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Poverty, Inequality, and Development

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Chapters 1 and 2 introduced the problem that despite significant improvements over the past half century, extreme poverty remains widespread in many lower-middle as well as low-income countries. In 2015, almost 750 million people lived on less than $1.90 per day at 2011 US Purchasing Power Parity (2018 World Bank estimate). Some 2 billion—more than one-quarter of the world's population—lived on less than $3.20 a day.

As you will see in the next few chapters, often these impoverished people suffer from undernutrition and poor health, have little or no literacy, live in environmentally degraded areas, have little political voice, are socially excluded, and attempt to earn a meagre living on small and marginal farms (or as day labourers), or in dilapidated urban slums. In this chapter, we set the stage with an in-depth examination of the problems of poverty and of highly unequal distributions of income.

That development requires a higher gross national income (GNI), and hence sustained growth, is clear. The basic issue, however, is not only how to make GNI grow but also who would make it grow: the few or the many. If it were the rich, it would, most likely, be appropriated by them, and progress against poverty would be slow, and inequality would worsen. But if it were generated by the many, they would be its principal beneficiaries, and the fruits of economic growth would be shared more evenly. Thus, attention to the types of productive work people perform is of central importance.

Although our main focus is on economic poverty and inequalities in the distribution of incomes, human capital and assets, it is important to keep in mind that this is only part of the broader inequality problem in the developing world. Of equal importance are inequalities of power, prestige, status, gender, job satisfaction, conditions of work, degree of participation, freedom of choice, self-esteem, and many other dimensions of capabilities to function. As in most social relationships, we cannot really separate the economic from the noneconomic manifestations of inequality. Each reinforces the other in a complex and often interrelated process of cause and effect.

After introducing appropriate measures of inequality and poverty, we define the nature of the poverty and income distribution problem and consider its quantitative significance in various developing nations. We then examine in what ways economic analyses can shed light on the problem and explore possible alternative policy approaches directed at the elimination of poverty and the reduction of excessively wide disparities in the distributions

of income in developing countries. This also provides the basis for analysis in subsequent chapters of more specific development issues, including population growth, education, health, rural development, and environmental degradation.

In this chapter, therefore, we will examine the following critical questions about the relationship among economic growth, income distribution, and poverty:

1. How can we best measure inequality and poverty?
2. What is the extent of relative inequality in developing countries, and how is this related to the extent of absolute poverty?
3. Who are the poor, and what are their economic characteristics?
4. What determines the nature of economic growth—that is, who benefits from economic growth, and why?
5. Are rapid economic growth and more equal distributions of income compatible or conflicting objectives for low-income countries? To put it another way, is rapid growth achievable only at the cost of greater inequalities in the distribution of income, or can a lessening of income disparities contribute to higher growth rates?
6. Do the poor benefit from growth, and does this depend on the type of growth a developing country experiences? What might be done to help the poor benefit more?
7. What is it about extreme inequality that is so harmful to economic development?
8. What kinds of policies are required to reduce the magnitude and extent of absolute poverty?
9. What has been learned about the psychological dimensions of poverty, and how can this research help us design and implement more effective poverty programmes?

We begin the chapter by defining *inequality* and *poverty*, terms that are commonly used in informal conversation but need to be measured more precisely to provide a meaningful understanding of how much progress has already been made, how much remains to be achieved, and how to set incentives for government officials to focus on the most pressing needs. You will see that the most important measures of poverty and inequality used by development economists satisfy properties that most observers would agree are of fundamental importance. After a discussion of why attention to inequality as well as poverty is important, we then use the appropriate measures of poverty and inequality to evaluate the welfare significance of alternative patterns (or "typologies") of growth. We highlight the importance of labour, considering the different forms of productive work people do. After reviewing the evidence on the extent of poverty and inequality in the developing world, we conclude with an overview of the key issues in poverty policy. Some

important principles of effective poverty policies are considered, together with some initial examples of programmes that have worked well in practice. We conclude the chapter with an in-depth country case study of India, which has important recent successes and also faces major challenges in generating employment with a surge of the labour force, as it seeks to take advantage of its onetime "demographic dividend" and continue its impressive poverty reduction progress.

5.1 Measuring Inequality

In this section, we define the dimensions of the income distribution and poverty problems and identify some similar elements that characterise the problem in many developing nations. But first we should be clear about what we are measuring when we speak about the distribution of income and absolute poverty.

Economists usually distinguish between two principal measures of income distribution for both analytical and quantitative purposes: the personal or size distribution of income and the functional or distributive factor share distribution of income.

5.1.1 Size Distributions

Personal distribution of income (size distribution of income) The distribution of income according to size class of persons—for example, the share of total income accruing to the poorest specific percentage or the richest specific percentage of a population—without regard to the sources of that income.

The **personal or size distribution of income** is the measure most commonly used by economists. It simply deals with individual persons or households and the total incomes they receive. The way in which they received that income is not considered. What matters is how much each earns, irrespective of whether the income is derived solely from employment or comes also from other sources such as interest, profits, rents, gifts, or inheritance. Moreover, the locational (urban or rural) and occupational sources of the income (e.g., agriculture, manufacturing, commerce, services) are ignored. If Ms. X and Mr. Y both receive the same personal income, they are classified together irrespective of the fact that Ms. X may work 15 hours a day as a doctor while Mr. Y doesn't work at all but simply collects interest on his inheritance.

Economists and statisticians therefore like to arrange all individuals by ascending personal incomes and then divide the total population into distinct groups, or sizes. A common method is to divide the population into successive **quintiles** (fifths) or **deciles** (tenths) according to ascending income levels and then determine what proportion of the total national income is received by each income group. For example, Table 5.1 shows a hypothetical but fairly typical distribution of income for a developing country. In this table, 20 individuals, representing the entire population of the country, are arranged in order of ascending annual personal income, ranging from the individual with the lowest income (0.8 units) to the one with the highest (15.0 units). The total or national income of all individuals amounts to 100 units and is the sum of all entries in column 2. In column 3, the population is grouped into quintiles of four individuals each. The first quintile

Quintile A 20% proportion of any numerical quantity. A population divided into quintiles would be divided into five groups of equal size.

Decile A 10% portion of any numerical quantity; a population divided into deciles would be divided into ten equal numerical groups.

TABLE 5.1 Typical Size Distribution of Personal Income in a Developing Country by Income Shares—Quintiles and Deciles

Individuals	Personal Income (money units)	Share of Total Income (%)	
		Quintiles	Deciles
1	0.8		
2	1.0		1.8
3	1.4		
4	1.8	5	3.2
5	1.9		
6	2.0		3.9
7	2.4		
8	2.7	9	5.1
9	2.8		
10	3.0		5.8
11	3.4		
12	3.8	13	7.2
13	4.2		
14	4.8		9.0
15	5.9		
16	7.1	22	13.0
17	10.5		
18	12.0		22.5
19	13.5		
20	15.0	51	28.5
Total (national income)	100.0	100	100.0

represents the bottom 20% of the population on the income scale. This group receives only 5% (i.e., a total of 5 money units) of the total national income. The second quintile (individuals 5 to 8) receives 9% of the total income. Alternatively, the bottom 40% of the population (quintiles 1 plus 2) is receiving only 14% of the income, while the top 20% (the fifth quintile) of the population receives 51% of the total income.

A common measure of **income inequality** that can be derived from column 3 is the ratio of the incomes received by the top 20% and bottom 40% of the population. This ratio, sometimes called a Kuznets ratio after Nobel laureate Simon Kuznets, has often been used as a measure of the degree of inequality between high- and low-income groups in a country. In our example, this inequality ratio is equal to 51 divided by 14, or approximately 3.64.

Income inequality The disproportionate distribution of total national income among households.

To provide a more detailed breakdown of the size distribution of income, decile (10%) shares are listed in column 4. We see, for example, that the bottom 10% of the population (the two poorest individuals) receives only 1.8% of the total income, while the top 10% (the two richest individuals) receives 28.5%. Finally, if we wanted to know what the top 5% receives, we would divide the total population into 20 equal groups of individuals (in our example, this would simply be each of the 20 individuals) and calculate the percentage of total income received by the top group. In Table 5.1, we see that the top 5% of the population (the twentieth individual) receives 15% of the income, a higher share than the combined shares of the lowest 40%.

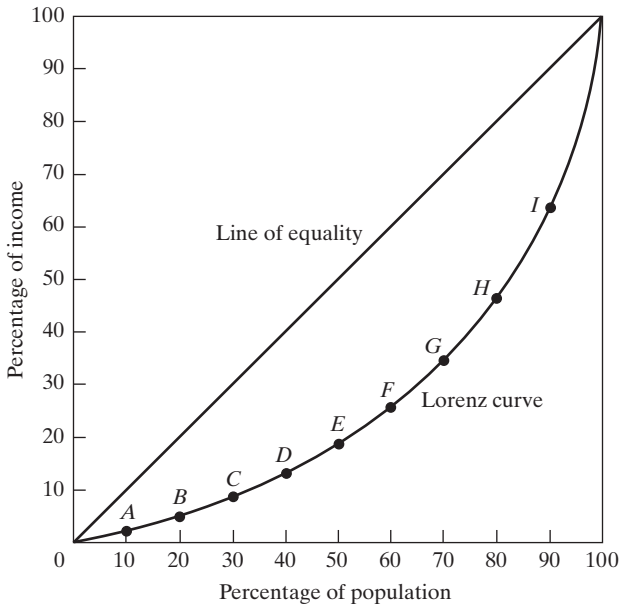
5.1.2 Lorenz Curves

Lorenz curve A graph depicting the variance of the size distribution of income from perfect equality.

Another common way to analyse personal income statistics is to construct what is known as a **Lorenz curve**.[1] Figure 5.1 shows how it is done. The numbers of income recipients are plotted on the horizontal axis, not in absolute terms but in *cumulative percentages.* For example, at point 20, we have the lowest (poorest) 20% of the population; at point 60, we have the bottom 60%; and at the end of the axis, all 100% of the population has been accounted for. The vertical axis shows the share of total income received by each percentage of population.

It is also cumulative up to 100%, meaning that both axes are the same length. The entire figure is enclosed in a square, and a diagonal line is drawn from the lower left corner (the origin) of the square to the upper right corner. At every point on that diagonal, the percentage of income received is *exactly equal* to the percentage of income recipients—for example, the point halfway along the length of the diagonal represents 50% of the income being distributed to exactly 50% of the population. At the three-quarters point on the diagonal, 75% of the income would be distributed to 75% of the population. In other words, the diagonal line in Figure 5.1 is representative of "perfect equality" in size distribution of income. Each percentage group of income recipients is receiving that same percentage of the total income; for example, the bottom 40% receives 40% of the income, while the top 5% receives only 5% of the total income.[2]

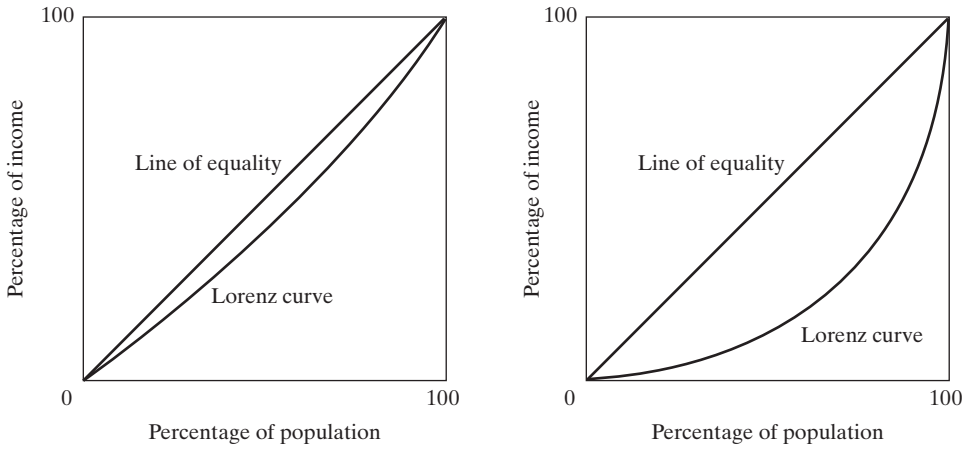
FIGURE 5.1 The Lorenz Curve



The Lorenz curve shows the *actual* quantitative relationship between the percentage of income recipients and the percentage of the total income they did in fact receive during, say, a given year. In Figure 5.1, we have plotted this Lorenz curve using the decile data contained in Table 5.1. In other words, we have divided both the horizontal and vertical axes into ten equal segments corresponding to each of the ten decile groups. Point *A* shows that the bottom 10% of the population receives only 1.8% of the total income, point *B* shows that the bottom 20% is receiving 5% of the total income, and so on for each of the other eight cumulative decile groups. Note that at the halfway point, 50% of the population is in fact receiving only 19.8% of the total income.

The more the Lorenz line curves away from the diagonal (line of perfect equality), the greater the degree of inequality represented. The extreme case of perfect inequality (i.e., a situation in which one person receives all of the national income while everybody else receives nothing) would be represented by the congruence of the Lorenz curve with the bottom horizontal and right-hand vertical axes. Because no country exhibits either perfect equality or perfect inequality in its distribution of income, the Lorenz curves for different countries will lie somewhere to the right of the diagonal in Figure 5.1. The greater the degree of inequality, the greater the bend and the closer to the bottom horizontal axis the Lorenz curve will be. Two representative distributions are shown in Figure 5.2, one for a relatively equal distribution (Figure 5.2a) and the other for a relatively unequal distribution (Figure 5.2b). (Can you explain why the Lorenz curve could not lie above or to the left of the diagonal at any point?)

FIGURE 5.2 The Greater the Curvature of the Lorenz Line, the Greater the Relative Degree of Inequality



(a) A relatively equal distribution

(b) A relatively unequal distribution

5.1.3 Gini Coefficients and Aggregate Measures of Inequality

Gini coefficient An aggregate numerical measure of income inequality ranging from 0 (perfect equality) to 1 (perfect inequality). It is measured graphically by dividing the area between the perfect equality line and the Lorenz curve by the total area lying to the right of the equality line in a Lorenz diagram. The higher the value of the coefficient, the higher the inequality of income distribution; the lower it is, the more equal the distribution of income.

A final and very convenient shorthand summary measure of the relative degree of income inequality in a country can be obtained by calculating the ratio of the area between the diagonal and the Lorenz curve divided by the total area of the half-square in which the curve lies. In Figure 5.3, this is the ratio of the shaded area *A* to the total area of the triangle *BCD*. This ratio is known as the *Gini concentration ratio* or **Gini coefficient**, named after the Italian statistician who first formulated it in 1912.

Gini coefficients are aggregate inequality measures and can vary anywhere from 0 (perfect equality) to 1 (perfect inequality). In fact, as you will soon discover, the Gini coefficient for countries with highly unequal income distributions typically lies between 0.50 and 0.70, while for countries with relatively equal distributions, it is on the order of 0.20 to 0.35. The coefficient for our hypothetical distribution of Table 5.1 and Figure 5.1 is approximately 0.44—a relatively unequal distribution.

Four possible Lorenz curves such as might be found in international data are drawn in Figure 5.4. In the "Lorenz criterion" of income distribution, whenever one Lorenz curve lies above another Lorenz curve, the economy corresponding to the upper Lorenz curve is more equal than that of the lower curve. Thus, economy *A* may unambiguously be said to be more equal than economy *D*. Whenever two Lorenz curves cross, such as curves *B* and *C*, the Lorenz criterion states that we "need more information" or additional assumptions before we can determine which of the underlying economies is more equal. For example, we might argue on the grounds of the priority of addressing problems of poverty that curve *B* represents a more equal economy, since the poorest are richer, even though the richest are also richer (and hence the middle class is "squeezed"). But

FIGURE 5.3 Estimating the Gini Coefficient

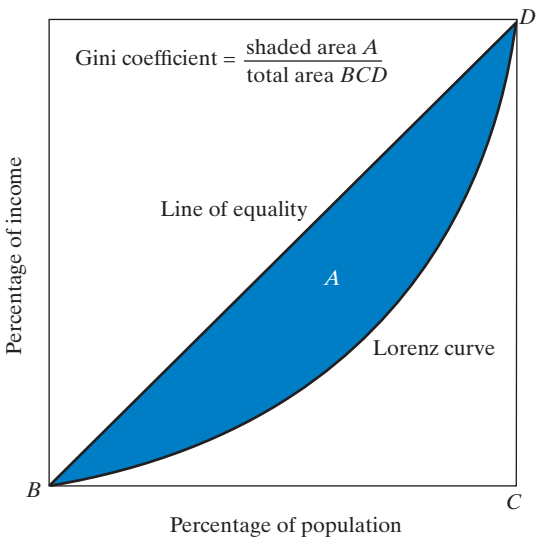
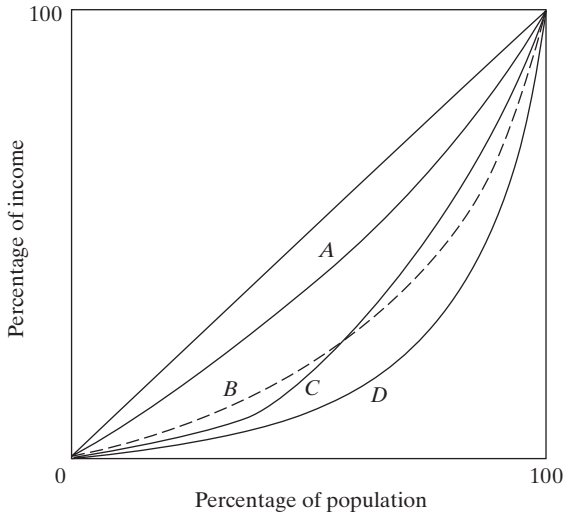


FIGURE 5.4 Four Possible Lorenz Curves



others might start with the assumption that an economy with a stronger middle class is inherently more equal, and those observers might select economy *C*.

One could also use an aggregate measure such as the Gini coefficient to decide the matter. As it turns out, the Gini coefficient is among a class of measures that satisfy four highly desirable properties: the anonymity, scale independence, population independence, and transfer principles.[3] The *anonymity principle* simply means that our measure of inequality should not depend on who has the higher income; for example, it should not depend on whether we believe the rich or the poor to be good or bad people. The *scale independence principle* means that our measure of inequality should not depend on the size of the economy or the way we measure its income; for example, our inequality measure should not depend on whether we measure income in dollars or in cents or in rupees or rupiahs, or for that matter on whether the economy is rich on average or poor on average—because if we are interested in inequality, we want a measure of the dispersion of income, not its magnitude (note that magnitudes are very important in poverty measures). The *population independence principle* is somewhat similar; it states that the measure of inequality should not be based on the number of income recipients. For example, the economy of China should be considered no more or less equal than the economy of Vietnam simply because China has a larger population than Vietnam.

Finally, we have the *transfer principle* (sometimes called the *Pigou-Dalton principle* after its creators); it states that, holding all other incomes constant, if we transfer some income from a richer person to a poorer person (but not so much that the poorer person is now richer than the originally rich person), the resulting new income distribution is more equal. If we like these four criteria, we can measure the Gini coefficient in each case and rank the one with the larger Gini as more unequal. However, this is not always a perfect solution. For example, the Gini coefficient can, in theory, be identical for two Lorenz curves that cross;

can you see why by looking at curves B and C in Figure 5.4? And sometimes different inequality measures that satisfy our four properties can give different answers as to which of two economies are more unequal.[4]

Note that a measure of dispersion common in statistics, the coefficient of variation (CV), which is simply the sample standard deviation divided by the sample mean, is another measure of inequality that also satisfies the four criteria. Although the CV is more commonly used in statistics, the Gini coefficient is often used in studies of income and wealth distribution due to its convenient Lorenz curve interpretation. Note, finally, that we can also use Lorenz curves to study inequality in the distribution of land, in education and health, and in other assets.

5.1.4 The Ahluwalia-Chenery Welfare Index (ACWI)

A final approach to accounting for the distribution of income in assessing the quality of growth is to value increases in income for all individuals but to assign a higher weight to income gains by lower-income individuals than to gains by higher-income individuals. Perhaps the best-known example is the Ahluwalia-Chenery Welfare Index (ACWI), which is explained in Appendix 5.2.

5.2 Measuring Absolute Poverty

Now let's switch our attention from relative income shares of various percentile groups within a given population to the fundamentally important question of the extent and magnitude of **absolute poverty** in developing countries.

Absolute poverty The situation of being unable or only barely able to meet the subsistence essentials of food, clothing, and shelter.

5.2.1 Income Poverty

In Chapter 2, we defined the extent of absolute poverty as the number of people who are unable to command sufficient resources to satisfy basic needs. They are counted as the total number living below a specified minimum level of real income—an international poverty line. That line knows no national boundaries, is independent of the level of national per capita income, and takes into account differing price levels by measuring poverty as anyone living on less than $1.90 a day (or sometimes other absolute thresholds) in PPP dollars. Absolute poverty can and does exist, therefore, as readily in New York City as it does in Kolkata, Cairo, Lagos, or Bogotá, although its magnitude is likely to be much lower in terms of percentages of the total population.

Absolute poverty is sometimes measured by the number, or "headcount," H, of those whose incomes fall below the absolute poverty line, Y_p. When the headcount is taken as a fraction of the total population, N, we define the **headcount index**, H/N (also referred to as the "headcount ratio"). The poverty line is set at a level that remains constant in real terms so that we can chart our progress on an absolute level over time. The idea is to set this level at a standard below which we would consider a person to live in "absolute human misery," such that the person's health is in jeopardy.

Headcount index The proportion of a country's population living below the poverty line.

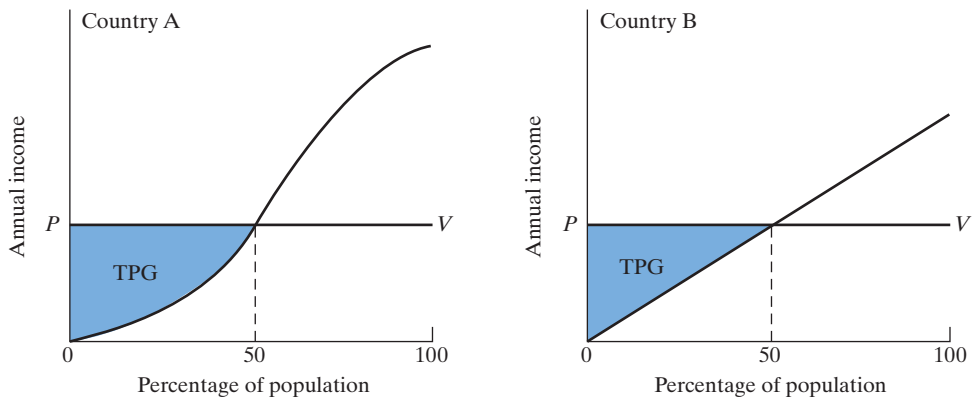
Of course, to define a minimum health standard that is invariant across historical epochs is an impossibility, in part because technology changes over time. For example, today we have 15-cent oral rehydration therapy packets that can save the life of a child in Malawi. Not long ago, the death of a child after a diarrheal disease would be taken as a sad but inevitable part of life, whereas today we regard such a death as a catastrophic moral failure of the international community. We simply come as close as we can to establishing a reasonable minimum standard that might hold over a few decades so that we can estimate more carefully how much progress we have made on a (more) absolute rather than a (highly) relative scale.

Certainly one would not accept the international poverty level of $1.90 a day in an unquestioning way when planning local poverty work. One practical strategy for determining a local absolute poverty line is to start by defining an adequate basket of food, based on nutritional requirements from medical studies of required calories, protein, and micronutrients. Then, using local household survey data, one can identify a typical basket of food purchased by households that just barely meet these nutritional requirements. One then adds other expenditures of this household, such as clothing, shelter, and medical care, to determine the local absolute poverty line. Depending on how these calculations are done, the resulting poverty line may come to more than $1.90 per day at PPP.

However, simply counting the number of people below an agreed-on poverty line has serious limitations. For example, if the poverty line is set at US $450 per person, it makes a big difference whether most of the absolute poor earn $400 or $300 per year. Both are accorded the same weight when calculating the proportion of the population that lies below the poverty line; clearly, however, the poverty problem is much more serious in the latter instance. Economists therefore attempt to calculate a **total poverty gap (TPG)** that measures the total amount of income necessary to raise everyone who is below the poverty line up to that line. Figure 5.5 illustrates how we can measure the total poverty gap

Total poverty gap (TPG) The sum of the difference between the poverty line and actual income levels of all people living below that line.

FIGURE 5.5 Measuring the Total Poverty Gap



(a) A relatively large poverty gap

(b) A relatively small poverty gap

as the shaded area between poverty line, *PV,* and the annual income profile of the population.

Even though in both country A and country B, 50% of the population falls below the same poverty line, the TPG in country A is greater than in country B. Therefore, it will take more of an effort to eliminate absolute poverty in country A.

The TPG—the extent to which the incomes of the poor lie below the poverty line—is found by adding up the amounts by which each poor person's income, Y_i, falls below the absolute poverty line, Y_p, as follows:

$$\text{TPG} = \sum_{i=1}^{H} (Y_p - Y_i) \tag{5.1}$$

We can think of the TPG in a simplified way (i.e., no administrative costs or general equilibrium effects are accounted for) as the amount of money per day it would take to bring every poor person in an economy up to our defined minimum income standards. On a per capita basis, the *average poverty gap* (APG) is found by dividing the TPG by the total population:

$$\text{APG} = \frac{\text{TPG}}{N} \tag{5.2}$$

Often we are interested in the size of the average poverty gap in relation to the poverty line, so we would use as our income shortfall measure the *normalised poverty gap* (NPG): NPG = APG/Y_p; this measure lies between 0 and 1 and so can be useful when we want a unitless measure of the gap for easier comparisons.

Another important poverty gap measure is the *average income shortfall* (AIS), which is the total poverty gap divided by the headcount of the poor: AIS = TPG/H. The AIS tells us the average amount by which the income of a poor person falls below the poverty line. This measure can also be divided by the poverty line to yield a fractional measure, the *normalised income shortfall* (NIS): NIS = AIS/Y_p.

The Foster-Greer-Thorbecke Index We are also often interested in the degree of income inequality among the poor, such as the Gini coefficient among those who are poor, G_p, or, alternatively, the coefficient of variation (CV) of incomes among the poor, CV_p. One reason that the Gini or CV among the poor can be important is that the impact on poverty of economic shocks can differ greatly, depending on the level and distribution of resources among the poor. For example, if the price of rice rises, as it did in 1998 in Indonesia, low-income rice producers, who sell a little of their rice on local markets and whose incomes are slightly below the absolute poverty line, may find that this price rise increases their incomes to bring them out of absolute poverty. On the other hand, for those with too little land to be able to sell any of the rice they grow and who are net buyers of rice on markets, this price increase can greatly worsen their poverty. Thus, the most desirable measures of poverty would also be sensitive to the distribution of income among the poor.

As is the case with inequality measures, there are criteria for a desirable poverty measure that are widely accepted by development economists: the anonymity, population independence, monotonicity, and distributional sensitivity principles. The first two principles are very similar to the properties we examined for inequality indexes: our measure of the extent of poverty should not depend on who is poor or on whether the country has a large or small population. The monotonicity principle means that if you add income to someone below the poverty line, all other incomes held constant, poverty can be *no greater* than it was.[5] The distributional sensitivity principle states that, other things being equal, if you transfer income from a poor person to a richer person, the resulting economy should be deemed strictly poorer. The headcount ratio measure satisfies anonymity, population independence, and monotonicity, but it fails on distributional sensitivity. The simple headcount fails even to satisfy the population independence principle. There is also an overarching "focus principle" introduced by Amartya Sen: that a good poverty measure will be based only on the incomes (well-being) of the poor; specifically, an increase or decrease in incomes of those above the poverty line should not affect how we measure the level of poverty (unless a fall in income pushes a person below the line).

A well-known poverty index that in certain forms satisfies all four criteria is the **Foster-Greer-Thorbecke (FGT) index**, often called the P class of poverty measures.[6] The P index is given by

Foster-Greer-Thorbecke (FGT) index A class of measures of the level of absolute poverty.

$$P_\alpha = \frac{1}{N}\sum_{i=1}^{H}\left(\frac{Y_p - Y_i}{Y_p}\right)^\alpha \tag{5.3}$$

where Y_i is the income of the ith poor person, Y_p is the poverty line, and N is the population. Depending on the value of α, the P_α index takes on different forms. If the numerator is equal to H, we get the headcount ratio, H/N. Unfortunately, this measure is the same whether those in poverty earn 90 cents per day or 50 cents per day, so it cannot reveal the depth of poverty.

If $\alpha = 1$, we get the normalised (per capita) poverty gap. An alternative formula that can be derived for P_1 is given by $P_1 = (H/N)^*(\text{NIS})$, that is, the headcount ratio (H/N) times the normalised income shortfall (NIS). So, P_1 has the properties that poverty goes up whenever either the fraction of people in poverty goes up or the fractional income deficits (poverty depth) go up (or both)—in general, this makes it a better measure than P_0.

If $\alpha = 2$, we account for poverty severity, in that the impact on measured poverty of a gain in income by a poor person increases in relation to the square of the distance of the person from the poverty line. For example, raising the income of a person from a household living at half the per capita poverty line by, say, one penny per day would have five times the impact on poverty reduction as would raising by the same amount the income of a person living at 90% of the poverty line; this differing magnitude results from squaring the poverty gaps, so the P_2 measure captures the *severity* of poverty.

As a numerical example of the calculation of P_2, consider an 8-person economy with a poverty line of 1, and a hypothetical income distribution

of: (0.6, 0.6, 0.8, 0.8, 2, 2, 6, 6). The headcount is 4, because two people have incomes of 0.6 and two people have incomes of 0.8; but the others have incomes above the poverty line. Using these numbers, we can find the P_2 level of poverty from Equation 5.3:

$$P_2 = (1/8)[0.4^2 + 0.4^2 + 0.2^2 + 0.2^2] = (1/8)[0.16 + 0.16 + 0.04 + 0.04] = 0.4/8 = 0.05$$

Note that P_2 can be expressed in an alternative form to add further intuition. If the resulting measure, P_2, can be rewritten as[7]

$$P_2 = \left(\frac{H}{N}\right)[\text{NIS}^2 + (1 - \text{NIS})^2(\text{CV}_p)^2] \tag{5.4}$$

As Equation 5.4 shows, P_2 contains the CV_p measure, and it satisfies all four of the poverty axioms.[8] Clearly, P_2 increases whenever H/N, NIS, or CV_p increases. Note from the formula that there is a greater emphasis on the distribution of income among the poor (CV_p) when the normalised income shortfall is small and a lesser emphasis when the NIS is large.

The P_2 poverty measure, also known as the squared poverty gap index, has become a standard of income poverty measure used by the World Bank and other agencies, and it is used in empirical work on income poverty because of its sensitivity to the depth and severity of poverty. Mexico uses the P_2 poverty measure to allocate funds for education, health, and welfare programmes for the poor (in particular in the Progresa/Oportunidades Programme, described at the end of Chapter 8), in accordance with the regional intensity of poverty.[9]

Another reason to prefer P_2 (or at least P_1) over P_0 is that standard headcount measures also have the perverse property of creating incentives for officials to focus efforts on the poor who are closest to the poverty line—because that is the easiest and cheapest way for them to demonstrate progress. We encountered a version of this problem in Chapter 1—a critique of the Millennium Development Goals focus on reducing the fraction of those living below the poverty line.

Values of P_0 and P_2 for selected developing countries are found in Table 5.5 later in this chapter.

Person-Equivalent Headcounts Although P_1 and P_2 are more informative measures, which provide better incentives to poverty programmes than P_0, many agencies (including US Agency for International Development—USAID) continue to report progress primarily if not exclusively in terms of P_0 headcount measures—apparently responding to public and legislative expectations to discuss poverty in terms of numbers of people. Given a political need to feature "headline" headcount measures, a partial improvement is to convert changes in the poverty gap into its headcount-equivalent (based on the initial average income shortfall). If aid agencies featured a supplementary headcount-equivalent, they could report in terms of numbers of people while accounting for changes in poverty depth. Estimates using this approach show progress against poverty in many countries is significantly greater than revealed using conventional headcount measures alone.[10]

5.2.2 Multidimensional Poverty Measurement

Poverty cannot be adequately measured with income alone, as Amartya Sen's capability framework, examined in Chapter 1, makes apparent. To fill this gap, Sabina Alkire and James Foster have extended the FGT index to multiple dimensions.[11]

As always, the first step in measuring poverty is to know which people are poor. In the multidimensional poverty approach, a poor person is identified through what is called the "dual cutoff method": first, the cutoff levels within each of the dimensions (analogous to falling below a poverty line such as $1.90 per day if income poverty were being addressed) and second, the cutoff of the number of dimensions in which a person must be deprived (below the line) to be deemed multidimensionally poor. Using calculations analogous to the single-dimensional P index, the multidimensional M index is constructed. The most basic measure is the fraction of the population in multidimensional poverty—the multidimensional headcount ratio H_M.

The most common measure in practice is M_0, the *adjusted* headcount ratio, which uses ordinal data and is similar conceptually to the poverty gap P_1 (which again can be expressed as the headcount ratio times the normalised income shortfall). M_0 may be represented by the product of the multidimensional headcount ratio times the average fraction of dimensions in which the poor are deprived (or "average intensity of poverty" A, that is, $M_0 = H_M{*}A$). In contrast to the simple multidimensional headcount ratio, the adjusted multidimensional headcount ratio satisfies the desirable property (called "dimensional monotonicity") that if the average fraction of deprivations increases, so does M_0.

In applied studies, proxy measures, called *indicators,* are used for each of the selected dimensions. Details of the way this measure has been constructed and applied in the UNDP Multidimensional Poverty Index and findings across countries are reported in Section 5.4, when we apply the poverty measures to examine the extent of poverty in different countries and regions. Another widely used application is the Women's Empowerment in Agriculture Index, referred to in Chapter 9.

5.3 Poverty, Inequality, and Social Welfare

5.3.1 What is it About Extreme Inequality That's So Harmful to Economic Development?

Throughout this chapter, we are assuming that social welfare depends positively on the level of income per capita but negatively on poverty and negatively on the level of inequality, as these terms have just been defined. The problem of absolute poverty is obvious. No civilised people can feel satisfied with a state of affairs in which their fellow humans exist in conditions of such absolute human misery, which is probably why every major religion has emphasised the importance of working to alleviate poverty and is at least one of the reasons why international development assistance has the nearly universal support of every

democratic nation. But it may reasonably be asked, if our top priority is the alleviation of absolute poverty, why should *relative inequality* be a concern? We have seen that inequality among the poor is a critical factor in understanding the severity of poverty and the impact of market and policy changes on the poor, but why should we be concerned with inequality among those *above* the poverty line?

There are three major answers to this question. First, extreme income inequality leads to economic inefficiency. This is partly because at any given average income, the higher the inequality, the smaller the fraction of the population that qualifies for a loan or other credit. Indeed, one definition of *relative poverty* is the lack of collateral. When low-income individuals (whether they are absolutely poor or not) cannot borrow money, they generally cannot adequately educate their children or start and expand a business. Moreover, with high inequality, the overall rate of savings in the economy tends to be lower, because the highest rate of marginal savings is usually found among the middle classes. Although the rich may save a larger dollar amount, they typically save a smaller fraction of their incomes, and they almost always save a smaller fraction of their marginal incomes. Landlords, business leaders, politicians, and other rich elites are known to spend much of their incomes on imported luxury goods, gold, jewellery, expensive houses, and foreign travel or to seek safe havens abroad for their savings in what is known as *capital flight.* Such savings and investments do not add to the nation's productive resources; in fact, they represent substantial drains on these resources. In short, the rich do not generally save and invest significantly larger proportions of their incomes (in the real economic sense of productive domestic saving and investment) than the middle class or even the poor.[12] Furthermore, inequality may lead to an inefficient allocation of assets. As you will see in Chapter 8, high inequality leads to an overemphasis on higher education at the expense of quality universal primary education, which not only may be inefficient but is also likely to beget still more inequality in incomes. Moreover, as you will see in Chapter 9, high inequality of land ownership—characterised by the presence of huge *latifundios* (plantations) alongside tiny *minifundios* that are incapable of supporting even a single family—also leads to inefficiency because the most efficient scales for farming are family and medium-size farms. The result of these factors can be a lower average income and a lower rate of economic growth when inequality is high.[13]

The second reason to be concerned with inequality above the poverty line is that extreme income disparities undermine social stability and solidarity. Also, high inequality strengthens the political power of the rich and hence their economic bargaining power. Usually this power will be used to encourage outcomes favourable to themselves. High inequality facilitates *rent seeking,* including actions such as excessive lobbying, large political donations, bribery, and cronyism. When resources are allocated to such rent-seeking behaviours, they are diverted from productive purposes that could lead to faster growth. Even worse, high inequality makes poor institutions very difficult to improve, because the few with money and power are likely to view themselves as worse off from socially efficient reform, and so they have the motive and the means to resist it (see Chapter 2). Of course, high inequality may also lead the poor to support populist policies that can be self-defeating. Countries with extreme

inequality, such as El Salvador and Iran, have undergone upheavals or extended civil strife that have cost countless lives and set back development progress by decades. High inequality is also associated with pathologies such as higher violent crime rates. In summary, with high inequality, the focus of politics often tends to be on supporting or resisting the redistribution of the existing economic pie rather than on policies to increase its size (Chapter 11 examines these concerns in more detail).[14]

Finally, extreme inequality is generally viewed as unfair. The philosopher John Rawls proposed a thought experiment to help clarify why this is so.[15] Suppose that before you were born into this world, you had a chance to select the overall level of inequality among the earth's people but not your own identity. That is, you might be born as Bill Gates, but you might be born as the most wretchedly poor person in rural Ethiopia with equal probability. Rawls calls this uncertainty the "veil of ignorance." The question is, facing this kind of risk, would you vote for an income distribution that was more equal or less equal than the one you see around you? If the degree of equality had no effect on the level of income or rate of growth, most people would vote for nearly perfect equality. Of course, if everyone had the same income no matter what, there would be little incentive to work hard, gain skills, or innovate. As a result, most people vote for *some* inequality of income outcomes, to the extent that these correspond to incentives for hard work or innovation. But even so, most vote for *less* inequality than is seen in the world (or in virtually any country) today. This is because much of the inequality we observe in the world is based on luck or extraneous factors, such as the inborn ability to kick a football or the identity of one's great-grandparents. (Although extending uncertainty to before one's birth is a purely mental exercise, experimental evidence has shown that behind the equivalent of a Rawlsian veil people can overcome the free rider problem, contributing an appropriate amount to pay for public goods.)[16]

For all these reasons, for this part of the analysis we will write welfare, *W*, as

$$W = W(Y, I, P) \tag{5.5}$$

where Y is income per capita and enters our welfare function positively, I is inequality and enters negatively, and P is absolute poverty and also enters negatively. These three components have distinct significance, and we need to consider all three elements to achieve an overall assessment of welfare in developing countries.

Distribution matters more generally. A similar framework can be applied to health and education, and to other capabilities to function.[17] Later in this chapter, we examine measures of multidimensional poverty, taking account of health and education as well as standard of living. We examine inequality and other forms of deprivation in health and education capabilities in Chapter 8.

5.3.2 Dualistic Development and Shifting Lorenz Curves: Some Stylised Typologies

As introduced by Gary Fields, Lorenz curves may be used to analyse three limiting cases of dualistic development:[18]

1. The *modern-sector enlargement* growth typology, in which the two-sector economy develops by enlarging the size of its modern sector while maintaining constant wages in both sectors. This is the case depicted by the Lewis model in Chapter 3. It corresponds roughly to the historical growth pattern of Western developed nations and, to some extent, the pattern in East Asian economies such as China, South Korea, and Taiwan.
2. The *modern-sector enrichment* growth typology, in which the economy grows but such growth is limited to a fixed number of people in the modern sector, with both the numbers of workers and their wages held constant in the traditional sector. This roughly describes the experience of many Latin American and African economies.
3. The *traditional-sector enrichment* growth typology, in which all of the benefits of growth are divided among traditional-sector workers, with little or no growth occurring in the modern sector. This process roughly describes the experiences of countries whose policies focused on achieving substantial reductions in absolute poverty even at very low incomes and with relatively low growth rates, such as Sri Lanka, and the state of Kerala in southwestern India.

Using these three special cases and Lorenz curves, Fields demonstrated the validity of the following propositions (reversing the order just presented):

1. In the *traditional-sector enrichment* typology, growth results in higher income, a *more equal* relative distribution of income, and less poverty. Traditional-sector enrichment growth causes the Lorenz curve to shift uniformly upward and closer toward the line of equality, as depicted in Figure 5.6.

FIGURE 5.6 Improved Income Distribution under the Traditional-Sector Enrichment Growth Typology

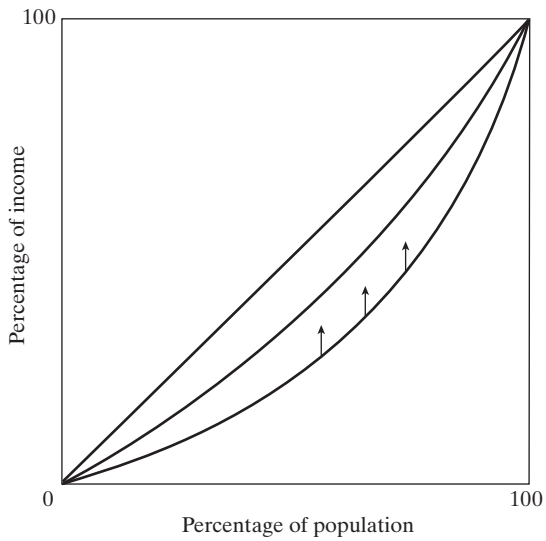
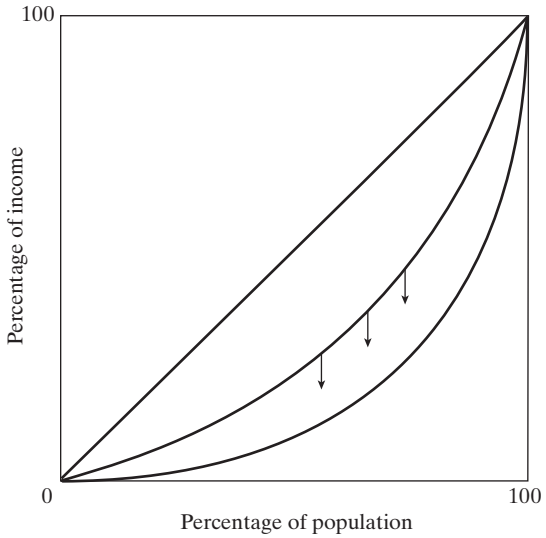


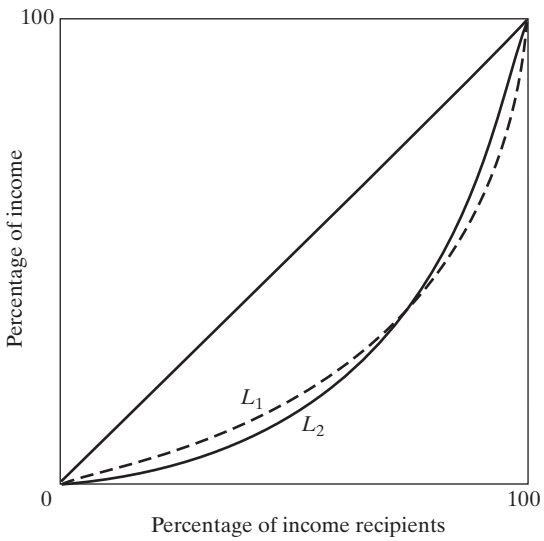
FIGURE 5.7 Worsened Income Distribution under the Modern-Sector Enrichment Growth Typology



2. In the *modern-sector enrichment* growth typology, growth results in higher incomes, a *less equal* relative distribution of income, and no change in poverty. Modern-sector enrichment growth causes the Lorenz curve to shift downward and farther from the line of equality, as shown in Figure 5.7.
3. Finally, in the case of Lewis-type, *modern-sector enlargement* growth, absolute incomes rise and absolute poverty is reduced, but the Lorenz curves will always cross, indicating that we cannot make any unambiguous statement about changes in relative inequality: it may improve or worsen. Fields shows that if, in fact, this style of growth experience is predominant, inequality is likely first to worsen in the early stages of development and then to improve. The crossing of the Lorenz curves is demonstrated in Figure 5.8.

The explanation for the crossing in Figure 5.8 is as follows: the poor who remain in the traditional sector have their incomes unchanged, but these incomes are now a smaller fraction of the larger total, so the new Lorenz curve, L_2, lies below the old Lorenz curve, L_1, at the lower end of the income distribution scale. Each modern-sector worker receives the same absolute income as before, but now the share received by the richest income group is smaller, so the new Lorenz curve lies *above* the old one at the higher end of the income distribution scale. Therefore, somewhere in the middle of the distribution, the old and new Lorenz curves must cross.[19]

FIGURE 5.8 Crossing Lorenz Curves in the Modern-Sector Enlargement Growth Typology



These three typologies offer different predictions about what will happen to inequality in the course of economic growth. With modern-sector enrichment, inequality rises steadily, while under traditional-sector enrichment, inequality falls steadily. Under modern-sector enlargement, inequality first rises and then falls;[20] if this admittedly highly stylised process of development were occurring, we would not be concerned about the temporary rise in inequality, because in addition to being temporary, it would be reflecting a process in which citizens are, one by one, achieving incomes above the absolute poverty line.[21]

These observations tell us that we have to qualify our conclusion that a rise in inequality is inherently bad. In some cases, inequality may increase on a temporary basis due to causes that will eventually make everyone better off and ultimately lower inequality. However, with modern-sector enrichment growth, the increase in inequality is not later reversed, and the poor do not escape their poverty.[22] So, we need to be careful about drawing conclusions from short-run changes in economic statistics before we know more about the underlying changes in the real economy that have given rise to these statistics.

Note that while modern sector enlargement growth has favourable properties, social conflict can still emerge, even though, in theory, the greater inequality would be temporary until more low-income people moved to high-income jobs. Early intuition was provided by Albert Hirschman, who asked readers to imagine being stuck in a tunnel where traffic is at a complete standstill. Finally, one of the lanes – not the one you are in – starts to move. At first, you are happy and optimistic, thinking your lane will surely move soon as well. But after a

longer wait, watching many cars pass by while you remain stuck, the temptation grows to cut into the moving lane, likely leading to incidents and causing gridlock if not altercations among motorists. The "Hirschman tunnel effect" allegory was used to describe problems in countries such as Pakistan and Nigeria, and was later borrowed to shed light on problems including the 1979 Iranian Revolution.[23]

The process of modern-sector enlargement growth suggests a possible mechanism that can give rise to Kuznets's "inverted-U" hypothesis, so we turn to this question next.

5.3.3 Kuznets's Inverted-U Hypothesis

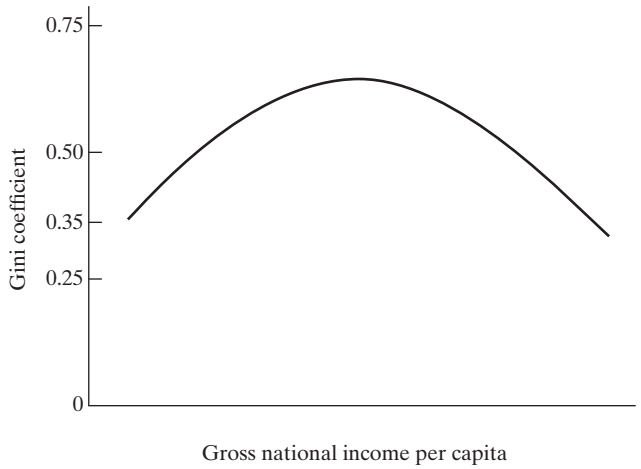
Simon Kuznets suggested that in the early stages of economic growth, the distribution of income will tend to worsen; only at later stages will it improve.[24] This observation came to be characterised by the "inverted-U" **Kuznets curve** because a longitudinal (time-series) plot of changes in the distribution of income—as measured, for example, by the Gini coefficient—seemed, when per capita GNI expanded, to trace out an inverted U-shaped curve in some of the cases Kuznets studied, as illustrated in Figure 5.9.

Kuznets curve A graph reflecting the relationship between a country's income per capita and its inequality of income distribution.

Explanations as to why inequality might worsen during the early stages of economic growth before eventually improving are numerous. They almost always relate to the nature of structural change. Early growth may, in accordance with the Lewis model, be concentrated in the modern industrial sector, where employment is limited but wages and productivity are high.

As just noted, the Kuznets curve can be generated by a steady process of modern-sector enlargement growth as a country develops from a traditional to a modern economy. Alternatively, returns to education may first rise as the

FIGURE 5.9 The "Inverted-U" Kuznets Curve



emerging modern sector demands skills and then may fall as the supply of educated workers increases and the supply of unskilled workers falls. So, while Kuznets did not specify the mechanism by which his inverted-U hypothesis was supposed to occur, it could in principle be consistent with a sequential process of economic development. But, as shown earlier, traditional- and modern-sector enrichment would tend to pull inequality in opposing directions, so the net change in inequality is ambiguous, and the validity of the Kuznets curve is an empirical question.

Disregarding the merits of the methodological debate, few development economists would argue that the Kuznets sequence of increasing and then declining inequality is inevitable. There are now enough case studies and specific examples of countries such as Taiwan, South Korea, Costa Rica, and Sri Lanka to demonstrate that higher income levels can be accompanied by falling and not rising inequality. It all depends on the nature of the development process.

Evidence on the Inverted-U Hypothesis Let us look at data collected from 18 countries on the percentage shares in total national income going to different percentile groups (see Table 5.2). Though methods of collection, degree of coverage, and specific definitions of personal income may vary from country to country, the figures recorded in Table 5.2 give a first approximation of the magnitude of income inequality in developing countries. For example, we see that in Zambia, the poorest 20% (first quintile) of the population receives only 3.6% of the income, while the highest 10% and 20% (fifth quintile) receive 38.9% and 55.2%, respectively. By contrast, in a relatively equal developed country such as Japan, the poorest 20% receives a much higher 10.6% of the income, while the richest 10% and 20% get only 21.7% and 35.7%, respectively. The income distribution of the United States, a relatively less-equal developed country, is given for comparison in Table 5.2.

Consider now the relationship, if any, between levels of per capita income and degree of inequality. Are higher incomes associated with greater or lesser inequality, or can no definitive statement be made? Table 5.3 provides data on income distribution in relation to per capita GNI for a sampling of countries, arranged from lowest to highest in terms of per capita income. What clearly emerges from Table 5.3 is that per capita incomes are not necessarily related to inequality. The very poorest countries, such as Niger, may have low inequality simply because there is so little income. But even very poor countries such as Mozambique have extremely high inequality by international standards. Although many high-inequality Latin American countries are found in the middle-income range, this range also includes countries such as Egypt and Indonesia, as well as eastern European countries, with relatively lower inequality. Brazil had far higher inequality than Mexico, though the countries had almost identical incomes. High-income countries do tend to be somewhat more equal than middle-income countries but, again, there is wide variation in inequality levels, with the Netherlands very low, and the United States relatively high—higher for example than the Philippines or Indonesia.

TABLE 5.2 Selected Income Distribution Estimates

Country	Lowest 10%	Quintile 1st	2nd	3rd	4th	5th	Highest 10%	Year
Bangladesh	4.3	9.4	12.6	16.1	21.1	40.8	26.6	2005
Brazil	1.1	3.0	6.9	11.8	19.6	58.7	43.0	2007
China	2.4	5.7	9.8	14.7	22.0	47.8	31.4	2005
Colombia	0.8	2.3	6.0	11.0	19.1	61.6	45.9	2006
Costa Rica	1.6	4.4	8.5	12.7	19.7	54.6	38.6	2007
Guatemala	1.3	3.4	7.2	12.0	19.5	57.8	42.4	2006
Honduras	0.7	2.5	6.7	12.1	20.4	58.4	42.2	2006
India	3.6	8.1	11.3	14.9	20.4	45.3	31.1	2005
Jamaica	2.1	5.2	9.0	13.8	20.9	51.2	35.6	2004
Namibia	0.6	1.5	2.8	5.5	12.0	78.3	65.0	1993
Pakistan	3.9	9.1	12.8	16.3	21.3	40.5	26.5	2005
Peru	1.3	3.6	7.8	13.0	20.8	54.8	38.4	2007
Philippines	2.4	5.6	9.1	13.7	21.2	50.4	33.9	2006
South Africa	1.3	3.1	5.6	9.9	18.8	62.7	44.9	2000
Tanzania	3.1	7.3	11.8	16.3	22.3	42.3	27.0	2001
Zambia	1.3	3.6	7.8	12.8	20.6	55.2	38.9	2005
Japan	4.8	10.6	14.2	17.6	22.0	35.7	21.7	1993
United States	1.9	5.4	10.7	15.7	22.4	45.8	29.9	2000

Source: Based on World Bank, *World Development Indicators, 2010.* (Washington, D.C.: World Bank, 2010), tab. 2.9.

In recent years, there has even been a tendency for inequality to rise in high-income countries and to fall at least somewhat in several Latin American countries.

In fact, the Kuznets curve that is seen in the data is now understood to be partially a statistical fluke resulting from the fact that for extraneous historical reasons, most Latin American countries just happen to have both a middle level of income and a high level of inequality (see Box 5.1).

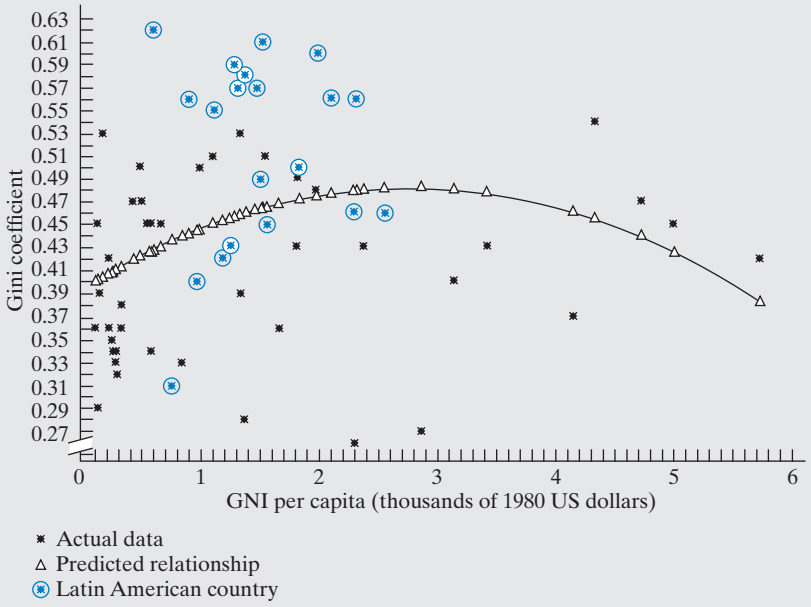
Detailed longitudinal studies of developing countries show a very mixed pattern. Juan Luis Lonondro found an inverted U for Colombia, but Harry Oshima found no particular pattern among several Asian countries.[25] In fact, for many countries, there is no particular tendency for inequality to change in the process of economic development. Inequality seems to be a rather stable part of a country's socioeconomic makeup, altered significantly only as a result of a substantial upheaval or systematic policies. East Asia achieved its relatively low inequality largely from exogenous forces: the US occupation of Japan, the Nationalist takeover of Taiwan, and the expulsion of the Japanese from South Korea. In all three cases, land reform that had far-reaching effects on inequality was implemented (we examine land reform in Chapter 9). But inequality can be gradually reduced through well-implemented policies to promote pro-poor growth over time. With regressive policies, inequality may rise over time.

BOX 5.1 Development Policy: The Latin America Effect

Gary Fields and George Jakubson used a combination of both cross-sectional and longitudinal (time-series) data to consider whether the inverted-U could result from the Latin American effect and how patterns might differ across countries. Figure 5.10 plots a combination of data from the 35 countries in Fields and Jakubson's data set, where reliable estimates of the Gini coefficient have been available for various developing countries at different points in time. The inverted-U relationship, tracing the triangles, is a computer-generated parabola that best fits the data under standard statistical criteria. Observations on Latin American countries are circled: all of the highest-inequality countries in their data come from that region. Statistically, when the Latin American identity of the country is controlled for, the inverted-U drawn in Figure 5.10 tends to disappear in this data set and others as well.[26]

So, the question is, what happens over time? In Figure 5.11, selected countries from the data in Figure 5.10 have been isolated. As can be seen, the data from Brazil, which have the label *1* in the diagram, do plainly show an inverted-U pattern. Data from Hong Kong and Singapore, in contrast, labelled *4* and *5* in the diagram, appear to reflect a U-shaped pattern.

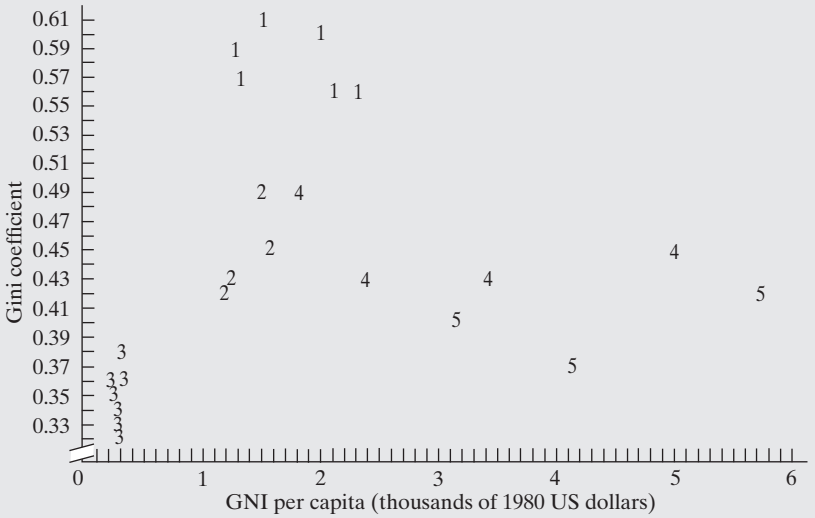
FIGURE 5.10 Kuznets Curve with Latin American Countries Identified



Source: Fields, Gary S. (2001), *Distribution and Development: A New Look at the Developing World*, Cambridge, M.A.: MIT Press, ch. 3, p. 46. © 2001 Massachusetts Institute of Technology, by permission of The MIT Press.

But when these separate experiences are merged into one picture, the eyes (and the computer) misleadingly trace an inverted U in the data taken as a whole. This reinforces the great importance of understanding what gives rise to the statistical patterns in the data rather than taking them at face value.

FIGURE 5.11 Plot of Inequality Data for Selected Countries



Source: Gary S. Fields, *Distribution and Development: A New Look at the Developing World* (Cambridge, Mass.: MIT Press, 2001), ch. 3, p. 44. © 2001 Massachusetts Institute of Technology, by permission of The MIT Press.

5.3.4 Growth and Inequality

Having examined the relationship between inequality and levels of per capita income, let us look now briefly at the relationship, if any, between economic growth and inequality. During the 1960s and 1990s, per capita growth in East Asia averaged 5.5% while that of Africa declined by 0.2%, yet both Gini coefficients remained essentially unchanged. Once again, it is not just the rate but also the **character of economic growth** (how it is achieved, who participates, which sectors are given priority, what institutional arrangements are designed and emphasised, etc.) that determines the degree to which that growth is or is not reflected in improved living standards for the poor. Clearly, it is not necessary for inequality to increase for higher growth to be sustained.

Character of economic growth The distributive implications of economic growth as reflected in such factors as participation in the growth process and asset ownership.

TABLE 5.3 Income and Inequality in Selected Countries

Country	Income per capita	Gini Coefficient (%)	Survey Year
Low Income			
Malawi	320	44.7	2016
Niger	360	34.3	2014
Mozambique	420	54.0	2014
Ethiopia	740	39.1	2015
Lower Middle Income			
Kyrgyz Rep.	1,130	26.8	2016
Honduras	2,250	50.0	2016
Indonesia	3,540	38.6	2016
Tunisia	3,490	32.8	2015
Philippines	3,660	40.1	2015
Upper Middle Income			
Armenia	3,990	32.5	2016
South Africa	5,430	63.0	2014
Thailand	5,950	36.9	2016
Brazil	8,610	53.7	2016
Mexico	8,610	43.4	2016
High Income			
United Kingdom	40,600	33.2	2015
Netherlands	46,910	28.2	2015
United States	59,160	41.5	2016
Norway	76,160	27.5	2015

Source: Data from World Bank, *World Development Indicator Tables, 2018* (Washington, D.C.: World Bank, 2018), tabs. WV.1 and 1.3, accessed 16 June 2019.

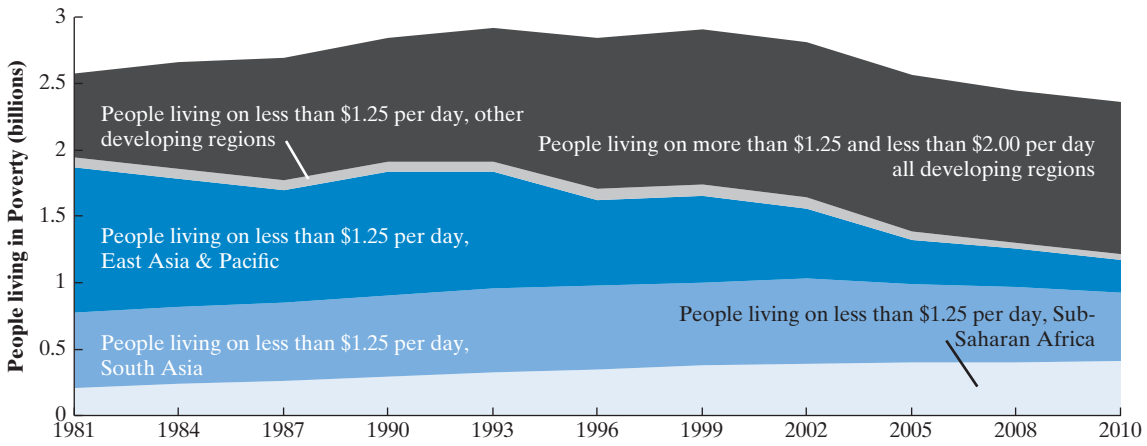
5.4 Absolute Poverty: Extent and Magnitude

Like so much in economic development, the critical problem of eradicating absolute poverty is one of bad news and good news—of a glass that may be seen as either half empty or half full.

It is extremely difficult to arrive at a tight estimate of the extent of global poverty at any point in time. Major World Bank reports issued within a couple of years of each other have provided estimates of the dollar-a-day headcount that differ by tens of millions of people. This reflects the difficulty of the task. Another difficulty is determining the most appropriate cutoff income for extreme poverty. The $1-a-day line was first set in 1987 dollars, and for years the standard was $1.08 in 1993 US Purchasing Power Parity. In 2008, the equivalent line was reset at $1.25 at 2005 US purchasing power; it was further readjusted to $1.90 after further improvements in data and methods.[27] These corrections (along with improved estimates of prices faced by the poor) resulted in an increase in the estimated number of the poor but did not change the conclusion that the number in poverty has been falling markedly since 1990, most conspicuously due to progress in China. Even when updated to today's dollars, the poverty line is to some degree arbitrary (although it has corresponded roughly to what many developing countries use and is at least related to expenditures of people who barely meet minimum nutrition).

The most recent systematic poverty estimates (available as of mid-2019) show that in 2010 some 1.22 billion people lived below $1.90 per day, and some

FIGURE 5.12 Global and Regional Poverty Trends, 1981–2010



Source: Figure drawn using data from PovcalNet/World Bank; data downloaded 13 February 2014 from http://iresearch.worldbank.org/PovcalNet/index.htm?1.

2.36 billion below $3.80 per day. The number of people living in $3.80 per day income poverty fell from about 1.94 billion from 1981 to 2010—a 37% reduction in the headcount. The drop in the number living on less than $2 per day was much smaller—under 8%—but this more modest decline was partly due to people whose incomes actually had crossed above the $1.90 per day, though still remained below $3.80 per day. These achievements in reducing the number of people living in poverty are all the more impressive when we note that world population rose by 2.39 billion people (53%) between 1981 and 2010 (UN estimates). Thus the headcount ratio (fraction of the population) living on less than $1.25 per day (currently equivalent to $1.90 per day) fell to about 18% by 2010—approaching half (55%) of its 1990 level of 33%. The first MDG of halving extreme income poverty was met by the end of 2013. By 2018, it was estimated that about 750 million people lived below the $1.90 poverty line. Global and regional poverty trends for the 1981–2010 period are summarised in Figure 5.12. Note that the numbers of the poor who live in sub-Saharan Africa rose steadily throughout this three-decade period; but the headcount of the poor declined in other regions.

The incidence of extreme poverty is very uneven around the developing world. Household survey-based estimates are regarded as the most accurate ways to estimate poverty incidence. Table 5.4 provides estimates for some specific countries in Africa, Asia, and Latin America at the $1.90 and $3.80 poverty lines. For example, it can be seen that about 15% of Bangladesh's population lived below the $1.90-a-day poverty line, while about 65% lived on less than $3.80 per day. In Brazil, these figures are about 5% and 12%, respectively. While high, these figures represent strong progress in recent years.

TABLE 5.4 Income Poverty Incidence in Selected Countries

Country	Year	P_0 (Head-count ratio, %) at $1.90 per day	P_2 (squared poverty gap, %) at $1.90 per day	P_0 (Head-count ratio, %) at $3.80 per day	P_2 (squared poverty gap, %) at $3.80 per day
Bangladesh	2016	14.77	0.78	65.15	9.97
Brazil	2017	4.83	1.03	12.28	2.96
Burundi	2013	71.79	15.99	92.67	39.65
Chad	2011	38.43	8.14	73.99	22.88
China	2015	0.73	0.07	11.78	0.91
Colombia	2017	3.92	0.96	14.97	2.79
Côte d'Ivoire	2015	28.21	4.30	66.32	16.49
Dominican Republic	2016	1.64	.25	9.21	1.17
Ethiopia	2015	27.34	3.28	71.85	15.90
Guatemala	2014	8.66	1.14	31.58	5.64
India	2011	21.23	1.28	70.96	12.81
Laos PDR	2012	22.75	1.80	69.17	13.27
Mali	2009	49.65	6.52	85.98	25.79
Mexico	2016	2.17	0.32	12.01	1.58
Niger	2014	44.51	5.56	83.56	23.65
Pakistan	2015	3.94	0.10	49.07	4.70
Rwanda	2016	55.50	9.74	84.83	29.81
South Africa	2014	18.89	2.90	44.30	10.88
Vietnam	2016	1.97	0.12	13.07	1.46
Yemen	2014	18.82	1.57	63.61	11.46

Source: Data from World Bank, "PovcalNet," http://iresearch.worldbank.org/PovcalNet/povOnDemand.aspx. All data are the most recent as of date accessed: 15 June 2019.

Unfortunately, sub-Saharan Africa has shown far less progress than other developing regions. While the fraction living in poverty has fallen somewhat in the last decade, the headcount of individuals living in poverty rose dramatically in the 1981–2010 period, from about 205 million to about 414 million (World Bank, 2013). The concentration of poverty may make it more difficult to redress. In most countries in other regions, the poverty gap has fallen along with the poverty headcount. But between 1981 and 2010, the average income of the extremely poor hardly increased in sub-Saharan Africa, remaining near an appalling 70 cents per person per day. From 2010–19, average incomes have been rising in most SSA countries, and poverty has begun falling. But in some countries, including Burundi and Rwanda, more than half the population still lives below the $1.90 per day poverty line; and in countries including Mali and Niger more than four-fifths live below the $3.80 line. There are questions about whether the response of poverty reduction to average incomes can be increased; and the extent to which gains of growth and poverty reduction will be extended to countries so far mostly left out, or continue in countries facing commodity price declines and renewed concerns over rising debt levels.

5.4.1 The Multidimensional Poverty Index (MPI)

The MPI is the most prominent application of multidimensional poverty measurement; it incorporates three dimensions at the household level: health, education, and wealth.

Income is imperfectly measured but, even more important, the advantages provided by a given amount of income greatly differ, depending on circumstances. To capture this idea, the United Nations Development Programme (UNDP) used its *Human Poverty Index*[28] from 1997 to 2009.

In 2010, the UNDP replaced the HPI with its **Multidimensional Poverty Index (MPI)**; by building up the index from the household level, the MPI takes into account that there are negative interaction effects when people have multiple deprivations—worse poverty than can be seen by simply adding up separate deprivations for the whole country, then taking averages, and only then combining them. The components of the MPI were modified in 2018 to align better with the Sustainable Development Goals (SDGs).

Multidimensional Poverty Index (MPI) A poverty measure that identifies the poor using dual cutoffs for levels and numbers of deprivations, and then multiplies the percentage of people living in poverty times the percentage of weighted indicators for which poor households are deprived on average.

The index's creators report that they selected the three dimensions (health, education, and standard of living) and each of their corresponding indicators because they reflect problems often mentioned by the poor, they have been long considered important by the development community particularly as reflected in the Millennium Development Goals (see Chapter 1), and they are well established philosophically as human rights or basic needs; naturally, reliable data also had to be available for enough countries when selecting specific indicators for the index. Each of the three dimensions receives equal weight in the MPI.

The health dimension has two parts: nutrition and child mortality. First, a household is designated as deprived in nutrition if there is a child who is either stunted or underweight; for family members aged 15 and older, body mass index (BMI) cutoffs are the indicators for the nutrition dimension. Second, a household is considered deprived if any child has died in the family in the five-year period preceding the survey (though when the available household survey lacks information about when the child died, the indicator is a child death that occurred at any time in the past). The nutrition and mortality components are given equal weight, so each counts as one-sixth (i.e., half of the 1/3 weighting for health) toward the maximum possible deprivation in the MPI.

The education dimension also has two, equally weighted parts. First, regarding school attainment, a household is designated as deprived if no member at least 10 years old has completed 6 years of schooling (the typical duration of primary school). Second, regarding attendance, a household is deprived if any child is not attending school up to the age at which students finish eighth grade (class 8). As with health, each of the two components of the education dimension then count as one-sixth toward the maximum possible deprivation.

Finally, in terms of standard of living, equal weight is placed on six deprivations (each counting one-eighteenth toward the maximum possible total deprivation score in the MPI): lack of electricity; insufficiently safe drinking water; inadequate sanitation; inadequate housing (either roof or walls made of "rudimentary" materials and/or floor made of "natural materials," including dirt); unimproved cooking fuel; and lacking ownership of more than one of the following assets—telephone, radio, television, refrigerator, computer, animal cart, bicycle, motorbike or similar vehicle and does not own a car or truck.

Calculating deprivation in this way, individuals are then identified as "multidimensionally poor" when their family is deprived by a "weighted sum" of 33% or more (those with deprivation scores in the 20% to 33% range are considered vulnerable to multidimensional poverty).

For concreteness, consider three examples of families whose members would be classified as multidimensionally poor. First, a person would get a value of 33% and thus be considered poor by having a child in the family who was malnourished, while at the same time the most educated person in the family received less than six years of schooling. Second, a multidimensionally poor person might live in a household that had experienced a child's death and was also deprived in at least three of the six living standard indicators, which also would sum to 1/6 + 1/18 + 1/18 + 1/18 = 1/3, or 33%. Third, they could live in a household that was deprived in the other three living standard indicators and in which there was a school-age child not attending school. But if there were no health or education deprivations, a person would have to live in a family that was deprived in all six standard-of-living indicators to be deemed poor. Thus, the MPI approach identifies the very poor by measuring a range of important household deprivations directly, rather than only indirectly through income, then building the index from household measures up to the aggregate measure. Rather than using a weighted average of already aggregated statistics in an index, the approach takes into account the *multiplied or interactive harm* done when multiple deprivations are experienced by *individuals in the same family*. In essence, the approach assumes that an individual's lack of capability in one area can to a degree be made up for by other capabilities—but only to a degree. (Put differently, capabilities are treated as substitutes up to a point but then as complements.) This greatly augments measures used previously.

Finally, the actual MPI for the country (or region or group) is computed with the adjusted headcount ratio; as noted previously, a convenient way to express the resulting value is the product of the headcount ratio, H_M (the percentage of people living in multidimensional poverty) and the average intensity of deprivation, A (the percentage of weighted indicators for which poor households are deprived on average). The adjusted headcount ratio, H_MA, is a special case of the broader class of multidimensional poverty measures developed by Sabira Alkire and James Foster introduced earlier; H_MA is readily calculated, and it also satisfies some desirable properties.[29]

In its 2018 "Human Development Report Statistical Update," the UNDP presents the MPI for 105 developing countries, based on the currently available data; 20 examples are given in Table 5.5. Brazil and Mexico have very low MPI levels of just 0.016 and 0.025 respectively, while the world's most impoverished country for which data were available to compute the MPI, Niger, has an MPI value of 0.591, which actually represents a significant improvement over its 2013 score of 0.642. The UNDP reports that there are approximately 1.3 billion people living in multidimensional poverty—several hundred million more than the estimated number living on an income of less than $1.90 per day. At the broadest level, the results are not out of line with what one might expect; sub-Saharan Africa and South Asia have about the same number of MPI poor people (42% and 41% respectively); but SSA has the highest *proportion* of people living in poverty.

In addition to Niger, eight other countries had an MPI higher than 0.450, all in sub-Saharan Africa: Burkina Faso, Central African Republic, Chad, Ethiopia, Madagascar, Mali, Somalia, and South Sudan.

Countries outside Africa with high levels of multidimensional poverty for their regions include Afghanistan (with an MPI of 0.273), Cambodia (0.158), Haiti (0.231), Lao PRD (0.211), Myanmar (0.176), Nepal (0.154), Pakistan (0.228), Timor-Leste (0.211), and Yemen (0.241).

The results show simply that knowing income poverty is not enough if our concern is with multidimensional poverty; in other words, income is not a "sufficient statistic." For example, multidimensionally, Bangladesh is substantially less poor and Pakistan substantially poorer than would be predicted by these countries' income poverty (this finding may be related to some of the comparisons in the end-of-chapter case study in Chapter 1). In Africa, Ethiopia is far more multidimensionally poor and Tanzania much less so than predicted by income poverty. Most Latin American countries studied rank worse on multidimensional poverty than on income poverty, but Colombia's income and MPI poverty ranks are about the same.

The severity of poverty in Africa is also highlighted by some of the findings. MPI research has shown that in Guinea, Mali, and Niger, more than 50% are poor and live in a household in which at least one child has died. In Mozambique, Guinea, Burundi, Mali, Ethiopia, Burkina Faso, and Niger, more than 50% live in a poor household where no one has completed five years of education. Outside of Africa, 39% in India and 37% in Bangladesh live in a poor household where at least one child or woman is undernourished.[30]

Different regions in the same country can have very different MPIs, as previous research has shown. In Kenya, the MPI for Nairobi is close to that of Brazil. Central Kenya's MPI is similar to that of Bolivia. And northeastern Kenya has a worse MPI even than Niger. There are also great inequalities across ethnic groups in Kenya, with 29% of the Embu considered multidimensionally poor, compared with a staggering 96% of the Turkana and Masai peoples. Great inequalities are also found in India, in which indigenous ("tribal") peoples and low-ranked ("scheduled") castes are far poorer than people from high-ranking castes. In the Delhi and Kerala regions, just 14 to 16% are MPI poor, but in Jharkhand and Bihar, 77 to 81% are MPI poor.

Finally, changes in the MPI over time have been examined for three countries: Ghana saw its MPI halved from 0.29 to 0.14; Bangladesh saw its MPI reduced by a more modest 22%; and in Ethiopia, the MPI fell by 16% in the periods studied.

As with all indexes, the MPI has some limitations. As mentioned, data are from the household rather than the individual level (such as whether *any* child of school age is out of school or whether *any* family member is undernourished). It does not fully distinguish between past and present conditions (because its measure sometimes includes whether a child has *ever* died). It does not distinguish differences within households (such as who may use the bicycle or whether the undernourished individuals are females). Proxies are imperfect; for example, nourishment does not capture micronutrient deficiencies. Sometimes a person has to be labelled nondeprived if data are missing, so the numbers may understate poverty somewhat. Education considers only inputs such as enrolling or attending for six years, not outputs such as being able to read or other indicators of education quality. And the choice of basic assets is questionable; for example, even where a radio and a simple bicycle are present, a woman may

TABLE 5.5 Multidimensional Poverty Index for Selected Countries*

Country	Survey Year	MPI	Headcount (H_M)	Intensity (A)
Afghanistan	2015–16	0.273	0.561	0.487
Bangladesh	2014	0.194	0.411	0.473
Brazil	2015	0.016	0.038	0.425
Burundi	2016–17	0.404	0.743	0.543
Cambodia	2014	0.158	0.349	0.453
Chad	2014-15	0.535	0.859	0.623
China	2014	0.017	0.041	0.414
Colombia	2015–16	0.021	0.050	0.408
Côte d'Ivoire	2016	0.236	0.461	0.512
Dominican Republic	2014	0.016	0.041	0.389
Ethiopia	2016	0.490	0.838	0.585
Guatemala	2014–15	0.134	0.291	0.462
India	2015–16	0.121	0.275	0.439
Mali	2015	0.457	0.781	0.585
Mexico	2016	0.025	0.063	0.392
Niger	2012	0.591	0.906	0.653
Pakistan	2012–13	0.228	0.439	0.520
Rwanda	2014–15	0.266	0.558	0.477
South Africa	2014–15	0.032	0.082	0.393
Vietnam	2014	0.020	0.050	0.395

* **Notes:** The headcount in the table corresponds to the survey year. Criteria for inclusion: household surveys more recent; countries represented in major text boxes or end-of-chapter case studies; and seven notable cases that stand out for their regions not otherwise included: Afghanistan, Chad, Colombia, Ethiopia, Mali, South Africa, and Vietnam.

Source: UNDP, 'Human Development Report Statistical Update,' 2018, Table 6.

have just one dress and the children may sleep on a rough concrete floor. More broadly, as the MPI does not span all important deprivations, it is important to supplement the MPI with additional individual ("dashboard") indicators.

The MPI has provided a new and fundamentally important way to measure poverty, to help us understand how poverty levels differ across and within countries, and also how the dimensions (or composition) of poverty can differ greatly in different settings. This can assist with better design and targeting of programmes and policies and help us evaluate their performance more quickly and effectively. For example, some countries including Colombia have held high-level meetings in which cabinet officers whose portfolio topic is represented in the MPI (such as health) are made responsible for presenting the extent of progress in those sectors.

For now, because of the way living standards and human development surveys are conducted, most of the usable data is at the household level, making it difficult to "drill down" to the individual level. Household data are far better than what used to be available; in fact, the availability of household data has already had a substantial impact on improving the study of development economics. It is a great improvement to be able to focus on what is happening at the family rather than the national level. Well-designed income poverty measures such as P_2 will always be used for many purposes; but the MPI is likely to help usher in an era in which multidimensional poverty is examined in most assessments.

Chronic Poverty Research suggests that approximately one-third of all people who are income poor at any one time are chronically (always) poor. Andrew

McKay and Bob Baulch provide a well-regarded "guesstimate" that about 300 to 420 million people were chronically poor at the $1-per-day level in the late 1990s. The other two-thirds are made up of families that are vulnerable to poverty and become extremely poor from time to time. These may be divided between families usually poor but occasionally receiving enough income to cross the poverty line and families usually nonpoor but occasionally experiencing a shock that knocks them temporarily below the poverty line. Chronic poverty is concentrated in India, where the largest numbers are found, and in Africa, where the severity of poverty among the chronically poor is greatest.[31]

Problems of the poorest of the poor pose particular challenges. Ultrapoverty differs from conventional poverty in terms of depth (degree of deprivation), length (duration of time), and breadth (the number of dimensions, such as illiteracy and malnutrition).[32] The mutual reinforcement among the different dimensions of poverty can potentially result in multiple mutually reinforcing poverty traps. This makes ultrapoverty a more difficult problem to address than conventional poverty, which can more often be redressed with simpler solutions such as microfinance (see Chapter 15) plus business training. The chronic nature and severity of ultrapoverty also make short-term policies more problematic. Poverty innovators such as Fazle Hasan Abed have concluded that conventional programmes have often not reached the ultrapoor. An income-based definition of ultrapoverty is living on half the dollar-a-day poverty line, or 54 cents per day in 1993 dollars. According to International Food Policy Research Institute (IFPRI) estimates, 162 million people live below this stark income level, generally with malnutrition and other destitute conditions. The IFPRI study found that the incidence of poverty just below the poverty line has been falling faster than poverty at one-half of the poverty line. The authors concluded that "it has been easier to reach those living closer to the dollar-a-day line rather than those living well below it." They emphasised the policy implication that even more priority should be given to the ultrapoor, arguing that "the slow progress of poverty reduction for the world's most deprived indicates the presence of poverty traps, or conditions from which the poorest individuals or groups cannot emerge without outside assistance."[33]

Some NGOs have responded to this problem, such as BRAC's Targeting the Ultrapoor Programme (TUP, now called the Graduation Programme), and Grameen's Beggars Programme, both introduced in the case study for Chapter 11.

The prospect for ending poverty depends critically on two factors: first, the rate of economic growth—provided it is undertaken in a shared and sustainable way—and second, the level of resources devoted to poverty programmes and the quality of those programmes.

5.5 Economic Characteristics of High-Poverty Groups

So far we have painted a broad picture of the income distribution and poverty problem in developing countries. We have argued that the magnitude of absolute poverty results from a combination of low per capita incomes and highly unequal distributions of that income. Clearly, for any given distribution of income, the higher the level of per capita income, the lower the numbers of the absolutely

poor. But higher levels of per capita income are no guarantee of lower levels of poverty. An understanding of the nature of the size distribution of income is therefore central to any analysis of the poverty problem in low-income countries.

But painting a broad picture of absolute poverty is not enough. Before we can formulate effective policies and programmes to attack poverty at its source, we need some specific knowledge of these high-poverty groups and their economic characteristics.

5.5.1 Children and Poverty

In most countries, the level of poverty is greater among children than among adults. The 2018 MPI was applied specifically to disaggregate the extent of child poverty, finding that half of all those in MPI poverty are children. This means that more than a third of all children globally are living in multidimensional poverty.

UNICEF has found that extreme poverty disproportionately affects children. In a 2016 report, UNICEF estimated that close to 385 million children were living in extremely poor households in 2013, so that they represented about half of the extreme poor, even though children represented only a third of the population.[34]

5.5.2 Women and Poverty

Women make up a substantial majority of the world's poor. If we compared the lives of the inhabitants of the poorest communities throughout the developing world, we would discover that virtually everywhere women and children experience the harshest deprivation. They are more likely to be poor and malnourished and less likely to receive medical services, clean water, sanitation, and other benefits.[35] The prevalence of female-headed households, the lower earning capacity of women, and their limited control over their spouses' income all contribute to this disturbing phenomenon. In addition, women have less access to education, formal-sector employment, social security, and government employment programmes. These facts combine to ensure that poor women's financial resources are meagre and unstable relative to men's.

A highly disproportionate number of the ultrapoor live in households headed by women, in which there are generally no male wage earners. Because the earning potential of women is considerably below that of their male counterparts, women are more likely to be among the very poor. In general, women in female-headed households have less education and lower incomes. Furthermore, the larger the household is, the greater the strain on the single parent and the lower the per capita food expenditure.

A portion of the income disparity between male- and female-headed households can be explained by the large earnings differentials between men and women. In addition to the fact that women are often paid less for performing similar tasks, in many cases they are essentially barred from higher-paying occupations. In urban areas, women are much less likely to obtain formal employment in private companies or public agencies and are frequently restricted to illegal, low-productivity jobs. The illegality of piecework, as in the garment industry, prevents it from being regulated and renders it exempt from minimum-wage laws or social security benefits. Even when women receive conventional wage payments

in factory work, minimum wage and safety legislation may be flagrantly ignored. Similarly, rural women have less access to the resources necessary to generate stable incomes and are frequently subject to laws that further compromise earning potential. Legislation and social custom often prohibit women from owning property or signing financial contracts without a husband's signature. Although there are a growing number of exceptions, government employment or income-enhancing programmes are accessible primarily if not exclusively by men, exacerbating existing income disparities between men and women.

But household income alone fails to describe the severity of women's relative deprivation. Because a higher proportion of female-headed households are situated in the poorest areas, which have little or no access to government-sponsored services such as piped water, sanitation, and health care, household members are more likely to fall ill and are less likely to receive medical attention. In addition, children in female-headed households are less likely to be enrolled in school and more likely to be working in order to provide additional income (see Chapter 8).

The degree of economic hardship may also vary widely within a household. We have already discussed the fact that GNI per capita is an inadequate measure of development because it fails to reflect the extent of absolute poverty. Likewise, household income is a poor measure of individual welfare because the distribution of income within the household may be quite unequal. In fact, among the poor, the economic status of women provides a better indication of their own welfare, as well as that of their children. Existing studies of intrahousehold resource allocation clearly indicate that in many regions of the world, there exists a strong bias against females in areas such as nutrition, medical care, education, and inheritance. Moreover, empirical research has shown that these gender biases in household resource allocation significantly reduce the rate of survival among female infants. This is one reason why recorded female–male sex ratios are so much below their expected values, primarily in Asian countries, that well over 100 million girls and women are said to be "missing."[36] The favour shown toward boys in part reflects the fact that men are perceived to have a greater potential for contributing financially to family survival. This is not only because well-paying employment for women is unavailable but also because daughters are often married to families outside the village, after which they become exclusively responsible to their in-laws and thus cease contributing to their family of origin (these problems are explored further in Chapters 6 and 8).

The extent of these internal biases is strongly influenced by the economic status of women. Studies have found that where women's share of income within the home is relatively high, there is less discrimination against girls, and women are better able to meet their own needs as well as those of their children. When household income is marginal, most of women's income is contributed toward household nutritional intake. Since this fraction is considerably smaller for men, a rise in male earnings leads to a less than proportionate increase in the funds available for the provision of daily needs. It is thus unsurprising that programmes designed to increase nutrition and family health are more effective when targeting women than when targeting men. In fact, significant increases in total household income do not necessarily translate into improved nutritional status (see Chapter 8). The persistence of low levels of living among women and children is common where the economic status of women remains low. Box 5.2 provides some views of the poor on gender relations, drawn from the *Voices of the Poor* study introduced in Chapter 1.

BOX 5.2 Development Policy: Problems of Gender Relations in Developing Countries: Voices of the Poor

Sister, if you don't beat them, they'll stop being good. And if they're good and you beat them, they'll stay that way.

—A man in Bangladesh

When my husband died, my in-laws told me to get out. So I came to town and slept on the pavement.

—A middle-aged widow in Kenya

When I was working, I used to decide. When she is working, she owns her money and does anything she wishes.

—A man from Vila Junqueira, Brazil

Problems have affected our relationship. The day my husband brings in money, we are all right together. The day he stays at home [out of work], we are fighting constantly.

—A woman from El Gawaber, Egypt

The unemployed men are frustrated because they can no longer play the part of family providers and protectors. They live on the money made by their wives and feel humiliated because of this.

—An elderly woman from Uchkun, Kyrgyzstan

When a woman gives her opinion, they [men] make fun of her and don't pay attention. If women go to a meeting, they don't give their opinion.

—A woman in Las Pascuas, Bolivia

Women's control over household income and resources is limited for a number of reasons. Of primary importance is the fact that a relatively large proportion of the work performed by women is unremunerated—for example, collecting firewood and cooking—and may even be intangible, as with parenting. Women's control over household resources may also be constrained by the fact that many women from poor households are not paid for the work they perform in family agriculture or business. It is common for the male head of household to control all funds from cash crops or the family business, even though a significant portion of the labour input is provided by his spouse. In addition, in many cultures, it is considered socially unacceptable for women to contribute significantly to household income, and hence women's work may remain concealed or unrecognised. These combined factors perpetuate the low economic status of women and can lead to strict limitations on their control over household resources.

Development policies that increase the productivity differentials between men and women are likely to worsen earnings disparities as well as further erode women's economic status within the household. Since government programmes to alleviate poverty frequently work almost exclusively with men, they tend to exacerbate these inequalities. In urban areas, training programmes to increase earning potential and formal-sector employment are generally geared to men, while agricultural extension programmes promote male-dominated crops, frequently at the expense of women's vegetable plots (see Chapter 9). Studies have shown that development efforts can actually increase women's workload while at the same time reduce the share of household resources over which they exercise control. Consequently, women and their dependents remain the most economically vulnerable group in developing countries.

The fact that the welfare of women and children is strongly influenced by the design of development policy underscores the importance of integrating women

into development programmes. To improve living conditions for the poorest individuals, women must be drawn into the economic mainstream. This would entail increasing female participation rates in educational and training programmes, formal-sector employment, and agricultural extension programmes. It is also of primary importance that precautions be taken to ensure that women have equal access to government resources provided through schooling, services, employment, and social security programmes. Legalising informal-sector employment where the majority of the female labour force is employed would also improve the economic status of women.

The consequences of declines in women's relative or absolute economic status have both ethical and long-term economic implications. Any process of growth that fails to improve the welfare of the people experiencing the greatest hardship, broadly recognised to be women and children, has failed to accomplish one of the principal goals of development. In the long run, the low status of women is likely to translate into slower rates of economic growth. This is true because the educational attainment and future financial status of children are much more likely to reflect those of the mother than those of the father. Thus, the benefits of current investments in human capital are more likely to be passed on to future generations if women are successfully integrated into the growth process. And considering that human capital is an essential prerequisite for growth, education and enhanced economic status for women are critical to meeting long-term development objectives. (We examine these issues in greater detail in Chapter 8.)

As feminist development economists have often expressed it, official poverty programmes cannot simply "add women and stir." Women-centred poverty strategies often require us to challenge basic assumptions. The harsher conditions for women and women's crucial role in a community's escape from poverty mean that involvement of women cannot be left as an afterthought but will be most effective if it is the *first* thought—and the consistent basis for action—when addressing poverty.

5.5.3 Ethnic Minorities, Indigenous Populations, and Poverty

A final generalisation about the incidence of poverty in the developing world is that it falls especially heavily on minority ethnic groups and indigenous populations. In recent years, domestic conflicts and even civil wars have arisen out of ethnic groups' perceptions that they are losing out in the competition for limited resources and job opportunities, sometimes involving harsh government sponsored repression and even genocide to crush indigenous rights movements, such as in Guatemala (see the case study for Chapter 14). The poverty problem is even more serious for indigenous peoples, whose numbers are estimated at 370 million in over 5,000 different groups in more than 70 countries.[37]

Although detailed data on the relative poverty of minority ethnic and indigenous peoples are difficult to obtain (for political reasons, few countries wish to highlight these problems), researchers have compiled data on the poverty of indigenous people in Latin America.[38] The results clearly demonstrate that a majority of indigenous groups live in greater extreme poverty and that being

TABLE 5.6 Indigenous Poverty in Latin America

Population below the Poverty Line (%), Early 1990s			Change in Poverty (%), Various Periods		
Country	Indigenous	Nonindigenous	Period	Indigenous	Nonindigenous
Bolivia	64.3	48.1	1997–2002	0	−8
Guatemala	86.6	53.9	1989–2000	−15	−25
Mexico	80.6	17.9	1992–2002	0	−5
Peru	79.0	49.7	1994–2000	0	+ 3

Sources: Data for the left side of the table from Psacharopoulos, George, and Patrinos, Harry A. (1994), 'Indigenous people and poverty in Latin America,' *Finance and Development*, 31: 41, used with permission; data for the right side of the table from Gillette Hall and Harry A. Patrinos, eds., *Indigenous Peoples, Poverty, and Human Development in Latin America, 1994–2004* (New York: Palgrave Macmillan, 2006).

indigenous greatly increases the chances that an individual will be malnourished, illiterate, in poor health, and unemployed. For example, the research has shown that in Mexico, over 80% of the indigenous population is poor, compared to 18% of the nonindigenous population. Table 5.6 shows that similar situations exist in countries such as Bolivia, Guatemala, and Peru (not to mention Native American populations in the United States and Canada). Moreover, a 2006 World Bank study confirmed that all too little progress had been made. Whether we speak of Tamils in Sri Lanka, the Rohingya in Myanmar, Dalits (Untouchables) in India, or Tibetans in China, the poverty plight of minorities is often as serious as that of indigenous peoples.

Rural Poverty Well over two-thirds of the poor are located in rural areas, primarily engaged in agricultural and other natural resource-based livelihoods, largely as small farmers or as low-paid farmworkers. We only mention this briefly here, as we examine rural poverty problems in detail in Chapters 9 and 10.

Poor Countries Finally, it should be noted that the poor come from poor countries. Although this may seem like a trivial observation, it is actually a useful note of optimism. The negative relationship between poverty and per capita income suggests that if higher incomes can be achieved, poverty will be reduced, if only because of the greater resources that countries will have available to tackle poverty problems and the growth of civil society and the voluntary sector. Unfortunately, as noted earlier, a high level of absolute poverty can also retard a country's growth prospects. Moreover, many of the poorest countries in sub-Saharan Africa experienced outright declines in per capita income throughout the 1980s and 1990s and in some cases during the first decade of this century. Among those that are growing, at current growth rates it would take decades to reach the levels of income at which poverty tends to be eradicated. After all, Brazil, which has been solidly middle-income for decades, still has citizens living on less than $1.90 per day. Income poverty, malnutrition, low school attendance, and child labour in Brazil finally showed a substantial decline after the turn of this century, when antipoverty and social safety net programmes were greatly expanded. We can conclude that higher national incomes greatly facilitate poverty reduction, while at the same time, poverty still needs to be addressed directly.

5.6 Growth and Poverty

Are the reduction of poverty and the acceleration of growth in conflict? Or are they complementary? Traditionally, a body of opinion held that rapid growth is bad for the poor because they would be bypassed and marginalised by the structural changes of modern growth. Beyond this, there had been considerable concern in policy circles that the public expenditures required for the reduction of poverty would entail a reduction in the rate of growth. The concerns that concentrated efforts to lower poverty would slow the rate of growth paralleled the arguments that countries with lower inequality would experience slower growth. In particular, if there were redistribution of income or assets from rich to poor, even through progressive taxation, the concern was expressed that savings would fall. However, while the middle class generally has the highest savings rates, the marginal savings rates of the poor, when viewed from a holistic perspective, are not small. In addition to financial savings, the poor tend to spend additional income on improved nutrition, education for their children, improvements in housing conditions, and other expenditures that, especially at poverty levels, represent investments rather than consumption. There are at least five reasons why policies focused toward reducing poverty levels need not lead to a slower rate of growth—and indeed could help to accelerate growth.

First, *widespread poverty creates conditions in which the poor have no access to credit,* are unable to finance their children's education, and, in the absence of physical or monetary investment opportunities, have many children as a source of old-age financial security. Moreover, lack of credit denies people living in poverty opportunities for entrepreneurship that could otherwise help to spur growth. Together, these factors cause per capita growth to be less than what it would be if there were less poverty.

Second, a wealth of empirical data bears witness to the fact that, unlike the historical experience of the now-developed countries, *the rich in many contemporary poor countries are generally not noted for their frugality or for their desire to save and invest* substantial proportions of their incomes in the local economy.

Third, the *low incomes and low levels of living for the poor, which are manifested in poor health, nutrition, and education, can lower their economic productivity and thereby lead directly and indirectly to a slower-growing economy.* Strategies to raise the incomes and levels of living of the poor will therefore contribute not only to their material well-being but also to the productivity and income of the economy as a whole.[39] (These issues are considered further in Chapter 8.)

Fourth, *raising the income levels of the poor will stimulate an overall increase in the demand for locally produced necessity products* such as food and clothing, whereas the rich tend to spend more of their additional incomes on imported luxury goods. Rising demand for local goods provides a greater stimulus to local production, local employment, and local investment. Such demand thus creates the conditions for rapid economic growth and a broader popular participation in that growth.[40]

Fifth, *a reduction of mass poverty can stimulate healthy economic expansion by acting as a powerful material and psychological incentive to widespread public participation in the development process*. By contrast, wide income disparities and substantial absolute poverty can act as powerful material and psychological disincentives to

economic progress. They may even create the conditions for an ultimate rejection of progress by the masses, impatient at the pace of progress or its failure to alter their material circumstances.[41] We can conclude, therefore, that promoting rapid economic growth and reducing poverty are not mutually conflicting objectives.[42]

That dramatic reductions in poverty need not be incompatible with high growth is seen both in case studies and in the cross-national comparisons of data. Countries where poverty has been reduced the most tend to have had sustained growth; at the same time, growth does not guarantee poverty reduction. From 1980–2005, China experienced the highest growth rate in the world and also the most dramatic reductions in poverty. The headcount of the poor in China fell from 634 million in 1981 to 128 million in 2004, with the corresponding headcount ratio falling from 64% to 10%. This did not occur merely as a result of high growth. Policies actively encouraged modern-sector enlargement. Moreover, China has worked with the World Bank and other development agencies to improve its poverty reduction programmes and has built on its long-standing efforts to provide at least minimal education and health care for its people as a firm foundation for long-term progress. Although the plight of many peasants has worsened in recent years, especially in interior regions, and inequality has greatly increased, the positive overall results of China's efforts to fight extreme poverty are apparent. Recent dramatic reductions of poverty in Vietnam have followed a similar pattern.

Richer countries strongly tend to have low levels of absolute poverty. Through one means or another—the availability of employment and entrepreneurship opportunities and greater public and NGO assistance—people who live in rich countries tend to escape from poverty. Among developing countries, there is evidence that countries with faster overall rates of per capita income growth also tend on average to have faster rates of per capita income growth among those in the bottom quintile of the income distribution, though the proportions vary widely. While we cannot passively count on even sustainable growth by itself to end absolute poverty, ending poverty can be greatly facilitated through wise and shared stewardship of the various resources provided by growth.[43]

Certainly, the relationship between economic growth and progress among the poor does not by itself indicate causality. Some of the effect probably runs from improved incomes, education, and health among the poor to faster overall growth (as suggested by some of the arguments listed previously). Moreover, as we have noted, poverty reduction is possible without rapid growth. But whatever the causality, it is clear that growth and poverty reduction are entirely compatible objectives.

Functional distribution of income (factor share distribution of income)
The distribution of income to factors of production without regard to the ownership of the factors.

Factors of production
Resources or inputs required to produce a good or a service, such as land, labour, and capital.

5.7 Labour, the Functional Distribution of Income, and Inclusive Development

5.7.1 The Functional Distribution

A different measure of income distribution used by economists, the **functional or factor share distribution of income**, is based on the share of total national income that each of the **factors of production** (land, labour, and capital) receives. Instead of looking at individuals as separate entities, the theory of functional

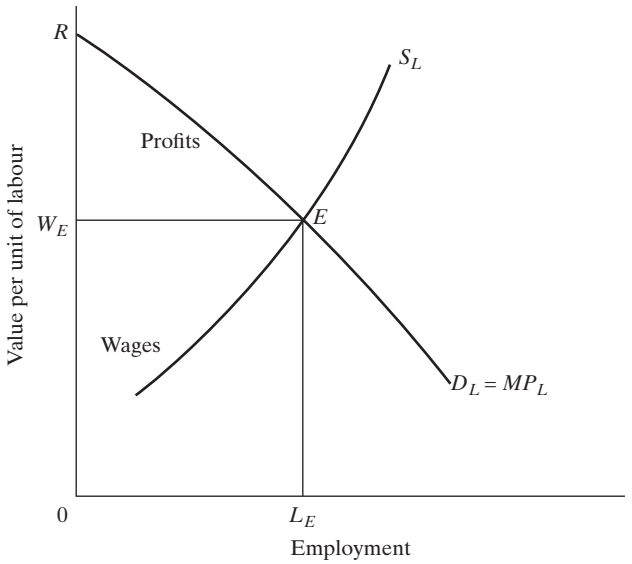
income distribution enquires into the percentage that labour receives as a whole and compares this with the percentages of total income distributed in the form of rent, interest, and profit (i.e., the returns to land and financial and physical capital). Although specific individuals may receive income from all these sources, that is not a matter of concern for the functional approach.

A sizeable body of theoretical literature has been built up around analysing the concept of functional income distribution. It attempts to explain the income of a factor of production by the contribution that this factor makes to production. In the traditional neoclassical approach, supply and demand curves are assumed to determine the unit prices of each productive factor. When these unit prices are multiplied by quantities employed on the assumption of efficient (minimum-cost) factor utilisation, we get a measure of the total payment to each factor. For example, the supply of and demand for labour are assumed to determine its market wage. When this wage is then multiplied by the total level of employment, we get a measure of total wage payments, also sometimes called the *total wage bill.*

Figure 5.13 provides a simple diagrammatic illustration of the traditional neoclassical theory of functional income distribution. For simplicity, we assume that there are only two factors of production: capital, which is a fixed (given) factor, and labour, which is the only variable factor. Under competitive market assumptions, the demand for labour will be determined by labour's marginal product (i.e., additional workers will be hired up to the point where the value of their marginal product equals their real wage). But in accordance with the principle of diminishing marginal products, this demand for labour will be a declining function of the numbers employed. Such a negatively sloped labour demand curve is shown by line D_L in Figure 5.13. With a traditional, neoclassical, upward-sloping labour supply curve S_L, the equilibrium wage will be equal to W_E and the equilibrium level of employment will be L_E. Total national output (which equals total national income) will be represented by the area $0REL_E$.[44] This national income will be distributed in two shares: $0W_EEL_E$ going to workers in the form of wages and W_ERE remaining as capitalist profits (the return to owners of capital). Hence, in a competitive market economy with constant-returns-to-scale production functions (a doubling of all inputs doubles output), factor prices are determined by factor supply and demand curves, and factor shares always combine to exhaust the total national product. Income is distributed by function—labourers are paid wages, owners of land receive rents, and capitalists obtain profits. It is a neat and logical theory in that each and every factor gets paid only in accordance with what it contributes to national output, no more and no less. In fact, as you may recall from Chapter 3, this model of income distribution is at the core of the Lewis theory of modern-sector growth based on the reinvestment of rising capitalist profits.

However, the relevance of the traditional neoclassical functional theory is diminished by its failure to take into account the important role and influence of nonmarket forces such as power in determining these factor prices—for example, monopsony power of employers, collective bargaining between employers and trade unions in setting modern-sector wage rates, and monopoly power of wealthy landowners and other elites to manipulate prices on capital, land, and output to their own personal advantage.

FIGURE 5.13 Functional Income Distribution in a Market Economy: An Illustration



The traditional neoclassical interpretation aside, aggregate labour supply and demand analysis remains useful for illustrating policy debates. Appendix 5.1 examines further the economic implications of factor price distortions; and we return to consider their implications for policy at the end of this chapter. In Chapter 7, we further address potential implications of wage floors; and in Chapter 8 use a modified labour supply analysis to help identify effective policies for addressing child labour.

5.7.2 Labour and Inclusive Development

Most people receive their income primarily from labour—that is, from the work that they do. Approximately 3.3 billion people currently work. But in most developing countries, only a minority of labour income comes from what is generally thought of as a "job" in high-income OECD countries. Having work does not mean having a wage. Close to half of the people in low- and middle-income countries are engaged in self-employment in different forms, especially farming and operating microenterprises in urban and peri-urban as well as rural areas. Most people living in poverty or vulnerable to falling into poverty already work, for long hours if they are physically able; but they find themselves limited to low-productivity work, with irregular incomes. Such income may be occasional, in kind, or otherwise informal, including activities such as subsistence farming and other natural resource-based livelihoods, in areas where property rights are insecure. Those who are employed are all too often subject to abuses.

Work is fundamental to economic development in several ways. Work is not only the way most people get most of their income, but the type of work a person does largely constrains their possibilities of getting higher income in the future. More broadly, a job is an important way that people gain and maintain capabilities. People spend a high percentage of their time working at their jobs, so it is hard to overstate the importance of the quality of that experience. For example, skills and attitudes that people develop at their jobs play a significant role in how people perceive their abilities and preferences in other spheres of life. People with jobs that develop multiple capabilities are more engaged in civic affairs. Thus, high inequality in labour markets can serve to magnify other forms of inequalities.

The availability of work cannot be taken for granted. With the growth of population, hundreds of millions of net new jobs will be needed over the next decade. Growth alone may not generate jobs—at least not good-quality jobs. Some jobs may facilitate economic development; others may offer little more than current income without prospect of future gains, and may even prove unsustainable. Most people appear to prefer a stable job with a regular salary over microentrepreneurship, as evidenced, for example, when workers drop their microenterprise activity after securing a regular factory job. There are approaches to assist microentrepreneurs, such as microfinance combined with other services (see Chapter 15), but longer term, one of the best ways to assist them is to help support job creation.

Perhaps unfortunately, the question "what do you do?" is typically intended and interpreted to mean "how do you earn money?." Much essential work is unpaid, including caregiving for children, seniors, and the sick; cooking and cleaning at home; collecting water and wood for cooking; and participating in community organisations. A holistic view of economic development must take into account ways to recognise these activities as work to be valued.

There is a relatively broad consensus that, taking into account a nation's current development conditions, good government policy can facilitate creation of quality jobs; while poorly designed or implemented policies can hinder quality job creation. A major policy challenge is to determine which types of job creation efforts would have the greatest net benefits given a country's current level of economic development and other constraints. There are substantial differences in perspective about the best way to proceed. One conceptual framework is loosely analogous to that of growth diagnostics (a topic examined in Chapter 4). Job creation diagnostics would seek to identify the binding constraints on quality job creation, and then direct policy to relax those constraints. Some constraints are far more readily addressed than others. Building and maintaining infrastructure is largely a matter of political will. But when the constraint is law and social norms that prevent women from working outside narrowly defined boundaries, effective remedies require broad engagement of society over time, in addition to legislation and enforcement.[45]

The analysis of labour in economic development is addressed in several other contexts in this text: comparative labour productivity in Chapter 2; the role of labour in economic growth in Chapter 3; the importance of labour complementarities such as illuminated by the "O-ring theory" in Chapter 4; the importance of the opportunity cost of women's labour time in fertility decisions in Chapter 6; the incentive for rural-to-urban labour migration and the characteristics of work

in the urban informal sector in Chapter 7; child labour, and the critical importance of human capital in Chapter 8; and issues in agricultural labour markets in Chapter 9.

5.8 Policy Options on Income Inequality and Poverty: Some Basic Considerations

5.8.1 Areas of Intervention

Developing countries that aim to reduce poverty and excessive inequalities in their distribution of income need to know how best to achieve their aim. What kinds of economic and other policies might governments in developing countries adopt to reduce poverty and inequality while maintaining or even accelerating economic growth rates? As we are concerned here with moderating the size distribution of incomes in general and raising the income levels of people living in poverty, it is important to understand the various determinants of the distribution of income in an economy and see in what ways government intervention can alter or modify their effect. The main focus of this section is on the relationship between income inequality and poverty. We examine the effects of policies and programmes involving nonincome aspects of poverty in the subsequent chapters in part two—particularly with respect to health, nutrition, and education in Chapter 8.

We can identify four broad areas of possible government policy intervention, which correspond to the following four major elements in the determination of a developing economy's distribution of income.

1. *Altering the functional distribution*—the returns to labour, land, and capital as determined by factor prices, utilisation levels, and the consequent shares of national income that accrue to the owners of each factor.
2. *Mitigating the size distribution*—the functional income distribution of an economy translated into a size distribution by knowledge of how ownership and control over productive assets and labour skills are concentrated and distributed throughout the population. The distribution of these asset holdings and skill endowments ultimately determines the distribution of personal income.
3. *Moderating (reducing) the size distribution at the upper levels* through progressive taxation of personal income and wealth. Such taxation increases government revenues, which decrease the share of disposable income of the very rich—revenues that can, with good policies, be invested in human capital and rural and other lagging infrastructure needs, thereby promoting inclusive growth. (An individual or family's **disposable income** is the actual amount available for expenditure on goods and services and for saving.)
4. *Moderating (increasing) the size distribution at the lower levels* through public expenditures of tax revenues to raise the incomes of the poor either directly (e.g., by conditional or unconditional cash transfers) or indirectly (e.g., through public employment creation such as local infrastructure projects or the provision of primary education and health care). Such public policies

Disposable income The income that is available to households for spending and saving after personal income taxes have been deducted.

raise the real income levels of the poor above what their personal income levels would otherwise be, and, as will become clear in later chapters, can do so sustainably when they build the capabilities and assets of people living in poverty.

5.8.2 Altering the Functional Distribution of Income Through Relative Factor Prices: Minimum Wage and Capital Subsidy Debates

Altering the functional distribution is a traditional economic approach. It is argued that as a result of institutional constraints and faulty government policies, the relative price of labour in the formal, modern, urban sector is higher than what would be determined by the free interplay of the forces of supply and demand. For example, the power of trade unions to raise minimum wages to artificially high levels (higher than those that would result from supply and demand) even in the face of widespread unemployment is often cited as an example of the "distorted" price of labour. From this it is argued that measures designed to reduce the price of labour relative to capital (e.g., through market-determined wages in the public sector or public wage subsidies to employers) will cause employers to substitute labour for capital in their production activities. Such factor substitution increases the overall level of employment and ultimately raises the incomes of the poor, who have been excluded from modern-sector employment and typically possess only their labour services. Put differently, artificially increased modern-sector wages reduce the rate of modern-sector enlargement growth, thus harming the poor. (For details of this analysis, see Appendix 5.1.)

However, in recent years, some scholars and practitioners, particularly from the developing world, argue that the impact of minimum wages on poverty is more nuanced in theory and practice, particularly when the possibility of income sharing among the poor is accounted for. In India, the Self-Employed Women's Association argues that minimum wages have beneficial effects even on informal-sector workers. And research by Darryl McLeod and Nora Lustig concludes that higher minimum wages are correlated with reductions in poverty.[46] Thus, actual impacts may vary, depending on local circumstances. These qualifications are particularly relevant for relatively low-skill and informal activities, such as garment stitching, beedi rolling, and incense rolling, in which workers have commonly held very low bargaining power, often due to monopsony, if not extramarket forces. Impacts of minimum wages are examined further in Chapter 7.

In addition, often the price of capital equipment is "institutionally" set at artificially low levels (below what supply and demand would dictate) through various public policies such as investment incentives, tax allowances, subsidised interest rates, overvalued exchange rates, and low tariffs on capital goods imports such as tractors and automated equipment relative to tariffs set on consumer goods. If these special privileges and capital subsidies were removed so that the price of capital would rise to its true "scarcity" level, producers would have a further incentive to increase their utilisation of the abundant supply of labour and lower their uses of scarce capital. Moreover, owners of capital (both

physical and financial) would not receive the artificially high economic returns they now enjoy.

Because factor prices are assumed to function as the ultimate signals and incentives in any economy, correcting these prices (i.e., lowering the relative price of labour and raising the relative price of capital) would, in general, not only increase productivity and efficiency but also reduce inequality by providing more wage-paying jobs for currently unemployed or underemployed unskilled and semiskilled workers. It would also lower the artificially high incomes of owners of capital. Removal of such *factor-price distortions* would therefore go a long way toward combining more growth, efficiently generated, with higher employment, less poverty, and greater equality (a more detailed analysis is presented in Appendix 5.1).

We may conclude that there is much merit to the traditional factor-price distortion argument and that correcting prices should contribute to a reduction in poverty and an improved distribution of income. How much it actually contributes will depend on the degree to which firms and farms switch to more labour-intensive production methods as the relative price of labour falls and the relative price of capital rises. These are important empirical questions, the answers to which will vary from country to country. Moreover, recent research would suggest that a close study of local conditions is needed before concluding that minimum wages slow progress against poverty in all circumstances.

5.8.3 Modifying the Size Distribution Through Increasing Assets of the Poor

Given correct resource prices and utilisation levels for each type of productive factor (labour, land, and capital), we can arrive at estimates for the total earnings of each asset. But to translate this functional income into personal income, we need to know the distribution and ownership concentration of these assets among and within various segments of the population. Here we come to what is probably the most important fact about the determination of income distribution within an economy: The ultimate cause of the unequal distribution of personal incomes in most developing countries is the unequal and highly concentrated patterns of **asset ownership** (wealth) in these countries. The principal reason why 20% of their population often receives over 50% of the national income (see Table 5.2) is that this 20% probably owns and controls well over 90% of the productive and financial resources, especially physical capital and land but also financial capital (stocks and bonds) and human capital in the form of better education and health. Correcting factor prices is certainly not sufficient to reduce income inequalities substantially or to eliminate widespread poverty where physical and financial asset ownership—and education—are highly concentrated.

Asset ownership The ownership of land, physical capital (factories, buildings, machinery, etc.), human capital, and financial resources that generate income for owners.

Redistribution policies Policies geared to reducing income inequality and expanding economic opportunities in or-der to promote development, including income tax policies, rural development policies, and publicly financed services.

Land reform A deliberate attempt to reorganize and transform existing agrarian systems with the intention of improving the distribution of agricultural incomes and thus fostering rural development.

It follows that the second and perhaps more important line of policy to reduce poverty and inequality is to focus directly on reducing the concentrated control of assets, the unequal distribution of power, and the unequal access to educational and income-earning opportunities that characterise many developing countries. A classic case of such **redistribution policies** as they relate to the rural poor, who comprise 70% to 80% of the target poverty group, is **land reform**. The basic purpose of land reform is to transform tenant cultivators into smallholders

who will then have an incentive to raise production and improve their incomes. But, as we explain in Chapter 9, land reform may be a weak instrument of income redistribution if other institutional and price distortions in the economic system prevent small farm holders from securing access to much-needed critical inputs such as credit, fertilisers, seeds, marketing facilities, and agricultural education. Similar reforms in urban areas could include the provision of commercial credit at affordable rates (rather than through traditional, high-interest moneylenders) to small entrepreneurs (microcredit—for details, see Chapter 15 and the case study on the Grameen Bank at the end of that chapter) so that they can expand their business and provide more jobs to local workers.

In addition to the redistribution of existing productive assets, dynamic redistribution policies could be gradually pursued. For example, governments could facilitate the transfer of a certain proportion of annual savings and investments to low-income groups so as to bring about a more gradual and perhaps politically more acceptable redistribution of additional assets as they accumulate over time. This is what is often meant by the expression "redistribution from growth." However, such a gradual redistribution from growth may be almost as politically difficult as redistribution of existing assets, especially in the context of very unequal power structures.

Human capital in the form of education and skills is another example of the unequal distribution of productive asset ownership. Public policy should therefore promote wider access to educational opportunities as a means of increasing income-earning potential for more people. But as in the case of land reform, the mere provision of greater access to additional education is no guarantee that the poor will be better off unless complementary policies—for example, the provision of more productive employment opportunities for the educated—are adopted to capitalise on this increased human capital. The relationship among education, employment, and development is discussed further in Chapter 8.

People living in poverty tend to have common problems, but the prevalent forms of deprivation and social exclusion can differ considerably even across regions within a country. Policymakers need to have a strong knowledge base. Essential to the process is a means to find out and utilise what the poor know about their own conditions of poverty. Practitioners stress that the more that people living in poverty are engaged in setting the agenda, the more effective programmes to increase their assets and capabilities tend to be. But attention must be given to different segments of the local poor communities, as different priorities are often found between men and women, between ethnic groups, and between castes.

5.8.4 Progressive Income and Wealth Taxes

Any national policy attempting to improve the living standards of the bottom 40% must secure sufficient financial resources to transform paper plans into programme realities. The major source of such development finance is the direct and progressive taxation of both income and wealth. Direct **progressive income taxes** focus on personal and corporate incomes, with the rich required to pay a progressively larger percentage of their total income in taxes than the poor. Taxation on wealth (the stock of accumulated assets and income) typically involves personal and corporate property taxes but may also include progressive

Progressive income tax A tax whose rate increases with increasing personal incomes.

inheritance taxes. In either case, the burden of the tax is designed to fall most heavily on the upper-income groups.

In reality, in many developing countries (and some developed countries), the gap between what is supposed to be a progressive tax structure and what different income groups actually pay can be substantial. Progressive tax structures on paper often turn out to be **regressive taxes** in practice, in that the lower- and middle-income groups often end up paying a proportionally larger share of their incomes in taxes than the upper-income groups. The reasons for this are simple. The poor are often taxed at the source of their incomes or expenditures (by withholding taxes from wages, general poll taxes, or **indirect taxes** levied on the retail purchase of goods such as cigarettes and beer). By contrast, the rich derive by far the largest part of their incomes from the return on physical and financial assets, which often go unreported. They often also have the power and ability to avoid paying taxes without fear of government reprisal. Policies to enforce progressive rates of direct taxation on income and wealth, especially at the highest levels, are what are most needed in this area of redistribution activity. (See Chapter 15 for a further discussion of taxation for development.)

Regressive tax A tax structure in which the ratio of taxes to income tends to decrease as income increases.

Indirect taxes Taxes levied on goods ultimately purchased by consumers, including customs duties (tariffs), excise duties, sales taxes, and export duties.

5.8.5 Direct Transfer Payments and the Public Provision of Goods and Services

The direct provision of tax-financed **public consumption** goods and services to the very poor is another potentially important instrument of a comprehensive policy designed to eradicate poverty. Examples include public health projects in rural villages and urban fringe areas, school lunches and preschool nutritional supplementation programmes, and the provision of clean water and electrification to remote rural areas. Direct money transfers and subsidised food programmes for the urban and rural poor, as well as direct government policies to keep the prices of essential foodstuffs low, represent additional forms of public consumption **subsidies**.

Public consumption All current expenditures for purchases of goods and services by all levels of government, including capital expenditures on national defence and security.

Subsidy A payment by the government to producers or distributors in an industry to prevent the decline of that industry, to reduce the prices of its products, or to encourage hiring.

Direct transfers and subsidies can be highly effective, but they need to be designed carefully. Four significant problems require attention. First, when resources for attacking poverty are limited—as they always are—they need to be directed to people who are genuinely poor. Second, it is important that beneficiaries not become unduly dependent on the poverty programme; in particular, we do not want to give the poor less incentive to build the assets, such as education, that can enable them to stay out of poverty. But a "safety net" can also be valuable to encourage the poor to accept a more entrepreneurial attitude toward their microenterprises. This is much more possible when the poor do not fear that their children will suffer terrible consequences if their small businesses fail. Third, we do not want to divert people who are productively engaged in alternative economic activities to participate in the poverty programme instead. Finally, poverty policies are often limited by resentment from the nonpoor, including those who are working hard but are not very far above the poverty line themselves.

When a subsidy of goods consumed by the poor is planned, it should be targeted to the geographic areas where the poor are found and should emphasise goods that nonpoor people do not consume. This helps conserve resources for the programme and minimises efforts by nonpoor people to benefit from

the programme. For example, nutritional supplements can be provided for any woman who brings her baby to the neighbourhood poverty programme centre located in villages and neighbourhoods with a high incidence of absolute poverty. Although more affluent mothers could use the programme, few would risk the stigma of venturing into the poorer villages and neighbourhoods, let alone the centre itself. The nutritional supplements help poor mothers and their small children stay healthy and thus help break the cycle of poverty.

In addition, it may be useful to impose a work requirement before food aid is provided. This was done in the well-known Bangladesh Food for Work Programme (later Food for Education Programme), and in the Mahatma Gandhi National Rural Employment Guarantee Act (MGNREGA) in India, which guarantees 100 days of employment to at least one family member each year. In programmes such as these, the poor are put to work building infrastructure, such as roads from outlying areas (where the poor live) to market towns, that will ultimately benefit the poor and others in the region. Although the administrative costs are generally higher and the skills of the workers significantly lower than would be the case with a commercially procured construction contract, in many cases these valuable infrastructure projects would never be tackled at all in the absence of the programme. The high work requirement and very modest payment discourage the nonpoor from participating, thus conserving resources. This characteristic is known as the "screening" function of **workfare programmes**. These requirements also help preserve the programme's political sustainability: when people see that the poor are getting "a hand up rather than a handout," the programmes tend to attract wider public support.

Workfare programme A poverty alleviation programme that requires programme beneficiaries to work in exchange for benefits, as in a food-for-work programme.

In summary, we can say that workfare, such as the Food for Work Programme, represents a better policy than welfare or direct handouts when the following criteria are met:

- The programme does not reduce or seriously undermine incentives for the poor to acquire human capital and other assets.
- There are greater *net* benefits of the work output of the programme.
- It is harder to screen the poor without the workfare requirement.
- There is lower opportunity cost of time for poor workers (so the economy loses little output when they join the workfare programme).
- There is higher opportunity cost of time for nonpoor workers (so they won't avail themselves of the benefits).
- The fraction of the population living in poverty is smaller (so the extra costs of a universal welfare programme would be high).
- There is less social stigma attached to participating in a workfare programme, so the poor do not suffer undue humiliation and are less deterred from seeking the help that their families need (otherwise, a discreet welfare transfer may be preferable to a highly visible workfare programme).[47]

The poor often have low bargaining power in their communities, and while it is difficult politically to increase this power, well-designed programmes can accomplish this indirectly by providing improved "outside options" such as guaranteed public employment programmes when they are needed.

We will be continuing our examination of policies for poverty reduction throughout the remainder of this text. Appropriate agricultural development policies represent a crucial strategy for attacking poverty because such a high fraction of the poor are located in rural areas and engaged in agricultural pursuits. Strategies for agricultural development are examined in Chapter 9. In addition, the poor in urban as well as rural areas suffer from degraded environmental conditions, which lower opportunities for economic growth and also worsen the health of the poor; these problems are examined in Chapter 10.

Another set of viable policies involve targeted poverty programmes to increase the capabilities and human and social capital of the poor. An important example centres on helping the poor develop their microenterprises, on which a large fraction of the nonagricultural poor depend for their survival. It has been found that credit is the binding constraint for many of these tiny firms. By building up the working capital and other assets of microenterprises, the poor can improve their productivity and incomes. The microfinance strategy for accomplishing this goal, as exemplified by BRAC and the Grameen Bank of Bangladesh, is examined in Chapter 15.

In addition, relatively new approaches to attacking poverty focus on an integrated approach to achieving higher incomes together with improved education, health, and nutrition among the poor—notably, conditional cash transfer (CCT) programmes that transfer incomes to poor families conditional on behaviours such as keeping their children in school; these approaches are considered in Chapter 8 and its case study. Strategies to assist the development of the urban informal sector are examined in Chapter 7.

Finally, a multidimensional poverty programme strategy known as targeting the ultrapoor (TUP), or as "graduation" programmes, has proved successful at identifying and assisting the poorest people. The programme transfers a microenterprise asset along with training and in-depth attention to addressing health, nutrition, education, and social problems of participants. The programme was pioneered by the NGO BRAC and is discussed in more detail in the case study at the end of Chapter 11.[48]

5.8.6 Applying Insights from Behavioural Economics to Address Poverty

For many policy initiatives, there is growing appreciation that findings of behavioural economics need to be taken into account to make poverty programmes more effective.

We now know that being poor means paying a hidden "cognitive tax of poverty." Research in development and behavioural economics has extended our understanding of the psychological lives of the poor, including the ways that poverty can impede cognitive functioning. The new findings also have implications for programme design and implementation.

In addition to physical health deprivations, evidence from several countries shows that the poor also struggle with stress- and environmentally-linked deficits in cognitive skills, lower noncognitive skills, and a greater incidence of mental illness. Cognitive functions that can be directly impaired by specific stressors of poverty include focused internal and external attention, inhibitory control, cognitive flexibility, and planning. The poor face much higher risks of depression, anxiety, and substance abuse.[49]

Poverty-related causes of stress can range from financial worries to persistent noise, air pollution, and short and disrupted sleep. In turn, poor thinking and judgement can create or worsen poverty, thereby creating the potential for a vicious circle. There is also growing suggestive evidence that poverty can lead to cognition-impairing stressors, specifically chronic pain, chronic exposure to noise, and potentially sleep deprivation and disruption. These factors make it more difficult for people living in poverty to take actions to improve their conditions.[50]

Being poor means having to focus more attention on urgent financial problems that require little or no attention by the affluent; these problems leave less cognitive capability (for example in memory or attentiveness) for other activities that would aid in breaking out of poverty. Examples of such activities include preventive health care, adherence to drug regimens, promptness for appointments, attentiveness to their children, management of family finances, and general work productivity. Cognitive challenges tend to increase with stress. For example, field evidence from India shows that farmers perform at lower levels during periods of financial stress before harvests relative to after the harvest—approximately equivalent to a ten IQ points effect. The new behavioural economics research on the cognitive burden of poverty is suggestive of ways that assistance (including by counsellors) might improve the capacity of people to make good decisions in other ways. Important examples are making the interviews required for assistance less threatening and challenging, and simplifying application and reporting forms and helping people fill them out. Other findings point to the importance of timing programmes and activities intended to benefit the poor to when cognitive load is likely to be lower.[51]

Undernutrition plays a significant role in the cognitive problems of the poor. It is readily apparent that undernutrition decreases physical strength. Recently, evidence has grown to show that it also leads to decreased cognitive functioning including difficulties concentrating and thinking clearly, inattentiveness, less self-discipline in resisting temptation, and other limitations. For example, a randomised controlled trial study examined the effects of providing additional calories for undernourished bicycle-rickshaw drivers in India. Work hours and earnings were recorded throughout the five-week study, and performance on physical and laboratory-based cognitive task tests was measured. Results showed that the rickshaw "pullers" given extra calories had more income and also significantly improved (by 12%) their performance on the cognitive tests. In addition, the researchers found that study participants significantly reduced their discount rates for work effort: the bicycle-rickshaw drivers were given the opportunity to choose between taking a journey with a lighter load today, or a heavier load tomorrow; both journeys earned the same payment received tomorrow. The nutrition-treated participants were a striking 25% more likely to choose the lighter journey today instead of delaying at the cost of having a more difficult task tomorrow.[52]

Several studies have demonstrated that reductions in poverty caused by cash transfers lead, in turn, to reduced stress and depression, and improved psychological well-being. Family cash transfer programmes, coupled with complementary family services, including psychosocial support home visits, can have wider beneficial effects on children and youth. For example, in poor South African households receiving cash transfers, adolescents who also received household visits by a home-based counsellor reported fewer HIV risk-taking behaviours than those in cash-only households. Other studies have offered valuable insights

into how to improve human capital—health and education—for children and adults living in poverty (see Box 8.2 in Chapter 8).

All people have cognitive limits, and memory is imperfect, so everyone can benefit from being reminded of important things that may otherwise be forgotten and not attended to in a timely way. When individuals are deprived and stressed, their cognitive resources can be far more challenged. Recent developing-country research has shown the benefits of sending reminders to the poor. Adherence by the poor to medicine regimens is lower than for the rest of the population in every country in which the topic has been studied; this difference has been attributed to the cognitive burden of living in poverty. Text (SMS) messages sent to simple (nonsmart) phones have helped the poor increase their adherence rates. Reminders to save money sent by text message have led to increased savings when they include mention of specified future goals. The implication is that limitations in memory and recall (or focus) are part of the cause of low savings; and reminding people of their future goals can change their current behaviour. Reminders can be implicit, rather than rely upon personal contact or phone or text messages. For example, providing people with chlorine where they collect water was more effective at increasing usage than providing it at their homes.[53]

Other research shows the benefits of offering "self-commitment devices." For example, in the Philippines, there was a high take-up rate of a product enabling a commitment to increase savings by voluntarily giving up access to the funds until their savings goal was reached. People's interest in taking part in these devices is both evidence of cognitive limits emphasised by behavioural economists, and of how people can be offered choices to help them to manage these limitations.[54]

More generally, the new research makes clear the value of building cognitive considerations into the design of any policies and programmes intended to include and benefit those living in poverty, as well as in programme enrolment outreach and follow up. This amounts to applying a general approach that Richard Thaler and Cass Sunstein labelled "choice architecture." An immediate consideration is to make it easy for qualified families to learn about programmes that could help them, select beneficial options, sign up and then follow up and participate. Probably the best-known example is the benefit of simplifying enrolment and reporting forms, taking account of how the poor are "taxed" with a higher cognitive burden. But, more generally, the design of programme structures, outreach, and follow up can benefit from taking into account the findings of behavioural economics.

5.9 Summary and Conclusions: The Need for a Package of Policies

To summarise our discussion of alternative policy approaches to the problems of poverty and inequality in development, the need is not for one or two isolated policies but for a "package" of complementary and supportive policies, including the following four basic elements:[55]

1. A policy or set of policies designed to correct factor price distortions (underpricing capital or overpricing modern-sector skilled wages) so as to ensure that market or institutionally established prices provide accurate signals and incentives to both producers and resource suppliers. Correcting distorted

prices should contribute to greater productive efficiency, more employment, and less poverty. The promotion of indigenous technological research and development of efficient, labour-intensive methods of production may also be valuable. (For a further analysis of factor price distortions, see Appendix 5.1.)

2. A policy or set of policies designed to bring about far-reaching structural changes in the distribution of assets, power, and access to education and associated income-earning (employment) opportunities. Such policies go beyond the realm of markets and touch on the whole social, institutional, cultural, and political fabric of the developing world. But such fundamental structural changes and substantive asset redistributions, whether immediately achieved (e.g., through public-sector interventions) or gradually introduced over time (through redistribution from growth), will increase the chances of improving significantly the living conditions of the masses of rural and urban poor.

3. A policy or set of policies designed to modify the size distribution of income at the upper levels through the enforcement of legislated progressive taxation on incomes and wealth; and, at the same time, providing the poor with direct transfer payments and the expanded provision of publicly provided consumption goods and services, including workfare programmes. The net effect is to create a social "safety net" for people who may be bypassed by the development process.

4. A set of targeted policies to directly improve the well-being of the poor and their communities, which goes beyond safety net schemes to offer programmes that build capabilities and human and social capital of the poor, such as microfinance, health, education, agricultural development, environmental sustainability, and community development and empowerment programmes, as described throughout this text. These can be carried out either by government or by nongovernmental organisations through local and international support.

While providing a focus on ending extreme poverty and mitigating harmful inequality, such policies can be designed to encourage and accelerate inclusive economic growth targeted at the poor, while keeping in mind the inherently multidimensional nature of poverty. Key examples include growth-supporting investments in education, nutrition, health, and infrastructure that raise the incomes of those in the bottom deciles of the income distribution. Chapters 2, 3 and 4 considered the sources of economic growth and basic policies to identify constraints and maintain growth that benefit people living in poverty. Additional supporting trade, macro, and financial policies are examined in more detail in Chapters 12 through to 15. But when it is not inclusive, growth by itself is insufficient to eliminate extreme poverty, at least in any timeframe that a nation—let alone people living in poverty—will find acceptable. So, encouragement of inclusive growth goes hand in hand with active policies and programmes to reduce poverty and to prevent nonpoor people from falling into poverty.

Though the task of ending extreme poverty will be difficult, it is possible, if we can only muster the will. As noted by James Speth, the executive director of the United Nations Development Programme, "Poverty is no longer inevitable. The world has the material and natural resources, the know-how and the people to make a poverty-free world a reality in less than a generation. This is not woolly idealism but a practical and achievable goal."[56]

Case Study 5

India: Complex Challenges and Compelling Opportunities

For three decades, India has been one of economic development's great but unheralded success stories. Although eclipsed in the imaginations of many by the China story, India has had more obstacles to overcome and has perhaps come farther and faster than almost anyone imagined it could. And there are good reasons for cautious optimism that India will seize emerging opportunities and achieve its promise in the coming decades. Before it does, India will have to address several complex and difficult challenges. In this case study, we highlight some of the key sources of India's development success to date, along with the nature of its challenges in coming decades.

Background

In 1947, India secured its independence from Britain in the midst of chaotic conditions following a poorly planned and implemented partition from Pakistan. The new democratic government inherited a deeply impoverished nation of about 350 million people. The huge country (seventh-largest in land area and already second-largest in population) was divided along several traditional identity lines including religion, language, ethnicity, and caste. After years of relatively slow progress in comparison to East Asia, since the 1990s economic development has accelerated impressively.

Dimensions of India's success include forging a national identity; achieving real democracy at an unprecedented scale of over a billion people; a pioneering green revolution; eliminating famines; a fully established industrial revolution now extending in several sectors to advanced technology; and substantially reducing extreme income poverty and multidimensional deprivations, even as much work remains to be done.

India's average growth rate generally has risen decade by decade, with the exception of a surge in growth from 2004 through to 2008 in which growth reached close to 9%, and since then has stabilised at a solid 7%. There are genuine prospects for sustaining high economic growth and human development with an effective mix of policies. Government can be less active in some areas where it may have been counterproductive, but more active and effective in other fields where its role is essential.

In the years after independence, India operated under what became known as the "license raj," by which formal government permissions were required for most major private economic activities. Ostensibly a vehicle of government control of "commanding heights" industries and for more general coordination, its effect was often to stifle investment opportunities and, sometimes, to facilitate corruption. Most commentaries on India's growth trajectory have focused on the importance of a series of market-oriented reforms that began in 1991 in response to a currency crisis, moving the country toward more dynamic and flexible policies (although some argue the change of course started earlier, others that the substantial changes came later). With the right policies, including facilitating expanded private-sector investment and the government leading higher social investments, some analysts think a return to 9% growth may yet be possible. Already, while India has had a lower investment rate than China, this has been partly made up for with higher (total factor) productivity growth (as identified by Junaid Ahmad, Florian Blum, Poonam Gupta, and Dhruv Jain). This may be an encouraging sign for the sustainability of higher income growth over time (although India's productivity growth has not been

extraordinarily high; part of the differential is that China's was surprisingly low).

In 2047, India will celebrate the centennial of independence. By that time it will be the world's largest country with about 1.6 billion people, exceeding the population of China by more than a quarter billion people. In that year, India will certainly be counted among the world's leading countries. What remains uncertain is whether India will have successfully overcome problems to achieve the status of a fully developed country with high income, human development, and broad opportunities for all citizens. To do this, it will first have to complete its work of overcoming the challenges of poverty and vulnerability.

Poverty and Vulnerability

More poor people live in India than in any other country. There were still 364 million people living in multidimensional poverty in 2016; and tens of millions more were vulnerable to multidimensional poverty (2018 UNDP MPI update).

As of 2019, the most recent comparable data indicated that over 21% of the population were living on less than $1.90 per day; and 58% were below $3.10 per day (2011 data, 2017 World Development Indicators, and povcal.net, accessed 7 February 2019). It is estimated that close to a quarter of all people in extreme income poverty still live in India. Many more Indians remain highly vulnerable to shocks, especially farmers and those otherwise dependent on agricultural sector employment, including day labourers. It is estimated that each year, health shocks send close to 10 million people back into poverty – this highlights the priority of health sector reforms.

Although the scope of the remaining challenge may seem daunting, India has already made considerable strides this century in reducing many types of human deprivations. One encouraging sign is that the greatest progress in reducing MPI has been due to improvements in the poorest areas and among marginalised groups including low-caste and "tribal" peoples. Continued progress toward ending poverty depends upon addressing problems in agriculture, education, health, jobs, and environment, as well as on improving poverty programmes.

Agriculture

India was one of the first countries to achieve transformative Green Revolution successes in the 1960s. Millions have left agriculture for the services sector, and to a lesser extent for industry. But the country again faces major challenges in the agricultural sector, where raising productivity and incomes are essential tasks. Although now the world's second-largest producer of wheat and rice, India ranks 60th in yield. With its low productivity, the agriculture sector contributes only 15% of national income, while half of families in India still receive at least part of their incomes from agricultural activities. There is still considerable post-harvest waste. And although the incidence of irrigation is several times higher than Africa, the country remains significantly dependent on the annual monsoon rains (although much less so than in the previous century). In all these respects, India's economy still retains a significant dual character.

Moreover, climate change is already having an impact, such as by increasing rainfall variance. Looking ahead, climate models project that river flow will diminish greatly, as the receding Himalayan glaciers become depleted. Meanwhile, the irrigation in place is wasteful, with "fossil aquafers" being drained, and water tables accordingly falling steeply. National food security, not to mention human development, will depend on substantially—and sustainably—increasing food production. Family farmers can benefit substantially from provision of digital technology; and small farmers have benefited from new hydro-meteorological equipment ("hydro-met") facilities in neighbouring Nepal. But much government spending is wasteful or misdirected, such as substantial input subsidies that accrue mostly to large, well-off farmers. Women, who play an underappreciated role in the agricultural sector, are comparatively neglected.

Gender Equity

The widespread sense that gender inequality is a serious problem in India is confirmed with the available statistics.

As of the last census in 2011, the ratio of male births to female births in India as a whole had already reached 1,000 to 933, one of the highest in the world. This reflects the effects of infanticide, feticide, and excess girl deaths (due, for example, to less medical care).

The labour force participation rate for women is very low—less than 27%—and, unusually, it has

been falling in recent years with a trend of women dropping out of the labour force. In part, this reflects disturbing problems including physical risks of commuting, and a hostile work atmosphere after arrival at the job. Part of the explanation seems to be cultural: women not working is widely perceived as a family goal—a preference more often but in some cases not only held by male heads of household—to be achieved as soon as family income is high enough to manage it. Nearly 90% of women in the northern India state of Uttar Pradesh reported that they need their husband's permission to work (2011 report, 'Gender Equality and Development'). This harms well-being directly in that it reduces capability to function (see Chapter 1), but it also reduces the incentives for education, which in turn has negative consequences for the next generation.

The need for gender equity is also one of the root causes of other challenges. Son preference may also have negative effects on girls' education, nutrition and health. Another, underappreciated, risk is that as many as 15% of the adult male population may find they are unable to marry, with negative implications including social stability.

The UNDP reports that in India the Human Development Index calculated for men is 0.683, while for women it is much lower at 0.575, driven in part by the average years of education in the population, which is 8.2 for men but only 4.8 for women. However, the UN is projecting that girls now entering primary school will end up with a full extra year of schooling than boys (12.9 vs 11.9) on average. Actually achieving this sweeping change will depend on favourable education policies, and continued improvements in social norms.

Education and Literacy

Improving access to quality, effective education is essential for meeting the challenges of India's workforce expansion of the next two decades.

It took an unnecessarily long time to approach universal enrolment. The pressing challenge is now to improve school quality in rural and low-income urban areas. Many children complete primary school several grade levels behind in reading, in some cases remaining almost illiterate and innumerate. According to the Annual Status of Education Report Centre in New Delhi, over 80% of tested grade 2 students could not read a single word in a text. In 2016 testing, about three-quarters of students in the third grade were unable to solve a two-digit subtraction problem, and by grade 5 about half were still unable do so. India's primary school student–teacher ratio is 35 to 1, double China's ratio of 17 to 1. Training and hiring more primary school teachers could have a large impact. A 2018 World Bank report concluded that "these severe shortfalls constitute a learning crisis."

India produces many highly educated, innovative, and creative graduates, found among the faculty and PhD candidates in top research universities throughout the world, and in top positions of globally leading technology firms. Clearly, the problem is not national know-how. Attention is needed to make improving institutions, reducing inequality of educational resources, and education for less advantaged citizens a national priority. One of the most common critical observations about education in India is that national school curricula has been designed for the elite, not for those who start behind and receive less family support. In recent years, private schools aimed at lower-income families have expanded rapidly; but their teacher qualifications are often lower than those in the public schools, and apparently parents are getting less for their money than they think.

But providing accurate information can make a big difference. Sandra Sequeira, Johannes Spinnewijn, and Guo Xu showed that receipt of a high school fellowship award is associated with a substantial increase in students' perceived mean earnings of an additional year of schooling, and decrease in perceived earnings variance. Parents of fellowship students also raised their estimates of the returns to education. In addition, low-cost tutoring programmes have been shown to have a significant positive impact (see Box 8.6 in Chapter 8).

A 2010 UNICEF study found that India invests a smaller proportion of GNP than the median in sub-Saharan Africa, despite India's significantly higher income, yet India's share of national income devoted to education was stagnating. As with health, India's spending on education is quite low by global standards; and, particularly with taxation reforms, India has the fiscal capacity to support a substantial increase in public support for education.

Nutrition, Health, and Sanitation

Like most countries, India has made substantial progress in child nutrition, health, and sanitation;

but these improvements have been below-trend for what would be predicted for India's income level. India's public spending on health is very low by global standards: just 1.4% of GNI compared to 3.5 global average. Again, India has the fiscal space to devote resources to the sector closer to global norms.

Life expectancy at birth in India is 68.8 and rising, but again below expectations for its income. In fact, India's life expectancy has now fallen four years behind that of Bangladesh, a country with much lower income per capita; and India's life expectancy is also lower than neighbours Bhutan and Nepal, as well as comparator countries such as Indonesia and Vietnam. (Pakistan is the only standard comparator country that has even lower life expectancy than India. Data: UNDP HDR update, 2018.)

Sanitation is a vital dimension of nutrition and health; for example, it plays a key role in preventing diarrheal diseases, including those caused by parasites that reduce the nutrients the body absorbs from food. As at India's last census, under half of urban households had piped water supply from the formal water distribution system.

Major initiatives have encouraged families to add sanitary toilets or latrines, leveraging social pressures, along with government financial incentives. A well-publicised movement has prospective brides refusing to marry until the prospective dwelling has improved sanitary facilities. Since 2014, a major government initiative, *Swachh Bharat* (Clean India Mission), has attempted to end open defecation by constructing household and community toilets. The initiative also provides funds and campaigns to clean up the streets, roads, and infrastructure in both urban and rural areas.

Another chronic problem is absenteeism in rural health clinics. Improved monitoring, higher staff qualifications and accreditation requirements with training and pay commensurate with performance, and establishing effective community feedback channels should all help, but there is a need for strong policy pushes.

Surveys show that, as with many countries, the population lacks health knowledge, but, as with education, a modest amount of accurate information can go a long way. Jyotsna Jalan and E. Somanathan used a randomised evaluation in India to show that informing households that their drinking water is contaminated increases the probability that they will begin purifying their water.

Demographic Challenges and Opportunities

India has long been the second most populous country in the world and, with its population growing faster than China's, the UN forecasts that India will soon become the most populous. The UN projected in 2017 that in 2024, the population of India will surpass that of China, reach a peak of nearly 1.7 billion around 2060, and then remain the largest country by population for the foreseeable future, exceeding China's population by some 40% in 2100. Although India's population is expected to decline, albeit slowly, it is projected to remain above 1.5 billion through to the end of the century.

But this continued expansion for the next decades masks a drastic decline in fertility. With attention on China's population policies, India's experience with family planning is widely overlooked. Despite its several disappointments and a 1970s scandal, it was a globally pioneering programme that played a modest but still notable role in reducing population growth nearly to replacement levels by 2019.

In 1949, India became the first country to implement a national family-planning programme. It probably had some effect, at least in the long run. But by the early 1970s, observers were becoming increasingly alarmed by the very high rate of population growth in India. When Prime Minister Indira Gandhi tried to implement drastic population control in 1975–77, a period during which she seized dictatorial powers, it was a failure. Reports of forced sterilisations and other coercive measures gave family planning a bad reputation. Public revulsion toward these coercive fertility policies accelerated the end of the "emergency" period. Gandhi was voted out of office; her return in the 1980 elections was aided by her commitment not to reintroduce coercive birth control policies. Years later, villagers in some parts of India avoided health workers out of fear of forced sterilisation. However, family planning did become more widely practised. Some acceptance of limits on family size reflected rising incomes; some reflected policy incentives at the state level. In Madhya Pradesh, individuals who had a third or subsequent child after January 2001 were banned from running for election to village council posts, spurring considerable controversy.

As fertility has fallen, a preference for boys over girls has developed, particularly in northern India. The result is the very high ratio of male to female births discussed above (and examined internationally in Chapter 8).

Stronger male bias is actually found in the better-off states of India. Jean Dreze, Anne-Catherine Guio, and Mamta Murthi found that "female disadvantage in child survival is significantly lower in districts with higher poverty levels." All of this may influence subsequent labour force participation. But this imbalance is not inevitable—social development can make all the difference. Kerala, a state on India's southwest coast that has emphasised poverty reduction and human development, is an important case in point. Already by the mid-1990s, Kerala's fertility rate had fallen to just 1.7 births per woman, where it has remained, implying a slowly falling population over time (in the absence of in-migration). Unlike China, or the emergency period in India, the dramatic reduction in fertility in Kerala was achieved without coercion, let alone China's huge direct economic incentives for lowered fertility. In Bihar, a socially backward state, the fertility rate in 2010 was still 3.7, similar to that of Pakistan. Overall, there are actually slightly more females than males in Kerala, closer to global averages. There has been a slow but steady movement in attitudes toward the notion that a happy family is a small family in the India of today. Amartya Sen has observed that sharp declines in the rate of fertility in India in literate states, particularly Kerala and Tamil Nadu, was greatly influenced by public discourse on the negative impacts of high fertility. Discussions have emphasised problems caused both for young women and for communities as a whole. In addition, and especially more recently, greater awareness on the part of rural women of urban norms of women's empowerment, facilitated by village television and the Internet, may have made a big impact, proving that cultural awareness can be powerful. Robert Jensen and Emily Oster provide some evidence on the power of television in India. While television, billboard, and other advertising in India has promoted family planning, such efforts have been more successful when the social climate has changed enough to be receptive to the message. In Kerala, official campaigns supporting small families have seemed more effective than elsewhere, in large part because both social and economic conditions on the ground changed previously or simultaneously. Over 85% of women in Kerala are literate, giving them more power in the household and opportunities in the workforce as well as the ability to read about family planning. Sen concluded that Kerala's impressive results in fertility reduction were achieved through active public dialogue that resulted ultimately in the emergence of new social attitudes and values—and that such dialogues on this sensitive subject were possible only because of the very high level of female literacy in the state.

Jobs

As the largest cohorts move through the peak productivity years, India will have a great opportunity to do even more than China in a period of very rapid economic growth. The median age of people in India was under 28 years in 2019. Thus India remains a relatively young nation. In contrast, the median age is over 37 in China, 38 in the US, 40 in the UK, and 47 in both Germany and Japan. Currently, there are about 12 million Indians entering the labour force each year, as will a similar number until about 2030. The cohorts after them will be comparatively smaller.

A demographic dividend presents an opportunity not only to get the larger amounts of low-skill output, but a potential opportunity for a surge in skills and productivity, as much experience shows that, given the opportunity, younger people acquire new job skills at a faster rate than older workers on average. Such a productivity surge was experienced in China (as described in the Chapter 4 case study). But the chance for such an enhanced demographic dividend depends upon job creation. The emergence of a strong information technological (IT) sector is one of India's remarkable success stories; but, by 2018, the sector still employed between only 3 and 4 million people in a narrower definition and about 10 million in a broader one. IT is likely to remain a limited part of the answer to India's larger development questions given their scale.

The bulge in working-age citizens has already arrived. Whether it can be converted into an effective demographic dividend will depend upon policy choices. In the early 2020s, nearly half-a-billion people will be in the 15 to 34 age bracket. The danger that the dividend will be realised at far below potential can be averted. But a major challenge is

presented by the strikingly low labour force participation (LFP) rates for women, estimated as less than 27%, significantly lower than neighbours Bangladesh and Nepal as well as global averages. In contrast, the LFP rate for men is about 80%, higher than average. Even if women's LFP is somewhat underestimated if a higher percentage of women's work in the informal sector is unmeasured, the trend is also striking and unusual, in that a decreasing fraction of women are working, explained in part by women dropping out of the labour force in current years. Aside from equity concerns, this means India is missing out on half of its potential workforce. Given the shift from manual to mental labour, and the emerging tendency globally for women to acquire more years of education than men, the potential losses are even greater.

Achieving the full dividend will require significantly higher rates of growth than those realised in the 2013–18 period. India's Federation of Indian Chambers of Commerce and Industry concluded in 2018 that, currently, India's "demographic dynamics are more of a challenge than a dividend." They and other analysts in India argue that success will require active labour market support programmes; some proposals receiving attention include regulatory reforms, active but more effective, targeted, depoliticised, and less cronyist industrial policies, restructured but determined rural and poverty programme initiatives, making it easier for firms to lay off workers so they are more willing to hire workers in the first place, and improved preparation for those entering the labour market.

In 2018, the national railway system announced 63,000 job openings and launched a national recruitment drive. The openings were for menial jobs including cleaners, porters, and helpers, and other low-level jobs such as track maintainer, "gateman," and "assistant switchman." About 19 million Indians applied—over 300 times the available positions. By itself, this is only one incident, but it was widely discussed as a symbol of the drama unfolding in India.

Environment and Pollution

The most polluted cities in the world are now located in India. Air pollution results in severe health problems, including measurable lost years of life. Water resource problems are already present and are worsening, as described earlier in the section on agriculture.

Coal accounts for well over half of India's electricity production, and many new plants are being brought online. Coal generates emissions that have direct and measurably highly negative impacts on health in India. From a broader perspective, coal generates more greenhouse gases than any other significant energy source. Although it is a global problem, India has much to lose, with over 17% of global population. Coal production also uses a lot of water, exacerbating India's looming water shortages. These problems are similar to those faced by China; but India has had a much less active policy response. Coal plants are long-lived investments, so the type of energy infrastructure built now will matter for decades to come.

Addressing all of these problems will require improved regulation, a change in norms, and an emphasis on greener infrastructure.

Infrastructure

Recent research has highlighted the importance of infrastructure in economic development, and for the case of India in particular. Saugato Datta found that firms in cities that were affected by the new quadrilateral highway system connecting India's largest cities achieved a reduction in stock of input inventories of 6–12 days' worth of production. Furthermore, these firms were more likely to choose a new primary input supplier after establishment of better-quality highways. Finally, firms in cities benefiting from the new highways also faced lower transportation obstacles to production (firms in control group cities reported no such change).

Moreover, Ghani, Goswami, and Kerr estimate that districts in India located 5–10 kilometres away from the new Golden Quadrilateral highway system gained more productivity than districts 10–50 kilometres from the highway. Datta (2012) uses the same quadrilateral programme as a natural experiment and concluded that the highway system led firms to enhance their efficiency by improving their supplier source and reducing necessary inventories.

As any regular visitor to New Delhi can report, infrastructure improvements over the past few years have been steady and dramatic.

Given the immense and now accelerating scale of rural-to-urban migration now being reached, the rapid urbanisation in India receives surprisingly little attention. But India faces a major challenge

of managing urbanisation. This will require careful infrastructure planning, and massive investments, to ensure efficient and desirable living conditions in India's rapidly growing cities. Close examination of lessons that can be drawn from China's experience—both its successes and its lost opportunities—will help sharpen India's policy focus. Global experience shows that urban patterns become established with or without planning, and then can last for a century or more.

In many of the challenges of development in India, the presence of regional imbalances have been an important factor. There are major, persistent development differences across states and regions. While India has become a unified nation, the different development levels of its states remain sometimes dramatic, and are particularly striking in comparing high-income Punjab and Delhi in relation to low-income Bihar and other backward regions.

Institutional Challenges

There are institutional and political weaknesses in India. In the Corruption Perception Index, India ranked 81—below China at 77. Transparency International ranks India at a middling score of 40 (in a range of 0–100) in its Corrupt Perceptions Index—also slightly worse than China (with a score of 41). India's ranking on the World Bank Ease of Doing Business Index at #77 is actually below Russia and China.

A recurrent theme is the slow pace of judicial procedure. India ranks very poorly compared with other major countries regarding time required for courts to resolve many types of basic disputes. For example, enforcing a contract in India takes an average of 1,445 days—around triple the time in many other large countries, such as 403 days in Indonesia, 454 in Nigeria, and 496 in China (World Bank Ease of Doing Business, 2018). On judicial effectiveness, in the 2018 Index of World Freedom, India received a troubling rating of 54.3, once again lower, for example, than China at 65.4, or South Africa at 65.9. Social tolerance is an informal institution. But social divisions and inequities require urgent attention both as a matter of fairness and because they can undermine gains from the one-time opportunity of the demographic dividend that India can ill afford to miss. The government can facilitate the work of civil society leaders who are trying to improve conditions.

Many Indians believe the judiciary is corrupt, although its extent is not proven. But one likely binding constraint should not be difficult to correct: by objective measures there are simply far too few judges to keep up with the growing caseload. The impediments to appointing many more judges in the near future should not be insurmountable. Making quality appointments in a transparent manner also provides an opportunity to reduce citizen perception that some or many judges may be tainted by corruption.

Similarly, the police force is understaffed. As the government workforce decreases in some sectors, this can be an opportunity to increase staffing in areas such as law enforcement where it is needed. Other reforms are needed such as hiring more women police officers along with training and response to gender-based violence, better use of cooperative local policing programmes, and across-the-board technology upgrading. Addressing these problems will be difficult and will not be accomplished overnight, but India's institutions are fully capable of meeting these challenges.

Other institutional reforms are clearly needed, including a regular system of benefit cost assessments of regulations, and ongoing monitoring of their impacts. Analysts have also concluded that it will be beneficial to ensure more regulatory independence (while preventing their capture by industry), streamlining in cases of multiple regulatory authorities, as well as accelerating the modernisation of regulations themselves. Most SOEs need improvements in efficiency; and many may need to be privatised soon, while the form of privatisation matters greatly (see Chapter 15, Box 15.3). Additional issues remain in the financial sector, and in reforming the insolvency and bankruptcy codes.

On the other hand, however imperfect its institutions, as a democracy with a free press there are comparatively favourable opportunities for reform and, just as important, checks against conditions worsening in the future. Democracy itself can do much to facilitate the development of other good institutions; to this extent, India is less constrained by its current institutional failings than some standard scorecards would imply.

The opportunities for successful economic development in India are now aligned as never before, if the country can seize them. ■

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Concepts for Review

Absolute poverty
Asset ownership
Character of economic growth
Decile
Disposable income
Elasticity of factor substitution (Appendix 5.1)
Factor price distortions (Appendix 5.1)
Factors of production
Foster-Greer-Thorbecke (FGT) index
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Gini coefficient
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Personal distribution of income
Progressive income tax
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Quintile
Redistribution policies
Regressive tax
Subsidy
Total poverty gap (TPG)
Workfare programmes

Questions for Discussion

1. Most development economists now seem to agree that the level and rate of growth of GNI and per capita income do not provide sufficient measures of a country's development. What is the essence of their argument? Give some examples.
2. Distinguish between size and functional distributions of income in a nation. Which do you conclude is the more appropriate concept? Explain your answer.
3. What is meant by absolute poverty? What measures of income poverty are favoured by development economists? How do income poverty measures differ from the UNDP's Multidimensional Poverty Index? Why should we be concerned with the measurement of poverty in developing nations?
4. What are the principal economic characteristics of high-poverty groups? What do these characteristics tell us about the possible nature of a poverty-focused development strategy?
5. Describe Kuznets's inverted-U hypothesis. Discuss the conceptual merits and limitations of this hypothesis for contemporary developing countries.
6. In the text, when we examined statistics from a wide range of developing countries, we found that growth does not guarantee poverty reduction; while higher income is clearly associated with less poverty, economies can even reach upper-middle-income status but continue to struggle with a quite high incidence of extreme poverty. What does this tell us about the importance of the character of a nation's growth process and about its institutional structure?
7. What is the relationship between a Lorenz curve and a Gini coefficient? Give some examples of how Lorenz curves and Gini coefficients can be used as summary measures of equality and inequality in a nation's distribution of income.
8. "The major determinant of a country's income distribution is its distribution of productive and income-earning assets." Explain the meaning of this statement, giving examples of different kinds of productive and income-earning assets.
9. Are rapid economic growth (as measured by either GNI or per capita GNI) and a more equal distribution of personal income necessarily conflicting objectives? Summarise the arguments both for and against the presumed conflict of objectives, and state and explain your own view.
10. How might inequality lead to faster growth or development? How might it lead to slower growth or development?
11. Is progress being made in the fight against poverty? Why or why not?
12. What types of poverty policies have proved effective?
13. Economic growth is said to be a necessary but not sufficient condition to eradicate absolute poverty and reduce inequality. What is the reasoning behind this argument?
14. Outline the range of major policy options for a developing country to alter and modify its size distribution of national income. Which policies do you believe are absolutely essential? Explain your answer.
15. Referring to the end of chapter case study, what are some of the main challenges and opportunities for more rapid growth and development in India?

Appendix 5.1

Appropriate Technology and Employment Generation: The Price Incentive Model

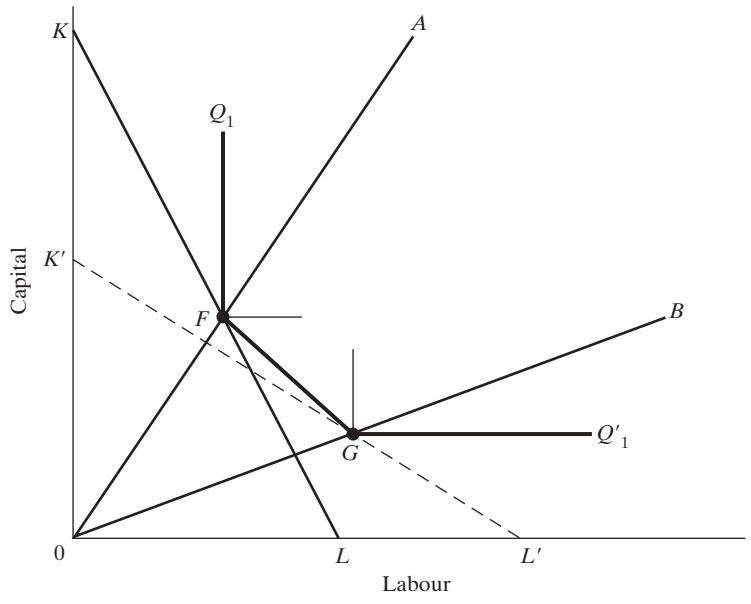
Choice of Techniques: An Illustration

The basic proposition of the **neoclassical price incentive model** is quite simple and in the best tradition of the neoclassical theory of the firm. Following the principle of economy, producers (firms and farms) are assumed to face a given set of relative factor prices (e.g., of capital and labour) and to use the combination of capital and labour that minimises the cost of producing a desired level of output. They are further assumed to be capable of producing that output with a variety of technological production processes, ranging from highly labour-intensive to highly capital-intensive methods. Thus, if the price of capital is very expensive relative to the price of labour, a relatively labour-intensive process will be chosen. Conversely, if labour is relatively expensive, our economising firm or farm will use a more capital-intensive method of production—it will economise on the use of the expensive factor, which in this case is labour.

Neoclassical price incentive model A model whose main proposition is that if market prices are to influence economic activities in the right direction, they must be adjusted to remove factor price distortions by means of subsidies, taxes, or the like so that factor prices may reflect the true opportunity cost of the resources being used.

The conventional economics of technical choice is portrayed in Figure A5.1.1. Assume that the firm, farm, industry, or economy in question has only two techniques of production from which to choose: technique or process $0A$, which requires larger inputs of (homogeneous) capital relative to (homogeneous) labour, and technique or process $0B$, which is relatively labour-intensive. Points F and G represent *unit* output levels for each process, and the line Q_1 FGQ′$_1$

FIGURE A5.1.1 Choice of Techniques: The Price Incentive Model



connecting F and G is therefore a unit-output isoquant. (Note that in the traditional neoclassical model, an infinite number of such techniques or processes are assumed to exist so that the isoquant or equal-product line takes on its typical convex curvature.)

According to this theory, optimum (least-cost) capital–labour combinations (efficient or appropriate technologies) are determined by relative factor prices. Assume for the moment that market prices of capital and labour reflect their scarcity or shadow values and that the desired output level is Q_1 in Figure A5.1.1. If capital is cheap relative to labour (price line KL), production will occur at point F using capital-intensive process $0A$. Alternatively, if the market prices of labour and capital are such that labour is the relatively cheap (abundant) factor (line $K'L'$), optimal production will occur at point G, with the labour-intensive technique, $0B$, chosen. It follows that for any technique of production currently in use, a fall in the relative price of labour, all other things being equal, will lead to a substitution of labour for capital in an optimal production strategy. (Note that if capital-intensive process $0A$ "dominates" labour-intensive process $0B$—that is, if technology $0A$ requires less labour and less capital than $0B$ for all levels of output—then for any factor price ratio, the capital-intensive technique will be chosen.)

Factor Price Distortions and Appropriate Technology

Given that most developing countries are endowed with abundant supplies of labour but possess very little financial or physical capital, we would naturally expect production methods to be relatively labour-intensive. But in fact we often find production techniques in both agriculture and industry to be heavily mechanised and capital-intensive. Large tractors and combines dot the rural landscape of Asia, Africa, and Latin America, while people stand idly by. Gleaming new factories with the most modern and sophisticated automated machinery and equipment are a common feature of urban industries, while idle workers congregate outside the factory gates.

Surely, this phenomenon could not be the result of a lesser degree of economic rationality on the part of farmers and manufacturers in developing countries?

The explanation, according to the price incentive school, is simple. Because of a variety of structural, institutional, and political factors, the actual market price of labour is higher and that of capital is lower than their respective true scarcity, or shadow, values dictate. In Figure A5.1.1, the shadow price ratio would be given by line $K'L'$, whereas the actual (distorted) market price ratio is shown by line KL. Market wage structures are relatively high because of trade union pressure, politically motivated minimum-wage laws, an increasing range of employee fringe benefits, and the high-wage policies of multinational corporations. In former colonial nations, high-wage structures are often relics of expatriate remuneration scales based on European levels of living and "hardship" premiums. By contrast, the price of (scarce) capital is kept artificially low by a combination of liberal capital depreciation allowances, low or even negative real interest rates, low or negative effective rates of protection on capital goods imports, tax rebates, and overvalued foreign-exchange rates (see Chapter 12).

The net result of these **factor price distortions** is the encouragement of inappropriate capital-intensive methods of production in both agriculture and

Factor price distortions
Situations in which factors of production are paid prices that do not reflect their true scarcity values (i.e., their competitive market prices) because of institutional arrangements that tamper with the free working of market forces of supply and demand.

manufacturing. Note that from the private-cost-minimising viewpoint of individual firms and farms, the choice of a capital-intensive technique is correct. It is their rational response to the existing structure of price signals in the market for factors of production. However, from the viewpoint of society as a whole, the social cost of underutilised capital, and especially labour, can be very substantial. Government policies designed to "get the prices right"—that is, to remove factor price distortions—contribute not only to more employment but also to a better overall utilisation of scarce capital resources through the adoption of more appropriate technologies of production.

The Possibilities of Labour–Capital Substitution

The actual employment impact of removing factor price distortions will depend on the degree to which labour can be substituted for capital in the production processes of various developing-world industries. Economists refer to this as the **elasticity of factor substitution** and define it roughly as the ratio of the percentage change in the proportion of labour used relative to capital (labour–capital or L/K ratio) compared to a given percentage change in the price of capital relative to labour (P_K/P_L). Algebraically, the elasticity of substitution, LK, can be defined as follows:

Elasticity of factor substitution A measure of the degree of substitutability between factors of production in any given production process when relative factor prices change.

$$\eta_{LK} = \frac{d(L/K)(L/K)}{d(P_K/P_L)(P_K/P_L)} \tag{A5.1.1}$$

For example, if the relative price of capital rises by 1% in the manufacturing sector and the labour–capital ratio rises as a result by, say, 1.5%, the elasticity of substitution in the manufacturing industry will be equal to 1.5. If P_K/P_L falls by, say, 10% while L/K falls by only 6%, the elasticity of substitution for that industry will be 0.6. Relatively high elasticities of substitution (ratios greater than about 0.7) are indicative that factor price adjustments can have a substantial impact on levels and combinations of factor utilisation. In such cases, factor price modifications may be an important means of generating more employment opportunities.

In general, most empirical studies of the elasticity of substitution for manufacturing industries in less-developed countries reveal coefficients in the range 0.5–1.0. These results indicate that a relative reduction in wages (either directly or by holding wages constant while letting the price of capital rise) of, say, 10% will lead to a 5% to 10% increase in employment.

Appendix 5.2

The Ahluwalia-Chenery Welfare Index

The necessity of reorienting development priorities away from an exclusive preoccupation with maximising rates of GNI growth and toward broader social objectives such as the eradication of poverty and the reduction of excessive income disparities is now widely recognised throughout the developing world. Figures for GNI per capita give no indication of how national income is actually distributed and who is benefiting most from the growth of production. We have seen, for example, that a rising level of absolute and per capita GNI can camouflage the fact that the poor are no better off than before.

The calculation of the rate of GNI growth is largely a calculation of the rate of growth of the incomes of the upper 40% of the population, who receive a disproportionately large share of the national product. Therefore, the GNI growth rates can be a very misleading index of improved welfare. To give an extreme example, suppose that an economy consisted of only 10 people and that 9 of them had no income at all and the tenth received 100 units of income. The GNI for this economy would be 100 and per capita GNI would be 10. Now suppose that everyone's income increased by 20% so that GNI rose to 120 while per capita income grew to 12. For the nine individuals with no income before and still no income now (1.2000), such a rise in per capita income would provide no cause for rejoicing. The one rich individual still would have all the income. And GNI, instead of being a welfare index of society as a whole, is merely measuring the welfare of a single individual!

The same line of reasoning applies to the more realistic situation where incomes are very unequally distributed, although not perfectly unequal as in our example. Taking the figures from Table 5.1, where we divided the population into quintiles that received 5%, 9%, 13%, 22%, and 51% income shares, respectively, we found that these income shares are a measure of the relative economic welfare of each income class and that the rate of income growth in each quintile is a measure of the economic welfare growth of that class. We can approximate the growth in the total welfare of society as the simple weighted sum of the growth of income in each class. This is in fact what the rate of GNI growth measures—the weights applied to each income class are their respective shares of national income. To be specific, in the case of a population divided into quintiles according to rising income levels, we have

$$G = w_1 g_1 + w_2 g_2 + w_3 g_3 + w_4 g_4 + w_5 g_5 \qquad \text{(A5.2.1)}$$

where G a weighted index of growth of social welfare, g_i the growth rate of income of the ith quintile (where the i quintiles are ordered 1, 2, 3, 4, and 5 in our example), and w_i the "welfare weight" of the ith quintile (in our example, w_1 0.05, w_2 0.09, w_3 0.13, w_4 0.22, and w_5 0.51). As long as the weights add up to unity and are nonnegative, our overall measure of the growth of social welfare, G, must fall somewhere between the maximum and minimum income growth rates in the various quintiles. In the extreme case of all income accruing to one

individual or one group of individuals in the highest quintile and where the welfare weights are the income shares (as they are with GNI growth calculations), Equation A5.2.1 would be written as

$$G = 0_{g_1} + 0_{g_2} + 0_{g_3} + 0_{g_4} + 1_{g_5} = 1_{g_5} \quad \text{(A5.2.2)}$$

The growth of social welfare would therefore be associated exclusively with the growth of incomes of the top quintile of the population!

In the example derived from Table 5.1, the GNI-share-weighted index of social welfare would be written as

$$G = 0.05_{g_1} + 0.09_{g_2} + 0.13_{g_3} + 0.22_{g_4} + 0.51_{g_5} = 1_{g_5} \quad \text{(A5.2.3)}$$

Now suppose that the income growth rate of the bottom 60% of the population was zero ($g_1 g_2 g_3 0$) while that of the top 40% was 10% ($g_4 g_5 0.10$). Equation A5.2.3 could then be written as

$$G = 0.05(0) + 0.09(0) + 0.13(0.10) + 0.22(0.10) + 0.51(0.10) = 0.073 \quad \text{(A5.2.4)}$$

and the social welfare index would rise by more than 7%, which is the rate of growth of GNI (i.e., GNI would rise from 100 in Table 5.1 to 107.3 if the incomes of the 4th and 5th quintiles grew by 10%). Thus, we have an illustration of a case where GNI rises by 7.3%, implying that social well-being has increased by this same proportionate amount even though 60% of the population is no better off than before. This bottom 60% still has only 5, 13, and 22 units of income, respectively. Clearly, the distribution of income would be worsened (the relative shares of the bottom 60% would fall) by such a respectable growth rate of GNI.

The numerical example given by Equation A5.2.4 illustrates our basic point. The use of the growth rate of GNI as an index of social welfare and as a method of comparing the development performance of different countries can be misleading, especially where countries have markedly different distributions of income. The welfare weights attached to the growth rates of different income groups are unequal, with a heavy social premium being placed on the income growth of the highest-quintile groups. In the example of Equation A5.2.3, a 1% growth in the income of the top quintile carries more than 10 times the weight of a 1% growth in the lowest quintile (0.51 compared with 0.05) because it implies an absolute increment that is 10 times larger. In other words, using the measure of GNI growth as an index of improvements in social welfare and development accords to each income group a welfare valuation that corresponds to its respective income share (i.e., a 1% increase in the income of the richest 20% of the population is implicitly assumed to be more than 10 times as important to society as a 1% increase in the income of the bottom 20%). It follows that the best way to maximise social welfare growth is to maximise the rate of growth of the incomes of the rich while neglecting the poor! If ever there was a case for *not* equating GNI growth with development, this example should provide a persuasive illustration.

Constructing a Poverty-Weighted Index of Social Welfare

An alternative to using a simple GNI growth rate or distributive share index of social welfare would be to construct an equal-weights or even a poverty-weighted index. Such indexes might be especially relevant for countries concerned with the elimination of poverty as a major development objective. As the name indicates, an equal-weights index weights the growth of income in each income class not by the proportion of total income in that class but rather by the proportion of the total population—that is, all people are treated (weighted) equally. In an economy divided into quintiles, such an index would give a weight of 0.2 to the growth of income in each quintile. So a 10% increase in the income of the lowest 20% of the population would have the same bearing on the overall measure of social welfare improvements as a 10% increase in the top 20% group or in any other quintile group, even though the absolute increase in income for the bottom group would be much smaller than for the upper groups.

Using an equal-weights index in our example of a 10% income growth of the top two quintiles with the bottom three remaining static, we would have

$$G = 0.20_{g_1} + 0.20_{g_2} + 0.20_{g_3} + 0.20_{g_4} + 0.20_{g_5} \qquad \text{(A5.2.5)}$$

or, inserting growth rates for g_1, through g_5,

$$G = 0.20(0) + 0.20(0) + 0.20(0) + 0.20(10) + 0.20(0.10) = 0.04 \qquad \text{(A5.2.6)}$$

Social welfare would increase by only 4%, compared to the 7.3% increase recorded by using the distributive shares or GNI growth rate index. Even though recorded GNI still grew by 7.3%, this alternative welfare index of development would show only a 4% rise.

Finally, consider a developing country that is genuinely and solely concerned with improving the material well-being of, say, the poorest 40% of its population. Such a country might wish to construct a poverty-weighted index of development, which places "subjective" social values on the income growth rates of only the bottom 40%. In other words, it might arbitrarily place a welfare weight on w_1 of 0.60 and on w_2 of 0.40 while giving w_3, w_4, and w_5 zero weights. Using our same numerical example, the social welfare growth index for this country would be given by the expression

$$G = 0.60_{g_1} + 0.40_{g_2} + 0_{g_3} + 0_{g_4} + 0_{g_5} \qquad \text{(A5.2.7)}$$

which, when substituting $g_1 g_2 g_3 0$ and $g_4 g_5 0.10$, becomes

$$G = 0.60(0) + 0.40(0) + 0(0) + 0(0.10) + 0(0.10) = 0 \qquad \text{(A5.2.8)}$$

The poverty-weighted index therefore records *no* improvement in social welfare (no development), even though recorded GNI has grown by 7.3%!

Although the choice of welfare weights in any index of development is purely arbitrary, it does represent and reflect important social value judgements about goals and objectives for a given society. It would certainly be interesting to know, if this were possible, the real implicit welfare weights of the various development strategies of different developing countries. Our main point, however, is that as long as the growth rate of GNI is explicitly or implicitly used to

compare development performances, we know that a "wealthy weights" index is actually being employed.

To put some real-world flavour into the discussion of alternative indexes of improvements in economic welfare and to illustrate the usefulness of different weighted growth indexes in evaluating the economic performance of various countries, consider the data in Table A5.2.1 compiled by Montek Ahluwalia and Hollis Chenery. The table shows the growth of income in 12 countries as measured first by the rate of growth of GNI (GNI weights), second by an equal-weights index, and third by a poverty-weighted index where the actual weights assigned to income growth rates of the lowest 40%, the middle 40%, and the top 20% of the population are 0.6, 0.4, and 0.0, respectively. Some interesting conclusions emerge from a review of the last three columns of Table A5.2.1:

1. Economic performance as measured by equal-weights and poverty-weighted indexes was notably worse in some otherwise high-GNI-growth countries such as Brazil, Mexico, and Panama. Because these countries all experienced a deterioration in income distribution and a growing concentration of income growth in the upper groups over this period, the equal-weights and poverty-weighted indexes naturally show a less impressive development performance than the simple GNI measure.
2. In five countries (Colombia, Costa Rica, El Salvador, Sri Lanka, and Taiwan), the weighted indexes show a better performance than GNI growth, because the relative income growth of lower-income groups proceeded more rapidly over the period in question in those five countries than that of the higher-income groups.
3. In three countries (Peru, the Philippines, and South Korea), little change in income distribution during the period in question resulted in little variation between the GNI measure and the two alternative weighted indexes of social welfare.

TABLE A5.2.1 Income Distribution and Growth in 12 Selected Countries

	Income Growth			Annual Increase in Welfare		
Country	Upper 20%	Middle 40%	Lowest 40%	GNI Weights	Equal Weights	Poverty Weights
Brazil	6.7	3.1	3.7	5.2	4.1	3.5
Colombia	5.2	7.9	7.8	6.2	7.3	7.8
Costa Rica	4.5	9.3	7.0	6.3	7.4	7.8
El Salvador	3.5	9.5	6.4	5.7	7.1	7.4
India	5.3	3.5	2.0	4.2	3.3	2.5
Mexico	8.8	5.8	6.0	7.8	6.5	5.9
Panama	8.8	9.2	3.2	8.2	6.7	5.2
Peru	3.9	6.7	2.4	4.6	4.4	3.8
Philippines	5.0	6.7	4.4	5.5	5.4	5.2
South Korea	12.4	9.5	11.0	11.0	10.7	10.5
Sri Lanka	3.1	6.3	8.3	5.0	6.5	7.6
Taiwan	4.5	9.1	12.1	6.8	9.4	11.1

Sources: International Bank for Reconstruction and Development/The World Bank: *Redistribution with Growth: An Approach to Policy*. Copyright © 1974 by The World Bank. Reprinted with permission.
Note: For further details, see Montek S. Ahluwalia, and Hollis Chenery, "The Economic Framework," in Hollis Chenery, et al. (ed.), *Redistribution with Growth*, Oxford University Press, London, 1974.

We may conclude, therefore, that a useful summary measure of the degree to which economic growth is biased toward the relative improvement of high-income or low-income groups is the positive or negative divergence between a weighted social welfare index and the actual growth rate of GNI.

Notes

1. The Lorenz curve is named for Max Otto Lorenz, an American economist who in 1905 devised this convenient and widely used diagram to show the relationship between population groups and their respective income shares.
2. A more precise definition of perfect equality would take into account the age structure of a population and expected income variations over the life cycle of all households within that population. See Morton Paglin, "The measurement and trend of inequality: A basic revision," *American Economic Review* 65 (1975): 598–609.
3. For the details, see Gary S. Fields, *Distribution and Development: A New Look at the Developing World* (Cambridge, Mass.: MIT Press, 2001), ch. 2.
4. For more details on this and an alternative exposition of inequality properties, see Amartya Sen and James E. Foster, *On Economic Inequality,* expanded ed. (Oxford: Clarendon Press, 1997).
5. If measured poverty is always *strictly lower* after such transfers, this property is called *strong* monotonicity. The headcount ratio satisfies monotonicity but not strong monotonicity.
6. For technical details, see James Foster, Joel Greer, and Erik Thorbecke, "A class of decomposable poverty measures," *Econometrica* 52 (1984): 761–766. Other valuable properties of this measure include decomposability by subgroup (and hence subgroup consistency), continuity, and additivity.
7. For proof that Equation 5.4 follows from Equation 5.3, see Foster, Greer, and Thorbecke, "A class of decomposable poverty measures," Cornell University Discussion Paper No. 242, 1981.
8. It is similar in spirit to the Sen index, $S = (H/N)[\text{NIS} + (1 - \text{NIS})G_p]$, where G_p stands for the Gini coefficient among the poor. For the technical details and derivations of the P_2 and S poverty measures, see Sen and Foster, *On Economic Inequality*, pp. 165–194, and ibid.
9. For the same reason, the P_2 measure essentially became part of the Mexican constitution (chap. 5, art. 34). Interview with Erik Thorbecke, *Cornell Chronicle,* May 11, 2000. For an early statement of the incentive problem of using poverty headcount measures, see François Bourguignon and Gary Fields (1990) "Poverty Measures and Anti-Poverty Policy," *Recherches Economique de Louvain*, 56(3–4), 409–27.
10. For example, Uganda saw impressive reductions in poverty between 1999 and 2009, but the headcount decreased by only 1.9 million people. By the person-equivalent measure, poverty fell by 4.4 million poor person-equivalents. This measure adjusts for poverty depth, but still does not reflect poverty severity (as would P_2). For more details on the measure, along with applications to data from a number of developing countries, see Tony Castleman, James E. Foster, and Stephen C. Smith, "Person Equivalent Headcount Measures of Poverty," in *Inequality and Growth: Patterns and Policy*, edited by Kaushik Basu and Joseph Stiglitz, Palgrave MacMillan, 2016, Chapter 3, pages 101–27. Available from: https://link.springer.com/chapter/10.1057/9781137554543_3.
11. The Alkire-Foster method, as it has come to be known, reduces to the FGT index when poverty is measured with just one dimension. See Sabina Alkire and James Foster, "Counting and multidimensional poverty measurement," *Journal of Public Economics* 95, No. 7 (2011): 476–487. For further intuition, see also Alkire and Foster "Understandings and misunderstanding of multidimensional poverty," *Journal of Economic Inequality* 9(2), pp. 289–314.
12. Various UN studies on sources of savings in developing nations show that small farmers and individuals seem to be among the highest savers. See Andrew Mason, "Savings, economic growth and demographic change," *Population and Development Review* 14 (1988): 13–144.
13. Two technical articles that address the mechanisms by which higher inequality may lead to lower growth or incomes are Abhijit V. Banerjee and Andrew F. Newman, "Occupational choice and the process of development," *Journal of Political Economy* 101 (1993): 274–298, and Oded Galor and

Joseph Zeira, "Income distribution and macroeconomics," *Review of Economic Studies* 60 (1993): 35–52. See also Fields, *Distribution and Development*, ch. 10. The empirical literature remains mixed, however.

14. See, for example, Jonathan David Ostry, Andrew Berg, and Charalambos G. Tsangarides, 2014, "Redistribution, Inequality, and Growth," IMF Staff Discussion Notes 14/02; Torsten Persson and Guido Tabellini, "Is inequality harmful for growth?" *American Economic Review* 84 (1994): 600–21, and Alberto Alesina and Dani Rodrik, "Distributive politics and economic growth," *Quarterly Journal of Economics* 109 (1994): 465–490. On the connection to violent crime, see Morgan Kelly, "Inequality and crime," *The Review of Economics and Statistics* 82, No. 4 (2000), pp. 530–539.
15. John Rawls, *A Theory of Justice* (Cambridge, Mass.: Belknap Press, 1971).
16. See Norman Frolich and Joe Oppenheimer, "Optimal Policies and Socially Oriented Behavior: Some Problematic Effects of an Incentive Compatible Device," Public Choice 117, 273–93. Using this as a mechanism design scheme comes with other problems; see Samuel Bowles, 2016, *The Moral Economy*, New Haven: Yale Univ. Press
17. Generally, we may think of welfare as a function W*:

$$W^* = W^*(Y, E, H, C),$$

where Y = Standard of living, E = Education, H = Health, and C stands for other important capabilities. In each case, these values can be appraised not only with average values, but also inequality in their distribution, and the extent of deprivation below some threshold analogous to the income poverty line.
18. This approach was developed by Gary S. Fields, *Poverty, Inequality and Development* (Cambridge: Cambridge University Press, 1980), pp. 46–56.
19. Ibid., p. 52.
20. This can perhaps be visualised most easily by considering a traditional economy in which everyone is "equally poor," each claiming their share of, say, 50 cents per day. If the absolute poverty line is $1.90 per day, all are in absolute poverty. Then modernisation begins, and the modern sector absorbs workers one by one, where the wage is, say, $5 per day. Starting from the line of perfect equality, the Lorenz curve bows out more and more until nearly half the people are in the modern sector. At that point, as more go to the modern sector, the Lorenz curve is less bowed in until finally everyone has been absorbed into the modern sector and all once again have equal incomes but now at a higher level of $2 per day. In the process, all of the people have been pulled out of poverty. (Try this as an exercise, plotting the Lorenz curve as this process takes place for an eight-person economy.) This exercise is adapted from Fields, ibid.
21. In fact, some would go further and say that an increase in relative inequality is not objectionable as long as everyone has a higher income, even though the rich get a larger share of the gains, even in proportion to their larger starting income. This situation is called "first-order stochastic dominance" in the literature. However, even in this case, incomes might be increased even more with less inequality.
22. Of course, in real economies, all three of these growth typologies may take place at the same time, and the net result may be little or no change in inequality. Or, in more unfortunate cases, with economies with negative growth, like many of those in sub-Saharan Africa in the 1980s and 1990s, there may be modern- and traditional-sector impoverishment, accompanied by a shrinking modern sector.
23. See Albert O. Hirschman and Michael Rothschild, 1973, "The Changing Tolerance for Income Inequality in the Course of Economic Development," *The Quarterly Journal of Economics*, 87, 4, pp. 544–66.
24. Simon Kuznets, "Economic growth and income inequality," *American Economic Review* 45 (1955): 1–28, and "Quantitative aspects of the economic growth of nations," *Economic Development and Cultural Change* 11 (1963): 1–80. One of the cross-sectional studies supporting the Kuznets hypothesis is Montek S. Ahluwalia, Nicholas G. Carter, and Hollis B. Chenery, "Growth and poverty in developing countries," *Journal of Development Economics* 16 (1979): 298–323. Studies arguing against the hypothesis include Ashwani Saith, "Development and distribution: A critique of the cross-country U-hypothesis," *Journal of Development Economics* 13 (1983): 367–382, and Sudhir Anand and S. M. R. Kanbur, "The Kuznets process and the inequality-development relationship," *Journal of Development Economics* 40 (1993): 25–42.
25. Ibid., p. 35.
26. The parabola plotted results from an ordinary least-squares regression. Fields reports results showing that in using a country fixed-effect

specification, the estimated inverted U flips to an estimated U-pattern. For details, see Fields, *Distribution and Development*, ch. 3 (pp. 42–43).

27. The 2008 and 2010 estimates are reported in the 2013 *World Development Indicators*. For an overview on the $1.25 a day estimation, see Martin Ravallion, Shaohua Chen, and Prem Sangraula, *New Evidence on the Urbanization of Global Poverty* (Washington, D.C.: World Bank, 2007), and Martin Ravallion, Shaohua Chen, and Prem Sangraula, "Dollar a Day Revisited," World Bank, Policy Research Working Paper No. 4620, May 2008.

28. The HPI measured three deprivations—of life (as the percentage of people unlikely to live beyond 40 years of age), of basic education (as the percentage of adults who are illiterate), and of overall economic provisioning (as the percentage of people without access to safe water plus the percentage of children underweight for their age), giving them equal weight in a manner analogous to the original HDI. The 2009 HDR report ranked 135 countries from lowest to highest HPI and found this could differ substantially from income poverty rankings and the old HDI ranking. Since the HPI value indicates the proportion of the population adversely affected by the three deprivations, a higher HPI reflects greater deprivation. In the report, Côte d'Ivoire ranked 29 places higher (worse) in the country rankings based on income poverty than on human poverty; Morocco ranked 50 places higher; Iran, 44 higher; Algeria, 19 higher; Ethiopia, 30 higher. The implication is that human poverty is worse in these countries than headcount ratio income poverty measures indicate. In contrast, some of the countries that perform better on the human poverty ranking include Nigeria, 11 places lower; Ghana, 18 lower; Madagascar, 14 lower; Bolivia, 21 lower; and Tanzania, 37 lower. The MPI is strongly preferred because it aggregates up from the household level and allows for interactions of poverty dimensions; an index like the HPI may be used because it is familiar, can be applied to a larger number of countries, and can be extrapolated further back in time and at more frequent intervals.

29. The MPI was introduced in the 2010 *Human Development Report* (New York: United Nations Development Programme, 2010); for details, see Sabina Alkire and Maria Emma Santos, *Acute Multidimensional Poverty: A New Index for Developing Countries*, Human Development Research Paper No. 2010/11 (New York: United Nations Development Programme, 2010). The MPI is based on the increasingly used Alkire-Foster Method (AFM); for an introduction, see Sabina Alkire and James Foster, "Counting and multidimensional poverty measurement," *Journal of Public Economics*. As described earlier in the chapter, its desirable properties include *dimensional monotonicity*, meaning that when a person deemed poor becomes deprived in another indicator, he or she is deemed even poorer. For details of the 2018 update see: http://hdr.undp.org/en/content/2018-statistical-update-presents-multidimensional-poverty-index-based-jointly-revised; and for the data and analysis see: http://hdr.undp.org/sites/default/files/2018_human_development_statistical_update.pdf; and https://ophi.org.uk/wp-content/uploads/G-MPI_2018_2ed_web.pdf.

30. UNDP *Human Development Report, 2010*; UNDP *Human Development Report 2018 Update*; and OPHI, Global *Multidimensional Poverty Index 2018: The Most Detailed Picture to Date of the World's Poorest People*. Oxford 2018. https://ophi.org.uk/wp-content/uploads/G-MPI_2018_2ed_web.pdf.

31. See Chronic Poverty Research Centre, *Chronic Poverty Report, 2004–05*, available at: http://www.chronicpoverty.org/resources/cprc_report_2004-2005_contents.html, and Andrew McKay and Bob Baulch, "How many chronically poor people are there in the world? Some preliminary estimates," CPRC Working Paper No. 45, Chronic Poverty Research Centre, 2003.

32. We may also note that greater spatial concentration of poverty—a higher percentage of people in a given region who are poor—is an additional consideration for how ultrapoverty differs.

33. See International Food Policy Research Institute, *The World's Most Deprived* (Washington: D.C.: IFPRI, 2007). These estimates were based on a previous poverty line of $1.08; ultrapoverty was defined as an income below one-half this amount (i.e. $0.54 per day).

34. See UNICEF, *The State of the World's Children 2019: Children, food and nutrition: Growing well in a changing world*, New York: UNICEF; and Ending Extreme Poverty: A Focus on Children, UNICEF Briefing Note, 2016. See also OPHI, *Global Multidimensional Poverty Index 2018: The Most Detailed Picture to Date of the World's Poorest People*, p. 34–37: https://ophi.org.uk/wp-content/uploads/G-MPI_2018_2ed_web.pdf; and Both UNICEF and OPHI reports are based on detailed DHS and other household surveys.

35. For a comprehensive analysis of how poverty directly affects women's lives in developing countries, see Irene Tinker, *Persistent Inequalities: Women and World Development* (New York: Oxford University Press, 1990); Judith Bruce and Daisy Dwyer, eds., *A Home Divided: Women and Income in the Third World* (Stanford, Calif.: Stanford University Press, 1988); Janet Momsen, *Women and Development in the Third World* (New York: Routledge, 1991); and Diane Elson, "Gender-aware analysis and development economics," *Journal of International Development* 5 (1993): 237–247.

36. Amartya Sen, "Missing women," *British Medical Journal* 304 (1992): 587–588. A well-regarded 2003 analysis concludes that about 100 million or more women are "missing" in Asia alone. Stephan Klasen and Claudia Wink, "Missing Women: Revisiting the Debate," *Feminist Economics*, 9 (2–3), 2003, 263–299.

37. The International Fund for Agricultural Development provides basic statistics and links to key resources on indigenous peoples and development at http://www.iFad.org/pub/factsheet/ip/e.pdf.

38. See, for example, Haeduck Lee, *The Ethnic Dimension of Poverty and Income Distribution in Latin America* (Washington, D.C.: World Bank, 1993); George Psacharopoulos and Harry A. Patrinos, "Indigenous people and poverty in Latin America," *Finance and Development* 31 (1994): 41–43; and Gillette Hall and Harry Anthony Patrinos, eds., *Indigenous Peoples, Poverty and Human Development in Latin America; 1994–2004* (New York: Palgrave Macmillan, 2006).

39. Partha Dasgupta and Debraj Ray, "Inequality as a determinant of malnutrition and unemployment policy," *Economic Journal* 97 (1987): 177–188.

40. An empirical study of variables explaining growth in developing countries during the 1960–1973 period provides support for the argument that policies designed to promote better distribution and reduce poverty are, on balance, growth-stimulating rather than growth-retarding. See Norman L. Hicks, "Growth vs. basic needs: Is there a trade-off?" *World Development* 7 (1979): 985–94.

41. For empirical evidence on how improved distribution can increase domestic demand, promote political stability, and generate higher growth rates, see Alberto Alesina and Roberto Perotti, "The political economy of growth: A critical survey of the recent literature," *World Bank Economic Review* 8 (1994): 351–371, and Alberto Alesina and Dani Rodrik, "Distributive policies and economic growth," *Quarterly Journal of Economics* 109 (1994): 465–490.

42. See World Bank, *World Development Report, 2000/2001* (New York: Oxford University Press, 2000). See also World Bank, *World Development Report, 1990* (New York: Oxford University Press, 1990); Albert Fishlow, "Inequality, poverty, and growth: Where do we stand?" in *Proceedings of the World Bank Annual Conference on Development Economics, 1995,* eds. Michael Bruno and Boris Pleskovic (Washington, D.C.: World Bank, 1996); Nancy Birdsall, David Ross, and Richard Sabot, "Inequality and growth reconsidered: Lessons from East Asia," *World Bank Economic Review* 9 (1995): 477–508; and George R. G. Clarke, "More evidence on income distribution and growth," *Journal of Development Economics* 47 (1995): 403–427.

43. A well-known study is David Dollar and Aart Kraay, "Growth is good for the poor," *Journal of Economic Growth* 7 (2002): 195–225. They find that, on average, incomes of the bottom 20% grow about as fast as the overall average. However, critiques of the generality of this claim of rough proportionality have been summarised by the University of Manchester Chronic Poverty Research Center in its *Chronic Poverty Report 2004/05:* "It does not allow for variation around the average (which is known to be significant), it uses a relative concept of poverty, the data set used has been criticised, it does not consider poverty depth, and researchers using different econometric methods with the same data have produced contradictory findings." Clearly it is possible and sometimes does occur that inequality can increase with growth enough to offset any gains for the poor, including some cases in which rapid growth increases the incentive and opportunity of theft of natural resources from poor communities. The essential point is that growth is not guaranteed to automatically end absolute poverty or do so in an acceptable timeframe, so targeted policies are generally also needed.

44. The sum of all workers' marginal product must equal total gross national income (GNI). Mathematically, GNI is simply the integral of the marginal product curve between 0 and L_E. This is because the marginal product function is the derivative of the GNI curve: $\text{GNI} = f(L, \overline{K})$; $MP_L = f'(L)$.

45. For alternative approaches to these issues, see the 2015 UNDP Human Development Report, and the 2013 and 2019 World Bank World Development Reports.

46. Darryl McLeod and Nora Lustig, "Minimum wages and poverty in developing countries: Some empirical evidence," in *Labor Markets in Latin America: Combining Social Protection with Market Flexibility* (Washington, D.C.: Brookings Institution, 1997). An interesting theoretical contribution is found in Gary S. Fields and Ravi Kanbur, "Minimum wages and poverty with income-sharing," *Journal of Economic Inequality* 5 (2007): 135–147. Details of SEWA's in-house studies on minimum wages for poor informal workers are found at http://www.sewaresearch.org.
47. For the classic analytical treatment of the workfare-versus-welfare problem, see Timothy J. Besley and Stephen Coate, "Workfare versus welfare: Incentive arguments for work requirements in poverty alleviation programs," *American Economic Review* 82 (1992): 249–261.
48. See M. Shahe Emran, Virginia Robano, and Stephen C. Smith, "Assessing the frontiers of ultrapoverty reduction: Evidence from CFPR/TUP, an Innovative programme in Bangladesh," Economic Development and Cultural Change, 62 (2), 339–80, February 2014.
49. See Vikram Patel, et al., "Depression in Developing Countries: Lessons from Zimbabwe," *British Medical Journal*, vol. 322, 2001: 482-84; and Vikram Patel, "Poverty, Inequality and Mental Health in Developing Countries," in David Leon and Gill Walt, eds., *Poverty, Inequality and Health: An International Perspective*, New York: Oxford Univ. Press, 2000.
50. See Nirav, P. Patel, et al., 2010, "'Sleep Disparity' in the Population: Poor Sleep Quality is Strongly Associated with Poverty and Ethnicity," *BMC Public Health*, 10, 1–11; Anandi Mani, SendhilMullainathan, Eldar Shafir, and Jiaying Zhao, 2013, "Poverty Impedes Cognitive Function," *Science* 341 (6149): 976–80; Frank Schilbach, Heather Schofield, and Sendhil Mullainathan, 2016, "The Psychological Lives of the Poor," *American Economic Review: Papers & Proceedings*, 106(5): 435–40; Stephen A. Stansfeld, et al., 2005, "Aircraft and Road Traffic Noise and Children's Cognition and Health: A Cross-National Study," *Lancet*, 365 (9475), 1942–1949;Emma Boswell Dean, Frank Schilbach, and Heather Schofield, 2018, "Poverty and Cognitive Function," *The Economics of Asset Accumulation and Poverty Traps*, edited by Barrett, et al., NBER 2018.
51. See Anandi Mani, Sendhil Mullainathan, Eldar Shafir, and Jiaying Zhao, 2013, "Poverty Impedes Cognitive Function," *Science*, 341 (6149): 976–80.
52. Cited in Frank Schilbach, Heather Schofield, and Sendhil Mullainathan, 2016, "The Psychological Lives of the Poor, American Economic Review: Papers & Proceedings," 106(5): 435–40; see also Emma Boswell Dean, Frank Schilbach, and Heather Schofield, 2018, "Poverty and Cognitive Function," *The Economics of Asset Accumulation and Poverty Traps*, edited by Christopher Barrett, et al., Cambridge: NBER, 2018. Heckman, Pinto, and Savelyev, 2013.
53. Thaler, Richard, and Cass Sunstein. 2008. *Nudge: Improving Decisions About Health, Wealth, and Happiness*. New Haven, CT: Yale University Press; Pop-Eleches, Cristian, et al. 2011. "Mobile Phone Technologies Improve Adherence to Antiretroviral Treatment in Resource- Limited Settings: A Randomized Controlled Trial of Text Message Reminders." *AIDS 25* (6): 825 -34; Kremer, Michael, Edward Miguel, Sendhil Mullainathan, Clair Null, and Alix Peterson Zwane. 2009, January. "Making Water Safe: Price, Persuasion, Peers, Promoters, or Product Design." Unpublished manuscript; Karlan, Dean, Margaret McConnell, Sendhil Mullainathan, and Jonathan Zinman. 2016. "Getting to the Top of Mind: How Reminders Increase Saving." *Management Science* 62 (12): 3393 -411; and Karlan, Dean, Melanie Morten, and Jonathan Zinman. 2016. "A Personal Touch: Text Messaging for Loan Repayment." *Behavioral Science and Policy* 1 (2): 31–39.
54. Ashraf, Nava, Dean Karlan, and Wesley Yin. 2006. "Tying Odysseus to the Mast: Evidence from a Commitment Savings Product in the Philippines." *Quarterly Journal of Economics* 121 (2): 635–72.
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56. James Speth, "Foreword," in United Nations Development Programme, *Human Development Report, 1997,* p. iii.