REDUCING GLOBAL POVERTY

PATTERNS OF POTENTIAL HUMAN PROGRESS

VOLUME 1

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Cover Art

The cover art, an oil painting by Margaret Lawless, represents a
world populated by individuals with very different incomes and life
situations, most of whom are poor and very large numbers of whom
suffer great poverty. Its images represent differing segments of the
world's population, the dynamism of movement within and between
them, the disruptive character of transition, and the uncertainty of
the future even for those who attain economic well-being.

Although poverty brings degradation and even death, the painting
captures our fundamental belief that all humans deserve treatment
that draws attention to their basic dignity and beauty. That belief
has influenced also our choice of pictures throughout this volume,
even though we could have chosen very painful images of the
affects of poverty.

The S-curve of the hillside behind the three abstract figures suggests
the character of multiple and interacting global human transitions,
of which the movement from poverty to well-being is only one.
The transformation of the global human condition to long-term,
sustainable well-being encompasses many such transitions, which
are therefore a pervasive theme and image of work from the
Frederick S. Pardee Center for International Futures.

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Preface

This is the first in a series of volumes that explore prospects for human development—how development appears to be unfolding globally and locally, how we would like it to evolve, and how better to ensure that we move it in desired directions. The UN Development Programme's (UNDP) annual Human Development Report (HDR) heavily influenced this series. Although our volumes are totally independent from the HDRs, they share the UNDP's attention to different specific issues each year. In our case, however, the analyses are forward looking with a time horizon of fifty years further into the century, making the series something of an HDR plus fifty. The country-specific tables accompanying the volumes constitute the most extensive available set of long-term forecasts across multiple issues of human development.

Each volume will be global, long-term, and integrated in perspective across a wide range of human development systems (namely systems such as population growth, the spread of education, the advance of health, the growth of economies, and changes in governance patterns). This first volume focuses on poverty reduction, recognized in the Millennium Development Goals to be the foundational human development goal. The next will look at the future of global education, and the third will turn to prospects for global health.

The volumes emerge from the Frederick S. Pardee Center for International Futures at the University of Denver's Josef Korbel School of International Studies. The International Futures (IFs) modeling project has been dedicated for three decades to developing and using the strongest possible global, long-term, multiple issue capability for exploring the future of key global issues. At the core of the project is the IFs computer system, with an extensive database, forecasting capability, and scenario analysis assistance. IFs facilitates such analysis for 182 countries individually or in groupings, across demographic, economic, energy, agricultural, environmental, and sociopolitical issues.

The IFs system has been used in support of many forecasting projects, including those of the European Commission, the U.S. National Intelligence Council, and the UN Environment Programme. The partners of the IFs team in such projects have been numerous, as they are in this set of volumes. For example, cooperation with the RAND Corporation has been very important in developing this first volume.

Among the philosophical underpinnings of the IFs project are the beliefs that (1) prediction is impossible, but forecasting is necessary for understanding change and to support policy making; (2) analysis should always be built around alternative possible futures; and (3) the tools for forecasting should be fully open and transparent (IFs with Pardee is freely available to all users).

The long-term, global, and integrated multiple-issue characteristics of this series make the effort both unique and highly ambitious. A number of assumptions underlie our belief that it is time for such a set of volumes focused on a variety of human development systems.

First, human development systems are growing in scope and scale. Human numbers and incomes continue to rise, causing the extent of our interactions with each other and with our broader environment to grow rapidly. This does not mean that issues are necessarily becoming more fundamentally insurmountable than in past eras. It does mean, however, that attention to the issues must have a global perspective, as well as local and regional ones, and that the issues require an integrated perspective.

Second, change in human systems has accelerated. Although demographic growth is slowing, global economic growth has gradually risen, and sociopolitical change is extraordinarily rapid. One important ramification of the pace of change is that it has become more important to look further ahead and to anticipate where that change may be or could be taking us. A long-term perspective, as well as an integrated and global one, is required.

Third, goals and priorities for human systems are becoming clearer and are more

The tables accompanying volumes in this series are the most extensive available long-term forecasts of human development.

Prediction is impossible, but forecasting is necessary.

frequently and consistently enunciated. For instance, the UN Millennium Summit and the 2002 conference in Johannesburg set specific goals for 2015, including many that focus on the human condition. Such goals are increasingly guiding a sense of collective human opportunity and responsibility.

Fourth, understanding of human systems has grown rapidly more sophisticated. With respect to data, the second half of the twentieth century was a period of explosion in human assessment of all the elements of sustainable development. It is remarkable to recall that at the middle of the twentieth century, the gross national product (GNP) was a relatively new measure and that the human database concerning worldwide individual life conditions, economic well-being, and social capacity was skimpy at best. Large-scale and consistent data collection has now characterized most of the world since about 1960 and has continued to improve. In addition, new concepts and measures linked to such data, such as the human development index, have emerged to tell us much about ourselves.

With respect to understanding the dynamics of our systems, progress has been equally rapid. Although it may sometimes be discouraging that debates about the drivers of economic growth, poverty reduction, and other change are so extensive and intense, any survey of the unfolding of development theory will quickly show the accumulation of insights. Windows into understanding the world condition have opened.

Fifth, and derivatively, the domain of human choice and action is broadening. Constructive action depends on being able to set goals, on being able to assess the condition of our environment, and on being able to anticipate the dynamics that might unfold with and without our action. As we have argued, each of these foundations of human action has strengthened.

Sixth, human development itself has increasingly given us new levers for action, should we choose to use them. These include the vast benefits of human development to date: the advance in the life conditions and individual capacity of so many, the growing wealth of humanity, the growth of our social capacity, and the expansion of a broad knowledge base. For instance, the recent emergence of new information and communication technologies has dramatically enriched the human ability to access existing knowledge, to develop and use networks for its application, and to accelerate creation of still more knowledge.

Seventh and finally, discussions and debates concerning the appropriateness of goals, the quality of measures, and the patterns of likely and possible development have emerged globally. There will probably always be metadebates around the need for conscious social choice and action to manage transitions (versus letting self-correcting systems function), as well as minidebates concerning the most appropriate tactics for accomplishing goals that have already been set. In the turmoil of those debates, we should not lose sight of the importance of their occurring at all.

Will humanity grasp its opportunities to build on these foundations and substantially enhance the global human condition in this century? Will we build a transition to sustainable development broadly defined to include human capacity development, social justice, and environmental sustainability? Our success in reducing poverty and in eliminating altogether the most egregious manifestations of it will be one key test. It is to that collective effort that we dedicate this volume.

Our success in reducing poverty is foundational to sustainable development.

Acknowledgments

The authors give special thanks to Frederick S. Pardee, who not only funded the development of this report but helped conceptualize the series that this volume initiates. In addition, he has generated a constant flow of ideas with respect to the subjects and structure of this volume, with special attention to the supporting data tables in the volume and online. It is often asserted that a volume would not exist without the contributions of a particular individual. In this instance, the contributions of Frederick Pardee were, in fact, absolutely essential.

The authors of the volume take both credit and responsibility for its ultimate content. We built, however, on tremendous foundations of work directed toward understanding and reducing global poverty. The hope that motivated our work was that this study would contribute something to that ongoing stream of effort.

The IFs simulation model, the core tool of this volume, has been developed over a great many years under the direction of Barry Hughes at the University of Denver. Thanks to the support of the University of Denver and the Frederick S. Pardee Center for International Futures, the complete system, including both a downloadable version and an online version, is available for all users at www.ifs.du.edu.

IFs, developed originally as an educational tool, owes much to the large number of students, instructors, and analysts who have used or reacted to the system over many years and provided much-appreciated advice for enhancement. It is impossible to name all those who have provided feedback and ideas, but they include John Agard, James Allan, Alan AtKisson, Robert Ayres, Steven Bankes, Gerald Barney, Christian Berg, Donald Borock, Mark Boyer, Peter Brecke, Stuart Bremer, Matthew Burrows, Jonathan Cave, Richard Chadwick, Claudio Cioffi-Revilla, Sam Cole, Tom Coyne, Mark Crescenzi, Thomas Cusack, Jim Dator, Paul Desanker, Pol Descamps, Karl Deutsch, Bert de Vries, James Dewar, William Dixon, Faye Duchin, Joan Eamer, Rich Engel, Thomas Ferelman, Martina Floerke, Miriam Galt, Siwa Msangi, Jay Gary, Ted Gordon, Paolo Guerrieri, Harold

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Abbreviations

ACC	Ahluwalia, Carter, and Chenery		MA	Millennium Ecosystem Assessment
AIDS	acquired immune deficiency syndrome		MDG	Millennium Development Goal(s)
BRICs	Brazil, Russia, India, and China		MER	market exchange rates
DOE	U.S. Department of Energy		MFP	multifactor productivity
DRC	Democratic Republic of the Congo		NAS	national account statistics
EIA	Energy Information Agency (of the US DOE)		NEPAD	New Partnership for Africa's Development
FDI	foreign direct investment		NGO	nongovernmental organization
FGT	Foster, Greer, and Thorbecke		OECD	Organization for Economic Cooperation and Development
G-7	Group of 7 (Canada, France, Germany, Italy, Japan, United Kingdom, United States)		PEI	Poverty and Environment Initiative
			PEP	Poverty-Environment Partnership
GDP	gross domestic product		PPP	purchasing power parity
GEO	Global Environment Outlook		R&D	research and development
GNI	gross national income		SAM	social accounting matrix
GSG	Global Scenario Group		SRES	Special Report on Emissions Scenarios
GTAP	Global Trade and Analysis Project		SSA	sub-Saharan Africa
GWP	gross world product		TI	Transparency International
HDI	human development index		UN	United Nations
HDR	Human Development Report		UNDP	United Nations Development Programme
HELI	Health and Environment Linkages Initiative		UNEP	United Nations Environment Programme
HIV	human immunodeficiency virus			
HPI	human poverty index		WCED	World Commission on Environment and Development
IBRD	International Bank for Reconstruction and Development (World Bank)		WDI	World Development Indicators
			WEC	World Energy Council
ICP	International Comparison Project		WHO	World Health Organization
IDA	International Development Association (World Bank)			
IEA	International Energy Agency			
IFI	international financial institution			
IFs	InternationalFu tures (modeling system)			
IIASA	International Institute for Applied Systems Analysis			
IMF	International Monetary Fund			
IISD	International Institute for Sustainable Development			
IPCC	Intergovernmental Panel on Climate Change			

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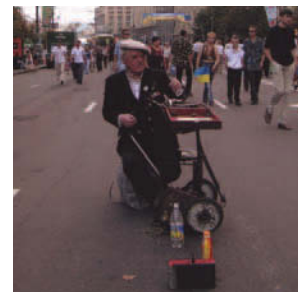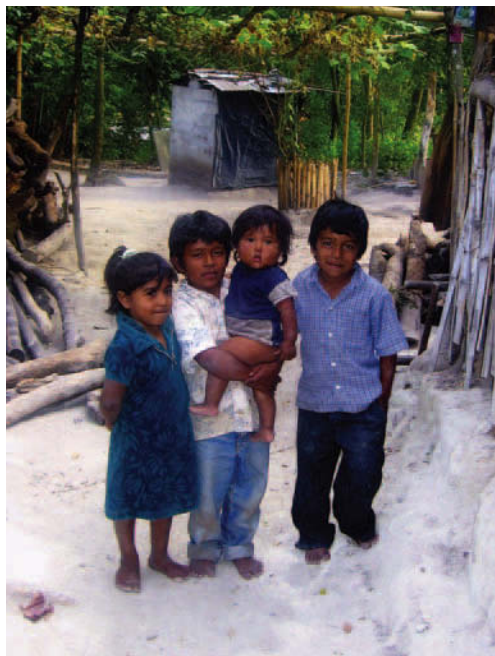
Introduction

Global Poverty

Poverty, the inability to attain a "minimum" level of well-being, is the most fundamental economic and social problem facing humanity. In the extreme case, poverty actually kills people. Even when it does not kill, poverty is a basic deprivation that stunts the very possibility of human development. It is therefore stating the obvious to declare that the reduction and ultimately the eradication of poverty must be a central goal for the people on this planet.

Even before the widespread publicity associated with the Millennium Development Goals (MDGs) by the United Nations, global poverty was understood to be a somewhat intractable problem. World Bank documents in the 1970s and 1980s illustrate the many efforts to analyze the state of global poverty and many proposals to reduce global poverty. However, with the increased emphasis given to the goal of poverty reduction in the MDGs, the measurement of poverty and its speedy amelioration have now become central to the efforts of the entire global development community.

There are deep moral motivations for a commitment to poverty reduction. To take one well-known approach, the Rawlsian principle of justice as fairness leads directly to the consideration of the state of the poor and a commitment to improve their lives. More recently, the Nobel laureate Amartya Sen advanced an even broader concept. According to Sen's capabilities approach, a liberal society is committed to the equalization of capabilities that roughly correspond to one's ability to lead a human life with reasonable longevity, nutrition, health, and social functionings. The upshot of Sen's approach is also that we must seriously try to improve the conditions of the poor in this world.

The Character and Extent of Poverty

Poverty is not a single phenomenon with a simple foundation, invariant across geographic location and social condition. Poverty has many

There are deep moral motivations for a commitment to poverty reduction.

faces. Important aspects of the global poverty profile include its global distribution, the rural-urban divide, its gender aspect, and features specific to particular countries or regions such as the caste system in India.

The spatial nature of poverty

Using two standard measures of poverty, namely living on less than $1 or $2 per day, Table 1.1 shows World Bank data and forecasts across the economically less developed part of our world.

South Asia and sub-Saharan Africa have two of the largest concentrations of the poor. In the more than sixty years since the end of World War II, East Asia has undergone the greatest progress in reducing poverty. In the last thirty years, the People's Republic of China (PRC) has shown a remarkable reduction in poverty also, although in absolute numbers China still has a large number of poor people.

More specifically, approximately 1 billion people globally lived on less than $1 per day

Table 1.1 World Bank data and forecasts of poverty						
	Millions of persons living on					
	Less than $1 per day			Less than $2 per day		
Region or country	1990	2004	2015	1990	2004	2015
East Asia and the Pacific	476	169	40	1,113	684	296
China	374	128	29	819	452	186
Rest of East Asia and the Pacific	102	41	11	294	232	110
South Asia	479	446	256	954	1,116	997
India	376	371	217	734	868	772
Rest of South Asia	103	76	39	220	248	226
Europe and Central Asia	2	4	2	20	46	16
Middle East and North Africa	5	4	2	49	59	38
Sub-Saharan Africa	240	298	290	396	522	567
Latin America and the Caribbean	45	47	34	115	121	102
Total	*1,247*	*970*	*624*	*2,647*	*2,548*	*2,017*
Excluding China	*873*	*841*	*595*	*1,828*	*2,096*	*1,831*
	Percentage of the population living on					
	Less than $1 per day			Less than $2 per day		
Region or country	1990	2004	2015	1990	2004	2015
East Asia and the Pacific	29.8	9.1	2.0	69.7	36.6	14.5
China	33.0	9.9	2.1	72.2	34.9	13.4
Rest of East Asia and the Pacific	22.1	7.1	1.6	63.7	40.4	16.9
South Asia	43.0	30.8	15.1	85.7	77.1	59.0
India	44.3	34.3	17.6	86.4	80.4	62.7
Rest of South Asia	38.9	20.6	8.5	83.4	67.6	49.2
Europe and Central Asia	0.5	0.9	0.3	4.3	9.8	3.4
Middle East and North Africa	2.3	1.5	0.7	21.7	19.7	10.3
Sub-Saharan Africa	46.7	41.1	31.4	77.1	72.0	61.5
Latin America and the Caribbean	10.2	8.6	5.5	26.3	22.2	16.3
Total	*28.7*	*18.1*	*10.2*	*60.8*	*47.6*	*32.9*
Excluding China	*27.1*	*20.7*	*12.6*	*56.8*	*51.6*	*38.7*

Source: World Bank 2008: 46 (Table 1.5).

in 2004, and more than 2.5 billion or half of all those in low- and middle-income countries lived on less than $2 per day. Although there has been limited reduction in those numbers since 1990 (none at all at $2 per day), the percentages have declined significantly, and the World Bank anticipates substantial further decline by 2015. In fact, the Bank expects the percentage of those living on less than $1 per day to have been cut by almost two-thirds between 1990 and 2015. Clearly, the extremely rapid reduction of poverty in China greatly influences broader trends. In India the numbers of the poorest fell little in the 1990s, but Thailand and Vietnam (not shown) achieved significant reductions.[1] And sub-Saharan Africa has experienced much smaller reductions since 1990 in the percentage living on less than $1 or $2 and, in fact, has seen substantial growth in the numbers of people living at those levels.

In addition to region of the world, urban/rural location affects the likelihood of living in poverty. The UN calculated that the urban share of global population reached 50 percent in 2007. In developing countries, however, the portion of the population in urban areas is closer to 40 percent, with the 50 percent number to be reached in about 2020.[2] Poverty is, however, disproportionately a rural phenomenon, and only about 30 percent of the world's poor live in urban areas (Ravallion 2001b: 2). Poverty will likely become predominantly an urban phenomenon as urban population growth outpaces that in rural areas. Martin Ravallion forecast that the urban share of poverty will reach 40 percent in 2020 and 50 percent about 2035 (when the urban population share reaches 61 percent).

The social nature of poverty

Subpopulations within societies differ significantly in their poverty levels. Both case studies (Agarwal, Humphries and Robeyns 2005; Nussbaum and Glover 1995) and empirical analyses (UN ECLAC 2005: 44–45) indicate that being female makes one more vulnerable to poverty.

One of the distressing manifestations of poverty and gender inequality is the phenomenon of excess mortality and artificially lower survival rates of women in many parts of the world. This phenomenon is known as "missing women" (Sen 1992b). In the United States and Europe, there tend to be more women than men in the total population, with a female-male ratio of 1.05. One reason is that women are biologically "hardier" than men and, given equal care, survive better. The situations in the developed West and in less developed nations reveal a sharp contrast. The contrast is especially grim in parts of Asia and North Africa, where the female-male ratio can be as low as 0.95. Using the Western ratio as the benchmark, approximately 100 million women worldwide appear to be "missing." Even adjusted measures with other benchmarks suggest that the number is roughly 60 million.[3]

The effects of income poverty and various dimensions of social exclusion upon the lives of individuals and subpopulations overlap and interact. A further element of vulnerability comes from being in the wrong segment of a status-hierarchical society. One example of this is the caste system in India. Particularly in rural areas, the intersection of gender and caste can make a woman very vulnerable, as the following example so movingly illustrates:

"I may die, but I still cannot go out. If there's something in the house, we eat. Otherwise, we go to sleep." So Metha Bai, a young widow with two young children in Rajasthan, India, described her plight as a member of a caste whose women are traditionally prohibited from working outside the home—even when, as here, survival itself is at issue. If she stays at home, she and her children may die shortly. If she attempts to go out, her in-laws will beat her and abuse her children (Nussbaum and Glover 1995: 1).

Like gender, age often shapes poverty rates, with the young and old suffering disproportionately. Ethnic differences within countries also commonly coincide with considerable differences in poverty levels. For instance, indigenous populations typically have rates of poverty that are multiples of the rates in European settler populations, as do the descendents of imported slaves. An extreme example is Paraguay, where the rate is nearly 8 to 1 (UN ECLAC 2005: 49).

This report will not be able to forecast poverty specifically for social subgroups, and its differentiation of poverty will be overwhelmingly structured by the borders of

Subpopulations within societies differ significantly in their poverty levels.

countries. Moreover, it will focus heavily upon the income bases of poverty. It is important, nonetheless, to recognize the complex social character of poverty around the world.

Why This Report?

The phenomenon of global poverty is the fundamental issue of global development, and a web search on "poverty" brings up over 50 million cyber addresses. One might therefore reasonably conclude that enough has been and is being done by others. Yet there are several remarkably large deficiencies in the huge body of studies and policy analyses on poverty. First, partly because of the time horizon of 2015 identified by the Millennium Development Goals, and in spite of the very long horizon of many interventions to reduce poverty, little analysis explores the longer-term human future on this critical issue. Second, global analyses of poverty typically do not cover regions of continents, much less individual countries. It is critical, however, to be able to explore the spatial dimension of poverty broadly. Third, there is a natural tendency for analysts and institutions to focus on specific, targeted interventions for several reasons: (1) sometimes because they are seen as "silver bullets"; (2) sometimes because of scholars' knowledge of or familiarity with the research terrain; and, more fundamentally, (3) because it is critical that we understand the different implications of various interventions. A much smaller portion of analysis explores a wide range of interventions, however, both singly and in comparison and in combination.

The need for a long horizon

Poverty will not disappear by 2015, even when defined with a bar as low as an income of just $1 per day for each individual. If the MDG of reducing the rate of poverty in the developing world by half between 1990 and 2015 were met but not exceeded, there would still be nearly 890 million people living on less than that amount. And although there is substantial consensus that the goal will likely be met and even exceeded globally, it will almost certainly not be met in sub-Saharan Africa.

We thus need to think beyond 2015, as well as maintaining and strengthening our efforts through that year. As humans, we understandably tend to be impatient. We want to see change in our lifetime so that we and our families and communities can benefit from it. Yet much sociopolitical change is slow. Payoffs for investment often accrue to successor generations, sometimes the children of those who act, but often their grandchildren and even great-grandchildren. In addition, changes often require sequencing. Thus shorter-term and longer-term horizons are essential.

It is also important to understand that, as critical as the reduction of poverty may be, it is not the only high-priority human goal. When historians of the future look back on the twenty-first century, hopefully they will be able to look at it in terms of a long, broad sustainability transition. That transition is likely to be defined, much as it already is today, in terms of individual human development (including poverty reduction and the development and exercise of human capabilities), social development (including the expansion of human participation in governance and social decision making on the basis of justice and fairness), and a sustainable relationship between humanity and its broader environment. The positioning of poverty as one aspect of this larger transition is another reason that both longer-term and near-term perspectives are needed.

The importance of maintaining global and country-specific perspectives

The global assault on poverty requires simultaneous attention to multiple levels of analysis. Global and continental perspectives help us to grasp the magnitude of the problem, to understand trends, and to begin to speculate about the appropriate interventions. Although some action against poverty is clearly being undertaken at the global level, most of it remains at and within individual countries.

This study crosses levels of analysis. Earlier chapters devote more attention to the global and continental level. Chapter 7 begins to explore regions within continents, and Chapter 8 dives into such regions, individual countries, and even subregions of countries. Most important, for those who have specific country interests, the forecast tables at the end of the volume provide an extensive set of variables for mapping poverty and human well-being more generally.

● It is unique to analyze poverty in the long term and at global and country-specific levels, with attention to multiple possible interventions. ●

The value of a deep and integrated look at poverty drivers

The transitions that have essentially eliminated the most extreme poverty in the rich countries of the world were broad and complex. The long and very substantial rise of incomes was clearly the key proximate driver of success, but stating that gives us little real insight.

Perhaps it was the introduction of widespread use of soap and other sanitation measures that set off the demographic transition and ultimately brought about the development of that portion of the world situated primarily around the North Atlantic. Perhaps it was the adoption of legal systems and the protection of property that triggered economic growth. Perhaps it was the invention of the stirrup or oxen harnesses, allowing the plowing of heavy soils. Perhaps it was the interaction of European peoples with others on the same latitudes, facilitating the diffusion of agricultural technology (a là Diamond 1997).

Perhaps, and actually most likely, it was a combination of many factors. Analysis of the prospects for global poverty reduction similarly requires attention to a broad range of forces, not simply the increase in income or changes in its distribution, but the deep drivers that give rise to both of those and also to demographic change that obviously helps immediately frame the number and characteristics of the poor.

Integrated methodology

There are many possible and useful ways of studying complex, integrated change over a long time horizon, including historical analysis and immersion in particular cultural environments. In this volume we have looked to the accumulated theoretical and empirical knowledge about the drivers of change and turned to an integrated computer simulation of global change as a principal tool for analysis.

The International Futures (IFs) simulation is a computer system that represents the structures of global demographic, economic, and sociopolitical systems and their interaction, with additional detail on agricultural, energy, education, health and (to a more limited extent), environmental systems. It provides detail for 182 countries. An extensive database supports the model. IFs is available for web-based use or for download,

so that the analyses in this volume can be replicated, amended, or extended.

Computer models have great limitations, which the next section will elaborate. At the same time, however, they have substantial strengths. They explicitly and formally represent assumptions about relationships. In the case of IFs, users of the system can quite flexibly change such assumptions. Such changes allow policy analysts to simulate interventions or experiments and explore their primary and secondary consequences. Using IFs, such explorations can extend to midcentury, well beyond the meaningful range of simple extrapolative analysis or regression models.

The IFs system makes it possible to explore not just the obvious linkages between poverty and its proximate drivers of economic and population growth and distribution. It is also possible to drill down into the deep drivers, including the development of human capital (education and health), the character and effectiveness of governance, and knowledge extension and diffusion.

Caveats and Cautions

There are, of course, limitations to our study. Caution needs to be exercised in interpreting poverty forecasts for several reasons.

Conflicts over poverty conceptualization

As Chapter 2 will discuss in greater detail, there is no universally accepted definition of poverty. Although income- or consumption-based measures are the most commonly used, many would prefer the broader "capabilities"-based approach of Sen (1984, 1999). The World Bank (1980, p. 32) defined extreme poverty even more broadly as a "condition of life so characterized by malnutrition, illiteracy, and disease as to be beneath any reasonable definition of human decency."

Within the income- and consumption-based measures, poverty can be measured in an absolute sense (for instance, those earning less than $1 per day) or a relative sense (for example, those earning less than a third of the average for the country). In each case, the poverty lines can be drawn at very different levels. Even though the absolute $1-per-day poverty measure has gained widespread usage, including extensive attention in this report, it

A methodology combining historical analysis and computer simulation of change supports this volume.

Conceptual, data, and model limitations reduce confidence in forecasting.

is by no means the best possible or universally accepted measure.

Despite limitations, the $1-per-day measure is easily quantifiable and calculable and allows ready comparison with estimates from other sources. We therefore use it as our benchmark measure but also selectively present absolute poverty measures with $2, $5, and $10 per day as the poverty line, look sometimes at the poverty gap (a measure capturing distribution more fully), and provide some information on other measures of human condition, such as life expectancy and education.

Data and measurement limitations

Chapter 2 also discusses the controversies surrounding the data. Household surveys on expenditure and income across a sample of the population form the basis for poverty data. However, in very poor countries, average consumption levels determined by national surveys are in general lower than average consumption estimated from aggregate national accounts (country-level statistics that include total household consumption). As better-designed surveys and better data collection methods come into use, we hope that the discrepancy between the two will diminish. In the meantime, IFs uses survey data to set the initialize conditions and national income data to compute changes in poverty rates.

Over and beyond that, we have highly incomplete data concerning poverty on a more disaggregated basis—for instance, by gender, rural versus urban status, skilled versus unskilled, or chronic versus transient poverty. Our general knowledge of the preponderance of poverty within specific groups, such as the rural, the unskilled, women, and indigenous populations, somewhat mitigates this limitation. Yet availability of disaggregated data (and structural representations in the model based on them) would have allowed us to study specific policies to alleviate poverty for subpopulations.

Model limitations

To the best of our knowledge, IFs is the only large-scale integrated global modeling system of its kind that can be used as a thinking tool for the analysis of near-term through long-term country-specific, regional, and global futures across multiple, interacting policy areas. Its economic, political, demographic, social, and environmental modules can handle a wide variety of inputs and capture various interactions.

Despite these strengths, there is a limit to the number of interactions it can capture in detail. For instance, through governmental budget constraints it can capture the decreased availability of resources for health expenditures if more is spent on education. However, it cannot capture the improved political empowerment that the disadvantaged can get from education, allowing them to demand policies that are conducive to poverty reduction.

Limitations on interpretation

Perhaps the greatest caution needs to be exercised in the interpretation of the poverty reduction outcomes we present in tables and figures throughout this volume. Our preferred interpretation of these numbers is the following.

IFs is a model of the economic, social, political, and other forces that can affect the evolution of income, poverty, and similar variables. It is extensive but incomplete. Indeed, no model can be complete. For reasons of simplicity, tractability, and concern with larger issues, many aspects of the world and interactions among them have to be left out. In short, IFs is a thinking tool, not a predicting tool.

Therefore, the reader should view IFs results as providing *tendencies*—simulated outcomes that can give us an idea of how certain strategic interventions fare under the assumptions of the model—rather than *predictions* of how the world will really be. It would have been very difficult in the late 1970s, for example, for any person or model to predict the sudden takeoff in the Chinese and Indian economies in the 1980s and 1990s. These are noncontinuous changes that arise from a confluence of complex political, economic, and social factors. One can conduct a scenario exercise with IFs to study what poverty outcomes would be when one or more countries embark on such economic "miracles," but IFs cannot confidently anticipate such miracles in the first place.

The larger contextual process finds methodological resonance in the "calibration" and "simulation" strategy followed by the modern macroeconomic literature since the

1980s; for instance, see Edward C. Prescott (2006). In this approach, model builders calibrate parameters so that the model outcomes broadly match key observed data. They then test the model by comparing a few ancillary outcomes or time paths of variables with data not used in the original calibration of the model. A match here increases the confidence that the model indeed captures aspects of reality. A model is never truly validated but does accrue increasing credibility from the process (see Hughes 2006 with respect to IFs). Analysts then use the model to simulate the future of an economy or other systems. Often, they conduct "counterfactual" policy exercises, asking how the simulated outcome might look under policies different from the current ones. They often use simulated outcomes for comparing policy alternatives and for getting an idea of the order of magnitude of responsiveness. Again, the search is for tendencies rather than predictions.

Why do this exercise?

A natural question is why the exercise we conduct is useful despite the described limitations in conceptualization, data, model, and result interpretation. In brief, poverty reduction is an overarching imperative facing the world today. Poverty is such a complex and multifaceted problem that any study of it will necessarily fall short. However, given the seriousness of the problem, it is important to take the small but bold steps needed to tackle it. Our model and simulation-based approach is one such step, useful in exploring the evolution of poverty under alternate strategies and scenarios.

The errors of the analysis are unlikely to be so large as to render meaningless all mappings of poverty reduction strategies into likely futures. For instance, fifty years from now the number of poor people in sub-Saharan Africa will almost certainly be lower or higher than the estimate the model generates, but history is highly likely to vindicate its expectation that most of the poor people in the world will live in that region.

Research on poverty, like the extent of poverty itself, is continuously evolving and improving. New concepts, measurements, and research methodologies appear in the study of poverty on an ongoing basis, and studies such as

ours and the debates surrounding them can only aid this process.

Most importantly, there is an urgent need to explore the efficacy of the many poverty reduction strategies that have been proposed. Given the time it takes for these strategies to work and for results to become visible in the form of lower poverty figures, it is critical to take a long-term, future-oriented perspective in such an assessment. Our model and simulation approach allows us to look far enough into the future to be a useful step in this direction.

Road Map for This Volume

Simply put, we want in this volume to understand what poverty is and to be able to describe its character and magnitude. We want to understand what the range of possible human futures is with respect to poverty, given reasonable assumptions about changes in its key or proximate drivers. We want to identify strategies for its reduction and for the elimination of poverty in its most severe and life-threatening manifestations. And we want to explore the possible leverage that various individual interventions and more complex strategies might give us with respect to accelerating the reduction of poverty. Figure 1.1 portrays these desires and helps to structure the volume around them.

Chapter 2 discusses poverty in conceptual terms and considers how to measure it. Conceptually, important distinctions exist

In spite of its limitations, all policy action requires forecasting.

Figure 1.1 The structure of poverty analysis

conceptual and analytical level

Deep drivers → Proximate drivers (income, distribution, population) → Poverty

Strategies of intervention

Deep drivers and action levers in IFs → IFs model → Proximate drivers (Income, distribution, population) → IFs poverty formulations → Poverty

model and simulation level
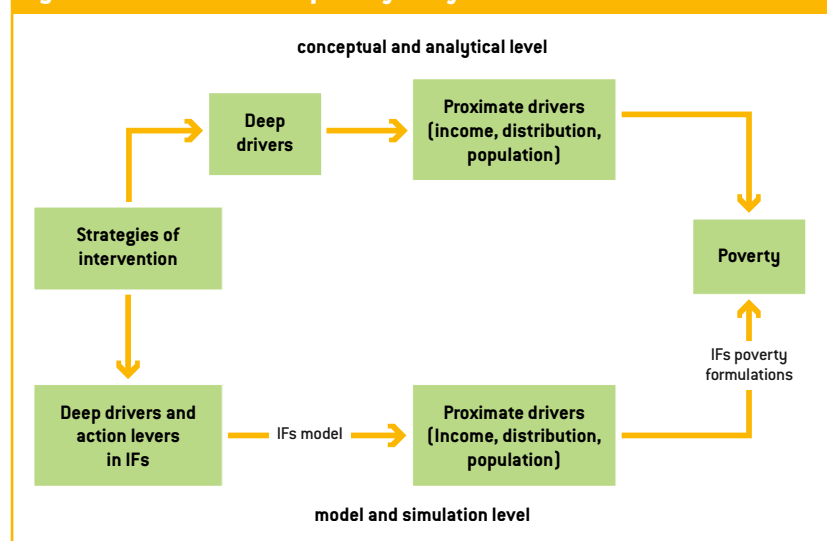
between poverty as an absolute and as a relative phenomenon, poverty as a chronic and as a transitory condition, and poverty in income terms and as an expression of capabilities deprivation. At the interface between conceptualization and measurement, especially when one attempts to construct summary measures or indexes for countries, there are important issues regarding the number or portion of a population falling below a poverty line versus poverty measures that also capture the severity of poverty relative to such a line. When one turns to collecting information and data, issues arise with regard to the operationalization of understandings of income and consumption and the relationship between data from the micro or survey level and that from the macro or national accounts level. In short, poverty may seem to be a simple concept, but in spite of much continuing progress, defining and measuring it is far from simple.

Chapter 3 turns to the critical task of understanding the foundations of poverty. To set the stage for assessing interventions that are likely to reduce poverty, the chapter discusses factors that drive poverty, both at a proximal and at a deep level. Economic growth, income inequality, and population are the proximate drivers of poverty; by knowing them, we can calculate the extent of poverty. The chapter then identifies and surveys deep drivers of poverty—factors that affect one or more proximate drivers. Different types of capital (physical, human, social, and knowledge capital) and fertility are examples of such deep drivers.

Next, Chapter 3 surveys policy levers believed to be useful in reducing poverty. We cannot just will accelerated economic growth; we must help bring it about. The chapter therefore explores the levers for intervention that have been identified in the development literature and via policy analysis. A key purpose of the chapter is to create an extensive inventory of such measures to explore throughout the volume. Decreasing import duties, increasing public expenditure on health and education, and increasing the foreign aid flowing from developed to developing countries are examples of policy levers that would address one or more of the deep drivers, which in turn drive the proximate drivers of growth and inequality. We rely heavily on policies

suggested by a wide variety of development organizations and researchers. Since a given policy is rarely implemented in isolation, from this survey we tease out strategic packages and conceptual and philosophical orientations toward poverty reduction. We identify three major strategic orientations—inward (self-reliant), outward (open), and foreign assistance (aid)—and the strategic components that are part of these orientations.

Chapters 2 and 3 thus collectively treat the top layer of Figure 1.1, the conceptualization and analysis of poverty and the forces that determine its extent. Chapter 4 moves to the bottom layer and shifts attention to exploring the future of poverty and the extent of human leverage upon it. The chapter first reviews efforts that have been made to forecast the likely extent of poverty and the methods by which they have done so. It then sketches briefly the tools and approaches that might be considered ideal for analyzing the future course of poverty. The chapter concludes with an introduction of the International Futures system as the primary tool used in this volume, identifying where it falls short of the ideal, as well as indicating the capabilities that it does offer.

Chapters 5 and 6 move further along the bottom layer of Figure 1.1 by considering possible futures for the proximate drivers of poverty and using IFs to explore the poverty futures that might be associated with those. Chapter 5 introduces and explores the base case forecast of IFs, because most subsequent analysis builds on the base case. Insofar as this volume is concerned with the impact that specific interventions might have relative to a baseline, the specification of the baseline itself may not be so important. But insofar as it is also concerned with the possible absolute levels and rates of future poverty, the elaboration of the base case of IFs in Chapter 5 is essential.

Chapter 6 looks at a likely range of futures for the proximate drivers and how those futures might frame the likely futures of poverty relative to the base case. In short, this analysis provides some understanding of the scope for human action. How much might be we able to accelerate the reduction of global poverty? Although Chapter 5 supports the conclusion that we are already well on course to dramatically reduce human poverty

The volume explores interventions and combinations of them, using a base case forecast.

before midcentury, Chapter 6 suggests that the scope for incremental human action remains very substantial.

Chapter 7 reaches back to Chapter 3's analysis of the specific levers and strategies for accelerating growth and otherwise reducing poverty, exploring them individually and in combination. It also begins to consider regional differences in the situations underlying poverty and therefore in the interventions with respect to deeper drivers that might be most effective. It concludes that there are no silver bullets in terms of individual interventions that capture most of the potential gains in poverty reduction. It argues instead that large numbers of small actions contribute to poverty reduction and that, very importantly, those contributions have a substantially additive (as opposed to overlapping or mutually exclusive) character.

Chapters 8 and 9 extend the analysis of poverty futures and strategies that Chapter 7 begins. Chapter 8 further explores regional variations in the specifics of poverty and identifies selected countries for closer attention. Countries, even within regions, vary considerably in their prospects regardless of their policy choices. The chapter therefore builds a stronger base for extended analysis of strategies for poverty reduction. The tables that accompany this volume extend the analysis of Chapter 8.

Chapter 9 widens the analysis by stepping back and looking at additional relationships of importance when considering poverty. For instance, poverty is strongly linked to environmental quality, and the linkages run in both directions, setting up feedback loops: the environment can fail to provide resources to reduce poverty, and poverty can exacerbate various kinds of environmental damage. Similarly, quality of governance and the presence or absence of domestic conflict shape the ability of societies to break free of poverty. Again, relationships run in both directions.

Conclusion

All major social philosophies and religions direct attention to the existence of poverty and call on us to address the problem. In relative terms, it may be correct to assert that the poor are and always will be with us, if only because relative poverty levels float upward with average incomes. Yet we have much reason to believe that extreme global poverty—poverty that strips individuals of the ability to develop and manifest their personal capabilities and that through malnutrition, inadequate health care, and other deficiencies can literally kill—need not persist.

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1 ADB (2004b) examines poverty experiences in Asia over this period. Wang (2005) and Srivastava (2005) provide information on China and India, respectively.

2 See http://esa.un.org/unup for the 2005 Population Revision numbers.

3 Sen believes that Europe and the United States are not the proper benchmark for a variety of reasons,

including longer overall life expectancies, the history of wartime deaths of males in the West, and higher South Asian fertility rates with associated maternal mortality. In sub-Saharan Africa, there is little female disadvantage in terms of relative mortality rates, and continental life expectancy is no higher and fertility rates are no lower than in South Asia. Using sub-Saharan Africa as the benchmark still leaves a total of more than 100

million "missing women." Sen points out that another way of "dealing with this problem is to calculate what the expected number of females would be had there been no female disadvantage in survival, given the actual life expectancy and the actual fertility rates in these respective countries." Even with this type of calculation, the number of "missing women" is still roughly 60 million.

2
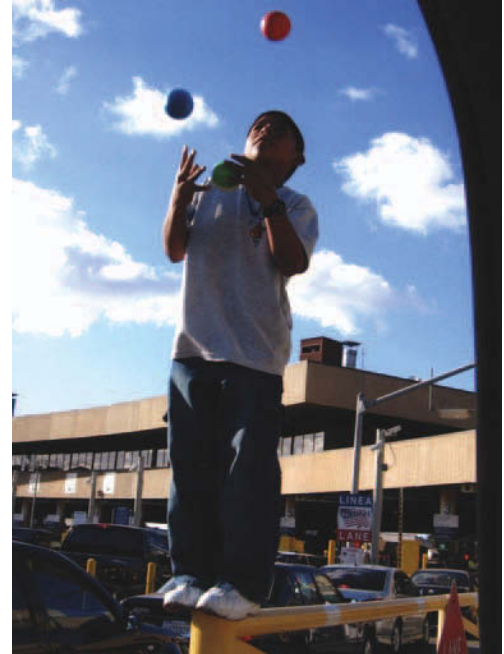
Concepts and Measurement

In September 2000, the Millennium Summit of UN members issued the Millennium Declaration. That declaration defined eight Millennium Development Goals (MDGs), an integrated global commitment to significantly reduce human poverty and underdevelopment by 2015. The 2002 World Summit on Sustainable Development in Johannesburg slightly extended but primarily reaffirmed those goals. The MDGs include eighteen elaborated targets and forty-eight mostly quantifiable indicators.

The first goal, reduction of poverty and hunger, calls for the dual targets of halving by 2015 the proportion of people around the world who live on less than $1 per day and the proportion who suffer from hunger. The three more specific indicators that accompany the poverty target and broaden attention to poverty are as follows:

1. The proportion of the population below $1 per day at purchasing power parity (PPP).

2. The poverty gap ratio, $1 per day.
3. The share of the poorest quintile in national income or consumption.

The very specific conceptualization and measurement of poverty embedded in the first MDG is extremely useful, and this report relies heavily upon it for much the same reason as do the UN, the World Bank, and others who pursue poverty reduction, namely that the definition is clear and the indicators are available. However, debate continues about how more generally and ideally to define and measure poverty, and this chapter reports on that debate in two parts.

The first part begins with fundamental conceptual issues related to the meaning and measurement of poverty. We discuss issues related to the conceptualization of poverty in income terms, beginning with the presentation of two groups of poverty measures (headcount/headcount ratio and poverty gap). The discussion then presents the ideas of relative

poverty and proceeds further to explore the notion of capabilities as a broader foundation for understanding poverty.

The rest of the chapter addresses some of the many complications confronting practical efforts to apply measures and to forecast poverty futures. Our critical focus in the second part is on the most influential approach to poverty measurement, that of the World Bank.

The Concept and Measurement of Poverty

There is a vast literature on the definition and measurement of poverty. Caterina Ruggeri Laderchi, Ruhi Saith, and Frances Stewart (2006: 11) compare four approaches to poverty definition—monetary, capability, social exclusion, and participatory:

> The considerable lack of overlaps between the different approaches means that targeting according to one type of poverty will involve serious targeting errors in relation to other types. Moreover, definitions also have implications for policy. While a monetary approach suggests a focus on increasing money incomes (by economic growth, or redistribution), a capability approach tends to lead to more emphasis on the provision of public goods. Social exclusion draws attention to the need to break down exclusionary factors, for example, by redistribution and antidiscrimination policies.

Ruggeri Laderchi and her colleagues make a good point about conceptualization affecting policy. A largely monetary approach has steered this volume toward domestic and international policy levers (see Chapters 7 and 8) that mainly seek to increase money incomes. Antidiscrimination policies do not figure prominently in the list of interventions for the simple reason that they do not directly influence an aggregate income-based poverty measure; indeed, there is no structure in our model to assess such policies.

A focus primarily on income and interventions to enhance it is important because it is difficult to envision a poverty assessment methodology in which an increase in money incomes would be *bad* for poverty reduction. Nonetheless, attention to human capability is also critical, and this chapter will explore Amartya Sen's approach to defining and using capabilities, related in part to health and education. It will direct much more limited attention to social exclusion and participation.

Income Poverty: Absolute Measures

The common general intuition is that **poverty** exists when a group of people cannot attain a "minimum" level of well-being. The minimum could be at least partly dependent upon the prevailing standards of society and therefore measure **relative poverty**, an issue to which the discussion will return. However, there are dimensions of well-being, such as biological minimums in nutrition, that might actually define **absolute poverty** in a manner that can allow comparison of people across societies.

Many complications can arise in setting income-based poverty levels in either absolute or relative terms. Gary Fields (2001) identified four questions:

1. Is the basis income or consumption, and how comprehensively will either one be measured?
2. What is the income-receiving unit: individual, family, per capita, or adult equivalent?
3. Will there be a single poverty line or will there be separate ones for urban and rural areas or different regions of the country?
4. Is the poverty line income determined scientifically, politically, subjectively, or as a matter of convenience?

In the following sections we discuss two groups of absolute income poverty measures: (1) the poverty headcount and headcount ratio and (2) the poverty gap within the general class of measures that are more sensitive to the deprivation of poorer people.

The poverty headcount and headcount ratio

Poverty headcount is defined as the number of people in a population who fall below a specified poverty line, such as $1 per day. From that we can derive the poverty **headcount ratio**, the fraction (normally percentage) of the total population that is poor.

These two measures have features that make them very attractive and widely used. First, they are simple in both concept and measurement.

● *Although the MDGs include very specific targets and indicators for poverty, conceptualization and measurement of poverty require broader perspectives.* ●

● *Both monetary and capabilities approaches help in understanding poverty.* ●

When we are told that 1 billion persons in the world are poor using a poverty line of U.S.$1 per person per day, the extent of poverty seems obvious. Second, they are universal, in that they potentially allow direct comparison of people anywhere in the world. Third, the data for use of the measures have been widely gathered via surveys around the world—they are available.

The measures also have many weaknesses. The headcount's most significant blind spot is that the measure is insensitive to the depth of deprivation among the poor. For example, a person well below the poverty line, earning only a few cents per day, may be said to be suffering much more than a person with daily income just below a dollar. Therefore the headcount does not satisfy a desired measurement property called **strong monotonicity**, which states that a poverty index must show less poverty in response to any increase in a poor person's income. Unfortunately, if large numbers of people moved from an income of 50¢ per day to 75¢ per day, a poverty headcount based on $1 per day would show no change.

Nor does headcount satisfy **distributional sensitivity**, which requires that any transfer from a poor person to a less poor person must also show an increase in poverty because the less poor person has a lower level of need. Ironically, if a poor person transferred enough money to a less poor person to lift the recipient above the poverty line, the poverty headcount would fall, contrary to commonsense notions of poverty reduction. A related problem with headcount is that if a poor person were to die from poverty-related deprivation and disease,

poverty as measured by this index would show a decrease. That certainly seems perverse.[1]

The poverty gap and the FGT family of measures

The poverty gap, another widely used measure, is the average (normalized) income shortfall among the poor, expressed as the average shortfall as a fraction of the poverty line. The IFs model calculates the poverty gap and its various power functions, as well as the headcount and headcount ratio.

The poverty gap measure is responsive to the distance of people below the poverty line and therefore does exhibit strong monotonicity. Still, problems persist. If an individual just below the poverty line were to receive a large enough income gain to escape poverty, the average income among the remaining poor would fall, and therefore poverty would rise. And if one individual moved from 50¢ to 30¢ per day, whereas another moved from 70¢ to 90¢ per day, they would offset each other. Our commonsense notions of poverty would say that the loss of 20¢ per day at a lower level is more significant than the gain of 20¢ at a higher level (the property of distributional sensitivity).

A variation of the measure can reduce the impact of the first weakness and eliminate the second weakness. The poverty shortfall of poor individuals can be used as a weighting scheme to give more weight to the poorer individuals. For instance, the gap of individuals below the poverty line can be squared. A popular family of such indexes is the one developed by James Foster,

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Box 2.1 The Foster, Greer, and Thorbecke family of poverty measures

The FGT index, which has been used with increasing frequency in macroeconomic models incorporating poverty analysis, has many desirable properties. In addition to having the monotonicity and distributional sensitivity properties, it also has the property of being **additively subgroup decomposable**. That means that the index is decomposable by subgroups (according to region, income class etc.) among the poor. It can also be used to measure specific types of poverty. Thus, for instance, this index can take into account the intensity of food poverty for different groups of poor people, which is done by looking at the deprivation of

calories. The poverty measure is given by:

$$p = 1/n \sum (Gj/z)^a$$

where   *n = total population*
        q = the number of poor
        z = the poverty line
        Gj = food expenditure shortfall of the jth individual (j = 1,2,...,q)

In many studies, a value of "a = 2" is used, which satisfies both the monotonicity and transfer axioms of Amartya Sen.

Source: Khan and Weiss (2006).

Joel Greer, and Erik Thorbecke (FGT). Box 2.1 gives further technical details.

There are other weaknesses of all standard absolute poverty measures. For instance, public goods and negative externalities do not often enter into the calculations of poverty indexes, but arguably they should.[2] Haider Khan (1994a, 1997a) shows theoretically that under even an egalitarian distribution of bads, proper use of environmental accounting would show rather more poverty under most circumstances than do our standard measurements.

Setting absolute poverty levels

The establishment of useful absolute poverty levels is also complicated. The widespread use of $1 per day at purchasing power parity, often referred to as the level of **extreme poverty**, is closely related to the rough correspondence between that level and the ability to acquire enough food to avoid calorie-related malnutrition.[3] It is not a coincidence that global counts of those suffering extreme poverty and those suffering malnutrition are similar. Box 2.2 explains purchasing power parities.

Montek S. Ahluwalia, Nicholas Carter, and Hollis Chenery (1979) first identified an absolute international poverty measure for comparison across countries. In doing so they used the International Comparison Project's (ICP's) earliest version of purchasing power parity data to explore global levels (see Kravis, Heston, and Summers 1978a, 1978b).[4] They set the poverty line based primarily on data from India. The level chosen was $200 per capita, the forty-fifth percentile of income in India in 1970 ICP dollars, which in 1985 dollars is quite close to the more contemporary $1-per-day level. That initial specification of poverty level also corresponded roughly with access to 2,250 calories per day.

Since 1990 the World Bank (see Ravallion, Datt, and van de Walle 1991) has relied upon a head-count measure of poverty based on a perception that extreme poverty exists with incomes of less than $1 per day at 1985 PPP. One dollar per day was subsequently converted to $1.08 per day at 1993 prices measured at PPP, but the shorthand, casual reference to $1 per day remains common and will be the practice in this study also.[5]

Unfortunately, the adjusted value is very controversial. Critics such as Thomas W. Pogge and Sanjay G. Reddy (2003) have argued that

the basket of goods used for PPP calculation does not reflect consumption by the poor and that changing the base year for the $1-per-day poverty definition from 1985 to 1993 is not innocuous (since they potentially yield different poverty numbers; there is no easy way to convert one line to the other).

A common argument is that the adjustment to 1993 was far below the inflation rate of the dollar over those eight years and that the adjusted level should therefore actually be much higher. For instance, Nanak Kakwani (2004a) converted poverty lines constructed in the late 1990s for ten low-income countries into 1993 PPP dollars using the relevant consumer price indices (CPIs) and PPP exchange rates. He found that the poverty lines diverged from the $1.08 per day World Bank's standard. For Gambia, the line was the highest, at $2.52 per day.

Martin Ravallion (2002a: 4) offered a spirited reply to criticism around inflation-based adjustment:

The naive approach of simply adjusting the old line upwards for inflation in the US would ignore the fact that there has been (in effect), a PPP devaluation of poor countries relative to the US over the period. For example, China's and Indonesia's poverty lines at 1985 PPP are almost identical to their poverty line at 1993 PPP; India's poverty line at 1993 PPP is only 17 percent higher than its poverty line at 1985 PPP. Yet adjusting the 1985 $1/day line for US inflation would entail an upward increase of roughly 50 percent. In other words, if we had simply

Setting absolute poverty levels for comparison across countries and adjusting them for inflation are far from trivial tasks.

adjusted the $1/day line for inflation in the US between 1985 and 1993 we would have obtained a poverty line which is well above the median of the 10 lowest poverty lines at 1993 PPP, and so could no longer claim to be the poverty line that is typical of poor countries. That would certainly entail a recalibration of the ruler.

In spite of the ongoing debates, the analysis of this report accepts the World Bank's numbers from recent surveys using the $1.08 standard as the best calculations available of extreme poverty headcount and rates. Because our base forecasting year is 2000 and because most economic data are now presented in constant 2000 dollars, our preference would have been to convert the $1.08 level from 1993 dollars into 2000 dollars; but the difficulty that even the World Bank has in adjusting the level across base years argues strongly against doing so.

Nonetheless, this report looks fifty years into the future. It would be unreasonable to expect the most common measure of absolute poverty to be unchanged during this period. Moreover, for selected regions of interest to us, including the transition economies of Eastern Europe, $1 per day is already not a very useful benchmark. We therefore frequently use the $2 per day standard (actually $2.15 at 1993 PPP), sometimes referred to as **moderate poverty**.

More generally, our use of lognormal representations of income distributions (see Chapters 3 and 4), allows the estimation of poverty headcount and rate at essentially any level of interest, for instance, $10 per day. The same foundations allow the estimation of a percentile level (such as the poorest quintile) and the inverted calculation of the income level that separates that quintile from the rest of the population (see again the third indicator for the first MDG target at the beginning of this chapter).

Income Poverty, Relatively Speaking

Is poverty in the eye of the beholder? Some people have thought so. Indeed, there is little doubt that people in different parts of the world feel subjectively different senses of deprivation relative to reference groups in their own societies. Thus, a $1 per day poverty line,

even for all "developing" countries, seems quite arbitrary and is usually justified by underlining the need for a uniform comparison of the success or failure of poverty reduction strategies followed by different developing countries. In contrast, a relative poverty measure may be attractive in assessing a subjective sense of well-being within a particular country.[6]

"Relative poverty" really embodies two separate ideas and sets of measures. On the one hand, there is poverty relative to some group within a population. For instance, a group that is relatively the poorest (e.g., the poorest 10, 20, or 40 percent) is identified, and the poverty measure is taken to be the average real income at a certain time of this "poorest" group.

On the other hand, there is poverty relative to average national incomes. For example, Martin Ravallion, Gaurav Datt, and Dominique van de Walle (1991) show empirically that the poverty lines used in countries tend to increase with their consumption levels. Abdel Gadir Ali (1997) quite forthrightly defends raising the poverty line as the mean increases. He claims that this is "obvious to us, Africans living amidst poverty." Although there are different ways of adjusting the poverty line as a function of the mean income or consumption, the easiest such adjustment is to raise the former in proportion to any increase in the latter. This will clearly lead to a continuously redefined relative poverty measure.[7]

The Capabilities Approach to Poverty
Some basic issues

Income allows comparison across individuals. The use of income-based poverty measures implicitly builds on an assumption that some degree of income equality, either the collective surpassing of an absolute poverty line or of a line relative to others in society, is desirable. But is income the right metric?

In his preface to *Inequality Reexamined*, Sen suggests it is not:

The central question in the analysis and assessment of equality is, I argue here, "equality of what?" I also argue that a common characteristic of virtually all the approaches to the ethics of social arrangements that have stood the test of

time is to want equality of *something*—something that has an important place in that particular theory. Not only do the income egalitarians … demand equal incomes, and welfare-egalitarians ask for equal welfare levels, but also classical utilitarians insist on equal weights on the utilities of all, and pure libertarians demand equality with respect to an entire class of rights and liberties. (Sen 1992a: ix; italics in the original)

Sen argues that what we need to equalize is not income or utility but human capabilities. A crucial distinction is between **functionings** and **capabilities**: "'functioning' is an achievement such as a level of nourishment or general state of health, and a 'capability' is the ability to achieve" (Kakwani 2006). Capabilities so defined do not lend themselves to easy measurement. In an essay discussing the empirical issues in making the capability approach operational, Sebastian Silva Leander (2005: 4) notes:

The question of how best to capture capabilities when measuring poverty has yet to be resolved at the conceptual level and hence, there is no consensus on how to proceed with this at the empirical level. The hard fact is that it is extremely difficult (arguably impossible) to observe capabilities in practice. And while it may be possible to approximate a very crude version of this concept by estimating vectors of achievable functionings, this will not take into account the concerns relating to agency and autonomy (i.e., why a person chooses or not to execute his attainable functionings), which are an important component of Sen's critique of neoclassical theory.

Underlying the capabilities perspective is thus a respect for individual diversity. One may choose the best possible functionings for oneself from all available ones. Poverty or deprivation in general is thereby redefined as not just inadequate income, but as more fundamental inadequacies of capabilities.

At the same time, the principle of equalizing capabilities in Sen's analysis of development leads to a policy of redistributing resources toward certain socially and economically disadvantaged groups (thereby linking the capabilities approach to those of social exclusion and participation). It is useful to underline the *social* nature of capabilities. Khan (1998) pointed out that without a concrete set of social, political, and economic institutions in the background, the concept of capabilities remains intractable and suggests the use of the term "social capabilities."

Since 1990, the United Nations, through its *Human Development Reports (HDRs)*, has supported the use of measures of human development and human capabilities.[8] Among other things, that has resulted in the formulation of the human development index (HDI). In addition to national income per capita, the HDI includes other capabilities-based functionings such as life expectancy and literacy rates (see Box 2.3 for more details). One does not have to accept the specific form of the United Nations' human development index to see the usefulness of moving beyond consumption- and income-based measures.

More recently, the UNDP has developed the human poverty index (HPI). It is a composite index measuring deprivations, as opposed to achievements, in the same three basic dimensions captured by the HDI (see, again, Box 2.3). Sakiko Fukuda-Parr (2006) reported that the correlation between the HPI and the $1-per-day poverty measure is weak.[9] Countries such as Pakistan and Yemen, which have lower levels of income poverty, have higher levels of HPI, whereas the situation is reversed in a country such as Tanzania. Similar reversals are seen in the rankings of per capita gross domestic

● *A capabilities-based approach to assessing poverty has much merit, and the HDI can help.* ●

Box 2.3 The United Nations Human Development Index (HDI)

The UN HDI is a composite measure of several human development factors such as income, literacy, education, and life expectancy. Many consider it the standard measure of human development or well-being for countries. The United Nations Development Programme (UNDP) developed the HDI in 1990 under the guidance of Mahbub ul Haq. The UNDP provides it annually in its *Human Development Reports*.

The HDI aggregates measures of three basic dimensions of human development: standard of living, basic knowledge acquisition, and the expected length of life. Knowledge is measured by adult literacy rate (given two-thirds weight) and the combined primary, secondary, and tertiary school enrollment rate (one-third weight). Standard of living is measured by a log of gross domestic product (GDP) per capita at purchasing power parity (PPP), capped with a maximum that can rise over time. Finally, length of the average life is measured by life expectancy at birth.

Source: UN 2007.

product (GDP) and HDI. Therefore, higher incomes do not automatically translate into lower poverty in this framework.

The relationship between income poverty and capability poverty

In spite of imperfect correlations, there is a direct relationship between the two primary approaches to understanding poverty. As income grows, other things being equal, realization of capabilities also increases. In addition, improvement of basic education or health care confers greater ability to generate income so as to escape income poverty.

Antipoverty policy should not concentrate solely on reducing income poverty, although that should be an important component. The fundamental issues associated with poverty and deprivation should be understood in terms of the freedoms people have and the lives they can actually lead; capabilities are themselves essential.

This contrast can be seen in several different areas connected to human well-being. As Sen illustrates, in the United States African Americans are poorer in terms of income than American whites; when compared to the rest of the world, however, African Americans are far richer, thus softening this inequality. But when other measurements of capability, such as the basic capability to live to a mature age, are considered, the situation looks very different. As a racial group, African Americans have a higher mortality rate than American whites. Furthermore, in some parts of the United States, the average life expectancy of an African American male is lower than that in some developing countries, which constitutes a very significant deprivation of capabilities. In the same light, focusing in Europe on the ability to be employed and the negative effects of unemployment, despite income support, paints a troubling picture.

Box 2.4 Chronic versus transient poverty: Where the poor are and why they are poor

It is important to understand that identifying poverty is not a simple problem because poverty has many different aspects and several dimensions. Two of the most important types of poverty uncovered by recent research are known as chronic and transient poverty.

Chronic poverty persists in spite of economic growth and interventions such as temporary transfers of income. The chronically poor are almost always poor throughout their lives and often pass this condition to future generations. In general, they benefit the least from economic growth and standard development projects. If and when the chronically poor have employment, it is insecure and often at very low wages. Many live in rural areas, urban slums, and conflict zones and often suffer mild to extreme health problems. Children, the elderly, and people with disabilities are particularly affected by chronic poverty. The chronically poor are the "invisible" poor; development projects often have little or no positive effects on their situations. Barriers to accessing resources and pursuing opportunities are the main reasons for the persistence of chronic poverty.

Those suffering **transient poverty** are not *always* in an economic and social situation that could be called "poor." They are the "sometimes poor." They are at risk of becoming chronically poor. They suffer many of the same risks and lack of opportunities to gain access to productive assets and lack basic capabilities. Transient poverty is particularly common in economies that are undergoing some type of transition, such as the Russian economy.

It has been estimated that in the world today there are between 300 and 420 million people trapped in chronic poverty. The chronically poor live in all regions of the world, with the largest numbers residing in South Asia. Additionally, the nations with the highest levels of chronic poverty, roughly 40 percent, are in sub-Saharan Africa. In terms of actual numbers of chronically poor individuals in the various regions of the world, 121.3 million reside in sub-Saharan Africa, 84.9 million in East Asia and the Pacific, and 187.5 million in South Asia, 28 million individuals are chronically poor and residing throughout the rest of the world.

Why are they poor? Although the picture differs slightly from country to country, both financial and physical asset holdings are among the major determining factors as to which households will suffer either of these aspects of poverty. For example, in China the lack of physical capital is a significant determining factor for both chronic and transient poverty; however, large household size and low level of education for the head of household determine chronic but not transient poverty. Isolation in remote rural areas is often associated with chronic poverty as well.

Events such as natural disasters, internal and external wars, and disease can promote the continuance of chronic poverty and transform transient poverty into chronic poverty. There could also be social and economic barriers arising from a caste system, as in India, or from belonging to groups that are generally discriminated against, such as the Indios in Latin America, the Burakumin in Japan, or women almost everywhere.

In the *Chronic Poverty Report*, the Chronic Poverty Research Center of the University of Manchester offers several suggestions for a framework of action for handling the problems presented by chronic poverty. Many of these suggestions also apply to transient poverty. Promoting livelihood security is a key step in helping the world's poor. This is especially pertinent when considering the effects of disease, war, and disasters on the chronically and transient poor. Also, ensuring access to opportunities and providing the means to access resources and capabilities are important in preventing both aspects of poverty. Additionally, there is a pressing need for empowering the chronically and transient poor to overcome the discriminatory factors that they face. In this light, basic education turns out to be an important part of a general antipoverty strategy. Finally, national and international efforts should focus on providing the needed resources to the geographical areas where the (chronically) poor are located. Thus the spatial dimension of poverty must be recognized as an important strategic variable in thinking about poverty reduction strategies (more on this in Chapter 3).

Source: Chronic Poverty Research Center 2005; World Bank, Attacking Poverty, World Development Report 2000–2001.

To summarize, there are at least three critical areas in which the capabilities approach can help us understand the dimensions of deprivation, and hence poverty and its effects, better than income-based measures can. One is the specificities of deprivation in concrete, nonincome dimensions such as health or literacy. The second is the variability in people's ability to convert income to concrete functionings and capabilities. Finally, the *social* capabilities approach helps focus attention directly on the institutions that help or hinder individuals to various degrees in realizing concrete achievements. Gender discrimination is an obvious but not the only illustration of this point. Similarly, the capabilities approach could be helpful on the important issue of chronic versus transient poverty (see Box 2.4).

The measurement of poverty in this book

In considering measures tied to capabilities and functionings, a few common themes emerge.

- Except for the HDI and HPI, most of the measures tied to capabilities and functionings have been applied to small groups of countries. Measures that attempt to more completely capture the nonincome facets of poverty are hard to generalize across countries, and data to support them are less readily available than those for the income-based measures.
- The application of capability-based measures appears very limited and when implemented captures functionings (achievements) such as nourishment rather than true capabilities (the ability to achieve). The HPI, though available for a broad cross-section of countries, is ultimately based on functionings.

It is important not to lose track of the reality that poverty is much more than an income-based phenomenon. Expansion of human capabilities and the freedom of action to which they give rise lie at the heart of human development.[10] Our forecasts in this report will, nonetheless, use mainly income- or consumption-based measures of poverty. We will supplement attention to income by some measures of education and health and by the

HDI and HPI, all of which are considerably more difficult to forecast. Except for these supplements, the current state of the art appears to offer no alternate measure to income that can be broadly and consistently applied to study global poverty across countries and time.

The Consequences of Conceptualization and Measurement Perspectives

The strengths and weaknesses of poverty concepts and measurements are not abstract. Very often, those who are closest to the poor, for instance field representatives of nongovernmental organizations (NGOs), see a variety of problems that may not always be apparent from more conceptual perspectives. They may begin with the nature of headcount ratio indexes widely used, but the problems go well beyond a critique of this special class of poverty measures.[11] In particular, there are problems that merit discussion related to the balance between the extent of poverty and the resources directed at addressing it, aggregation of poverty into single numbers, policy time horizons for even helpful interventions, and market and nonmarket aspects of poverty.

Poverty incidence and resource availability

People involved in ground-level operations experience increasing pressure on their ability to provide services to the poor when their absolute number increases, even though the national or even regional statistics may show a decline in the percentage of poverty. If there is a limited amount of food to be distributed to the poor or a limited amount of shelter for them, it is their absolute number that really matters for the adequate provision of these services. With budget constraints that often cannot be relaxed as the absolute number of poor increases, the per capita service provision has to decline.

Improvements in measurement might indicate a poverty decline even when nothing has changed. That is what apparently happened in Ghana in the 1990s (Kanbur 2004). Since the 1980s, the household income expenditure surveys have improved a great deal. Previously omitted elements, such as production for home consumption, regional price variations, and

This study, although heavily focused on income poverty, also looks to capabilities.