Appendix A
Data Details

The poverty and shared prosperity measures and supporting analysis in this report are based on household surveys from around the world. Because the variables available in the household surveys differ across countries and years, the country coverage varies from chapter to chapter according to the data requirements for the analysis. As the data requirements become more demanding, the subset of countries that can meet them decreases. Thus, the same country coverage is not possible across all five chapters of this report.

This data appendix first provides an overview of the main data sources for this report along with country classification definitions applicable throughout the report. In the subsequent sections, chapter-specific data and methodological issues, such as survey selection criteria, definitions, additional data sources, and key measurement issues are described separately for each of the five chapters.

Main databases for the report

PovcalNet

PovcalNet is an online analysis tool for global poverty monitoring hosted by the World Bank (http://iresearch.worldbank.org/PovcalNet). PovcalNet was developed with the purpose of public replication of the World Bank's poverty measures at the international poverty line (IPL). PovcalNet contains poverty estimates from more than 1,600 household surveys spanning 164 countries and over 40 years, from 1977 to 2017. To produce global and regional estimates and to facilitate comparisons across countries, PovcalNet aligns the surveys to specific reference years (for additional details, see the chapter 1 section of this appendix). This report is based on the September 2018 vintage of PovcalNet. The PovcalNet poverty measures are used for the analysis of global poverty at the IPL in chapter 1 and for the analysis of poverty at higher poverty lines in chapter 3 (table A.1).

Global Database of Shared Prosperity

The Global Database of Shared Prosperity (GDSP) includes the most recent figures on annualized consumption or income growth of the bottom 40 percent of the population (the bottom 40) and related indicators over similar time periods and intervals. All numbers were vetted by an internal Technical Working Group. This report is based on the sixth edition of the GDSP (the fall 2018 release), which features data on 91 economies circa 2010–15 (http://www.worldbank .org/en/topic/poverty/brief/global-database -of-shared-prosperity). The harmonized surveys for the GDSP are all sourced from the Global Monitoring Database (see below). The GDSP is the main data source for the shared prosperity analysis presented in chapter 2 of this report (see table A.1).

Global Monitoring Database

The Global Monitoring Database (GMD) is the World Bank's repository of multitopic

TABLE A.1 Overview of Principal Data Sources by Chapter

	Global Monitoring Database	PovcalNet	Global Database of Shared Prosperity
Chapter 1: Ending Extreme Poverty	Fall 2018 release, data from circa 2015	Fall 2018 release, data from 1977–2017	
Chapter 2: Shared Prosperity	Fall 2018 release, data from circa 2010–15		Fall 2018 release, data from circa 2010–15
Chapter 3: Higher Standards for a Growing World		Fall 2018 release, data from 1977–2017	
Chapter 4: Beyond Monetary Poverty	Fall 2017 release, data from circa 2013		
Chapter 5: Inside the Household	Fall 2016 release, data from circa 2013		

income and expenditure household surveys used to monitor global poverty and shared prosperity.[1] As of June 2018, the GMD contains more than 1,100 household surveys conducted in 156 countries. For a few countries, the welfare aggregate of the GMD spans up to 46 years, from 1971 to 2017, whereas for most other countries, coverage is significantly less. The household survey data are typically collected by national statistical offices in each country, and then compiled, processed, and vetted by the World Bank's internal Technical Working Group. Selected variables have been harmonized to the extent possible such that levels and trends in poverty and other key sociodemographic attributes can be reasonably compared across and within countries over time. The GMD's harmonized microdata are used in PovcalNet and the GDSP.

In this report, the GMD is used for the global poverty profile in chapter 1, the multidimensional poverty measures in chapter 4, and the individual poverty measures in chapter 5. Whereas chapter 1 uses the latest version of the GMD, analyses in chapters 4 and 5 are based on a previous version (see table A.1).

Classification of economies

The economy classifications by income level, geographical region, and fragile and conflict-affected situation are described in this section. The term country, used interchangeably with economy, does not imply political independence but refers to any territory for which authorities report separate social or economic statistics.

By income

The World Bank updates annually the income classification of economies. The income classification used in this report is based on the World Bank's 2018 fiscal year classifications. According to fiscal 2018 definitions, low-income economies are defined as those with a gross national income (GNI) per capita, calculated using the World Bank Atlas method, of US$1,005 or less in 2016; lower-middle-income economies are those with a GNI per capita between US$1,006 and 3,955; upper-middle-income economies are those with a GNI per capita between US$3,956 and 12,235; and high-income economies are those with a GNI per capita of US$12,236 or more. The list of economies by income and lending classification is available at http://databank .worldbank.org/data/download/site-content /OGHIST.xls.

By geographical region

In this report, the six geographical regions comprise (1) low- and middle-income economies, and (2) economies eligible to receive loans from the World Bank (such as Chile) and recently graduated economies (such as Estonia). The aggregate for the six geographical regions is reported as the "sum of regions," which in previous publications was often referred to as the "developing world."

The economies excluded from the six geographical regions (as defined above), mostly high-income economies, are grouped in a category called "rest of the world" in this

report. This group was often referred to as "other high-income" or "industrialized economies" in previous publications.

The economies in each of the six regions and the "rest of the world" category are listed on the next page.

East Asia and Pacific: American Samoa; Cambodia; China; Fiji; Indonesia; Kiribati; Democratic People's Republic of Korea; Lao People's Democratic Republic; Malaysia; Marshall Islands; Federated States of Micronesia; Mongolia; Myanmar; Northern Mariana Islands; Palau; Papua New Guinea; Philippines; Samoa; Solomon Islands; Thailand; Timor-Leste; Tonga; Tuvalu; Vanuatu; Vietnam.

Europe and Central Asia: Albania; Armenia; Azerbaijan; Belarus; Bosnia and Herzegovina; Bulgaria; Croatia; Czech Republic; Estonia; Georgia; Hungary; Kazakhstan; Kosovo; Kyrgyz Republic; Latvia; Lithuania; former Yugoslav Republic of Macedonia; Moldova; Montenegro; Poland; Romania; Russian Federation; Serbia; Slovak Republic; Slovenia; Tajikistan; Turkey; Turkmenistan; Ukraine; Uzbekistan.

Latin America and the Caribbean: Argentina; Barbados; Belize; Bolivia; Brazil; Chile; Colombia; Costa Rica; Cuba; Dominica; Dominican Republic; Ecuador; El Salvador; Grenada; Guatemala; Guyana; Haiti; Honduras; Jamaica; Mexico; Nicaragua; Panama; Paraguay; Peru; St. Kitts and Nevis; St. Lucia; St. Vincent and the Grenadines; Suriname; Trinidad and Tobago; Uruguay; República Bolivariana de Venezuela.

Middle East and North Africa: Algeria; Djibouti; Arab Republic of Egypt; Islamic Republic of Iran; Iraq; Jordan; Lebanon; Libya; Morocco; Oman; Syrian Arab Republic; Tunisia; West Bank and Gaza; Republic of Yemen.

South Asia: Afghanistan; Bangladesh; Bhutan; India; Maldives; Nepal; Pakistan; Sri Lanka.

Sub-Saharan Africa: Angola; Benin; Botswana; Burkina Faso; Burundi; Cabo Verde; Cameroon; Central African Republic; Chad; Comoros; Democratic Republic of Congo; Republic of Congo; Côte d'Ivoire; Equatorial Guinea; Eritrea; Eswatini; Ethiopia; Gabon; The Gambia; Ghana; Guinea; Guinea-Bissau; Kenya; Lesotho; Liberia; Madagascar; Malawi; Mali; Mauritania; Mauritius; Mozambique; Namibia; Niger; Nigeria; Rwanda; São Tomé and Príncipe; Senegal; Seychelles; Sierra Leone; Somalia; South Africa; South Sudan; Sudan; Tanzania; Togo; Uganda; Zambia; Zimbabwe.

Rest of the world: Andorra; Antigua and Barbuda; Aruba; Australia; Austria; The Bahamas; Bahrain; Belgium; Bermuda; British Virgin Islands; Brunei Darussalam; Canada; Cayman Islands; Channel Islands; Curaçao; Cyprus; Denmark; Faroe Islands; Finland; France; French Polynesia; Germany; Gibraltar; Greece; Greenland; Guam; Hong Kong SAR, China; Iceland; Ireland; Isle of Man; Israel; Italy; Japan; Republic of Korea; Kuwait; Liechtenstein; Luxembourg; Macao SAR, China; Malta; Monaco; Nauru; Netherlands; New Caledonia; New Zealand; Norway; Portugal; Puerto Rico; Qatar; San Marino; Saudi Arabia; Singapore; Sint Maarten (Dutch part); Spain; St. Martin (French part); Sweden; Switzerland; Taiwan, China; Turks and Caicos Islands; United Arab Emirates; United Kingdom; United States; U.S. Virgin Islands.

By fragile and conflict-affected situation

Countries with fragile situations are primarily International Development Association–eligible countries and nonmember or inactive countries and territories with a 3.2 or lower harmonized average of the World Bank's Country Policy and Institutional Assessment (CPIA) rating and the corresponding rating by a regional development bank, or with a United Nations or regional peacebuilding and political mission (for example by the African Union, European Union, or Organization of American States) or peacekeeping mission (for example, by the African Union, European Union, North Atlantic Treaty Organization, or Organization of American States) during the last three years. The group excludes World Bank countries (for which the CPIA scores are not publicly disclosed) unless they have a peacekeeping or political/peacebuilding mission. This definition is pursuant to an agreement between the World Bank and other multilateral develop-

ment banks at the start of the International Development Association 15 round in 2007.

The World Bank releases annually the Harmonized List of Fragile Situations. The first such list was compiled in fiscal 2006 and has gone through a series of changes in terms of classification from the Low-Income Countries Under Stress List (2006–09), to the Fragile States List (2010), to the current Harmonized List of Fragile Situations (2011–15). The concept and the list have evolved as the World Bank's understanding of the development challenges in countries affected by violence and instability has matured. The lists of economies by year are available at http://www.worldbank .org/en/topic/fragilityconflictviolence/brief /harmonized-list-of-fragile-situations.

Chapter 1 data and methodology

The World Bank now reports global and regional poverty estimates every two years, coinciding with the publication of the Poverty and Shared Prosperity report. Up until 2008, the frequency of the global estimates was every three years. Because new surveys become available and existing survey and auxiliary data are sometimes updated, the global and regional estimates are revised regularly.

The 2018 edition of global poverty estimates is based on the most recent data available. This section explains notable changes since the 2016 edition of global poverty estimates, discusses some key measurement issues, and describes the auxiliary data, including purchasing power parity (PPP) conversion factors, consumer price indexes (CPIs), population data, and national accounts data.

Household survey data for poverty monitoring

Poverty rates for a region are marked with a note if the available household surveys cover less than 40 percent of the population in the region. The criterion for estimating survey population coverage is whether at least one survey used in the reference year estimate was conducted within two years of the reference year. For the purpose of this chapter, the imputation estimates for India are not counted

toward the 40 percent, which means the South Asia coverage for 2015 is below the threshold. The recent availability of additional survey data has filled gaps in the regional poverty trend for the Middle East and North Africa. In the 2016 edition of the *Poverty and Shared Prosperity Report*, the estimates for the Middle East and North Africa region were not reported for 1999, 2002, and after 2008 because of low population coverage of the data. In the current edition, regional estimates for the Middle East and North Africa are reported for all years.

India

Although the most recent round of National Sample Survey (NSS) data that the Government of India uses for poverty estimation was collected in 2011–12, a subsequent round of the NSS was collected in 2014–15. This more recent survey collects socioeconomic and demographic information similar to the 2011–12 NSS and earlier NSS rounds. But the 2014–15 NSS cannot be used for direct poverty estimation because the consumption data on only a small subset of items have been released. Given the importance of India to the global poverty count, and the unique situation of having common socioeconomic and demographic data in the 2014–15 NSS (and found in earlier NSSs), a model of consumption has been estimated on the basis of the common socioeconomic, demographic, and geographic characteristics of the population (Newhouse and Vyas 2018). Given the importance of India to the global count of extreme poverty, and the unique situation of having essentially the same socioeconomic and demographic data at two points in time, a model of consumption has been estimated on the basis of the socioeconomic, demographic, and geographic characteristics of the population at these two points in time (Newhouse and Vyas 2018). This allows for an estimate of poverty at the IPL for India in 2014–15, which is then lined up to 2015 and used as the poverty estimate for India in chapter 1 (for details on the lineup method, see the section "Estimating global and regional poverty: The 'lineup,'" below). For further details on the consumption model for India, see box 1.3 in chapter 1.

Auxiliary data: PPP, CPI, population, and national accounts

PPP conversion factors. The poverty estimates for all countries are based on consumption PPPs from the 2011 round of data collection coordinated by the International Comparison Program. The PPP conversion factors include benchmark countries where actual price surveys were conducted, and regression-based PPP estimates where such surveys were not conducted or not appropriate for poverty measurement. Since the 2016 edition of the *Poverty and Shared Prosperity Report*, the 2011 PPP conversion factors for Egypt, Iraq, Jordan, Lao PDR, and the Republic of Yemen have been revised (Atamanov, Jolliffe, and Prydz 2018).

CPI. The primary source of CPI data used for global poverty measurement is the International Monetary Fund's International Finance Statistics (IFS) monthly series. Previously, the World Development Indicators (WDI) annual series were used. When monthly IFS series are not available or not appropriate for poverty monitoring, other sources are used. China and India use rural and urban CPIs provided by the national statistical offices, six countries use national series provided by the national statistical offices (the Islamic Republic of Iran, Iraq, Kenya, Maldives, Nicaragua, and República Bolivariana de Venezuela), and five countries use CPIs implied from the surveys (Bangladesh, Ghana, Lao PDR, Malawi, and Tajikistan). A more detailed description of CPIs used for global poverty monitoring is available in Lakner et al. (2018).

Population. The primary source of population data is the December 2017 version of the WDI. For additional details see Chen et al. (2018).

National accounts. The primary source of per capita gross domestic product (GDP) and household final consumption expenditure (HFCE) data is the December 2017 version of the WDI. Per capita GDP is used for countries in Sub-Saharan Africa and in countries for which HFCE is not available. Everywhere else, per capita HFCE is used. A more detailed description of the national accounts data used for global poverty monitoring will be available on the PovcalNet website. For nowcasts, growth projections for recent years are taken from the World Bank's Global Economic Prospects, and from the International Monetary Fund's World Economic Outlook, when the former is unavailable.

The CPI, population, and national accounts data used for the latest global estimates are available on the PovcalNet site (http://iresearch.worldbank.org/PovcalNet/Data.aspx). For additional details on recent changes and data updates, see the What's New notes of the Global Poverty Monitoring Technical Notes (http://iresearch.worldbank.org/PovcalNet/whatIsNew.aspx).

Estimating global and regional poverty: The "lineup"

Because the household surveys necessary to measure poverty are conducted in different years and at varying frequencies across countries, producing global and regional poverty estimates entails bringing each of the country-level poverty estimates to a common reference or "lineup" year. For countries with surveys available in the reference year, the direct estimates of poverty from the surveys are used. For other countries, the poverty estimates are imputed for the reference year using the country's recent household survey data and real growth rates from national accounts data. The procedures for doing this depend on the survey years available for the country.

When a survey is available only prior to the reference year, the consumption (or income) vector from the latest survey is *extrapolated* forward to the reference year using real growth rates of per capita GDP (or HFCE) obtained from national accounts. Each observation in the welfare distribution is multiplied by the growth rate in per capita GDP (or HFCE) between the reference year and the time of the survey. Poverty measures can then be estimated for the reference year. This procedure assumes distribution-neutral growth—that is, no change in inequality—and that the growth in national accounts is fully transmitted to growth in household consumption or income. If the only available surveys are after the reference year, a similar approach is applied to extrapolate backward.

When surveys are available both before and after the reference year, information from both surveys is used to interpolate pov-

erty. In these cases, the welfare vectors (that is, per capita consumption or income) from the two surveys are both lined up to the reference year using growth rates of per capita GDP (or HFCE). After this, the poverty rate is calculated for each of the two lined-up surveys and then averaged, with each point weighted by the relative distance of the survey year to the reference year. The surveys are lined up to the reference year using two different interpolation methods. The default method is applied when the growth in the survey mean between the two surveys is of the same sign as the real growth in per capita GDP (or HFCE) from the first survey to the reference year, and from the reference year to the second survey. With this default method, the growth in welfare from the time of the survey to the reference year is proportional to the relative growth in per capita GDP (or HFCE) over the same period. The first step entails imputing the survey mean at the reference year using the following formula:

$$\mu_{t_r} = \mu_{t_1} + \frac{GDP_{t_r} - GDP_{t_1}}{GDP_{t_2} - GDP_{t_1}} * (\mu_{t_2} - \mu_{t_1}), \text{ (A.1)}$$

where t_r indicates the reference year, t_1 indicates the time of the first survey, t_2 indicates the time of the second survey (such that $t_2 > t_r > t_1$), and μ indicates the survey mean at the specified time. Upon computing μ_{t_r}, each element of the welfare vector from the first survey is grown or shrunk by the rate $\frac{\mu_{t_r}}{\mu_{t_1}}$, while each element of the welfare vector from the second survey is grown or shrunk by the rate $\frac{\mu_{t_r}}{\mu_{t_2}}$. The alternative method involves extrapolating the consumption vector to the reference year for each of the two surveys using the real growth rates of per capita GDP (or HFCE). The mechanics of the extrapolation and interpolation are described in more detail in box 6.4 in Jolliffe et al. (2015).

A truly global approach to poverty measurement

All economies are now included in the global poverty estimates. Previously, the practice was to assume that economies in the "rest of the world" category have zero extreme pov-

erty. As pointed out in the Commission on Global Poverty report, this assumption is inconsistent with a "truly global" approach to poverty measurement (World Bank 2017b, 47). The Commission therefore advised the inclusion of all economies in the global poverty measures. For further discussion, see Ferreira, Lakner, and Sanchez (2017).

Key poverty measurement issues

There are many technical details on how global poverty is measured. Ferreira et al. (2016) provide a good overview of many of these issues, particularly concerning the valuation of the most recent IPL at US$1.90 in 2011 PPPs. For a more in-depth discussion of select measurement and data issues, see also Jolliffe et al. (2015). Two key measurement concerns are discussed below. These two areas are currently being examined, and potential methodss for improvement are being considered.

Consumption- and income-based measures of well-being

National poverty rates are based on measures of consumption or income. Countries typically choose the measure that can be more accurately measured while balancing concerns about respondent burden. On the one hand, consumption measures of poverty require a wide range of questions and are thus more time consuming. Income measures, on the other hand, are difficult to obtain when a large fraction of the population works in the informal sector or is self-employed, and income data are not collected for tax purposes. This is frequently the case in poorer countries, which therefore often opt for using consumption (figure A.1). None of the low-income countries uses income, but this share increases to 10 percent, 40 percent, and 97 percent for lower-middle-, upper-middle-, and high-income countries, respectively. As living standards have improved, so has the share of countries using income-based measures of poverty, and it will likely continue to do so (figure A.1).

Both approaches to measuring poverty have advantages and disadvantages. The consumption approach is arguably more con-

FIGURE A.1 Use of Income/Consumption to Measure Poverty

a. By income group, 2015

b. Over time
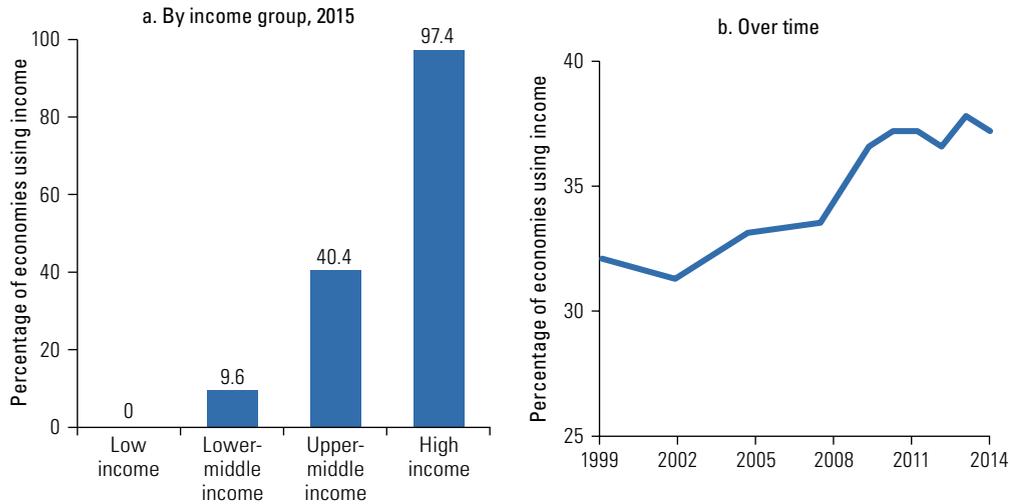
Source: PovcalNet, World Bank, Washington, DC, http://iresearch.worldbank.org/PovcalNet/.

nected to economic welfare. Whereas income is valuable because it allows individuals to purchase goods, consumption is valuable for its own sake. Income measures of poverty also suffer from the disadvantage that incomes might be very low—even negative—in a given period. Negative incomes are often not an accurate depiction of the well-being of a household, so currently negative valuesare being discarded. This is particularly relevant for self-employed individuals who tend to experience large income shocks at greater frequencies. At a theoretical level, consumption will likely be smoothed to safeguard against such shocks, preventing consumption-based measures of poverty from being as vulnerable to large shocks as income-based measures. A household that has managed to save sufficient resources may not suffer greatly from a negative income shock. Consumption-based measures of poverty, conversely, are often more time demanding, require detailed price data, and often post fieldwork adjustments, such as rent imputations, which can matter greatly for the final poverty estimates. Income measures need not rely on more than a handful of questions and can, at times, be verified from other sources.

The differences between income and consumption measures matter for comparing trends and patterns in poverty. Given that incomes can be very low and negative, poverty rates are typically higher when income is used rather than consumption. For a given poverty rate, poor households also tend to be further below the poverty line when income is used. This is explained by the earlier point about very low incomes: whereas it is plausible that households have a zero income in a given time period, subsistence requires a minimum level of consumption, which is strictly above zero. The differences also matter for nowcasting and making poverty projections for the future. Typically, such projections are made by assuming a fixed growth rate of household consumption/income over time. If some households have zero income or a negative income, then, regardless of how large growth rates are assumed to be, those households will never be projected to move out of poverty.

Accounting for spatial price differences across and within countries

Welfare is measured by aggregating a household's total value of consumption or total income over a defined time period and then dividing by household size. When converted at market exchange rates, US$100 can buy different quantities and qualities of goods and services in say Nigeria than in the United States. When comparing poverty rates across countries, local currencies are converted to PPP dollars to account for differences in the pur-

chasing power across countries, ensuring that a dollar can purchase approximately the same bundle of goods and services across countries.

Important differences in price levels also appear *within* countries. Suppose a household pays $1.00 for a kilo of rice in an urban center, whereas a rural household in the same country pays only $0.50 for a similar quality and amount of rice. Assume more generally that prices for all goods are twice as high in urban areas. If both households consumed the same quantity of goods, and if one were to assess poverty on the basis of the self-reported value of goods and services consumed without accounting for these price differences, one would conclude that the rural household in this scenario is poorer than the urban household. From a welfare perspective, however, both households are consuming the same items and are at approximately the same level of well-being. To properly compare the welfare levels of the two households, one would need to account for the differences in price levels that the two households face.

This example highlights the importance of spatial price adjustments within countries. If certain households are deemed poorer solely because they face different price levels, then policy responses to poverty within countries may be misinformed. Because price differences can vary greatly within a country, accounting for regional price differences can have vast implications for subnational profiles of poverty, allocation of resources, and the design of poverty reduction strategies. As national poverty is falling in many countries around the world, it is becoming increasingly important to correctly identify the remaining areas where poverty reduction lags. Without spatial price adjustments, a national poverty line could overestimate poverty in areas with low prices, typically rural areas, and underestimate poverty in areas with high prices, typically urban areas.

Current measurement practices comprise a wide range of methods to account for differences in the cost of living across regions, or across rural and urban areas. Some countries peg prices to the price level of the capital region, or a large city. With this approach, the mean of the spatially adjusted welfare aggregate is larger than the mean without adjustments, essentially inflating the overall level of

well-being relative to other countries at the same nominal level of average consumption. Much work is yet to be done to assure that similar practices are applied in various countries. Ferreira et al. (2016) contains more information on the methods applied in different countries.

Data for global and regional poverty profiles

The global poverty profile for 2015 in chapter 1 is an update of the global profile of the poor first reported in Castaneda et al. (2016) for 2013. The methodological details of poverty profiling are presented in the original paper. The current exercise uses the 2018 vintage of the GMD, covering 91 countries and more than 5.6 billion people, and lines up the survey-based poverty estimates to 2015. The exercise also uses recent population projections from the United Nations Department of Economic and Social Affairs to adjust (that is, post-stratify) the sampling weights to the "lineup" year.

For the Sub-Saharan Africa regional poverty profile, the analysis of demographic characteristics presented in this section builds on the harmonized 24-country data from the book *Poverty in a Rising Africa.* The book examines the trends in poverty and inequality in Sub-Saharan Africa using comparable surveys (Beegle et al. 2016). Of the 148 surveys conducted in 48 Sub-Saharan African countries between 1990 and 2012, two or more surveys were comparable in only 27 of 48 countries, and the data were available for 24 of the 27 countries. The current analysis adds Burundi (2006 and 2013) and Seychelles (2006 and 2013); uses more recent data for Cameroon (2014), Côte d'Ivoire (2015), Madagascar (2012), Rwanda (2013), and Togo (2015); and drops Mauritius, resulting in a 25-country sample with a slightly different compostion. For the set of countries and surveys included in the present analysis, the median year for the base period is 2004 and the median year for the terminal period is 2011. The countries represent 73 percent of the total population of Sub-Saharan Africa in 2015, and the average poverty rates for the two periods are 59.7 and 47.7 percent, respectively. These figures are different

from but close to the poverty rates for Sub-Saharan Africa around the same time—56.9 percent in 2002 and 44.9 percent in 2011 from PovcalNet. The discrepancy arises because PovcalNet includes a wider range of surveys.

Missing data on forcibly displaced persons

Worldwide, it is estimated that there are nearly 70 million people in 2017 who have been forcibly displaced because of persecution, conflict, and generalized violence. Over the last 10 years, the number of forcibly displaced persons has increased by more than 50 percent (UNHCR 2018). As the number of forcibly displaced persons—refugees, asylum seekers, and internally displaced persons—continues to increase, it becomes essential to measure their welfare for an accurate monitoring of global poverty. However, there are many challenges in monitoring the welfare of the displaced persons. Many countries do not count refugees as part of the usual resident population in the population census, and the census enumeration often excludes refugee camps and temporary reception centers where refugees are housed. The exclusion of refugees from the population census implies they are not a part of the sampling frame used in household surveys. Similarly, typical sample designs for household surveys used for poverty measurement explicitly exclude people living in institutions or camps and without an address.

Administrative registration databases maintained by government agencies or international organizations like the United Nations High Commissioner for Refugees are not well integrated into the data systems of national statistical offices throughout the world, nor do these data correspond well with definitions in household surveys. For example, the unit of record in administrative databases is typically a case (for example, border crossing that can occur multiple times for an individual) or application, which does not match the definition of a household, the unit of analysis for sample surveys. This difference makes administrative databases challenging to use as sampling frames of the population of displaced persons (Expert Group on Refugee and Internally Displaced Persons Statistics 2018).

Because of the low prevalence of refugees in general and their concentration in dense geographical pockets, it might be difficult to draw a nationally representative sample using conventional sampling methods. Refugees and internally displaced persons are highly mobile, especially when the crisis is unfolding, which complicates the survey effort. Even when the displaced households can be located, the nonresponse rate might be high because of their wariness of divulging personal information. The problem with nonresponse can become more severe when the survey needs to interview vulnerable populations like women (for example, for birth history) and children (for example, for anthropometric measures).

In sum, socioeconomic surveys on displaced persons are marked with incomplete coverage, unrepresentative samples, and possibly larger-than-usual sampling and nonsampling errors, which results in an underestimate of the level of global poverty and an undercount of the number of poor. To improve the ability to get a complete picture of the poverty situation in the world, and to understand how policy can affect the well-being of displaced persons, a first step is to ensure that they are included in population censuses and the national sample surveys of the country of their residence.

Chapter 2 data and methodology

Welfare aggregate

The mean of the bottom 40 within each country refers to the average household per capita consumption or income among this segment of the population. The choice of consumption or income depends on the data available for each economy, and in most cases is consistent with the welfare aggregate used to measure poverty (see annex 2B, table 2B.1).

For China, shared prosperity is estimated by PovcalNet using grouped data. Because grouped data are provided separately for urban and rural populations, the bottom 40 percent of the national population must be estimated. The bottom 40 are identified using the national poverty gap and choosing a poverty line that corresponds to the threshold

consumption level of the national bottom 40 percent. PovcalNet uses a parametric Lorenz curve fitted to grouped data, with an adjustment for differences in price levels between urban and rural areas, and urban–rural population shares from the WDI. Because shared prosperity is estimated using grouped data for China, it is approximate and may differ from using official microdata (see Chen et al. 2018 for details).

In countries in Europe and Central Asia using household per capita income as the welfare aggregate, households with negative incomes are included when estimating shared prosperity.

Surveys used to calculate shared prosperity

Among the 164 economies with a poverty estimate, significantly fewer have a shared prosperity estimate because of stricter data requirements. Economies are included in the fall 2018 edition of the GDSP if the following requirements are met:

- Two relevant household surveys have been conducted and have yielded comparable data.

- Among comparable surveys, one must be conducted within two years of 2010, and the other within two years of 2015. For example, the Solomon Islands cannot be included because, although two rounds of a comparable household survey have been conducted (in 2005 and 2013), 2005 is more than two years from 2010. China is an exception to this rule because a survey break between 2012 and 2013 means that surveys conducted around 2010 and 2015 are not comparable. The shared prosperity period used for China is 2013–15.

- The period between the selected initial and end years should range between three and seven years. For example, a shared prosperity period of 2012–13 meets the second selection criterion but would not be allowed because it does not meet this third requirement.

- In cases where multiple surveys can fulfill these criteria, the most recent survey years are typically chosen.

Factors affecting the inclusion of economies in the GDSP

The computation of the shared prosperity measure relies on frequent data collection, which may depend on the capacity of a national statistics office—often related to the level of development of a country. Among the 107 countries with a poverty rate below 10 percent in 2015 measured by the IPL, 78 also have a shared prosperity estimate for 2010–15 (figure A.2). Meanwhile, among 57 economies with a poverty rate at more than 10 percent, only 13 have a shared prosperity indicator.

Population coverage is also limited among economies grouped by other World Bank country categories, such as vulnerable, poor, or small nations. For example, a shared prosperity measure is not available on any of the 15 small island nations.

FIGURE A.2 **Shared Prosperity Indicators Are Less Likely in Economies at Lower GDP per Capita**

- Economies with a poverty and shared prosperity indicator
- Economies with a poverty indicator but no shared prosperity indicator
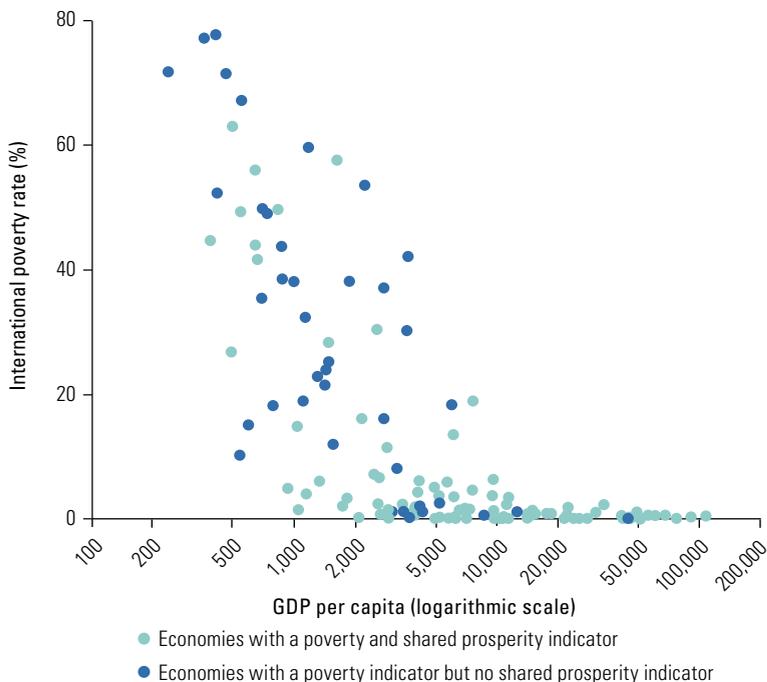
Sources: GDSP (Global Database of Shared Prosperity), fall 2018, World Bank, Washington, DC, http://www.worldbank.org/en/topic/poverty/brief/global-database-of-shared-prosperity; PovcalNet (online analysis tool), World Bank, Washington, DC, http://iresearch.worldbank.org/PovcalNet/; WDI (World Development Indicators) (database), World Bank, Washington, DC, http://data.worldbank.org/products/wdi.
Note: Based on data on 164 economies in PovcalNet associated with direct estimates of poverty. Poverty rates are based on the PovcalNet 2015 lineup.

Comparison of shared prosperity across rounds of GDSP

Comparing the performance in shared prosperity across rounds has limitations. The current release of the GDSP includes 91 countries. Since the circa 2008–13 GDSP used in *Poverty and Shared Prosperity 2016* (World Bank 2016b), 19 countries have been added, and 10 countries removed because they no longer fulfill the data requirements (table A.2). Of the 72 economies occurring in both rounds, the shared prosperity measure has not been updated in five—Mexico, Montenegro, Nicaragua, Rwanda, and Togo—because no new surveys have become available or, in the case of Mexico, because of a break in the survey series. A comparison of shared prosperity indicators can be carried out in 67 economies across rounds.

The country sample changed across the releases of the GDSP for two main reasons:

1. Data requirements were met in one round but not in the next because appropriate data within the established time frame were not available or because of a lack of data comparability. Between circa 2008–13 and circa 2010–15, 10 countries were removed for these reasons.

2. Some countries that did not previously meet data requirements do so now. Between circa 2008–13 and circa 2010–15, 19 countries were added for this reason. This occurs when countries collect new household surveys, following a long gap.

Despite these challenges, the fall 2018 GDSP contains updated values of shared prosperity for three-quarters of the sample (67 countries) used in *Poverty and Shared Prosperity 2016* (World Bank 2016b). Econ-omies with data updates were mainly in Europe and Central Asia, Latin America and the Caribbean, and other high-income countries (the rest of the world). Therefore, only in these regions can trends in shared prosperity be reliably examined. At the other extreme, new household survey data in the Middle East and North Africa and in Sub-Saharan Africa are scarcer, and shared prosperity estimates were updated in only one country per region following the publication of *Poverty and Shared Prosperity 2016.*

Chapter 3 data and methodology

Poverty rates at higher poverty lines

The poverty estimates at the higher poverty lines presented in chapter 3 are extracted from PovcalNet. See the discussion in the chapter 1 section of this appendix for details on household surveys, auxiliary data, and measurement issues. For India, the poverty estimates are extrapolated using 2011–12 survey data and the pass-through rate described in box 1.3 in chapter 1. Poverty rates at the societal poverty line are also estimated from PovcalNet.

Database of harmonized national poverty lines

A database of harmonized national poverty lines is used to derive the societal poverty line presented in chapter 3. Jolliffe and Prydz (2016) construct a set of national poverty lines by combining national poverty headcounts from national sources, reported in the World Bank's databases, with corresponding consumption and income distributions from PovcalNet used for international poverty estimates. Because the consumption and income distributions used are all expressed in per capita PPP terms, the estimated national poverty lines are all expressed in comparable per capita PPP dollars. The national poverty lines are harmonized in terms of the unit of measure in the sense that they are all expressed in per capita terms.

Following this approach, rather than collecting publicly reported poverty lines, al-

TABLE A.2 **Shared Prosperity Availability across Rounds**

GDSP round	Number of economies
Circa 2008–13	82
Removed	10
Added	19
Circa 2010–15	91
Circa 2008–13 and circa 2010–15	72
With updated shared prosperity measure	67

lows for a substantial increase of the set of countries for which we have national poverty thresholds. This approach also results in a series of historic and current poverty lines that allows one to subset on a specific year corresponding to the most recent International Comparison Program reference year (for example, 2011).

Subsetting on national poverty lines closest to 2011 both provides recent socioeconomic assessments of basic needs and reduces the reliance on CPI data for lining up the poverty lines to a common year. The larger database contains 864 harmonized national poverty lines. The analysis of the circa-2011 national poverty lines for the lower-middle-income and upper-middle-income country lines is based on a subsample of 126 lines; and the estimation of the societal poverty line, discussed in this chapter, is based on a subsample of 699 harmonized national poverty lines. For more details on the construction of the database of harmonized national poverty lines, see Jolliffe and Prydz (2016); and for discussion of the data underlying the estimation of the societal poverty line, see Jolliffe and Prydz (2017). For a discussion of the precision of these harmonized lines, see the online appendix to their paper at https://static-content.springer.com /esm/art%3A10.1007%2Fs10888-016-9327-5 /MediaObjects/10888_2016_9327_MOESM1_ ESM.pdf.

Chapter 4 data and methodology

Chapter 4 uses data from the harmonized household surveys from the 2017 edition of the GMD. Surveys have been included in the multidimensional poverty analysis if they satisfy the following criteria:

- They include a monetary welfare measure (consumption or income) and indicators on education and service 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 circa 2013 restriction strikes a balance between maximizing country coverage of

indicators and maintaining cross-country comparability.

Most of the surveys used in the analysis were conducted during 2012–14 (88 countries). No household income and expenditure survey data were available for the populous African countries of Nigeria and Sudan in the 2010–16 period, which explains the low regional population coverage in Sub-Saharan Africa (see table 4.4). The population coverage for the rest of the world category is small because of limited coverage in the GMD. Because of the selection criteria above, the set of countries differs from that in chapter 1.

Differences from chapter 1 poverty estimates

The extreme poverty rates (headcount ratios) reported in this chapter cannot be compared to the information presented in chapter 1 for three practical and methodological reasons. First, if a survey was available for a country in both 2013 and 2015, the 2013 data are used in this chapter to minimize the overall dispersion in survey years. Second, to examine the simultaneous incidence of deprivations, only unit-record data are used in this chapter, which limits the number of countries considered. In contrast, grouped data also enter into the estimation of the global poverty rate reported in chapter 1 if unit-record data are unavailable. China is a notable example where only grouped data are available. This explains the low population coverage of the East Asia and Pacific region in this chapter. Third, PovcalNet relies on recent surveys to impute the headcount ratio for the lineup year, 2015, assuming distribution-neutral growth. These adjustments are not made in this chapter because the lineup process cannot be applied to the other indicators of well-being. A full list of the countries for which different surveys are used in chapter 1 (for the 2015 estimates) and chapter 4 is included in table A.3.

Six-country sample

The extended multidimensional analyses covering five dimensions of poverty are based on the household surveys for the six countries in table A.4. Except for Iraq, the surveys

TABLE A.3 Surveys Used in Chapter 1 and Chapter 4 in Cases Where Different Survey Rounds Are Used

Country/economy	Survey used in chapter 4	Survey(s) used in chapter 1 for extreme poverty
Argentina	EPHC 2014	EPHC 2014 and EPHC 2016
Armenia	ILCS 2013	ILCS 2015
Austria	EU-SILC 2014	EU-SILC 2016
Bangladesh	HIES 2010	HIES 2010 and HIES 2016
Belarus	HHS 2013	HHS 2015
Belgium	EU-SILC 2014	EU-SILC 2016
Bhutan	BLSS 2012	BLSS 2012 and BLSS 2017
Bolivia	EH 2014	EH 2015
Brazil	PNAD 2014	PNAD 2015
Chile	CASEN 2013	CASEN 2015
Colombia	GEIH 2014	GEIH 2015
Costa Rica	ENAHO 2014	ENAHO 2015
Croatia	EU-SILC 2014	EU-SILC 2016
Cyprus	EU-SILC 2014	EU-SILC 2016
Czech Republic	EU-SILC 2014	EU-SILC 2016
Denmark	EU-SILC 2014	EU-SILC 2016
Dominican Republic	ENFT 2013	ENFT 2015
Ecuador	ENEMDU 2014	ENEMDU 2015
Egypt, Arab Rep.	HIECS 2012	HIECS 2015
El Salvador	EHPM 2014	EHPM 2015
Estonia	EU-SILC 2014	EU-SILC 2016
Ethiopia	HICES 2010	HICES 2010 & HICES 2015
Finland	EU-SILC 2014	EU-SILC 2016
France	EU-SILC 2014	EU-SILC 2016
Gambia, The	IHS 2010	IHS 2010 and IHS 2015
Georgia	HIS 2013	HIS 2015
Germany	EU-SILC 2012	EU-SILC 2016
Greece	EU-SILC 2014	EU-SILC 2016
Honduras	EPHPM 2013	EPHPM 2015
Hungary	EU-SILC 2014	EU-SILC 2016
Indonesia	SUSENAS 2016	SUSENAS 2015
Iran, Islamic Rep.	HEIS 2013	HEIS 2014
Ireland	EU-SILC 2014	EU-SILC 2016
Italy	EU-SILC 2014	EU-SILC 2016
Kazakhstan	HBS 2013	HBS 2015
Kosovo	HBS 2013	HBS 2015
Kyrgyz Republic	KIHS 2013	KIHS 2015
Latvia	EU-SILC 2014	EU-SILC 2016
Lithuania	EU-SILC 2014	EU-SILC 2016
Luxembourg	EU-SILC 2014	EU-SILC 2016
Malta	EU-SILC 2014	EU-SILC 2016
Mexico	ENIGH 2012	ENIGH 2014 and ENIGH 2016
Moldova	HBS 2013	HBS 2015
Mongolia	HSES 2016	HSES 2014 and HSES 2016
Montenegro	HBS 2013	HBS 2014
Netherlands	EU-SILC 2014	EU-SILC 2016
Norway	EU-SILC 2014	EU-SILC 2016
Pakistan	PSLM 2013	PSLM 2013 and PSLM 2015
Paraguay	EPH 2014	EPH 2015
Peru	ENAHO 2014	ENAHO 2015
Portugal	EU-SILC 2014	EU-SILC 2016
Romania	HBS 2013	EU-SILC 2016
Russian Federation	HBS 2013	HBS 2015
Serbia	HBS 2013	HBS 2015
Slovak Republic	EU-SILC 2014	EU-SILC 2016
Slovenia	EU-SILC 2014	EU-SILC 2016

(continued)

TABLE A.3 Surveys Used in Chapter 1 and Chapter 4 in Cases Where Different Survey Rounds Are Used *(continued)*

Country/economy	Survey used in chapter 4	Survey(s) used in chapter 1 for extreme poverty
Spain	EU-SILC 2014	EU-SILC 2016
Sri Lanka	HIES 2016	HIES 2012 and HIES 2016
Sweden	EU-SILC 2014	EU-SILC 2016
Switzerland	EU-SILC 2014	EU-SILC 2016
Thailand	SES 2013	SES 2015
Turkey	HICES 2013	HICES 2015
Uganda	UNHS 2012	UNHS 2012 and UNHS 2016
Ukraine	HLCS 2013	HLCS 2015
United Kingdom	EU-SILC 2014	EU-SILC 2016
Uruguay	ECH 2014	ECH 2015
Vietnam	VHLSS 2014	VHLSS 2014 and VHLSS 2016
West Bank and Gaza	PECS 2011	PECS 2011 and PECS 2016

Source: GMD (Global Monitoring Database), Global Solution Group on Welfare Measurement and Capacity Building, Poverty and Equity Global Practice, World Bank, Washington, DC.
Note: Only economies where different survey rounds are used for chapter 4 and the 2015 poverty estimates of chapter 1 are listed. For economies where EU-SILC is used, the income data is from the year prior to the survey. For example, the EU-SILC 2016 survey uses data from 2015. Romania is the only economy where both the survey year and the type of survey differ from chapter 1 to chapter 4.

are not the same surveys used for official national poverty estimates. Therefore, the monetary poverty headcounts cited in this section may vary from official estimates.

Definitions of indicators

Monetary poverty

- **Income per capita.** A person is considered deprived if the household consumption or income per person per day falls below the IPL, currently set at US$1.90 in 2011 PPPs.

Education

- **Child school enrollment.** Individuals are considered deprived if they live in a household in which at least one school-aged child up to the age of grade 8 is not enrolled in school. If a household has no

child up to this age, this indicator is not applicable, and the deprivation in the education dimension is measured solely using the adult school attainment indicator.

- **Adult school attainment.** Individuals are considered deprived if no adult (at or above the age one is normally at when attending the ninth grade) in the household has completed primary education.

Access to basic infrastructure

- **Electricity.** A person is considered deprived if the household has no access to electrification from any source, that is, grid electricity or self-generation.

- **Limited-standard drinking water.** A person is considered deprived if the household has no access to even a limited standard of drinking water. For a selection of countries, a variation closer to the Sustainable Development Goals' safely managed drinking water concept is available: a household is considered deprived if it has no access to basic drinking water (a limited-standard source that is within a round-trip time of 30 minutes).

- **Limited-standard sanitation.** A person is considered deprived if the household has no access to even a limited standard of san-

TABLE A.4 Household Surveys, Six-Country Sample

Country	Year	Survey
Ecuador	2013–14	Encuesta de Condiciones de Vida
Indonesia	2014	Indonesian Family Life Survey
Iraq	2012	Iraq Household Socio-Economic Survey
Mexico	2009–12	Mexican Family Life Survey
Tanzania	2012–13	National Panel Survey
Uganda	2013–14	Uganda National Panel Survey

itation facilities, that is, a sanitation facility that hygienically separates excreta from human contact. For a selection of countries, exclusivity of the facility is also taken into consideration. In those countries, a household is considered deprived if it lacks a limited-standard facility that is used only by members of the same household. The addition of this criterion to "limited" is called "basic sanitation."

Health and nutrition

- **Birth delivery.** A person is considered deprived if any woman in the household between the ages of 15 to 49 has given birth (live) in the previous 36 months, and the delivery did not occur in a formal facility.

- **Vaccination.** A person is considered deprived if the household has any child between the ages of 12 to 59 months who has not received a third diphtheria-pertussis-tetanus vaccination.

- **Child stunting.** A person is considered deprived if the household has any child between the ages of 0 to 59 months who is stunted (the height-for-age Z-score is below −2, that is, more than two standard deviations below the reference population median).

- **Undernourishment.** A person is considered deprived if any woman between the ages of 15 to 49 in the household is undernourished (her body mass index is below 18.5 [underweight]).

The measure of access to formal health care is not applicable to all households because a significant share of households have not experienced a birth in the previous three years or do not have a child younger than 5 years. For such households, access to health services is approximated by the share of individuals in applicable households in the same community who are observed to be deprived. The deprivation threshold for the rate of health service access 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 younger than 6 years.

Security

- **Incidence of crime.** A person is considered deprived if anyone in the household has experienced crime in the previous year or lives in a neighborhood where at least 20 percent of households contain at least one individual who experienced crime in the previous year.

- **Incidence of natural disaster.** Individuals are considered deprived if their household has experienced a severe shock (a loss of income, property, or livestock) because of drought, flooding, earthquake, or other natural disaster in the previous 12 months.

Chapter 5 data and methodology

This section uses the harmonized household surveys from the 2016 release, circa 2013 data, edition of the GMD. Even though GMD data for circa 2013 was used for chapters 4 and 5, the set of countries covered differs because different variables are required for the analysis. The combined sample of the data used in chapter 5 contains records representing 5.2 billion individuals in 89 countries, with estimates of poverty figures lined up—that is, extrapolated—to 2013 and then updated to 2016. The data include welfare aggregates based on a money metric, either household per capita consumption or income, depending on the concept used in each country (see chapter 1 discussion above for details). Nearly 83 percent of the sample originates in middle-income countries. East Asia and Pacific and South Asia account for nearly two-thirds of the sample. The GMD sample has a high regional coverage of developing countries in East Asia and Pacific, South Asia, Latin America and the Caribbean, and Europe and Central Asia (above 87 percent) and partial coverage of Sub-Saharan Africa (74 percent). Additional labor data from the International Income Distribution dataset were merged for 17 countries in Sub-Saharan Africa (Muñoz

TABLE A.5 Household Surveys for Case Studies and Sharing Rule Estimates

Country	Survey	Year(s)
Case studies		
Bangladesh	Bangladesh Integrated Household Survey	2011–12
China	China Health and Nutrition Survey	1989, 1991, 1993, 1997, 2000, 2004, 2006, 2009
Senegal	Poverty and Family Structure Survey	2006–07
Burundi	Panel Priority Survey	2012
Sharing rule estimates		
Bangladesh	Bangladesh Integrated Household Survey	2011–12, 2015
Malawi	Malawi Integrated Household Survey	2004–05, 2010–11
Tanzania	National Panel Survey	2012–13, 2014–15

Boudet et al. 2018). Because of remaining quality concerns in the economic participation variables, 18 countries were dropped for the economic typology of households. Because of low coverage in the Middle East and North Africa (4.1 percent), the results from this region are not presented.

Differences in resources and poverty within households

This section draws on the household surveys in table A.5.

An individual perspective on multidimensional poverty

This section uses the same household surveys that were used in the six-country sample in chapter 4 (see table A.4), except Uganda is excluded because the survey did not collect anthropometric information for adults.

Note

1. GMD (Global Monitoring Database), Global Solutions Group on Welfare Measurement and Capacity Building, Poverty and Equity Global Practice, World Bank, Washington, DC.