, then monetary poverty and even multidimensional poverty measures in three dimensions fail to capture many households. The number of deprivations people experience declines rapidly as the deprived indicator count increases, and virtually no one is deprived in all 12 indicators (or 11 or 10) in any country. Yet the decline occurs more quickly in some countries than in others. In Tanzania and Uganda, about half of the population is deprived in five indicators, highlighting the compounded disadvantages many households suffer in these countries.

Comparing alternative measures of poverty

Because of the frequency of cumulative deprivations, headcount ratios rise several-fold in some countries if one shifts from monetary poverty to the multidimensional poverty measure in five dimensions (figure 4.7). In Iraq, 2.5 percent of the population are counted among the monetary poor; 10.4 percent are poor if three dimensions are considered (with a cutoff of one-third); and 28.4 percent are poor if five dimensions are considered (with a cut-off of one-fifth). Poverty rates climb by an average 41 percent if the five-dimension measure is used instead of the three-dimension measure. Clearly, as the poverty measure becomes more comprehensive and deprivation in a single dimension (or indicators whose weights add up to that of a single dimension) continues to define poverty, the count of individuals living in poverty rises.

The headcount ratios mask the dimensions and indicators driving the rise in poverty rates, and those dimensions and indicators vary across countries. The increase may be caused by any of the added dimensions,

FIGURE 4.6 **Share of Individuals Deprived in at Least a Given Number of Indicators, Selected Countries**
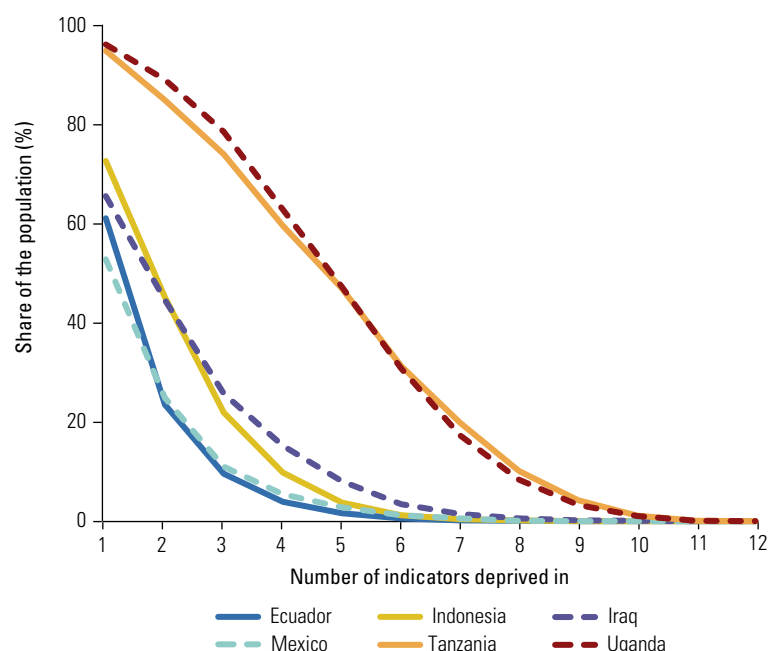
Source: Calculations based on Ecuador's Encuesta de Condiciones de Vida 2013–14; Indonesian Family Life Survey, 2014; Iraq Household Socio-Economic Survey, 2012; Mexican Family Life Survey, 2009–12; Tanzania's National Panel Survey, 2012–13; Uganda National Panel Survey 2013–14. See appendix A for details.

more stringent definitions in the services dimension, or the correlational structure linking the various dimensions. The last reason may be less apparent, but it is conceptually important: if households deprived in any of the added dimensions were already deprived according to the three-dimension measures, implying that the correlation between the deprivations are high, then adding new dimensions need not raise the poverty headcount rates. Conversely, if the new dimensions are uncorrelated or, especially, negatively correlated with deprivation according to the three-dimension measure, then the addition of the new dimensions may lead to an upward surge in poverty rates. Similar to the three-dimension multidimensional measure above, decompositions of the adjusted headcount ratios (M) can be used to unpack how much the different dimensions contribute to poverty in each of the countries studied.

The addition of the health and security dimensions to the three-dimension measure shifts the drivers of poverty in several countries (figure 4.8). Measured in three dimen-

FIGURE 4.7 The Headcount Ratio, by Alternative Poverty Measures, Selected Countries
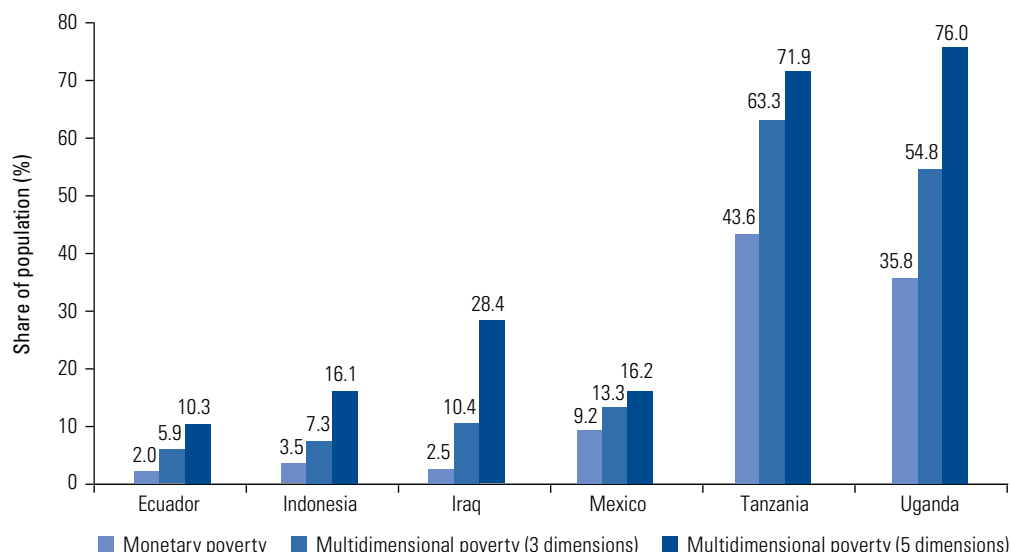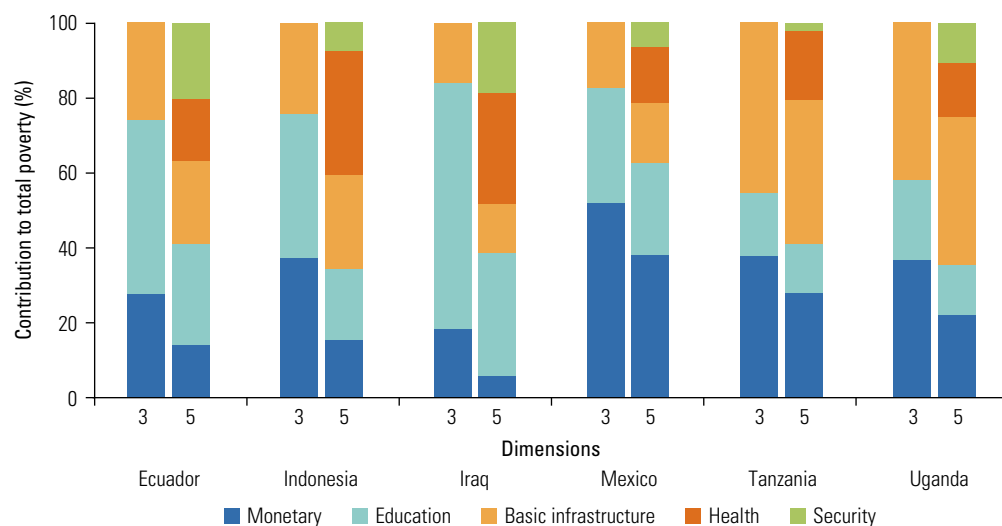

Source: Calculations based on Ecuador's Encuesta de Condiciones de Vida 2013–14; Indonesian Family Life Survey, 2014; Iraq Household Socio-Economic Survey, 2012; Mexican Family Life Survey, 2009–12; Tanzania's National Panel Survey, 2012–13; Uganda National Panel Survey 2013–14. See appendix A for details.

Note: The figure shows the share of the population that is considered poor under three different definitions of poverty. Monetary poverty = individuals living on less than US$1.90 a day. Multidimensional poverty (three dimensions) = individuals deprived in at least 33 percent of the (weighted) indicators according to the multidimensional headcount measure; the dimensions considered are monetary poverty, education and access to basic infrastructure. Multidimensional poverty (five dimensions) = individuals deprived in at least 20 percent of the (weighted) indicators according to the multidimensional headcount measure and considering all five dimensions. Each dimension in the three-dimension measure is weighted 0.33. Each dimension in the five-dimension measure is weighted 0.20. In the multidimension measures, each indicator is weighted equally within dimensions. Monetary poverty rates might differ from recent official estimates because, in all cases except for Iraq, this exploratory analysis is based on different household surveys than the ones used to calculate official monetary poverty, as reported in chapter 1 and earlier in this chapter.

FIGURE 4.8 Contribution to Multidimensional Poverty (M), by Dimension, Selected Countries

Source: Calculations based on Ecuador's Encuesta de Condiciones de Vida 2013–14; Indonesian Family Life Survey, 2014; Iraq Household Socio-Economic Survey, 2012; Mexican Family Life Survey, 2009–12; Tanzania's National Panel Survey, 2012–13; Uganda National Panel Survey 2013–14. See appendix A for details.

Note: The figure shows the contribution of each dimension to the adjusted-headcount ratio M based on the dimensional breakdown method of Alkire et al. (2015).

sions, deprivations in the education dimension are behind two-thirds of the headcount ratio in Iraq. If the five-dimension measure is used, the role of educational deprivations decreases noticeably, and the two extra dimensions are behind roughly half the poverty headcount. Particularly, health deprivations emerge as an area with large contributions to poverty in Iraq. In contrast, in Tanzania and Uganda, the two new dimensions account for only 20 percent of poverty; and, in both the three-dimension measure and the five-dimension measure, monetary poverty and lack of access to basic infrastructure services are the major contributors to poverty.

These effects are partially driven by the extent to which the deprivations tend to appear together, and the number of deprivations experienced by households. In Ecuador and Mexico, monetary poverty and threat of crime are negatively correlated, implying that the two indicators capture different types of households; households that suffer from monetary poverty are less likely to suffer from deprivations associated with crime relative to households that do not suffer from monetary poverty. When deprivations linked to crime are included in the measure of multidimensional poverty, many new households may be added to the ranks of the poor, which is the case in Ecuador. In the case of Mexico, many

of the households that suffer from crime do not experience other deprivations, and hence do not meet the criteria for classification among the poor. Consequently, security contributes only modestly to multidimensional poverty in Mexico. In Tanzania and Uganda, health care deprivations are positively correlated with monetary poverty, education deprivations, and deprivation in services. Yet, because many households already meet the cutoff for classification among the poor without adding the health care dimension, the dimension does not contribute much to the ranks of the poor.

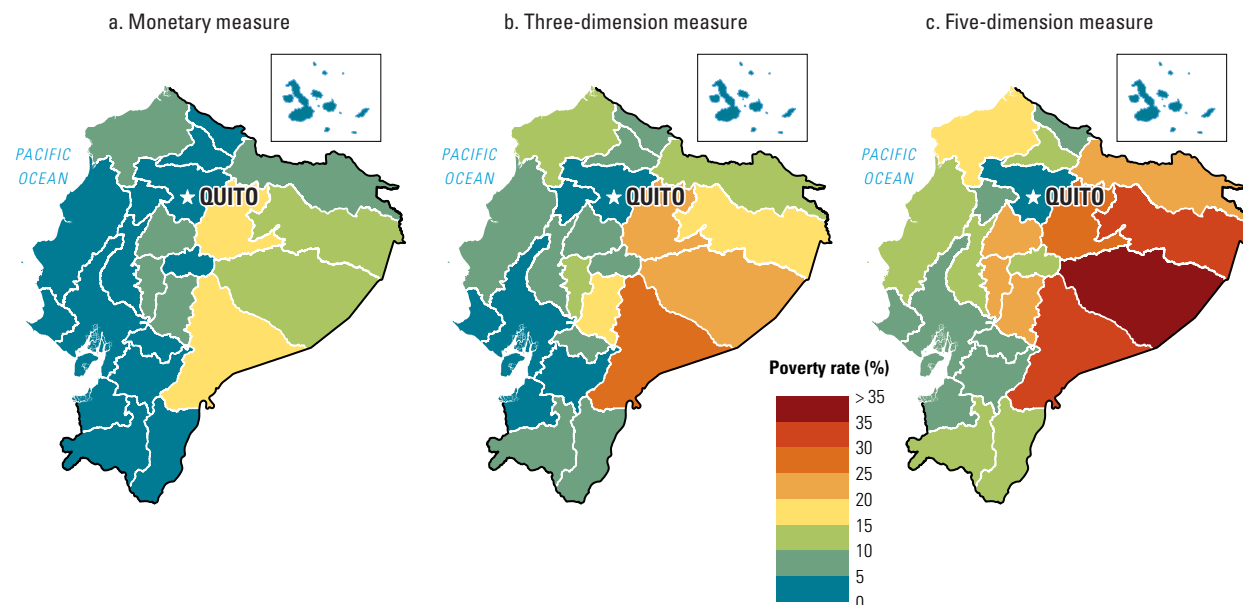## Poverty profiling with five dimensions of well-being

The correlational structure between the dimensions of well-being and their association with population characteristics may change the composition of the poor and the corresponding policy actions needed to reduce poverty. In Ecuador and Iraq, where the contribution to poverty from the security dimension is relatively large, many of the individuals suffering from threats of crime reside in urban centers. As a result, the share of the poor who reside in urban areas in Iraq rises from 31 percent to 44 percent if the focus shifts from monetary poverty to five-

FIGURE 4.9 **The Poor, by Sociodemographic Characteristics, Selected Countries**
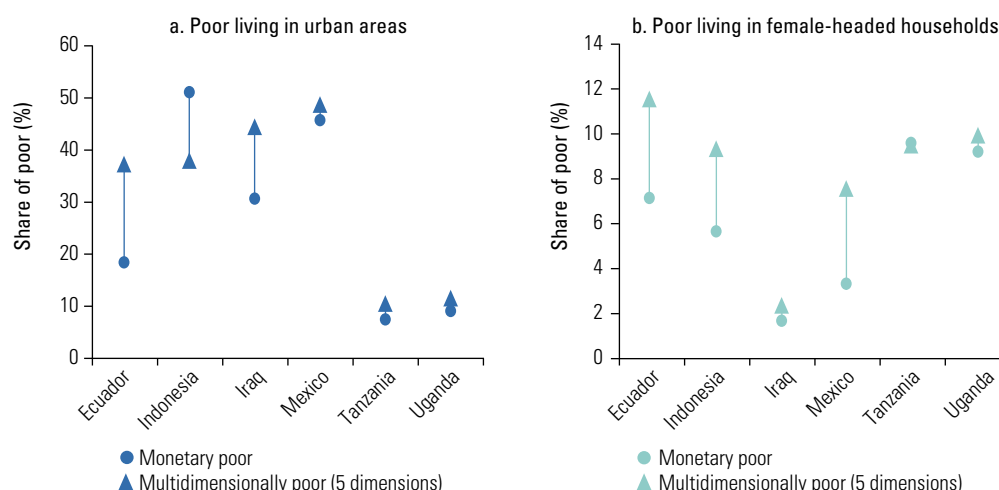
Source: Calculations based on Ecuador's Encuesta de Condiciones de Vida 2013–14; Indonesian Family Life Survey, 2014; Iraq Household Socio-Economic Survey, 2012; Mexican Family Life Survey, 2009–12; Tanzania's National Panel Survey, 2012–13; Uganda National Panel Survey 2013–14. See appendix A for details.

MAP 4.1 **Provincial Poverty Rates, Ecuador**

a. Monetary measure

b. Three-dimension measure

c. Five-dimension measure

Poverty rate (%)

> 35
35
30
25
20
15
10
5
0

IBRD 43980 | OCTOBER 2018

Source: Calculations based on Ecuador's Encuesta de Condiciones de Vida 2013–14. See appendix A for details.

dimension poverty, and similarly from 18 percent to 37 percent in Ecuador (figure 4.9). In contrast, in Mexico, Tanzania and Uganda, where the security addition had a relatively small contribution to total poverty, urban poverty rates change only marginally in response to the addition of more dimensions. In Indonesia, where health deprivations make up the greatest contribution to poverty, the share of poor in urban areas decreases, suggesting that lack of health care primarily is germane to rural areas.

Adding more dimensions also highlights differences in the types of households considered poor. If the five-dimension measure is used instead of the monetary poverty measure, the share of the poor living in female-headed households, defined as households in which the only adult is a woman, increases in all six countries in the sample except Tanzania. In Indonesia, the shift causes the poverty rate among individuals in female-headed households to rise from less than the average rate to more than the average rate, hence targeting female-headed households becomes an important means to combat poverty.

As the composition of poverty changes, so does the spatial concentration of poverty within a country. In Ecuador, for example, the thinly populated province of Pastaza is one of several eastern provinces with high poverty rates according to the monetary poverty measure, but it has an exceptionally high poverty rate according to the extended multidimensional poverty measure (map 4.1). Similar changes occur in other countries, suggesting that the geographical concentration of poverty shifts if more dimensions are considered. This may have important implications for policies aiming to eliminate the pockets of poverty and for the allocation of resources across regions within a country.

Conclusion

Monetary poverty is the World Bank's workhorse measure to assess progress in poverty reduction across the world. This chapter examines the effects of extending the measure of poverty by adding nonmonetary dimensions in an attempt to broaden the measurement of well-being. The analysis should be viewed as a starting point for a deeper investigation of the measurement of poverty that recognizes that many dimensions of well-being are not all readily available through markets.

In addition to income and consumption, up to four other dimensions of poverty are included in the analysis, represented by a total of 12 indicators of well-being. Although there are many other valuable indicators that could have been included in the portfolio of nonmonetary indicators, the selected indicators satisfy explicit principles, including the centrality of private consumption, data availability and parsimony.

The consideration of access to education and basic infrastructure alongside income, in a sample of 119 economies for circa 2013 reveals that about a third of those that are multidimensionally deprived are not captured by monetary poverty. The most prevalent deprivation is access to adequate sanitation, which is associated with higher deprivation rates than income. In the exploratory analysis for six countries in which indicators of health, nutrition, and security are added to the analysis of poverty, new aspects of deprivation are uncovered. In some cases, the incidence of crime or the threat of crime is weakly or even negatively associated with monetary poverty. This implies that the characteristics of the poor shift as the definition of poverty is broadened to include security. For several countries, a larger share of the multidimensional poor live in urban areas and in female-headed households.

A growing toolbox for the assessment of well-being enhances the understanding of poverty. In some regions, deprivations in one dimension are accompanied by deprivations in other dimensions, whereas this is not the case for other regions. This has important implications for policies aimed at reducing human suffering. Although this appreciation is not new or original, elevating additional aspects of well-being to the same level as consumption or income poverty can highlight the relevance of those aspects in comparison to an exclusive focus on monetary poverty.

Going forward, the World Bank will monitor progress on multidimensional poverty using the three-dimension poverty headcount presented in this chapter. However, the empirical challenges of a multidimensional poverty measure, especially at the global level, are great. The analysis described in this chapter relies heavily on available data for the various components of well-being. The data on 119 economies had to have been standardized so indicators on education and utilities could be examined alongside consumption. However, household consumption or income surveys often lack adequate information on many key aspects of well-being, such as health, nutrition, and security. Thus, the extended analysis on additional dimensions of poverty was restricted to six countries. These exercises are also suboptimal because information on the quality of the related services is missing. Richer datasets harmonized with respect to the measurement of essential service access and quality are needed. This appeal does not necessarily mean that already lengthy household survey questionnaires should be lengthened further. Where possible, alternative information sources, such as administrative data or vital statistics, can be combined with survey data at relatively little additional cost in order to broaden the understanding of well-being.