

---

# 3

## Income Distribution, Inequality, and Those Left Behind

Over the past 20 years, the global distribution of income has undergone significant structural shifts. While aggregate measures of global inequality have changed little between the 1980s and today, the relative positions of countries and the welfare of millions of the world's citizens have experienced much more dramatic transformations. The sustained high growth rates of China and India (and to a lesser extent, those of other Asian nations) lifted millions out of poverty, while the stagnation in many African countries caused them to fall behind. In comparing the world income distribution in 1980 with that in 2002, one study notes that the poorest country in 2002 had a lower income per capita than the poorest country in 1980 (Bourguignon, Levin, and Rosenblatt 2004). The same is true for the entire bottom 6 percent of the world income distribution. Are these trends likely to continue in the future? Who will be the poor and the rich of 2030 under the global scenarios developed in the previous chapter?

Average incomes of people in developing countries are expected in chapter 2's baseline scenario to converge slowly toward levels in high-income countries. But for households in particular countries and particular social groups, improvements in living standards

over the coming decades are likely to be much more dramatic than those suggested by the averages—and other households are likely to benefit less than average. This chapter explores future trends in income distribution to identify households positioned to benefit most and least, and suggests policy interventions to help spread the benefits of the anticipated growth over the next several decades. Building on the demographic and educational trends described in the previous chapter, it explores whether incomes are likely to become more equal across and within countries. It also examines the role of globalization in producing these outcomes, through the lens of microanalysis at the household level (see box 3.1; see also Bussolo and others [forthcoming], available at [www.worldbank.org/prospects/gep2007](http://www.worldbank.org/prospects/gep2007), for methodological details).

Findings for any specific country or region should be taken with a grain of salt. First, microsimulation techniques used here mimic markets' adjustments and agents' responses only imperfectly. Furthermore, potentially large measurement errors and comparability issues affect the income and consumption data used in the microsimulation model. Second, the focus on income (or consumption) inequality deals with inequality of *outcomes* and not inequality of *opportunities*. This is because it is less difficult to measure income inequality than to measure inequality of opportunities.

---

For details on the methods used to project the world income distribution in 2030 please visit [www.worldbank.org/prospects/gep2007](http://www.worldbank.org/prospects/gep2007).

### Box 3.1 Changes in demographic structure, occupational choices, and factor rewards determine the authors' hypothetical 2030 world income distribution

This chapter's forward-looking exercise is based on methodologies developed in recent literature, including Bourguignon and Pereira da Silva (2003); Ferreira and Leite (2003, 2004); Chen and Ravallion (2003); and Bussolo, Lay, and van der Mensbrugghe (2006). The objective of the exercise is to create a hypothetical income distribution for all countries of the world in 2030. The starting point is global income distribution in 2000, assembled using data from household surveys for 84 countries and data on income groups (usually vintiles) for the remaining countries (see this book's Web site for a full detailed list). The hypothetical 2030 distribution is then obtained by applying three main exogenous changes to the initial distribution: (a) demographic changes, including aging and shifts in the skill composition of the population; (b) shifts in the sectoral composition of employment; and (c) economic growth, including changes in relative wages across skills and sectors.

In reality these changes take place simultaneously, but in this chapter's simplified framework they are accommodated in a sequential fashion. In the first step, total population in each country is expanded until it reaches the World Bank's projections for 2030. The structure of the population is also changed; for example, as fertility rates decrease and life expectancy increases, older age cohorts will become larger in many countries. To accommodate these changes in the surveys data, larger weights have been assigned to older people than have been assigned to younger individuals. In the next step, workers move from traditional agricultural sectors to more dynamic industrial and service sectors, and new incomes are estimated for these movers. Finally, consistent with an overall growth rate of real income per capita, changes in labor remuneration by skill level and sector are

applied to each worker in the sample depending on their education and sector of employment. The number of workers changing sectoral occupation and the differential growth rates in wage rewards used to "shock" the study's micro-data are consistent with the results of the global computable general equilibrium (CGE) model described in the previous chapter. (Note that the outcomes of the CGE model are also influenced by the same demographic changes described above.)

The sequential changes described above reshape national income distribution under a set of strong assumptions. In particular, income inequality within population subgroups formed by age, skills, and sector of employment is assumed to be constant over the period. Moreover, data limitations affect estimates of the initial inequality and its evolution. In particular, consumption data are not available for all countries' surveys, so, to get a global picture, the study had to include countries for which only income data were available. Consumption expenditure is a more reliable welfare measure than income, and its distribution is normally more equal than the distribution of income. Finally, measurement errors implicit in purchasing power parity (PPP) exchange rates, which have been used to convert local currency units, also affect comparability across countries.

The resulting income distribution should thus not be seen as a *forecast* of what the future distribution might look like; instead it should be interpreted as the result of an exercise that captures the *ceteris paribus* distributional effect of demographic, sectoral, and economic changes. Although the results of this exercise provide a good starting point for debating potential policy trade-offs, they should not be used as the basis for detailed policy blueprints.

*Note:* For details see [www.worldbank.org/prospects/gep2007](http://www.worldbank.org/prospects/gep2007).

Therefore policy conclusions based on income inequality scenarios in this chapter should be considered with caution. For example, some degree of inequality can be the

reflection of efficient incentive structures, even though excessive levels of inequality are often associated with market distortions and protection of vested interests. Moreover, the

redistribution of opportunities has to include “deep” institutional reform often accompanied or “financed” by some redistribution of outcomes. These concerns notwithstanding, individuals’ economic status can shape the opportunities they have to improve their situation (World Bank 2005), so income levels are often correlated with access to better education and health, which in turn are key determinants of future earnings. To reiterate a central message of the 2006 *World Development Report* (World Bank 2005: 10), “equity-enhancing redistributions can often be efficiency-increasing.”

With these limitations in mind, the chapter’s exploration of the distributional effects of future scenarios in the global economy raises some broad policy issues. It highlights five key messages:

- For a large number of people in developing countries, the convergence to Organisation for Economic co-operation and Development (OECD) income levels will come much faster than the average numbers suggest. In 2030, 16.1 percent of the world population will belong to what can be called a “global middle class,” up from 7.6 percent in 2000. That is, in 2030 more than a billion people in developing countries will buy cars, engage in international tourism, demand world-class products, and require international standards for higher education. Compare that with only 400 million people in developing countries who had access to these kinds of living standards in 2005. Assuming faster income convergence in a scenario where developing countries continue for the next 25 years the sustained pace of growth in recent years, the share of the global middle class in the world population will rise even further, to 19.4 percent. This large middle class will create rapidly growing markets for international products and services—and become a new force in domestic politics.
- Poverty will decline worldwide, but the remaining poor are likely to be more concentrated in Sub-Saharan Africa. At present, almost half of the poorest tenth of the world’s people live in South Asia; by 2030 this could be reduced to just one-fifth. By contrast, Africa, now home to one-third of the world’s poorest people, may see its share double by 2030. The likelihood of this outcome is high, even if favorable developments in Africa continue.
- In a given growth context, individuals will realize most of their income gains by moving from one social group to another. The income gains that people achieve by migrating out of agriculture into manufacturing and services or by attaining higher skill levels surpass by far the gradual increases of those who do not move. Consequently, and conditional on higher sustainable growth rates, policies that reduce restrictions to mobility across sectors and that provide broader access to education are key to spreading the benefits of growth.
- Although general indicators of global income distribution will probably change little, growth will generate pressure toward increasing inequality *within* a number of developing countries, calling for policy interventions to offset these forces. Trade integration, a key aspect of globalization and important for efficiency, does not seem to systematically increase inequality. As average incomes rise, the number of poor will shrink and the tax base will grow, making effective assistance easier to provide and social safety nets a viable remedy for increasing inequality.
- Although investing in education may not by itself be enough to spur growth, improved access to education at any given level of growth can limit the rise in income inequality and reduce poverty by facilitating the movement of poor people from low-paying jobs in agriculture to higher-paying jobs in industry and services.

## The global distribution of income

### *Assessment of past inequality trends is contentious*

Assessing what has happened to global income distribution in the last two decades—and what will happen in the next 25 years—presents challenges. Part of the difficulty lies with choosing an appropriate measure of inequality. The literature identifies three main approaches to measuring income inequality, all of which have strengths, but each of which measures a slightly different thing.<sup>1</sup>

- *Inter-country inequality* is a concept favored by macroeconomists. It measures relative movements of per capita incomes across countries and gives each country an equal weight in the world distribution (that is, population size does not matter). This literature tends to conclude that in the last two decades, income distribution has become more unequal.
- *International inequality* takes into account the relative sizes of countries (that is, results are population-weighted). Its proponents (such as Theil and Seale 1994) point out that failing to use population weights will cause, for example, the fast growth of China to be exactly offset by the anemic growth rates of Malawi or Honduras, even though the number of Chinese citizens who experienced improvements in their incomes far exceeds the populations of either of the other two countries.<sup>2</sup> The broad consensus in this literature is that income inequality has decreased, although this finding is mostly driven by the fast growth in China and India.<sup>3</sup>
- *Global inequality*, which compares individual incomes regardless of country of citizenship, is a fairly recent concept (Milanovic 2002). It takes into account within-country inequality, which is ignored by the international inequality approach, where each individual is deemed to earn the country's average income. To a large extent, fast growth in the large emerging economies tends to offset the

increases in inequality within countries; therefore by this measure, global inequality has remained roughly constant since the late 1980s.

Even though these three methodologies can yield quite different pictures of past and future trends, and none is clearly preferable to the others (Ravallion 2004), it is worth elaborating on some general trends.<sup>4</sup>

Inter-country measurements of inequality suggest that the last five decades of development have done little to bring the average incomes of developing countries closer to those of OECD countries. For example, Quah (1996, 1997) finds “emerging twin peaks” in the global distribution, supporting the argument that the relative distance between the top and the bottom of the global income distribution has increased since the 1950s. More generally, Pritchett (1997) has concluded that a “big time” divergence in incomes occurred between 1870 and 1990, evidenced by a doubling of the gap between the per capita incomes of the rich and poor countries.<sup>5</sup> Underlying this general pattern is a large degree of variation in individual country performance, with growth peaks and valleys across various regional groupings and time periods. However, the overall trend is of an increasing distance between countries in different income brackets, although Pritchett (1997) also shows evidence of convergence at the top of the distribution (that is, among the group of today's high-income countries).

Once different weights are assigned to countries based on their population (using the international inequality approach), the global income distribution appears to have improved. For example, Bourguignon, Levin, and Rosenblatt (2004) demonstrate a decrease in world income inequality between 1980 and 2002, as long as the relevant inequality measures are not too sensitive to the distance of mean income from the bottom.<sup>6</sup> A similar decrease is observed by Atkinson and Brandolini (2004).<sup>7</sup> However, these approaches do not take into account inequality *within* countries (see box 3.2 for the importance of accounting for within-country distributional changes),

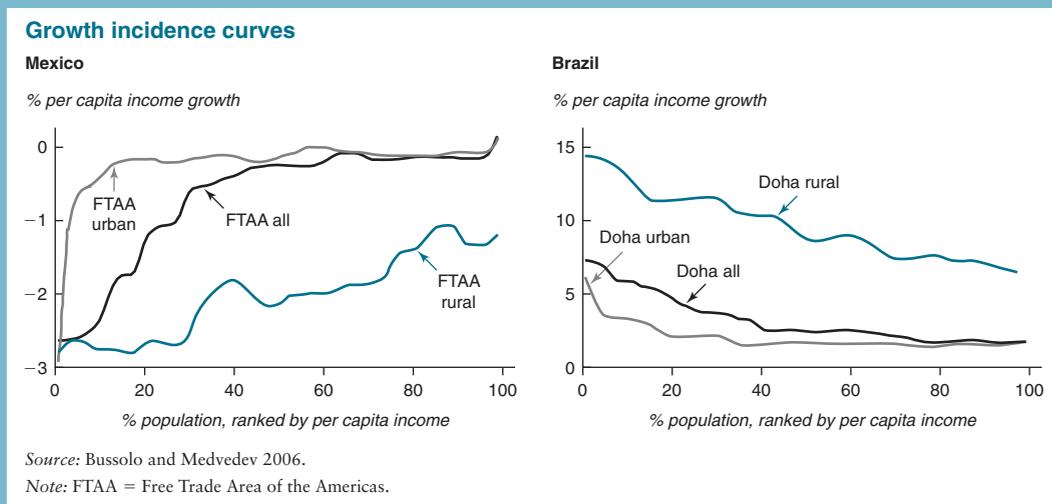
## Box 3.2 Aggregate economic performance: distribution matters

In measuring social welfare, economists have struggled to provide simple statistics that reflect changes in both aggregate income (that is, the gross national product—GNP) and distribution. This box presents a graphic approach—the growth incidence curve (GIC)—that, by jointly measuring size and distribution effects, provides an intuitive evaluation of welfare changes.

The basic idea behind the GIC was already present more than 30 years ago in a well-known study entitled “Redistribution with Growth.” In this study, Chenery and others (1974) proposed to use the weighted sum of the growth of all income groups as a summary measure for changes in social welfare. In a typical developing country the top two quintiles—the richest 40 percent of the population—would normally account for about three-quarters of total GNP. Therefore the GNP growth rate, the most commonly used index of performance, measures the income growth of the richer minority and “is not much affected by what happens to the income of the remaining 60 percent of the population” (Chenery and others 1974: 40). The trends observed in aggregate economic performance will differ according to the weights associated to the various income groups. Chenery and others (1974) found that when using GNP growth rates, where the weights are income shares of the initial distribution,

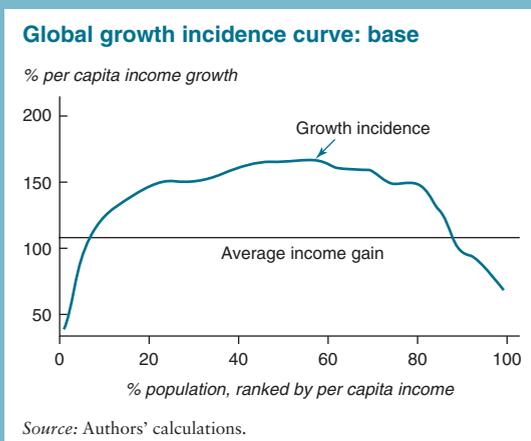
Brazil, Mexico, Panama, and República Bolivariana de Venezuela showed strong positive growth. However, because of their worsening income distributions, when equal weights (0.2 for each quintile) or poverty weights (0.6 for the poorer 40 percent, 0.3 for the next 40 percent, and 0.1 for the richest quintile) are used, these countries display much lower welfare increases. Conversely, countries enjoying improving income distribution during the 1960s and 1970s, such as Colombia, El Salvador, Sri Lanka, and Taiwan (China), scored better when their performance was measured with indicators that gave more weight to poorer individuals.

This weighting idea underlies the GIC, originally proposed by Ravallion and Chen (2003). The GIC is a graphical representation of the growth rate in income or consumption at each percentile of the distribution. It can summarize the distributional effects of income growth by plotting the cumulative share of the population (the *x*-axis) against the income growth rate of the *n*th percentile of the distribution (the *y*-axis) when the population percentiles are ranked in ascending order of income. Ravallion and Chen (2003) show that a measure of pro-poor growth can be obtained by integrating under the GIC. However, a simple comparison of the growth rate of the poorest percentiles against the mean



(continued)

## Box 3.2 (continued)



growth rate of the entire distribution already demonstrates whether income growth is biased for or against the poor. For example, consider the effects of trade liberalization on the income distributions of Mexico and Brazil (obtained from Bussolo and Medvedev 2006). While both reforms (the Free Trade Area for the Americas in Mexico and the Doha Round in Brazil) produced similar gains in

aggregate gross domestic product (GDP), poor Mexicans gained much less than poor Brazilians. In other words, the GIC for Mexico shows that trade reform can be somewhat regressive, whereas strong progressivity is observed for Brazil. This implies that focusing exclusively on changes in macro variables cannot convey the full amount of information needed to evaluate different policy alternatives.

Now consider the global GIC in the microsimulation here, obtained by comparing the initial situation in 2000 with a final distribution in 2030. It shows that for 81 percent of the world's population, per capita income will rise faster than the global average.

The growth incidence curve shows that the pattern of expected growth is not clearly pro-poor, since the poorest 2 percent of households gain less than half of the global average. Instead, future changes in the global economy are likely to particularly benefit the households in the third, fourth, and fifth world income deciles. Although these changes do not favor the extremely poor (because the benefits are not concentrated at the bottom of the income distribution), the poor and the middle class, taken together, benefit much more than the rich.

which has been steadily increasing since the late 1980s (World Bank 2005). Nonetheless, the extent to which increases in inequality within countries have offset the decreases in inequality between them is a hotly debated subject.<sup>8</sup> Therefore the overall direction of change in global inequality since the 1980s is not clear.<sup>9</sup>

Bourguignon, Levin, and Rosenblatt (2004) offer a “mobility” argument to reconcile the seemingly divergent strands of the literature on intercountry and international inequality. Most of the improvement in global income distribution since the mid-1980s has been driven by increases in the incomes of millions of people in East and South Asia. So the individuals at the bottom of the income distribution today are not the same as the poor of 20 years ago. Therefore, “those who insist upon equal-weights inequality and corresponding worsening of the distribution have in mind the implicit

mobility argument. For them, the fact that some world citizens lost (for example, in Sub-Saharan Africa or the Former Soviet Union) is not necessarily compensated by the fact that others, initially poorer, in China or India have gained. The initial income position matters and the social cost of falling incomes is not compensated by the social gain of increasing incomes, even if these changes take place in the same income range” (Bourguignon, Levin, and Rosenblatt 2004: 21).

Using the global inequality approach (which takes into account within-country inequality), Milanovic and Yitzhaki (2002) proposed disaggregating world income distribution into three categories irrespective of country of citizenship—the poor, the middle class, and the rich, where the middle class is defined as individuals earning an income falling between the per capita income of Brazil and the

per capita income of Italy. They then showed that, in 1993, the resulting middle-class group accounted for 8 percent of global population and 12 percent of global income, and that income differences between the rich, the poor, and the middle class captured 90 percent of inequality between countries and almost 70 percent of total global inequality.<sup>10</sup>

The next section turns to the future and uses the concept of global inequality and three global classes to identify the characteristics of those whose fortunes are likely to improve—the new global middle class—and of those who risk falling behind.

### *The future: an emerging global middle class*

While the global middle class' share in the population remained largely the same from 1993 to 2000, its income share rose from 12 percent to 14 percent (table 3.1). By 2030, the size of this group is projected to surpass one billion, making it the fastest-growing segment of the world's population.<sup>11</sup> Meanwhile its income share will remain largely unchanged, indicating that inequality between countries is falling. Today 56 percent of the members of the middle class reside in developing countries; in 2030 this share should reach 92 percent.<sup>12</sup>

The results of table 3.1 are based on an absolute definition of the “global middle class”: the per capita income thresholds are approximately equal to \$4,000 and \$17,000 (in 2000 international dollars) and remain the same in 2030.<sup>13</sup> Since an average middle-class family from a developing country has 4.3 household members, these income boundaries imply annual household earnings of \$16,800 to \$72,000 in PPP terms. This absolute definition implies that today (as of 2000) many of the *relatively* rich in developing countries are in the global middle class, while the vast majority of the absolutely rich (per capita incomes above \$17,000) live in OECD countries. Since the study projections contain only positive growth rates for all countries in the world, there is some “natural” expansion in the absolute size of the middle class. However, since these growth rates represent growth in *real* incomes, it is not appropriate to eliminate this “natural” expansion by setting higher thresholds for 2030 relative to the thresholds of 2000.<sup>14</sup> The study's definition of the global middle class is based on real purchasing power, which remains constant throughout the model horizon and is therefore equally relevant in 2000 and 2030.<sup>15</sup>

**Table 3.1 The global middle class is growing, its composition changing**

*Percentage shares*

	1993		2000		2030	
	Pop.	Income	Pop.	Income	Pop.	Income
Poor (per capita income below the average of Brazil)	76	29	82.0	28.7	63.0	17.0
Middle class (per capita income between Brazil and Italy)	8	12	7.6	13.8	16.1	14.0
High-income country nationals			3.4	6.8	1.2	1.0
Low- and middle-income country nationals, of which:			4.2	7.0	14.9	12.9
East Asia and the Pacific			1.3	2.0	7.3	6.4
Eastern Europe and Central Asia			0.8	1.3	2.2	1.9
Latin America and the Caribbean			1.5	2.7	2.6	2.2
Middle East and North Africa			0.4	0.6	0.8	0.7
South Asia			0.1	0.1	1.6	1.3
Sub-Saharan Africa			0.2	0.3	0.5	0.4
Rich (per capita income at or above the average of Italy)	16	58	10.5	57.5	20.9	69.0
Total	100	100	100.0	100.0	100.0	100.0

*Source:* Authors' calculations.

*Note:* Totals may not sum to 100 because of rounding. Estimates for 1993 are from Milanovic (2002).

Thresholds of Brazil and Italy are annual per capita incomes (2000 PPP) of US\$3,914 and US\$16,746.

There are several reasons behind the dramatic increase projected in the size of the middle class and the major shift in composition in favor of the low- and middle-income countries. Faster population growth in the developing world is responsible for some of the change in the composition. Thus regions with population growth above the world average (for example, South Asia and Sub-Saharan Africa) will increase their share in the global middle class. The main determinant of joining the middle class ranks, however, is not population growth but income growth. Although East Asia's population grows more slowly than the world average, this region is projected to increase its share of residents in the global middle class by a factor of five, compared with a doubling for Africa. The difference is due to the fact that annual per capita income growth in Asia is forecast to be more than twice the growth in Sub-Saharan Africa, easily offsetting the decline in the former's population share.

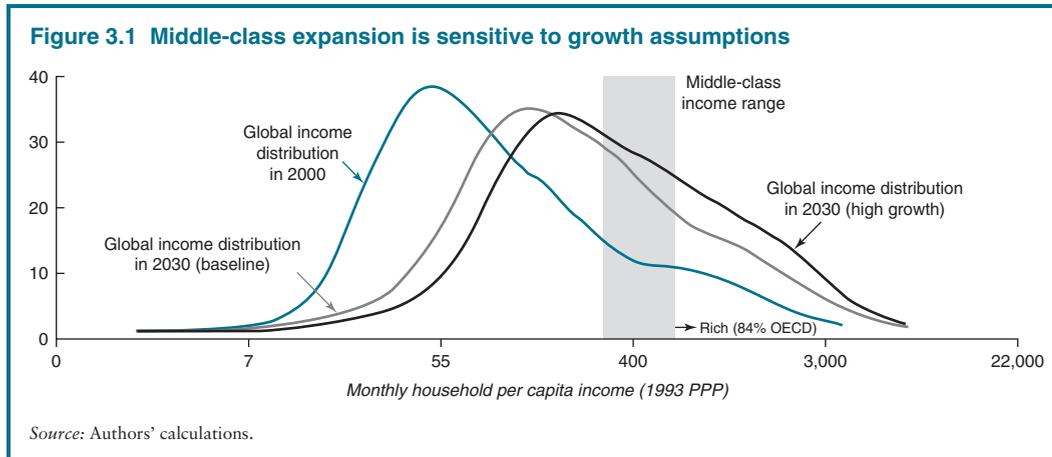
Another determinant of the changing composition of the middle class is the (unequal) shape of the initial income distribution by region. South Asia, which could see a dramatic increase (87-fold) in the share of its residents in the global middle class, is currently the least unequal region in the world. This means that the benefits of its projected per capita growth of 3.9 percent per year (roughly equal to that of East Asia) are distributed across the population much more equally than in other regions. Sub-Saharan Africa, by contrast, has an initial inequality level that is twice as high. Therefore the same amount of growth would be much less effective at moving large numbers of people up the ladder of income distribution.

Most developing-country members of today's (as of 2000) global middle class earn incomes far above the averages of their own countries of residence. In other words, being classified as middle class at the global level is equivalent to being at the top of the distribution in many low-income countries. For example, in our sample, as of 2000, 165 million (out of the total 231 million) developing-country citizens in the global middle class are

in the top 20 percent of earners within their own countries. By contrast, only 10 percent of global middle-class members occupy the lower seven deciles of their national income distributions. Thus, for many nations, the correspondence between the global middle class and the within-country middle class is quite low.

The situation will change quite dramatically by 2030. A full 42 percent of developing-country members of the global middle class will be earning incomes in the seventh decile or lower at the national level. Consider the example of China, where 56 million people belonged to the global middle class in 2000—each of them earning more than 90 percent of all Chinese citizens. By 2030, there will be 361 million Chinese in the global middle class, and their earnings will range from the sixth to the ninth decile of the Chinese national income distribution.<sup>16</sup> They will no longer be among the richest Chinese citizens but will probably be considered upper middle class. Another example is Brazil, a country that grows one-third as fast as China in per capita terms. Even with slower growth, the number of Brazilians in the global middle class will expand by more than one-third by 2030. The compositional change is also important. In 2000, the Brazilians in the global middle class were split evenly across the eighth and ninth income deciles of their national distribution. By 2030, 75 percent of the members of the global middle class will earn the incomes of the sixth and seventh deciles in Brazil, and no member of that class will earn more than 80 percent of the country's population.

Consistent with these data, by 2030 the middle class, together with the rich, will account for a larger share of the population in a greater number of countries. In 2000, the middle class and the rich exceeded 40 percent of the population in just six developing countries, and these countries were home to 0.7 percent of the population of the developing world. By 2030, the middle class and the rich will exceed 40 percent of population in 30 countries, and these countries will account for 36 percent of the world's developing-country population. Therefore, although the



ability of the global middle class (together with the rich) to influence policy in many low- and middle-income countries is initially limited by its small size, this group is likely to become a much stronger political force at both the global and national levels by 2030. The increase in developing-country nationals in the global middle class may also strengthen developing countries in the global policy arena.

It is important to emphasize that the projected expansion in the global middle class is not a formal forecast. Alternative assumptions about income and population growth, as well as effects of policy interventions, can have a significant impact on the estimates of table 3.1. Figure 3.1 illustrates some of these possibilities by plotting the income distribution of the world in 2000 and in 2030 under different growth assumptions.<sup>17</sup> The size of the global middle class is represented by the area under the distribution curve between the two middle-class boundaries. Faster growth shifts the peak of the distribution closer to the middle-class threshold, although even the optimistic scenario here—which increases growth to 1.6 percent above the baseline growth rates—falls short of moving the thickest part of the distribution into middle-class territory. Still, under the high-growth scenario the global population share of the middle class rises to 19.4 percent,

allowing an additional 235 million people to gain access to middle-class standards of living.

In addition to growth assumptions, policy intervention at the global and national levels—such as trade liberalization—can also affect the rate of middle-class expansion. The effects of policy reforms are considered in the policy section at the end of this chapter.

#### *The growth of the global middle class may have far-reaching consequences*

The ascent of hundreds of millions of developing-country nationals into the global middle class will produce a large group of people in the developing world who can afford, and will demand access to, the standards of living that were previously reserved mainly for the residents of high-income countries. This has two major implications: the demand for international goods and services will rise, and pressures for policies that favor global integration will increase.

*Goods and services.* Much of the effect of the middle-class expansion on the world economy will be realized through a changing demand for goods. The fact that the middle class will be growing twice as fast as the overall population implies that multinational enterprises will be able to market their products to a much larger audience in 2030 than they do today.

Furthermore, the rules of this new global marketplace will be increasingly determined by the tastes and preferences of the developing world, particularly the desires of consumers in East and South Asia. Therefore, while most of the world's purchasing power will continue to be concentrated in the OECD countries, the global economic influence of those countries will vastly diminish. By 2030 marketing to the developing world will be a much more important strategy for multinationals than it is today.

The rise of the global middle class will also affect demand for services. For example, given the strong correlation between education levels and income, the growing middle class is likely to demand more and better education. The share of the global middle class in developing countries with less than a secondary school certificate is projected to decline from 47 percent in 2000 to 38 percent in 2030. This is roughly comparable to the mean education levels among rich individuals in 2000, when 32 percent of the working-age population had not completed secondary school. Furthermore, by 2030 the likelihood of completing at least primary school will be virtually the same for the rich and the middle class.<sup>18</sup> The increased emphasis on education among the middle class will help establish the foundations for continued growth in the developing countries, as rising educational attainments and growing demand for schooling deepen the human capital stocks across the developing world.

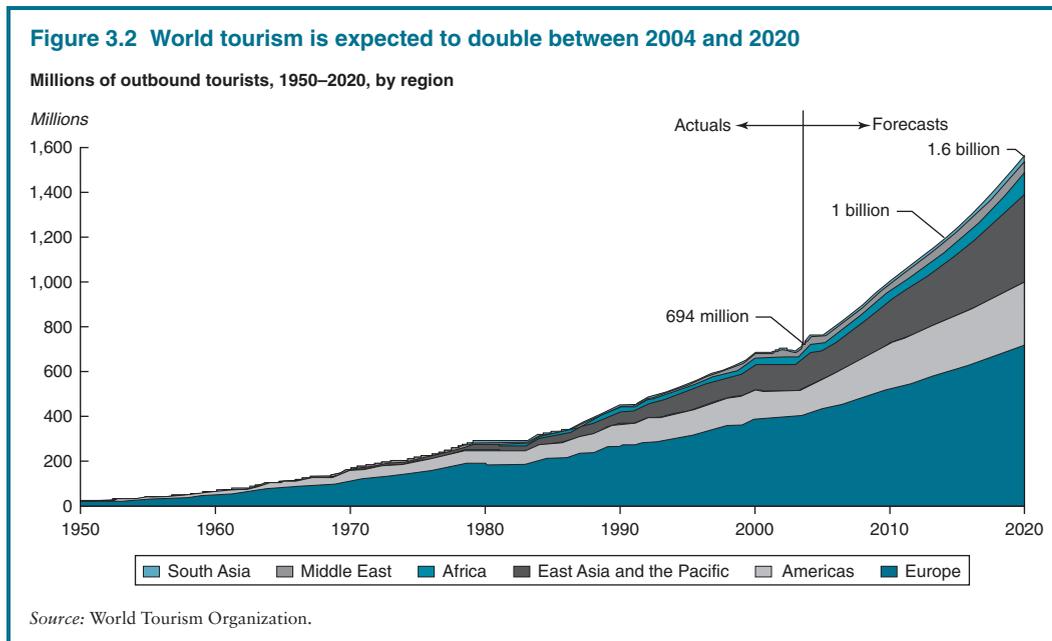
Demand for health services is also likely to rise with the growth in the global middle class. The ability to afford better care is a major determinant of health outcomes: the World Bank (2005) estimates that eliminating within-country differences in infant health would prevent 3.1 million infant deaths in developing countries—more than three-quarters of the total reduction that could be achieved by lowering mortality to the OECD averages. However, the increasing demand for education and health is likely to put pressure on the budgets of developing-country governments and will require heightened policy attention in the future.

The rise of the global middle class is also likely to increase the demand for international tourism services. Already in 2004, 20 percent of all outbound tourism came from East and South Asia, with an additional 6 percent from Africa and the Middle East (World Tourism Organization 2006). By 2020 the overall number of tourist arrivals is expected to double to 1.5 billion, with a growing share coming from developing regions (figure 3.2).

*Integration policies.* A significantly larger global middle class composed mainly of developing-country nationals will exert a stronger influence on international and domestic policy making. As shown above, by 2030 these middle-class members will constitute a significant share of their home country populations, allowing them to have a greater say in the policy process.

Some evidence points to a correlation between rising incomes and a shift in demand toward more globalization-supportive policies. Recent literature has found that pro-trade preferences are significantly correlated with an individual's skill level and the relative abundance of skilled labor in a given country (Scheve and Slaughter 1998; O'Rourke 2003). These results link pro-trade attitudes to the predictions of the Stolper-Samuelson trade theorem, which states that wage rates for skilled workers rise (relative to the returns of other factors) in skill-abundant countries as international trade increases. Mayda and Rodrik (2005) confirm these findings, while showing that individuals' relative economic and social status is highly correlated with pro-globalization preferences. Therefore, not only will the new global middle class possess the means to purchase products previously targeted mainly toward consumers in the OECD countries, but their demand for these products is likely to become a major driver of calls for further openness.

The literature on the political economy of trade policy proposes that the direction of policy is determined by the preferences of the median voter (Mayer 1984).<sup>19</sup> Today the median voter in most developing countries is



unlikely to be a member of the middle class, which may help explain why some studies find a negative relationship between pro-market policies of the incumbent party and its performance at the ballot box (Olivera and Lora 2005). However, the near-tripling of the global middle class by 2030 increases the likelihood that the median voter in many countries will have a pro-openness stance.

These changes are likely to have an impact not only on the domestic policy arena (for example, increased pressure for unilateral lowering of tariffs) but also on negotiations in multilateral forums such as the World Trade Organization (WTO). Countries with a rapidly growing middle class could emerge as strong proponents of improved dialogue and faster progress on multilateral liberalization of trade in goods and services.

However, as calls to remove trade restraints become stronger in some countries, they may turn weaker in others. Liberalization of trade may also lead to an antiglobalization backlash from lower-income citizens of industrial countries, who will experience increased wage and

employment competition from developing-country nationals entering the global middle class. Therefore understanding and managing the effects of globalization on within-country distribution of income are likely to become more important in the future; this point will be revisited later in this chapter.

Other policy goals—among them improved transparency, intensified anticorruption efforts, and demand for a more open society and cleaner environment—are also likely to move to the forefront of the policy agenda with the expansion in the size of the middle class. Although most of these issues are usually more easily addressed by domestic policy, multilateral efforts can assist the progress. For example, Bonaglia, Braga de Macedo, and Bussolo (2001) found a strong link between increased trade openness and lower corruption in a large sample of countries between 1980 and 1998. Other challenges, such as improving the quality of the environment, require at least as much cooperation on the multilateral front as they do in domestic policy circles. (See chapter 5 for a discussion of these issues.)

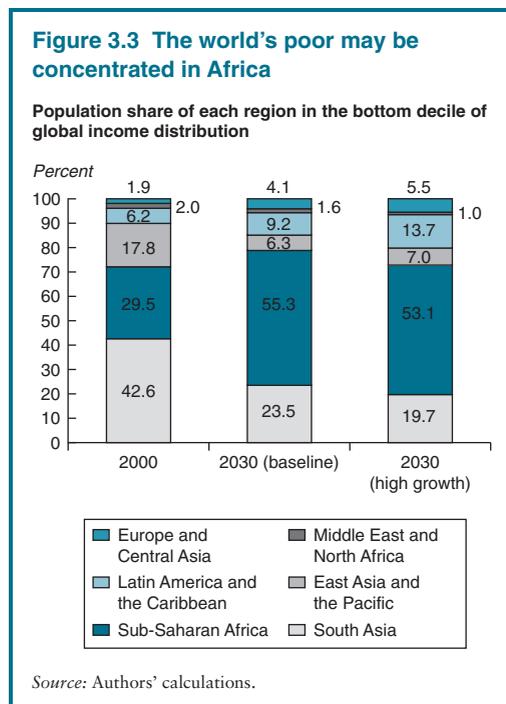
*Africa may fall behind*

Even though a rising share of the global population will have access to living standards currently reserved mainly for OECD nationals, more than half the world in 2030 will continue to earn less than middle-class incomes. Although the share of people whose living standards fall below those of the middle class will decline from 82 percent in 2000 to 66.5 percent in 2030, those left behind are likely to become increasingly concentrated in Sub-Saharan Africa, revealing geographic polarization in the lower ranges of the global income distribution. By 2030 Sub-Saharan Africa alone could be home to almost 55 percent of the poorest decile of the world income distribution—an 80 percent increase from its initial share in 2000 (figure 3.3). In other words, in 25 years the likelihood that a random person in the bottom decile will live in Africa may increase twofold, indicating a significant deterioration of relative living

standards in Sub-Saharan Africa compared to other regions.<sup>20</sup>

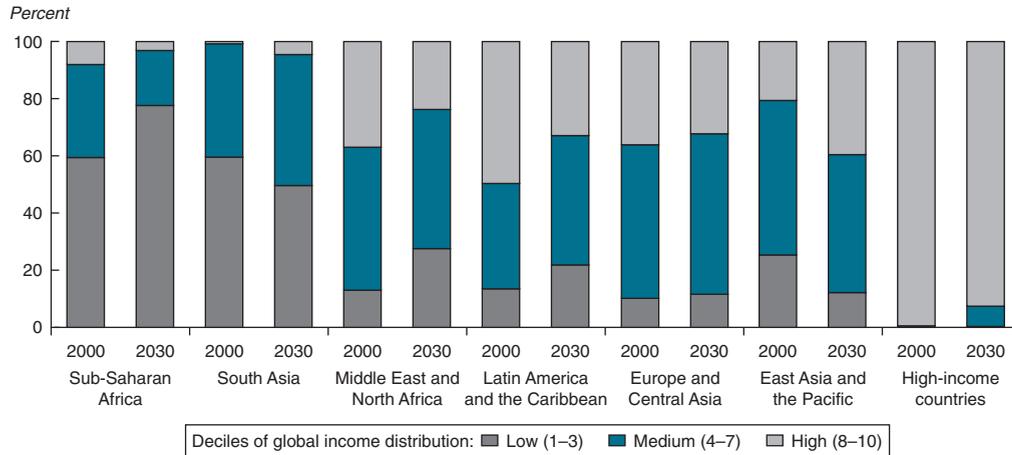
There are three main factors driving Africa’s decline: high initial income inequality, relatively high population growth, and the lowest per capita income growth among developing-country regions. The second and third reasons imply that more and more Africans are falling behind the rest of the world, while the first compounds the problem by limiting the ability of the poor to enjoy the growth benefits equally. Similar mechanisms operate in Latin America, which also is expected to increase its share in the bottom decile. Slower growth of income per capita relative to other regions means that the share of Latin America in the bottom decile could rise by 50 percent in 2030—a much slower increase than that of Sub-Saharan Africa, but significant nonetheless. This underscores the universal importance of growth and growth-oriented policies, which are equally relevant for low- and middle-income regions.

The bleak outlook for Sub-Saharan Africa (and to a lesser extent Latin America) is not foreordained or immutable. Policies that raise growth rates, both international and domestic, as well as policies aiming at efficiency-enhancing redistributions, can lead to different outcomes. Consider the third column of figure 3.3, which represents the high-growth scenario described in chapter 2. In this scenario, Sub-Saharan Africa performs slightly better because it experiences a larger-than-average increase in per capita growth. By contrast, Latin America falls further behind. It is important to keep in mind that figure 3.3 summarizes a relative measure of performance and that everyone’s living standards improve under high growth relative to the baseline. However, the important point is that while growth is effective in raising living standards, closing the income gap with wealthier countries requires faster-than-average growth—which is successfully achieved in South Asia but not in Sub-Saharan Africa, even under this chapter’s optimistic growth scenario. Similarly, maintaining one’s relative standard of



**Figure 3.4 By 2030, East and South Asia are likely to move up the global income distribution ladder, while other regions will lag**

Population of each region by deciles of global income distribution



Source: Authors' calculations.

living is also conditional on growing at least as fast as the global average.

The relative stagnation in Africa and Latin America is not limited to the poorest 10 percent of the world. Virtually all Africans are at risk of underperforming their counterparts from other regions. For example, in 2000, 59 percent of the population of Sub-Saharan Africa and 25 percent of the population of East Asia were in the bottom third of the world income distribution (figure 3.4). By 2030, more than three-quarters of the population of Sub-Saharan Africa is likely to be among the world's poorest, while only 16 percent of East Asia's residents will remain in the bottom third. This contrasting performance is largely a function of the difference in per capita income growth rates. South Asia will continue to be the largest group in the three bottom deciles in 2030 owing to the very high initial poverty rates. But its citizens are moving up through the ranks of the global distribution at a fast pace owing to high per capita growth and, unlike in the initial situation,

most of South Asia's poor will earn incomes in the second and third deciles in 2030. The growth effect is exactly the opposite in Sub-Saharan Africa, where an average African is 30 percent more likely to be in the three bottom deciles in 2030 than in 2000.

Moving away from geographic regions, it is possible to identify alternative typologies of countries whose citizens could fail to improve or even lose their position in the world income distribution. One group includes low- and middle-income energy exporters, defined as countries whose exports of oil or natural gas exceed 20 percent of their total value of exports.<sup>21</sup> In 2000 citizens of energy-exporting countries made up 15 percent of the first (bottom) decile of the global income distribution. By 2030, the population share of energy exporters in the poorest decile could rise to 27 percent. Similarly, agricultural exporters may fall behind by 2030.<sup>22</sup> While in 2000 their citizens accounted for just one-tenth of the poorest global decile, that share could rise to 23 percent in 30 years. Although everyone

in the above countries will be better off in 2030 than they are today in absolute terms, these developments imply a large deterioration in the *relative* living standards of a large share of the population.<sup>23</sup>

The outlook for Sub-Saharan Africa underlines the importance of international efforts to reduce poverty. International development policy is already focused on the problems facing Sub-Saharan Africa, but still more attention is needed. One avenue for improving the lot of countries left behind will be the increased demand for multilateral trade liberalization. Another mechanism of global income redistribution that has the potential to help the poor is represented by international aid. (These two global policies are discussed in more detail in the final section of the chapter.)

### Within-country inequality and poverty reduction

The moderately sanguine conclusions about the expansion of the middle-class population and the increasing access of developing-country residents to living standards currently reserved to OECD nationals are only one part of the global income-distribution story. Changes in the distribution of income *within countries* are no less important. Worsening inequality can mute the positive effects of growth on poverty reduction in both the short and long run, increase the risk of social alienation of people at the bottom of the income distribution, and perhaps produce counterproductive backlashes against further integration with the global economy.

#### *On balance, past trends of inequality are mixed*

When one looks backward, clear trends of rising or falling inequality are difficult to identify, but recent evidence casts doubt on the view of unchanging inequality. Some empirical studies concerned with the intertemporal evolution of inequality and its possible

determinants have found that income inequality within countries shows no time trend. Li, Squire, and Zou (1998), using the Gini coefficients for 47 developing and developed countries covering the period 1974–94, found no significant time trend. Bruno, Ravallion, and Squire (1998) found very few countries that had recorded discernible long-term changes in inequality in either direction.

More recently, however, this view of constant income inequality has been challenged by some new evidence. Focusing on the OECD countries between the 1970s and 1995, Osberg (2003) concluded that inequality changed relatively little in Canada, Sweden, and Germany, but that income distribution in the United Kingdom and the United States saw substantial increases in polarization.<sup>24</sup> Similar conclusions were reached by Atkinson (2003).

In the developing world, inequality has generally increased in many, if not most, countries since 1980, even though a sizable minority of countries have exhibited the opposite trends toward greater equality. In East Asia, inequality has increased significantly over the last several decades—and more so during the recent period of high growth in China and Vietnam than in the earlier years of growth of the East Asian “tigers” (World Bank 2005). However, Ravallion and Chen (2004) caution against drawing a causal relationship between growth and inequality in China, since inequality increased fastest during periods of slow growth. In South Asian countries, the evolution of inequality in India is difficult to ascertain owing to data problems, but other countries in the region experienced very large increases in inequality during the 1990s (World Bank 2005). For the countries of Latin America, de Ferranti and others (2004) show that inequality increased almost uniformly during the 1980s (a period of volatile and low growth coupled with high inflation), but that in the 1990s (a period of improved macroeconomic stability) the deterioration was less pronounced and limited to approximately half the countries in the region.

*Is trade a cause of changes in inequality?*

One potential determinant of inequality is the increasing integration of developing countries into the global economy, which, while raising overall incomes, may also increase the return to more mobile factors of production such as capital and highly skilled workers. But the impact of trade (one channel of globalization) on income inequality shows no consistent pattern. Another source of the past decade's increase in inequality could be increases in the premium for skills generated by technological change. The effects of trade are difficult to isolate from technological diffusion and foreign investment, and the combination may raise the relative wages of skilled workers and widen the distribution of income (for more details see the "Policy Implications" section below and chapter 4).

*Demography and social mobility affect equality and poverty*

Another determinant of inequality is demographic change. The aging of the world's population may increase inequality, as older workers often earn higher salaries (Deaton and Paxson 1997) and inequality tends to be higher among older age cohorts (Jenkins 1995; Mookherjee and Shorrocks 1982).<sup>25</sup> The mixed rise in inequality in developing countries has been accompanied by a fall in poverty, largely driven by high growth rates in East and South Asia. Nevertheless, rising inequality will hamper further poverty reduction, particularly in Africa, where poverty is rising and inequality remains high. This section and the next one assume circumstances of healthy growth in the modern sectors, which give rise to new jobs in industry and services. The role that intersectoral mobility can play in reducing poverty is then considered, as well as how policies can help the *poor* move between occupations and take advantage of the new opportunities offered by growth.

Moving from low-paying jobs in agriculture, where poverty rates are often high, to higher-paying jobs in industry or services is a

major avenue for individuals looking to escape poverty. The size of the migration-related reduction of poverty depends on the initial poverty rate in agriculture, and the income differential between households whose heads are employed in agriculture and those whose heads are employed in nonagricultural activities. For all developing countries in the sample, the headcount poverty ratio falls by 2 percentage points (calculated as an unweighted average) when 10 percent of the agricultural population moves to industry or services. In Sub-Saharan Africa, where agricultural households account for 75 percent of national poverty and agriculture-related incomes are only 47 percent of incomes earned in the other sectors of the economy, the equivalent reduction in poverty is 4 percent. This reduction could be larger, but not all migrants are poor, and not all of the poor who migrate escape poverty.<sup>26</sup>

Although migration does not lead to a large reduction in poverty at the national level, the improvement in welfare of individuals migrating from agriculture can be quite large. Even for impoverished migrants who fail to escape poverty, an increase in income from migration can reduce the poverty gap. Other long-term effects can also be attributable to the migration process. By reducing the labor supply in the agricultural sector, wages of nonmovers in this sector tend to rise, exerting a direct positive impact on relatively poor households.

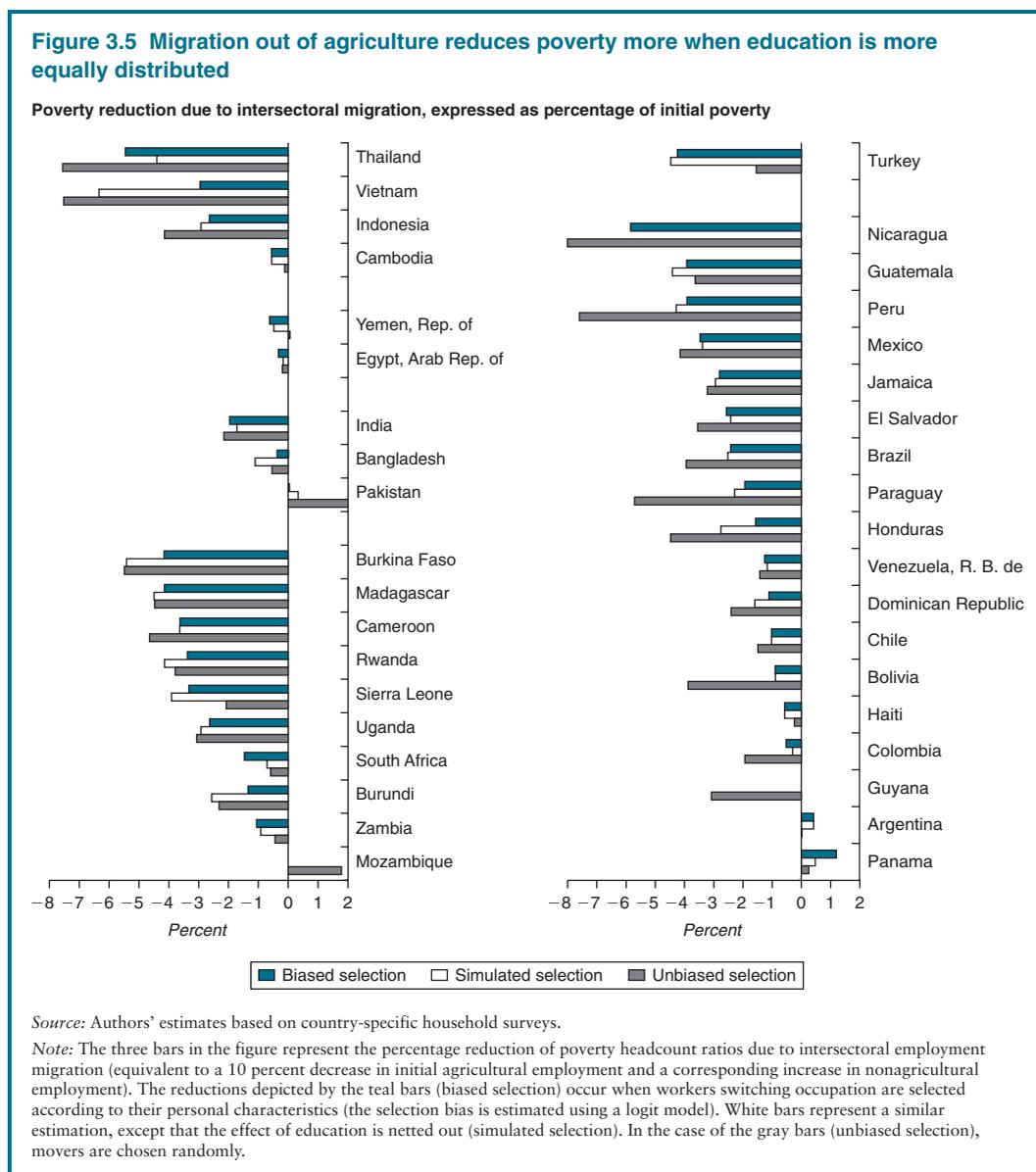
*Education facilitates mobility*

To help the poor take advantage of new growth opportunities, governments can implement measures ranging from expanding relevant infrastructure to increasing poor people's access to credit and insurance. This section focuses on how *education* can improve the pro-poor effects of the described employment shift out of agriculture.<sup>27</sup> To the extent that the poor lack access to education, intersectoral migration may be limited. The unequal access to education in many developing countries is documented in World Bank (2005) and works cited therein. Among the relevant

findings: family members of households headed by women and of rural households have marked disadvantages in attaining higher levels of education. Additionally, parents' initial wealth and education greatly influence their children's educational achievements and their expected earnings, thereby contributing to future income inequalities. For many countries, the correlation between the education level of

the head of the household and the average level of education of the other members of the household was observed to be very high. The average value for this correlation in the developing-country sample is almost 0.4.

The influence of education on the poverty-reducing impact of intersectoral migration is illustrated in figure 3.5 for a sample of developing countries. For the majority of these



countries, heads of households who are more educated, younger, and already in urban areas are more likely to migrate from agriculture—and less likely to be poor.<sup>28</sup> Thus poverty reduction through intersectoral mobility is limited, reflecting a phenomenon known as biased selection, represented by the teal bars of the figure.<sup>29</sup> By contrast, if heads of households were randomly selected to move out of agriculture, poverty reduction would be greater, as a larger share of the poor would move (shown in the gray bars of the figure).

One way the government could improve the poverty-reducing impact of intersectoral mobility would be to increase access to education. Consider this thought experiment. If every individual initially employed in agriculture were given the same level of education, poverty reduction would rise closer to the random selection case (referred to as “simulated selection” and represented by the white bars of figure 3.5). For example, in Burkina Faso, a migration out of agriculture of 10 percent of those employed in agriculture reduces poverty by 5.5 percent in the best-case scenario, that is, when the poor and nonpoor have the same chances of moving. Poverty decreases by a smaller amount, 4 percent, when movers are selected according to their characteristics and the nonpoor have a greater chance to move. If Burkinabe policy makers were able to grant the same education level to all citizens employed in agriculture, the intersectoral migration considered here would approach the outcome of the best-case scenario: poverty reduction would be 5.4 percent.

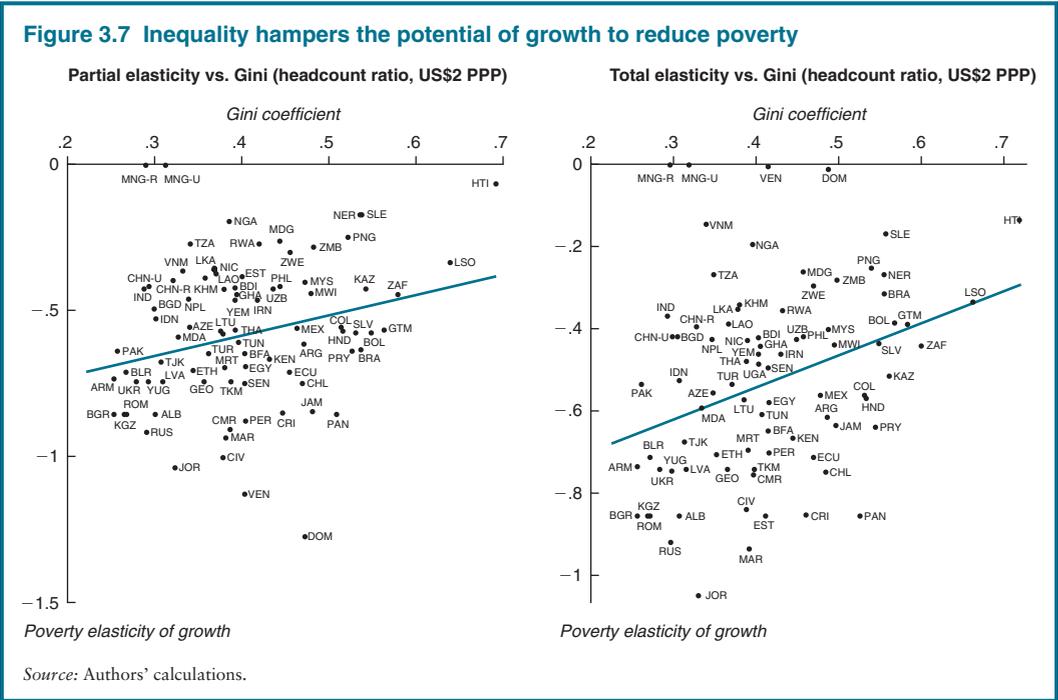
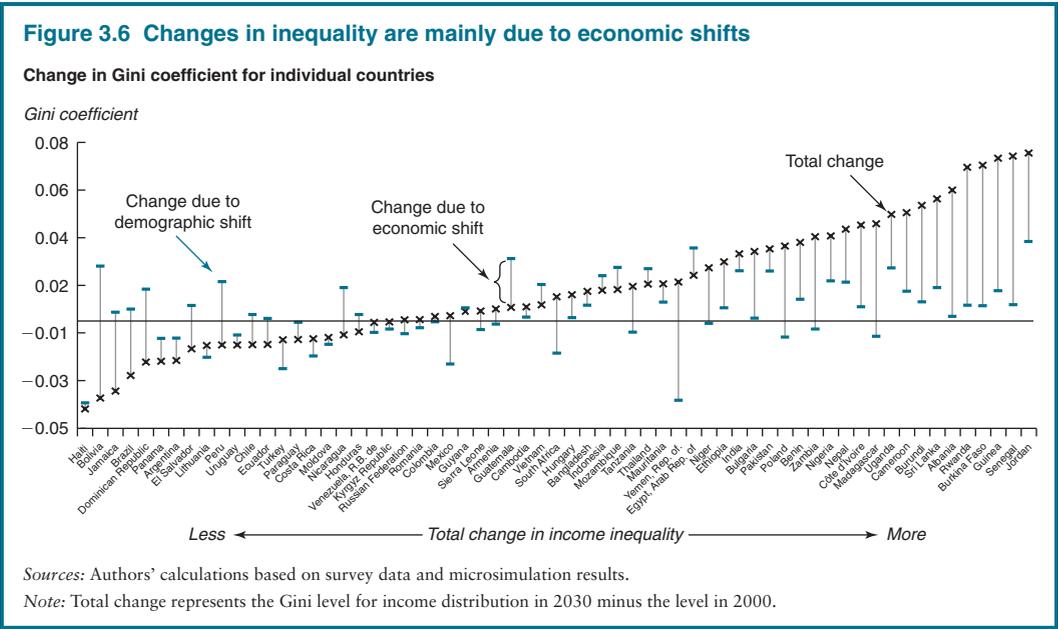
It is important to reiterate that complementary policies are necessary to exploit fully the poverty-reducing impact of expanding access to education. As already said, in many countries a poor investment climate limits the ability of the economy to absorb newly educated workers. Improvements in economic policies and institutions are often critical to encouraging the higher investment required to employ graduates. And care must be taken to maintain quality standards. Raising access to education means providing the trained teachers,

infrastructure, and materials required for a useful educational experience, not just enrolling everyone in school.

***By 2030, inequality within countries may rise, leaving the unskilled poor farther behind***

More than two-thirds of low- and middle-income countries in the study sample, comprising 86 percent of the population in the developing world, are projected to experience a rise in inequality by 2030. For some countries the increase is quite significant (figure 3.6).

Rising inequality is worrisome because there is an inverse relationship between inequality and poverty reduction.<sup>30</sup> Even if growth is distribution-neutral (that is, if the incomes of the poor rise by the same amount as average incomes), inequality can still hamper the ability of growth to reduce poverty. This point is illustrated in the left panel of figure 3.7, which plots the relationship between the partial (neutral) poverty elasticity of growth and the Gini coefficient for a sample of 84 developing countries (see also World Bank 2005). This elasticity has been calculated by simulating a counterfactual income distribution, where the income of each person in a given country rises by 1 percent, and calculating the resulting percentage change in the poverty headcount. The results show that there is a robust positive relationship between the level of initial income inequality and the absolute value of the poverty elasticity. At low levels of income inequality, a 1 percent increase in per capita growth generates a more-than-proportional change in the poverty headcount. However, as inequality rises to the high levels of Lesotho or Haiti, the ability of growth to reduce poverty approaches zero. A similar relationship is observed for the total elasticity of growth (the right panel of figure 3.7), which is calculated using observed income growth rates and therefore allows inequality to vary within the sample period. These results show that, while growth is the major vehicle of lifting individuals out of poverty (see Dollar and Kraay 2002), it is



more likely to be pro-poor when initial inequality is low.

Figure 3.7 thus demonstrates the long-term benefits of reducing income inequality: in addition to a contemporaneous reduction in poverty that may be expected from lowering inequality, policies that promote a more equal distribution of income are likely to enable the economy to realize greater poverty reduction from future growth. The projected rise in inequality would imply that in 2030 poverty elasticities will be lower and, with more unequal income distribution in 2030, countries will need higher growth rates than they need today to achieve a given reduction in poverty. If higher growth rates cannot be achieved, the countries will need more active redistribution policies.

#### *Within-country inequality in 2030: two main drivers*

In each country, income distribution is affected by two sets of factors: shifts in the *demographic structure* of the population, in terms of aging and education attainment, and changes in *rewards for individuals' characteristics*, such as their education level, experience, sector of employment, and so on. Although in the real world these demographic and economic shocks occur simultaneously and jointly determine inequality changes, this analysis applies each of them sequentially and decomposes the total change into various components.

This study's view of the demographic structure of the world in 2030 is based on the World Bank's population projections by age group and a simple model of human capital accumulation that assumes a continuation of the educational trends observed over the 1980–2000 period. Controlling for other factors, both the level and dispersion (inequality) of household income tend to increase with the age and education of the household head.<sup>31</sup> Therefore as the population shares of groups with more income inequality rise, one may expect to see higher inequality.<sup>32</sup> However, as shown by teal tick marks in figure 3.6, there is no clear pattern in changes in inequality driven by demographic forces. One explanation

is that countries with relatively large public sectors and relatively high education levels (such as countries in Eastern Europe and the Commonwealth of Independent States) tend to have more egalitarian distribution of income among skilled workers, possibly because their governments and other bureaucracies have more compressed wage structures. Hence, changes in the demographic structure work to *reduce* income inequality. By contrast, many countries in Latin America and Sub-Saharan Africa experience an increase in inequality as the shares of older and more skilled workers rise, since wage dispersion within these groups tends to be high.

Although aging and the accumulation of human capital imply important changes in the demographic structure of many countries, the overall effect of demographic changes on inequality varies within a narrow band (figure 3.6). On the other hand, widening gaps in factor rewards, and particularly in the premium paid for higher skills, tend to produce larger changes in inequality and generally determine the overall direction of the effect. This is shown in figure 3.6, where for large changes in inequality, the distance between the black and teal marks—that is, the change in inequality attributable to changes in economic factors—increases, a sign that economic factors are the most important determinant for the final level of inequality.<sup>33</sup>

The initial skill premia and the pattern of growth experienced by each country determine the consequences for inequality of the economic factors. Those consequences are obtained by applying the changes in the factor rewards of the model in chapter 2 to the income sources of individual households. For example, countries in Latin America are characterized by high initial income inequality and relatively slow growth rates. This implies a slower transition to a service-oriented economy and lower rates of capital deepening—both of which dampen the growth of the wages of skilled workers, whose labor is a complement to capital and is highly demanded in the service sectors.

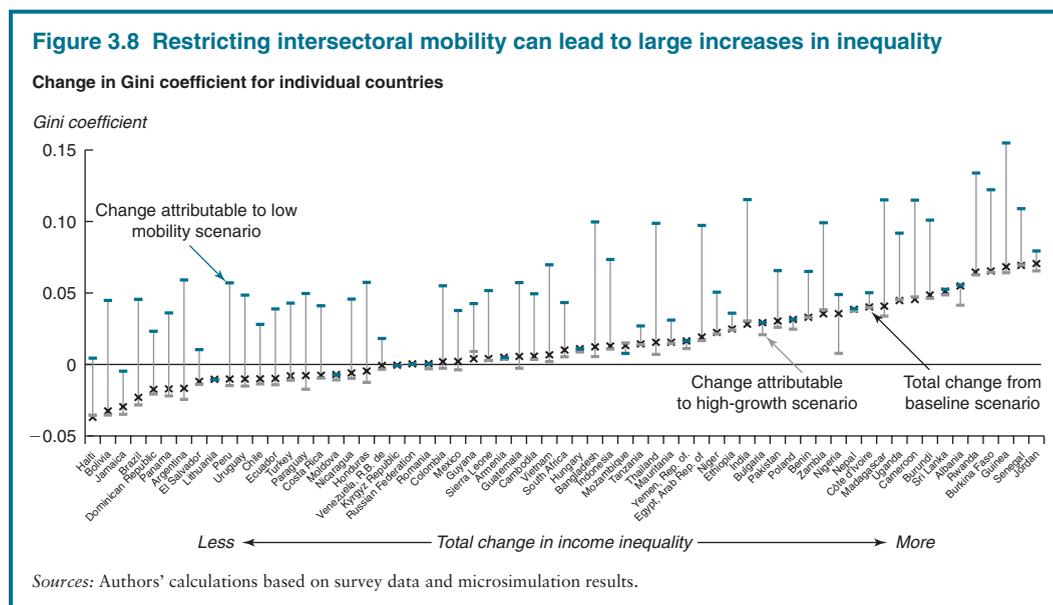
Since initial wage gaps are high—the per capita income of a household headed by an unskilled worker in Brazil is only 27 percent of that of a household headed by a skilled worker—and growth is relatively unskilled-intensive, unskilled wages rise faster than skilled incomes and inequality tends to fall (figure 3.6).<sup>34</sup> The reduction in inequality is compounded by the diminishing rural-urban wage differentials in countries with a comparative advantage in agriculture, which tends to be relatively unskilled-intensive. For example, farm workers in Brazil—a country with one of the largest decreases in the Gini coefficient—earned 40 percent of the average manufacturing wage in 2000 but will likely earn more than 72 percent of the average industrial wage in 2030.

By contrast, countries in East and South Asia will experience increasing inequality, driven by low initial skill premia and high per capita growth rates. Faster income growth generates more demand for skill-intensive products and requires higher rates of investment, both of which increase the returns to skilled labor. For example, one of the largest increases in inequality in the sample is observed in India—a country with low initial

inequality (the incomes of unskilled-headed households are 52 percent of the skilled-headed incomes) and an average per capita growth of more than 4 percent, which leads to a substantial rise in the skill premium. The rise in inequality is somewhat mitigated by convergence between farm and nonfarm incomes, but this effect is quite small because growth is concentrated in the nonagriculture sectors.

In sum, changes in income inequality over the next 30 years are likely to be driven mainly by changes in the rewards for individual characteristics and investment in education—rather than globalization in isolation. Countries with low initial inequality and fast growth are likely to experience a worsening distribution of income, while countries with slower growth rates and greater initial inequality in income are likely to see inequality fall. The results therefore illustrate a “convergence” of income distributions across countries, which can be interpreted as a manifestation of the Kuznets hypothesis or as a consequence of the globalization-induced equalization of factor prices.

It must be borne in mind that these trends are driven by the assumptions of the baseline scenario and are far from inevitable. Figure 3.8



illustrates the inequality consequences of two alternative scenarios: the high-growth scenario introduced earlier (gray marks) and a low-labor-mobility scenario (teal marks), where unskilled workers are not allowed to move from farm to nonfarm activities. By increasing rural incomes, the high-growth scenario reduces within-country inequality, although the overall magnitude of the changes is not very large. On the other hand, limiting the intersectoral mobility of workers markedly increases income inequality for the majority of countries. For example, India experiences an 11-point increase in the Gini coefficient, which makes its level of income inequality approximately the same as that of República Bolivariana de Venezuela.

The inability of workers to take up jobs in the urban sector counteracts the natural processes of growth and urbanization, applying upward pressure on nonfarm wages while depressing earnings in agriculture. Even in such countries as Brazil, which has a comparative advantage in agriculture, labor-market rigidities in the low-mobility scenario result in a significant increase in inequality. Because distortions can have severe effects on inequality, policy makers must be careful not to erect barriers to labor mobility.<sup>35</sup> On the other hand, as is argued below, public intervention can counteract the tendencies toward rising inequality by creating new opportunities that benefit low-income groups.

*Who is left behind: the face of the poor in 2030.* As is true today, in 2030 most people in the lowest income decile will be without primary school education, will work in agricultural sectors, and will live in rural areas. Lack of education appears to be the single most important characteristic common to people at the bottom of the distribution. Completing primary education reduces the probability of being in the lowest income decile in every developing country in the forecast. However, the magnitude of this effect varies dramatically across countries. Consider, for example, the cases of Rahmane and Ali, two

young men who live in rural areas of Senegal and Yemen, respectively. Rahmane and Ali have not completed primary education, work in agriculture, and belong to families whose per capita income is in the poorest decile. After completing his primary education, Rahmane's probability of remaining in poverty would be reduced by more than 13 percentage points. This is explained, to a great extent, by the 40 percent increase in his income produced by completing his primary school education. Ali's efforts to combine his hard work in the field with elementary studies will not be met with as great a reward. Once he gets his primary school degree, his probability of escaping poverty will fall by less than 1 percentage point, because his income will increase only 6 percent.

This example illustrates the large variation in the welfare effects of education among different countries in different geographical regions. In Europe and Central Asia, for example, completing primary school reduces the probability of being in the lowest income decile by 11 percentage points and increases income by less than 3 percent (table 3.2). By contrast, in Sub-Saharan Africa, completing primary education reduces the probability of being in the lowest income decile by 7.2 percentage points and increases income by more than a third. Even among countries in the same region, there is heterogeneity. For example, in the Middle East and North Africa, as mentioned, a Yemeni who obtains a primary education is only slightly less likely to end up in the lowest income decile (a difference in probability of less than 1 percentage point), whereas Egyptians with a primary education improve their chances of escaping the bottom decile by more than 10 percentage points. Nevertheless, there is a strong negative correlation within all regions between the returns to education and the marginal effect of primary school education on the probability of being in the lowest decile: where the return to education is high, the probability of remaining poor is low.

Additional variables, such as the number of elders in the household and the gender and

**Table 3.2 Where the return to education is high, its poverty-reducing impact is also high***Poverty and income effects due to completing primary education (regional averages)*

Region	Marginal effect on probability of being in the lowest decile	Marginal effect on returns to primary schooling	Within-region correlation between effect of primary school completion on poverty and return to primary schooling
Sub-Saharan Africa	-0.072	0.340	-0.674
East Asia and the Pacific	-0.079	0.242	-0.733
Europe and Central Asia	-0.111	0.264	-0.743
Latin America and the Caribbean	-0.066	0.431	-0.464
Middle East and North Africa	-0.056	0.229	-0.996
South Asia	-0.068	0.257	-0.946

*Source:* Authors' estimates based on country-specific household surveys.

*Note:* For each country, the income of a head of household and the probability of the head of household being in the bottom income decile depend on individual and household-specific characteristics—among them education, age, gender, and sector of employment. As simple averages for all the countries within the six developing regions, the first two columns represent the marginal effect of completing primary school on the probability of being in the bottom decile and on income, respectively.

**Table 3.3 Some factors affect the probability of being in the lowest income decile more than others—and the differences are changing over time***Poverty effects of specific characteristics (developing-country averages)*

Factor	Marginal effects on probability of being in the lowest decile (2000)	Marginal effects on probability of being in the lowest decile (2030)	Difference (2000–30)
Primary school	-0.066	-0.081	0.016
Secondary school	-0.110	-0.100	-0.011
Gender (women = 1)	0.020	0.017	0.006
Age	0.002	0.002	0.000
Age squared	0.000	0.000	0.000
Number of elderly in the household	0.021	0.020	0.003
<b>Industry effects</b>			
Mining	-0.028	0.011	-0.038
Manufacturing	-0.066	-0.013	-0.054
Public services	-0.066	0.008	-0.071
Construction	-0.060	-0.007	-0.057
Retail, Hotels	-0.076	-0.025	-0.051
Transport communications	-0.065	-0.023	-0.050
Finance services	-0.065	-0.014	-0.047
Other services	-0.067	-0.018	-0.052
Others not well specified	-0.011	0.020	-0.026

*Source:* Authors' estimates based on country-specific household surveys and microsimulation results.

*Note:* For each country, the probability (estimated with a probit model) of the head of household being in the bottom income decile depends on individual and household-specific characteristics—among them education, age, gender, and sector of employment. As simple averages for all the developing countries, the first two columns represent the marginal effect of each independent variable estimated at the initial and final years, respectively. For each country, the difference between the marginal effects between the two years has been calculated for each factor and the factor's average across all countries is shown in the last column.

the sector of employment of its head, among others, affect the likelihood of being poor (table 3.3). Everything else being equal, households headed by a woman are more likely (by 2 percentage points) to be in the

lowest income decile than are households headed by a man. A similar difference is observed between workers in agricultural sectors and those in nonagricultural sectors. Working in the former increases the probability of being

in the lowest income decile by 5 percentage points.

The correlations between poverty and individual characteristics change over the forecast period. Owing to a slightly increasing skill premium, completing primary education reduces the probability of a person being in the lowest income decile by 6.6 percentage points in 2000; it could reduce that probability by 8.1 percentage points by 2030. Hence lack of education is likely to become a more important determinant of who is left behind in the next 25 years. By contrast, the gender of the head of household will become less important. As just noted, in 2000, households whose head was a woman were 2 percentage points more likely to be found in the lowest income decile than were male-headed households. That difference could shrink to 1.7 percentage points in 2030. Finally, as agricultural incomes approach those generated in other sectors,<sup>36</sup> disparities in the probability of poverty of workers in the agricultural sector and those in other industries may be less in 2030 than they were in 2000.

### Policy implications

These forecasts of growth, demographic shifts, and trends in inequality point to significant challenges—and opportunities. Developing countries' growing participation in the global middle class will represent a substantial improvement in welfare for hundreds of millions of people, increase the weight of developing countries in the global economy and in international policy, and possibly even increase support for open economic policies that could further improve growth rates. While poverty will fall quite sharply, hundreds of millions of people, concentrated in Africa, will continue to live on less than \$1 a day. Demographic shifts, coupled with unequal access to both wealth and services, are likely to increase inequality within countries, thus further hampering the potential for overall growth to reduce poverty. Policy can help lessen the effects of these tendencies.

### *Global policies: is development assistance a useful instrument to reduce inequality?*

The improving fortunes of the developing world raise the question of whether official development assistance (ODA) is still necessary. It is—for the following reasons.

Aid flows can have a significant impact on the global distribution of income when they raise the incomes of the poorest countries. To be sure, aid has to be well invested and relatively free of corruption to be fully effective. Bourguignon, Levin, and Rosenblatt (2006) show that as long as aid is distributed equally—that is, it does not change the national income distribution—in recipient countries, its effect can be particularly beneficial to the poor: 41 percent of all aid accrues to the bottom decile of the global income distribution and another 25 percent to the second decile.<sup>37</sup> Furthermore, empirical evidence demonstrates that aid can lead to additional growth in the recipient countries, although some studies reach the opposite conclusion (Easterly, Levine, and Roodman 2004), and others show that aid can enhance growth only in the presence of good institutional characteristics (Burnside and Dollar 2000; Collier and Dollar 2002).

To illustrate the potential effect of aid on incomes by region, consider a simple exercise that adopts the same methodology that Bourguignon, Levin, and Rosenblatt (2006) used to estimate the global redistribution effects of aid flows. This chapter calculates growth rates without aid using the empirical relationship between annual income growth and ODA estimated by Collier and Dollar (2002).<sup>38</sup> It is further assumed that the share of aid in developing countries' GDP does not change between 2000 and 2030, that institutional quality<sup>39</sup> remains constant, and that aid is distributed equally *within* recipient countries.<sup>40</sup> By removing all aid, the forecast growth rate for Sub-Saharan Africa would fall by more than 0.5 percentage points a year, or almost one-third of projected per capita income growth. By contrast, the complete cessation of aid flows would have small effects on growth in East Asia and Latin America.

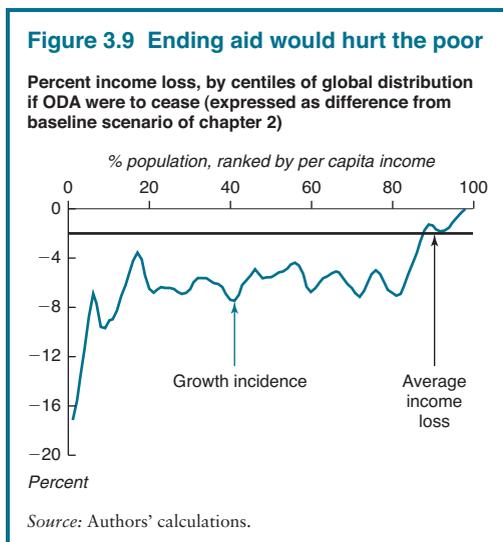


Figure 3.9 extends this approach to the full set of countries in the microsimulation model.<sup>41</sup> For the world as a whole, per capita income gains are 2 percent lower than in the baseline. Distributional effects are much more pronounced, with 87 percent of the world experiencing greater-than-average losses, although no one ends worse off in 2030 than they were in 2000. The bottom 1 percent of the income distribution experiences an income loss of 17 percent relative to the baseline. Expressed positively, the poorest 1 percent will see their incomes rise by 37 percent between 2000 and 2030 if aid levels remain unchanged, versus a 20 percent real income gain if their countries receive no aid.

These results are only illustrative. The exercise assumes that the allocation of aid and the effectiveness of aid in promoting growth follow their historical patterns. The growth penalty of aid removal is thus constant through the forecast period—and such fast-growing countries as China and India appear to be penalized for not receiving developmental assistance, even though they may require significantly less of it by 2030. In reality, improvements in the allocation of aid to the poorest countries and to countries with good policies could boost aid effectiveness and

enable larger reductions in poverty than those anticipated in this study's forecasts. On the other hand, efforts to reduce poverty could be hampered by conflict, macroeconomic instability, or high levels of corruption that afflict many of the poorest countries.<sup>42</sup>

A final limitation of the approach followed here is that it does not consider the general equilibrium effects of removing aid. In fact, the different without-aid growth rates may have implications for global trade (among other effects) and thus may affect relative prices of goods and factors: these second-order effects are not considered here. However, even with these limitations, the conclusion that aid can be powerfully pro-poor, combined with the worsening outlook for Sub-Saharan Africa in the baseline, underscores the importance of focusing the aid flows on Africa and improving its effectiveness.

#### *Global policies: further liberalization of trade stands to benefit everyone*

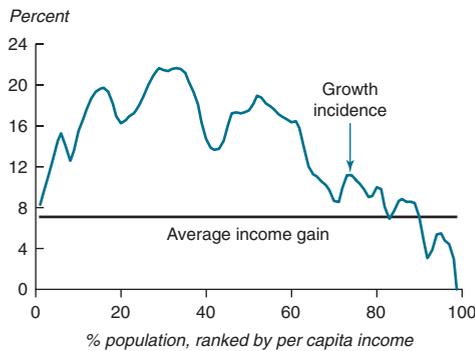
The lowering of trade barriers around the world would benefit all segments of the world population, including the poor. Previous estimates showed that full multilateral trade reform could lift roughly 100 million people out of extreme poverty (defined as living on less than \$2 a day)—see Anderson, Martin, and van der Mensbrugge (2006). Increased preference for free trade, combined with greater visibility of the plight of the poor, may help implement the global reforms that can be effective in elevating the living standards of the poor.

Unfortunately, as illustrated by the impasse in the multilateral Doha negotiations, the progress toward freer trade is currently stymied and will take a major effort among the rich and poor countries together to realize even its limited progress.

This section illustrates the potential effects of a successful global trade reform by implementing a scenario with a 75 percent cut in tariffs and domestic support in all countries by 2025,<sup>43</sup> thus projecting into the future the liberalization trend of the past few decades. The resulting income gains, which include the

**Figure 3.10 Global trade reform can be pro-poor**

Percent income gain from trade liberalization, by centiles of global income distribution (difference from baseline scenario of chapter 2)



Source: Authors' calculations.

positive effects of increased trade openness on productivity, are quite modest: average per capita income (in PPP terms) in the final year rises by 7 percent relative to the baseline. The distributional consequences of trade reform are summarized in figure 3.10, which for each centile of the global distribution shows the income gains experienced over and above the baseline improvements in income.<sup>44</sup> Despite the modest overall gain, trade reform is decidedly pro-poor in the sample because the poorest households experience income gains above the global average. Furthermore, the bottom 30 percent gain slightly more than the four middle deciles, and more than twice the increase in incomes experienced by the top 30 percent of the world.<sup>45</sup> In absolute terms, these income gains translate into a 13 percent increase in the size of the global middle class and reduce the number of people earning less than middle-class incomes by 231 million relative to the baseline.

***Domestic policies: powerful instruments to attain mutually reinforcing growth and equity objectives***

Well-designed domestic policies are likely to be the most powerful instruments to reduce

both inequality and poverty in any specific country. Such policies need not interfere with sustainable long-term growth. In fact, as clearly shown by World Bank (2005: 10), the “dichotomy between policies for growth and policies specifically aimed at equity is false,” and governments should be able to design equity-enhancing policies that can also increase efficiency. Even so, potential trade-offs may arise. Raising direct taxes to excessive levels to finance social services, such as education, targeted to the poor may create disincentives and even curb investment. However, in the long run, once access to education has become more equitable, a larger share of the population will be educated; growth should also be higher. These long-term benefits of redistribution should be considered when assessing trade-offs between equity and efficiency.

In addition, specific policies that may boost growth, such as trade liberalization, may in some cases negatively affect the poor. In many cases, the solution consists of designing complementary policies that mitigate the adverse poverty consequences of reform rather than abandoning or modifying the pro-growth policy, either of which may have even worse consequences for equity. In the trade-liberalization example, mitigation policies may range from investing in access roads to improve access by the poor to markets, to setting up or improving safety nets, and to better labor-market policies and institutions.

The design and successful implementation of a development strategy that positively reinforces growth and equity objectives is highly country-specific. It will depend, among other things, on countries' initial conditions in terms of equity, institutions, and economic structures. Yet from recent literature, and through one's consideration of the scenarios described in this and the previous chapters, some policy lessons emerge that may be relevant for a large number of countries.

A first lesson can be inferred by observing that with increasing incomes and the expansion of the middle class, governments should be able to collect larger revenues and thus

gain fiscal space for redistributive spending. Furthermore, the composition of tax sources also changes with a shift toward more direct taxes and fewer indirect taxes. Unfortunately the distributional impact of such a shift cannot be tested directly on this study's household survey data, which do not report tax payments, but the available literature is not overly optimistic. For example, ex post studies for Chile, a country with one of the most effective tax systems in Latin America, estimated that in 1996 the after-tax Gini coefficient was 0.496—slightly *higher* than the before-tax index of 0.488.<sup>46</sup> Lopez and others (2006) show that income inequality in European countries is barely affected by taxes and social security contributions, indicating that the overall distributional effect of taxation is almost equivalent to that of a proportional (flat-rate) tax. The same study also shows that redistribution takes place mainly through transfers rather than through taxes: in most European countries transfers seem to be almost equally distributed across the population, thus contributing to a substantial reduction in income inequality before tax and transfers.

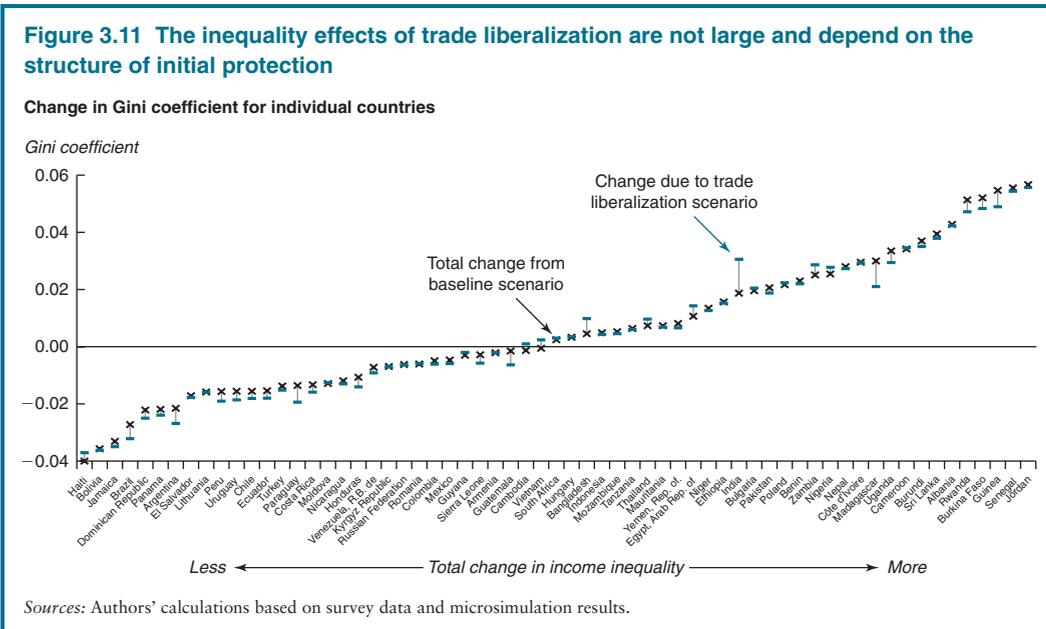
This evidence suggests that although taxation can be redistributive, at least in principle, transfers and expenditures (for education, for example) may be governments' preferred levers of redistribution. This chapter has emphasized the critical role that education can play in reducing poverty. Improving access to education can reduce poverty both by increasing individual productivity and by facilitating the movement of poor people from low-paying jobs in agriculture to higher-paying jobs in industry and services. Even more important, public spending on education (as well as on health and other human capacity), when targeted toward the poor, can produce a double dividend, reducing poverty in the short run and increasing the chances for poor children to access formal jobs and thus break free from the intergenerational poverty trap. Empirical evidence of the double advantages of targeted education programs has been emphasized by other studies. Morley and Coady (2003) state

that “a good deal of the *success* of these programs stems from their system of targeting [...] On average 71 percent of conditional [for education] cash transfer program benefits go to the bottom 40 per cent of families.” Evidence on the educational impact of these programs is sparser, and given their relative recent implementation, very little is known about the long-term earnings benefits accruing to the recipients. However, the existing evidence is strongly positive: most reviewed programs have achieved their objectives of increasing enrollment rates among their targeted population.<sup>47</sup>

Increasing educational levels must be accompanied by a strong investment climate to ensure productive jobs for the newly educated, and the quality of education needs to be maintained. The shift from agriculture should be undertaken within a wider context of improving agricultural productivity and expanding opportunities in modern sectors, not through policies that discriminate against agriculture. Labor-market policies are important in aiding worker adjustment and enhancing mobility, but too often such policies end up raising the cost of hiring labor and push workers into informal sectors or unemployment. World Bank (2005) emphasizes the role of labor unions in improving worker conditions, but cautions that product markets must be competitive to prevent the unions from commanding rents at the expense of consumers. Success stories include unionizing landless export agriculture workers in northeastern Brazil, which resulted not only in better worker protections but also enhanced productivity and quality of output.

Government intervention is another mechanism for improving working conditions. Cambodia was able to significantly limit labor abuse in the textiles sector through a monitoring program designed to improve labor standards in exchange for higher U.S. import quotas. The Slovak Republic lowered employment taxes and increased labor-market flexibility through concentrated efforts by a reform-minded government seeking to join the European Union.

**Figure 3.11 The inequality effects of trade liberalization are not large and depend on the structure of initial protection**



Domestic policy reforms can also strongly influence the final effects on inequality and poverty of multilateral trade reforms. As shown above, multilateral trade liberalization has a discernible impact on global income distribution; however, the “pure” trade policy effect on within-country inequality does not seem to be very large (figure 3.11). Within-country inequality will change according to the initial pattern of protection, the evolution of global prices, and the sectoral and factor-specific productivity impacts (see Winters, McCulloch, and McKay 2004 and Bussolo and Round 2005). For example, in a scenario where global trade barriers are eliminated and international prices for agricultural goods increase, Brazil, which currently protects skill- (and capital-) intensive industries more than it does agriculture, will likely experience a reduction of within-country inequality. Conversely, India or Mexico, countries with tariff structures that protect unskilled workers (especially in agriculture), will probably have to face pressure toward increasing inequality. Because they assume that other factors will remain equal, these have been labeled “pure” trade effects. Clearly,

well-designed additional policy interventions, especially those that improve education and infrastructure and address other “behind the border” investment climate reforms, can militate against the inequality changes that may result from trade liberalization.

Such policies are likely to play an increasingly important role in the future, not least because the coming globalization will include two new challenges—the integration of large emerging economies such as China and India, and the global sourcing of services. While the above scenario explores the impact of reductions in tariffs on goods, the global sourcing of services, enabled by new advances in technology, is leading to an increasing number of services-related tasks—and increasingly higher-skilled tasks—being undertaken in developing countries. This will bring new implications for wage distribution along the skill spectrum, and most likely change the inequality results shown in figure 3.11. The implications of this combination of technological advance and trade integration for workers in developing and developed countries are discussed in more detail in chapter 4.

## Notes

1. In this discussion the authors have adopted the naming conventions of World Bank (2005). Milanovic (2005) refers to the following different measurements as inequality concepts 1, 2, and 3.

2. Bourguignon, Levin, and Rosenblatt (2004) point out that using the intercountry concept may represent an implicit welfare judgment, whereby the rising incomes of more populous countries cannot offset the losses of smaller countries when their incomes are falling.

3. The influence of China and India is so large that omitting these two countries would reverse the conclusion: international inequality excluding China and India has increased in the past two decades (World Bank 2005).

4. It should also be noted that measurement of inequality is sensitive to both the precise indicators used to measure it and the time horizon chosen.

5. The ratio of per capita incomes of the richest and poorest country in the sample has grown by a factor of more than five.

6. Bourguignon, Levin, and Rosenblatt (2004) show that it is possible to produce rising inequality statistics if, for example, the sensitivity of the Atkinson inequality index to deviations from mean income at the bottom of the distribution is set sufficiently high (over five).

7. Atkinson and Brandolini (2004) use the Gini coefficient, the Theil index, and mean logarithmic deviation to show that income inequality declined between 1970 and 2000.

8. Bourguignon and Morrison (2002) argue that inequality between countries has been responsible for most of the time-series variation in global inequality. See also Milanovic (2002), who shows that in 1993, inequality between countries accounted for three-quarters of global inequality.

9. Some of the studies examining global inequality have relied on parameterized Lorenz curves to add the within-country dimension to the analysis: see for example, Sala-i-Martin (2002a, 2002b), and Bhalla (2002). Others, such as Milanovic (2002) and World Bank (2005), have built up the global distribution from household surveys.

10. The between-group decomposition is accomplished by giving each person within the group that group's average income. As a result, differences between the average incomes of the rich, the poor, and the middle class account for 68 percent of total world inequality. On the other hand, if every person in the world is assigned the average income of his or her country of residence, income differences between countries account for 76 percent of global inequality. Thus, income differentials between the rich, the poor, and the middle class are responsible for the bulk of global variation in incomes.

11. The size of the middle class doubles between 2000 and 2030. In comparison, the number of the rich increases by 75 percent and the number of the poor decreases by 19 percent.

12. The number of developing-country citizens in the global middle class increases 3.25 times between 2000 and 2030. The share of low- and middle-income country nationals among the rich rises even faster (4.7 times), but their influence in this group is likely to be moderate, as OECD citizens will still constitute one-half of the category.

13. Note that this is not true for the first column of table 3.1, which is based on 1993 international dollars.

14. This study's qualitative conclusions about the composition of the middle class hold even if the authors adopt a relative definition of the middle class and confine their attention to the fifth decile of the world's income distribution—that is, the “median” individuals.

15. The authors' global middle class concept is in this sense similar to a poverty line, which is the amount of real income required to buy a fixed amount of calories. Poverty lines do not move through the periods of growth and decline, since the latter do not affect caloric intake requirements. Similarly, the study's definition of the middle class is based on the ability to afford a certain basket of goods and services, and anyone who can purchase this basket (whether in 2000 or in 2030) is a member of the middle class.

16. Note that the simulation design for China differs from the majority of countries in this study's sample. Because the authors do not have information on individual earnings, they cannot pass the changes in skill premia from the CGE model to the microsimulation. All other steps, including demographic change and growth in per capita incomes, remain fully consistent with the standard simulation approach. See box 3.1 and Bussolo and others (forthcoming) for more details.

17. The distribution is plotted as a kernel density function of the household per capita incomes.

18. In other words, the study results show that 13 percent of the middle-class population in 2030 will have completed less than a full cycle of primary education. The relevant population share for those earning more than middle class incomes is 12 percent.

19. As cited in Mayda and Rodrik (2002).

20. Note that the Africans of 2030 will be better off in absolute terms than in 2000, since the study forecasts non-negative real growth rates even at the bottom of the distribution.

21. There are 12 developing energy exporters in the study's 114-country database. These include three countries in the Middle East and North Africa, two in Sub-Saharan Africa, three in Latin America and the Caribbean, and four in Europe and Central Asia.

22. There are 15 developing-country agriculture exporters in the study sample. A country is defined as an agriculture exporter if its exports of any one agricultural commodity exceed 20 percent of total exports.

23. This is another case showing that this chapter's results should not be considered "forecasts" but *ceteris paribus* scenarios; a forecast should include at least some countries with negative performances.

24. Osberg (2003) measures polarization by the shares of population earning less than 50 percent and more than 150 percent of the median income. In both the United States and the United Kingdom, the shares of low and high earners increased substantially over the sample period.

25. These effects are somewhat ameliorated because with population aging, older and more experienced workers tend to become less scarce, reducing their wage premium (Higgins and Williamson 1999). Also, in 45 percent of the developing countries in the study sample, younger household heads tend to earn more than older ones, owing in part to higher education.

26. The maximum poverty elasticity (assuming that all migrants are poor and all poor migrants increase their incomes sufficiently to escape poverty) for developing countries is about 2—see table below, column (a). However, on average, of every 100 migrants only 20 are below the poverty line (column b). These results are based on the case where movers are selected according to their characteristics (that is, with a logit selection model). Furthermore, of the average 20 poor migrants among the movers, 7 remain in poverty in their new occupation (column c). This results in an observed poverty elasticity of 0.2 (column d).

27. By facilitating access to higher-paying jobs, education contributes to reducing poverty even for those workers who do not move across sectors.

28. This finding is informed by country-specific regression analysis focusing on the determinants of employment in farm and nonfarm sectors (probit models). Although this pattern is true for most countries, in some cases migrants tend to have different characteristics. For example, in a recent study for Brazil, Bussolo, Lay, and van der Mensbrugge (2006) used a more complex behavioral model to show that, with only a few exceptions, poorer individuals are more likely to migrate to nonfarm occupations.

29. The authors of this study assume that, once the migrants are selected, in one way or another, they find a job in the rest of the economy and earn the modern sector's higher wage adjusted to take into account their personal characteristics.

30. See, for example, World Bank (2005) and Lopez and others (2006).

31. The relationship between household income and age of the household head is positive in approximately 70 percent of the sample countries, while the age-income profile is positive in 60 percent of the countries.

32. The literature on the evolution of income inequality identifies three channels that determine the effects of demographic change: first, given an upward-sloping age-earnings (incomes) profile, aging will increase inequality between old and young groups (Deaton and Paxson 1997); second, different age groups are characterized by different within-group inequality, and inequality tends to be higher among older

## Moving from agricultural to nonagricultural occupations reduces poverty in some regions more than others

*Migration-poverty elasticity when 10 percent of the population employed in agriculture migrates*

Region	Maximum poverty elasticity (a)	Poverty among migrants before moving (b)	Poverty among migrants after moving (c)	Observed poverty elasticity (d)
Sub-Saharan Africa	1.60	0.35	0.14	0.36
East Asia and the Pacific	3.78	0.11	0.09	0.48
Europe and Central Asia	4.45	0.03	0.01	0.03
Latin America and the Caribbean	1.74	0.19	0.08	0.09
Middle East and North Africa	1.18	0.26	0.01	—
South Asia	1.81	0.23	0.07	0.15
Average in the developing world	2.03	0.19	0.07	0.20

*Source:* Authors' estimates from household surveys.

*Note:* Column (a) shows how much poverty could be reduced in percent terms with respect to the initial poverty headcount if all migrants are initially poor and all escape poverty after the move. Column (b) represents the actual poverty headcount of movers (accounting for the fact that many nonpoor migrate). Column (c) shows the poverty headcount among movers calculated after they are assigned the income of the new occupation. Column (d) is the actual migration-poverty elasticity (for a 10 percent migration rate). — = not available.

age cohorts (see Deaton and Paxson 1997; Jenkins 1995; and Mookherjee and Shorrocks 1982). With everything else remaining constant, when older cohorts become more populous, as is the case with lower population growth rates, aggregate inequality increases. These two channels affect aggregate inequality without any change in the age premium, that is, with a fixed age-earnings profile; however, the third channel considers changes in inequality due to changes of the life-cycle income profile. As the population ages, older high-wage and more experienced workers tend to become less scarce and the wage premium they initially receive will be reduced (Higgins and Williamson 1999). This third channel works through the labor market and contributes to attenuating the inequality increases brought about by the first two channels. This channel is explored in more detail as part of the discussion on price-wage adjustments.

33. Some of the changes in inequality shown in figure 3.6 may seem implausible when compared with some ex post evidence; however, the aim of this figure is not to present forecasts of income inequality, but rather to show what may happen, *ceteris paribus*, to inequality in a specific scenario for the evolution of the global economy.

34. The simulated reduction of the gap between skilled versus unskilled workers' wages for Latin America is plausible and in line with recent evidence. Manacorda, Sanchez-Paramo, and Schady (2005), using micro-data for five Latin American countries, show that the relative rewards of workers who completed tertiary school have increased but, apart from Mexico, relative wages of workers who completed secondary school have decreased. In this study's micro-simulation the authors define a worker as skilled when his or her level of education is, at least, completed secondary. In Latin America, about 25 percent of heads of household have secondary education (without tertiary) compared with 12 percent of heads with tertiary schooling. Therefore, even with an increase of the tertiary-educated workers' wages, the average wage for the group defined in the study as skilled would still be reduced.

35. Notice that this is not the same as encouraging mobility by means of "forced urbanization," which is known to generate negative consequences. The focus here is on removing distortions rather than adding them.

36. These income dynamics—that is, the changes of the premia received by agricultural workers versus nonagricultural ones, as well as those obtained by skilled versus unskilled—are consistent with the CGE results of chapter 2.

37. Bourguignon, Levin, and Rosenblatt (2006) also show that although aid is often viewed as a zero-sum game, that is not the case if aid flows are measured in

PPP terms, which account for lower prices of nontradable goods in the recipient countries.

38. This is given by the equation:

$$G_i = \{\text{Set of variables not related to aid}\} - 0.54 * (\text{ODAi/GDPi}) - 0.02 * (\text{ODAi/GDPi})^2 + 0.31 * (\text{CPIAi} * \text{ODAi/GDPi})$$

39. Institutional quality is captured by the World Bank's Country Performance and Institutional Assessment (CPIA) ratings. For International Development Association (IDA) member countries, CPIA scores are available online starting with 2005.

40. The assumption of equal distribution of ODA implies that the removal of aid flows does not change the income distribution within countries. On the one hand, assuming equal distribution may be too optimistic—aid may not reach the desired recipients owing to a host of factors including corruption and lack of access to infrastructure. On the other hand, it may be too pessimistic, since the rich in the recipient countries are assumed to derive some benefits from the aid that the donors never intended for them to obtain.

41. In estimating this effect, this study's methodology and the approach of Bourguignon, Levin, and Rosenblatt (2006) differ in two important ways. First, this study uses growth rates generated by the model of chapter 2 rather than historical growth rates. Second, while Bourguignon, Levin, and Rosenblatt (2006) disregard the within-country distribution of income (by assigning every individual within a country that country's per capita gross national income—GNI), this study's approach explicitly takes into account both between- and within-country distributions.

42. In 2004 only 10 of 66 low-income aid recipient countries received a "good enough" rating of their budget system according to the CPIA indicators (World Bank 2006). In the presence of bad policies, conventional aid delivery methods are unlikely to benefit the intended recipients, even if the aid is targeted toward human development-intensive sectors such as education and health (World Bank 1998). This is because aid is often fungible and can be easily reallocated away from target activities once it enters the public budget. At the same time, even the most distorted policy environments are likely to have "pockets of reform," which can become the focal point of donors' efforts to improve the overall policy environment. For example, efforts to improve public procurement—the mechanisms through which governments purchase goods and services—lie at the heart of the ability of aid to deliver the desired outcomes (World Bank 2006).

43. Notice that this implies a larger absolute cut in protection for developing countries, whose initial tariff levels are significantly above the high-income average.

44. In other words, figure 3.10 represents the difference between the growth incidence curve of the

trade reform scenario and the growth incidence curve of the baseline scenario. The horizontal line is the increase in the global average per capita income.

45. Figure 3.10 shows the dynamic gains from trade reform, which allow for feedback from increases in trade openness (exports-to-output ratio) to total factor productivity. Since low-income countries tend to have higher trade barriers, the trade reform scenario results in larger absolute tariff cuts in these countries and therefore greater increases in trade flows. The CGE model used to simulate the trade reform scenario does not capture the possibility of imperfect pass-through of price shocks to different individuals (because they are in remote areas, involved in subsistence activities and the like), and accounting for these imperfections would dampen the pro-poor potential of trade liberalization.

46. Engle, Galetovic, and Raddatz (1998), cited in Lopez and others (2006).

47. Morley and Coady (2003) even attempt to estimate the future earnings of poor children receiving transfers under programs in Mexico and Nicaragua. In their words: “under the reasonable assumption that the wage structure of the future labor force will be the same as it was in the year of the most recent survey, we estimate that the additional education would add about 8 per cent to the average earnings of the poor in Mexico and about 9 per cent in Nicaragua.”

## References

- Anderson, Kym, Will Martin, and Dominique van der Mensbrugghe. 2006. “Doha Merchandise Trade Reform: What Is at Stake for Developing Countries?” *World Bank Economic Review* 20: 169–95.
- Atkinson, Anthony B. 2003. “Income Inequality in OECD Countries: Data and Explanations.” Munich: CESifo Working Paper Series 881.
- Atkinson, Anthony B., and Andrea Brandolini. 2004. “Global World Inequality: Absolute, Relative or Intermediate.” Paper prepared for the 28th Conference of the International Association for Research in Income and Wealth, Cork, Ireland, August 22–28.
- Bhalla, Surjit. 2002. *Imagine There’s No Country: Poverty, Inequality, and Growth in the Era of Globalization*. Washington, DC: Institute for International Economics.
- Bonaglia, Federico, Jorge Braga de Macedo, and Maurizio Bussolo. 2001. “How Globalization Improves Governance.” CEPR Discussion Paper 2992, Centre for Economic Policy Research, London.
- Bourguignon, François, Victoria Levin, and David Rosenblatt. 2004. “Declining International Inequality and Economic Divergence: Reviewing the Evidence through Different Lenses.” *Économie Internationale* 100: 13–25.
- . 2006. “Global Redistribution of Income.” World Bank Policy Research Working Paper 3961, Washington, DC, July.
- Bourguignon, François, and Christian Morrison. 2002. “Inequality among World Citizens: 1890–1992.” *American Economic Review* 92 (4): 727–44.
- Bourguignon, François, and Luiz Pereira da Silva, eds. 2003. *The Impact of Economic Policies on Poverty and Income Distribution: Evaluation Techniques and Tools*. Washington, DC: World Bank and Oxford University Press.
- Bruno, Michael, Martin Ravallion, and Lyn Squire. 1998. “Equity and Growth in Developing Countries: Old and New Perspectives on the Policy Issues.” In *Income Distribution and High-Quality Growth*, ed. Vito Tanzi and Ke-young Chu. Cambridge, MA: MIT Press.
- Burnside, Craig, and David Dollar. 2000. “Aid, Policies, and Growth.” *American Economic Review* 90 (4) (September): 847–68.
- Bussolo, Maurizio, Rafael De Hoyos, Denis Medvedev, and Victor Sulla. Forthcoming. “Demographic Change, Economic Growth, and Income Distribution: An Empirical Analysis Using Ex-Ante Microsimulations.” Background paper for *Global Economic Prospects 2007: Confronting Challenges of the Coming Globalization*.
- Bussolo, Maurizio, Jann Lay, and Dominique van der Mensbrugghe. 2006. “Structural Change and Poverty Reduction in Brazil: The Impact of the Doha Round.” In *Poverty and the WTO: Impacts of the Doha Development Agenda*, ed. Thomas Hertel and Alan Winters. Washington, DC: World Bank.
- Bussolo, Maurizio, and Denis Medvedev. 2006. “What Is the Role of Labor Markets in Making Trade Reform Pro-Poor in Latin America?” World Bank Policy Research Working Paper, Washington, DC. Draft.
- Bussolo, Maurizio, and Jeffery Round, eds. 2005. *Globalisation and Poverty: Channels and Policy Responses*. London: Routledge/Warwick Studies in Globalisation, Routledge.
- Chen, Shaohua, and Martin Ravallion. 2003. “Household Welfare Impacts of China’s Accession to the World Trade Organization.” Policy Research Working Paper 3040, World Bank, Washington, DC.
- Chenery, Hollis, Montek Ahluwalia, C. Bell, John Duloy, and Richard Jolly. 1974. *Redistribution with Growth*. New York: Oxford University Press.
- Collier, Paul, and David Dollar. 2002. “Aid Allocation and Poverty Reduction.” *European Economic Review* 46 (8): 1475–1500.
- de Ferranti, David, Guillermo E. Perry, Francisco H. G. Ferreira, and Michael Walton. 2004. *Inequality in Latin America: Breaking with History?* Washington, DC: World Bank.

- Deaton, Angus, and Christina Paxson. 1997. "The Effects of Economic and Population Growth on National Saving and Inequality." *Demography* 34 (1) (February): 97–114.
- Dollar, David, and Aart Kraay. 2002. "Growth Is Good for the Poor." *Journal of Economic Growth* 7 (3): 195–225.
- Easterly, William, Ross Levine, and David Roodman. 2004. "Aid, Policies, and Growth: Comment." *American Economic Review* 94 (3) (June 1): 774–80.
- Engle, E., A. Galetovic, and C. Raddatz. 1998. "Taxation and Income Distribution in Chile: Some Unpleasant Redistributive Arithmetic." NBER Working Paper 6828, National Bureau of Economic Research, Cambridge, MA.
- Ferreira, Francisco H. G., and Phillippe G. Leite. 2003. "Meeting the Millennium Development Goals in Brazil: Can Microsimulations Help?" *Economía* 3 (2): 235–79.
- . 2004. "Educational Expansion and Income Distribution: A Microsimulation for Ceará." In *Growth, Inequality and Poverty*, ed. Anthony Shorrocks and Rolf van der Hoeven. London: Oxford University Press.
- Higgins, Matthew, and Jeffrey G. Williamson. 1999. "Explaining Inequality the World Round: Cohort Size, Kuznets Curves, and Openness." Staff Reports 79, Federal Reserve Bank of New York.
- Jenkins, Stephen P. 1995. "Accounting for Inequality Trends: Decomposition Analyses for the UK, 1971–86." *Economica* [London School of Economics and Political Science] 62 (245) (February): 29–63.
- Li, Hongyi, Lyn Squire, and Heng-fu Zou. 1998. "Explaining International and Intertemporal Variations in Income Inequality." *Economic Journal* 108 (446): 26–43.
- Lopez, J. Humberto, William F. Maloney, Guillermo E. Perry, Omar S. Arias, and Luis Servén. 2006. *Poverty Reduction and Growth: Virtuous and Vicious Circles*. Washington, DC: World Bank.
- Lutz, Wolfgang, and Anne Goujon. 2001. "The World's Changing Human Capital Stock: Multi-State Population Projections by Educational Attainment." *Population and Development Review* 27 (2): 323–39.
- Lutz, Wolfgang, Anne Goujon, Gabriele Doblhammer-Reiter. 1998. "Demographic Dimensions in Forecasting: Adding Education to Age and Sex." *Population and Development Review* 24 (Supplement: Frontiers of Population Forecasting): 42–58.
- Manacorda, M., Carolina Sanchez-Paramo, and Norbert Schady. 2005. "Changes in Returns to Education in Latin America: The Role of Demand and Supply of Skills." CEP Discussion Paper dp0712, Centre for Economic Performance, London School of Economics.
- Mayda, Anna Maria, and Dani Rodrik. 2005. "Why Are Some People (and Countries) More Protectionist than Others?" *European Economic Review* 49 (6) (August): 1393–1430.
- Mayer, W., 1984. "Endogenous Tariff Formation." *American Economic Review* 74: 970–85.
- Milanovic, Branko. 2002. "True World Income Distribution, 1988 and 1993: First Calculation Based on Household Surveys Alone." *Economic Journal* (Royal Economic Society) 112 (476) (January): 51–92.
- . 2005. *Worlds Apart: Global and International Inequality 1950–2000*. Princeton, NJ: Princeton University Press.
- Milanovic, Branko, and Shlomo Yitzhaki. 2002. "Decomposing World Income Distribution: Does the World Have a Middle Class?" *Review of Income and Wealth* 48 (2): 155–78.
- Mookherjee, Dilip, and Anthony Shorrocks. 1982. "A Decomposition Analysis of the Trend in UK Income Inequality." *Economic Journal* 92: 886–902.
- Morley, Samuel A., and David Coady. 2003. *From Social Assistance to Social Development: Targeted Education Subsidies in Developing Countries*. Washington, DC: Center for Global Development and the International Food Policy Research Institute.
- O'Rourke, Kevin. 2003. "Heckscher-Ohlin Theory and Individual Attitudes towards Globalization." CEPR Discussion Paper 4018, Centre for Economic Policy Research, London.
- Olivera, Mauricio, and Eduardo Lora. 2005. "The Electoral Consequences of the Washington Consensus." Inter-American Development Bank Working Paper 530, Washington, DC.
- Osberg, Lars. 2003. "Long Run Trends in Income Inequality in the United States, UK, Sweden, Germany and Canada: A Birth Cohort View." *Eastern Economic Journal* 29 (1): 121–42.
- Pritchett, Lant. 1997. "Divergence, Big Time." *Journal of Economic Perspectives* 11 (3): 3–17.
- Quah, Danny T. 1996. "Twin Peaks: Growth and Convergence in Models of Distribution Dynamics." *Economic Journal* [Royal Economic Society] 106 (437) (July): 1045–55.
- . 1997. "Empirics for Growth and Distribution: Stratification, Polarization, and Convergence Clubs." *Journal of Economic Growth* 2 (1): 27–59.
- Ravallion, Martin. 2004. "Competing Concepts of Inequality in the Globalization Debate." In *Brookings Trade Forum 2004*, ed. Susan Margarett

- Collins and Carol Graham. Washington, DC: Brookings Institution.
- Ravallion, Martin, and Shaohua Chen. 2003. "Measuring Pro-Poor Growth." *Economics Letters* 78 (1): 93–99.
- . 2004. "China's (Uneven) Progress against Poverty." World Bank Policy Research Working Paper Series 3408, Washington, DC.
- Sala-i-Martin, Xavier. 2002a. "The Disturbing 'Rise' of Global Income Inequality." NBER Working Paper 8904, National Bureau of Economic Research, Cambridge, MA. April.
- . 2002b. "The World Distribution of Income (Estimated from Individual Country Distributions)." NBER Working Paper 8933, National Bureau of Economic Research, Cambridge, MA. May.
- Scheve, Kenneth, and Matthew Slaughter. 1998. "What Determines Individual Trade Policy Preferences?" NBER Working Paper 6531, National Bureau of Economic Research, Cambridge, MA.
- Theil, Henri, and James Seale. 1994. "The Geographic Distribution of World Income, 1950–1990." *De Economist* 142 (4): 387–419.
- Winters, L. A., N. McCulloch, and A. McKay. 2004. "Trade Liberalization and Poverty: The Evidence So Far." *Journal of Economic Literature* 42 (1): 72–115.
- World Bank. 1998. *Assessing Aid: What Works, What Doesn't, and Why*. New York: Oxford University Press.
- . 2005. *World Development Report 2006: Equity and Development*. Washington, DC: World Bank and New York: Oxford University Press.
- . 2006. *Global Monitoring Report 2006: Millennium Development Goals—Strengthening Mutual Accountability, Aid, Trade, and Governance*. World Bank: Washington, DC.
- World Tourism Organization. 2006. "Facts and Figures." Available at <http://www.unwto.org/facts/menu.html>.

