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Contemporary Models of Development and Underdevelopment

Individuals need not make the right tradeoffs. And whereas in the past we thought the implication was that the economy would be slightly distorted, we now understand that the interaction of these slightly distorted behaviors may produce very large distortions. The consequence is that there may be multiple equilibria and that each may be inefficient.

—*Karla Hoff and Joseph E. Stiglitz, Frontiers in Development Economics, 2002*

Governments can certainly deter entrepreneurship when they try to do too much; but they can also deter entrepreneurship when they do too little.

—*Dani Rodrik, One Economics, Many Recipes, 2007*

After more than a half century of experience with attempting to encourage modern development, we have learned that development is both possible and extremely difficult to achieve. Thus, an improved understanding of impediments and catalysts of development is of the utmost importance. Since the late 1980s, significant strides have been made in the analysis of economic development and underdevelopment. In some cases, ideas of the classic theories reviewed in Chapter 3 have been formalized, and in the process, their logical structure and their significance for policy have been clarified and refined. At the same time, the analysis has also led to entirely new insights into what makes development so hard to achieve (as witnessed in sub-Saharan Africa) but also possible to achieve (as witnessed in East Asia). Indeed, this is what makes the study of economic development so very important: It does not happen automatically; it requires systematic effort. But development is far from a hopeless cause; we know it can be done. Theory helps us think systematically about how to organize our efforts to help achieve development—a goal second to none in its importance to humanity.

In this chapter, we review a sample of some of the most influential of the new models of economic development. In some ways, these models show that development is harder to achieve, in that it faces more barriers than had previously been recognized. But greater understanding itself facilitates improvements in development strategy, and the new models have already influenced development policy and modes of international assistance. The

chapter concludes with a framework for appraising the locally **binding constraints** on the ability of a developing nation to further close the gap with the developed world.

The new research has broadened considerably the scope for modeling a market economy in a developing-country context. One of its major themes is incorporating problems of coordination among **economic agents**, such as among groups of firms, workers, or firms and workers together. Other key themes, often but not always in conjunction with the coordination problem, include the formal exploration of situations in which increasing returns to scale, a finer division of labor, the availability of new economic ideas or knowledge, learning by doing, information externalities, and monopolistic competition or other forms of industrial organization other than perfect competition predominate. The new perspective frequently incorporates work in the “new institutional economics,” such as that of Nobel laureate Douglass C. North, and introduced in Chapter 2. All of these approaches depart to some degree from conventional neoclassical economics, at least in its assumptions of perfect information, the relative insignificance of externalities, and the uniqueness and optimality of equilibria.¹

4.1 Underdevelopment as a Coordination Failure

Many newer theories of economic development that became influential in the 1990s and the early years of the twenty-first century have emphasized **complementarities** between several conditions necessary for successful development. These theories often highlight the problem that several things must work well enough, at the same time, to get sustainable development under way. They also stress that in many important situations, investments must be undertaken by many agents in order for the results to be profitable for any individual agent. Generally, when complementarities are present, an action taken by one firm, worker, or organization increases the incentives for other agents to take similar actions.

Models of development that stress complementarities are related to some of the models used in the endogenous growth approach (described in Appendix 3.3), in ways we will point out later in the chapter, but the **coordination failure** approach has evolved relatively independently and offers some significant and distinct insights.² Put simply, a coordination failure is a state of affairs in which agents’ inability to coordinate their behavior (choices) leads to an outcome (equilibrium) that leaves all agents worse off than in an alternative situation that is also an equilibrium. This may occur even when all agents are fully informed about the preferred alternative equilibrium: They simply cannot get there because of difficulties of coordination, sometimes because people hold different expectations and sometimes because everyone is better off waiting for someone else to make the first move. This section spells out the meaning and implications of these perspectives in detail, through both simple models and examples.

When complementarities are present, an action taken by one firm, worker, organization, or government increases the incentives for other agents to take

Binding constraint The one limiting factor that if relaxed would be the item that accelerates growth (or that allows a larger amount of some other targeted outcome).

Economic agent An economic actor—usually a firm, worker, consumer, or government official—that chooses actions so as to maximize an objective; often referred to as “agents.”

Complementarity An action taken by one firm, worker, or organization that increases the incentives for other agents to take similar actions. Complementarities often involve investments whose return depends on other investments being made by other agents.

Coordination failure A situation in which the inability of agents to coordinate their behavior (choices) leads to an outcome (equilibrium) that leaves all agents worse off than in an alternative situation that is also an equilibrium.

Big push A concerted, economy-wide, and typically public policy-led effort to initiate or accelerate economic development across a broad spectrum of new industries and skills.

O-ring model An economic model in which production functions exhibit strong complementarities among inputs and which has broader implications for impediments to achieving economic development.

Middle-income trap A condition in which an economy begins development to reach middle-income status but is chronically unable to progress to high-income status. Often related to low capacity for original innovation or for absorption of advanced technology, and may be compounded by high inequality.

Underdevelopment trap A poverty trap at the regional or national level in which underdevelopment tends to perpetuate itself over time.

similar actions. In particular, these complementarities often involve investments whose return depends on other investments being made by other agents. In development economics, such network effects are common, and we consider some important examples later in this chapter, including the model of the **big push**, in which production decisions by modern-sector firms are mutually reinforcing, and the **O-ring model**, in which the value of upgrading skills or quality depends on similar upgrading by other agents. Curiously, such effects are also common in analyses of frontier technologies in developed countries, particularly information technologies, in which the value of using an operating system, word-processing program, spreadsheet program, instant messaging, and other software or product standard depends on how many other users also adopt it. In both cases, the circular causation of positive feedback is common.³ This framework may also be used in analyses of the **middle-income trap**, in which countries develop to a degree but chronically fail to reach high-income status, often due to lack of innovation capacity.

An important example of a complementarity is the presence of firms using specialized skills and the availability of workers who have acquired those skills. Firms will not enter a market or locate in an area if workers do not possess the skills the firms need, but workers will not acquire the skills if there are no firms to employ them. This coordination problem can leave an economy stuck in a bad equilibrium—that is, at a low average income or growth rate or with a class of citizens trapped in extreme poverty. Even though all agents would be better off if workers acquired skills and firms invested, it might not be possible to get to this better equilibrium without the aid of government. As we will see, such coordination problems are also common in initial industrialization, as well as in upgrading skills and technologies, and may extend to issues as broad as changing behavior to modern “ways of doing things.” Such problems are further compounded by other market failures, particularly those affecting capital markets.⁴

Another example typical of rural developing areas concerns the commercialization of agriculture. As Adam Smith already understood, specialization is one of the sources of high productivity. Indeed, specialization and a detailed division of labor are hallmarks of an advanced economy. But we can specialize only if we can trade for the other goods and services we need. Producers must somehow get their products to markets while convincing distant buyers of their quality. As Shahe Emran and Forhad Shilpi stress, in the development of agricultural markets, middlemen play a key role by effectively vouching for the quality of the products they sell; they can do this because they get to know the farmers from whom they buy as well as the products. It is difficult to be an expert in the quality of many products, so in order for a specialized agricultural market to emerge, there needs to be a sufficient number of concentrated producers with whom a middleman can work effectively. But without available middlemen to whom the farmers can sell, they will have little incentive to specialize in the first place and will prefer to continue producing their staple crop or a range of goods primarily for personal consumption or sale within the village. The result can be an **underdevelopment trap** in which a region remains stuck in subsistence agriculture.⁵

In many cases, the presence of complementarities creates a classic “chicken and egg” problem: Which comes first, the skills or the demand for skills? Often the answer is that the complementary investments must come at the same time,

through coordination. This is especially true when, as is generally the case, there is a lag between making an investment and realizing the return on that investment.⁶ In this case, even if, for some reason, all parties expect a change to a better equilibrium, they will still be inclined to wait until other parties have made their investments. Thus, there can be an important role for government policy in coordinating joint investments, such as between the workers who want skills that employers can use and the employers who want equipment that workers can use. Neither may be in a position (or find it in their self-interest) to take the first step; each may be better off waiting for the other parties to invest first.

As another example, a new or modernizing firm using new technologies may provide benefits to other firms that the adopting firm cannot capture; so each firm has an incentive to underinvest in the new technology unless a sufficient number of others invest. Some of these benefits may include raising demand for key industrial products such as steel, helping pay for the fixed costs of an essential infrastructure such as railroads or container ports, or learning from others' experiences. We will take a closer look at this problem later in the chapter.

The new work expands the scope for potentially valuable government policy interventions, but it does not take their success for granted. Rather, government itself is increasingly analyzed in contemporary development models as one of the components of the development process that may contribute to the problem as well as to the solution; government policy is understood as partly determined by (endogenous to) the underdeveloped economy (see Chapter 11). For example, a dictator such as Mobutu Sese Seko, the former ruler of the Democratic Republic of Congo when it was known as Zaire, may prefer to keep his country in an underdevelopment trap, knowing full well that as the economy develops, he will lose power. But rather than concluding that government generally exacerbates underdevelopment rather than facilitates development (as in extreme versions of the neoclassical counterrevolution school), many development specialists look actively for cases in which government policy can still help, even when government is imperfect, by pushing the economy toward a self-sustaining, better equilibrium. Such **deep interventions** move an economy to a preferred equilibrium or even to a higher permanent rate of growth in which there is no incentive to go back to the behavior associated with the bad equilibrium. In these cases, government has no need to continue the interventions, because the better equilibrium will be maintained automatically. Government can then concentrate its efforts on other crucial problems in which it has an essential role (e.g., in addressing problems of public health). This onetime-fix character of some multiple-equilibrium problems makes them worthy of special focus because they can make government policy that much more powerful in addressing problems of economic development. But it also makes the policy choices more momentous, because a bad policy today could mire an economy in a bad equilibrium for years to come.

In much of economics, such complementarities are not present. For example, in competitive markets, when there is excess demand, there is counterpressure for prices to rise, restoring equilibrium. Whenever **congestion** may be present, these counterpressures are very strong: The more people there are fishing in one lake, the more fishers try to move to another lake that is less crowded; the more people there are using one road, the more commuters

Deep intervention A government policy that can move the economy to a preferred equilibrium or even to a higher permanent rate of growth, which can then be self-sustaining so that the policy need no longer be enforced because the better equilibrium will then prevail without further intervention.

Congestion The opposite of a complementarity; an action taken by one agent that decreases the incentives for other agents to take similar actions.

Where-to-meet dilemma A situation in which all parties would be better off cooperating than competing but lack information about how to do so. If cooperation can be achieved, there is no subsequent incentive to defect or cheat.

Prisoners' dilemma A situation in which all parties would be better off cooperating than competing, but once cooperation has been achieved, each party would gain the most by cheating, provided that others stick to cooperative agreements—thus causing any agreement to unravel.

try to find an alternative route. But in the process of economic development, joint externalities are common: Underdevelopment begets underdevelopment, while processes of sustainable development, once under way, tend to stimulate further development.

Coordination problems are illustrated by the **where-to-meet dilemma**: Several friends know that they will all be in Buenos Aires on a certain day but have neglected to settle on a specific location within the city. Now they are out of communication and can arrive at a common meeting point only by chance or by very clever guessing. They want to meet and consider themselves better off if they can do so; there is no incentive to “cheat.” Thus, the where-to-meet problem is quite different from that of **prisoners' dilemma**, another problem often encountered in theories of economic development.⁷ But the fact that all gain from coordination does not make the where-to-meet dilemma easy to solve. There are many famous places in Buenos Aires: the Plaza de Mayo, the Cathedral, the colorful Caminito neighborhood, the Café Tortoni, the Cementerio de la Recoleta, even the casino. Only with luck would the friends end up making the same guesses and meeting in the same place. Arriving at, say, the center of Caminito and not finding the others there, one of our travelers might decide to try the Plaza de Mayo instead. But en route she might miss another of the other travelers, who at that moment might be on his way to check out the Cementerio. So the friends never meet. Something analogous happens when farmers in a region do not know what to specialize in. There may be several perfectly good products from which to choose, but the critical problem is for all the farmers to choose *one* so that middlemen may profitably bring the region's produce to market.

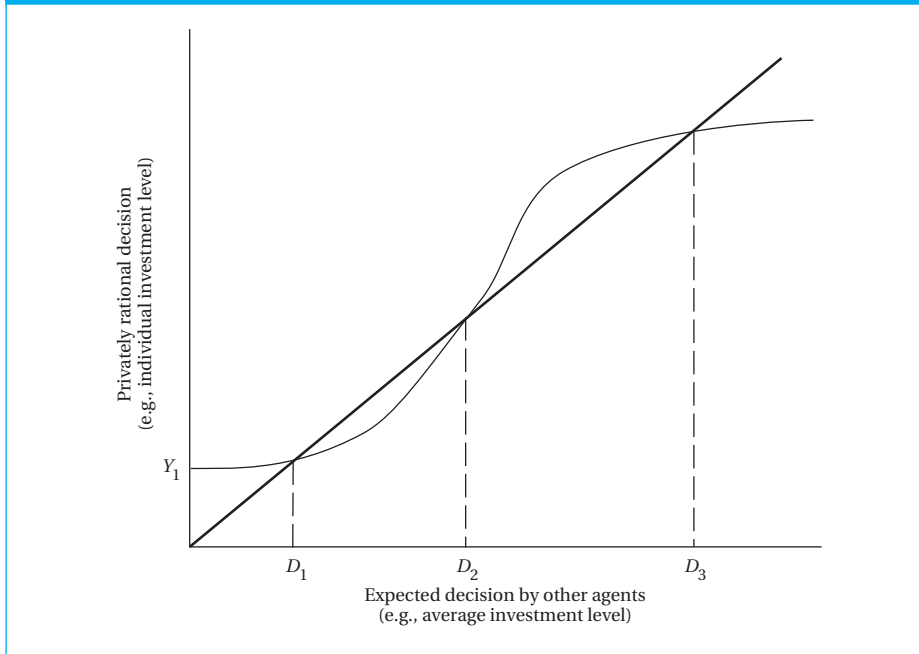
The story may lose a bit of its power in the age of texting, cell phones, and e-mail. For example, as long as the friends have each other's contact information, they can come to an agreement about where to meet. Sometimes what seems at first a complex problem of coordination is really a simpler one of communication. But anyone who has tried to establish a meeting time by phone or e-mail with a large number of participants with no formal leader knows that this can be a slow and cumbersome process. Without a clear leader and with a large enough number of participants, no meeting place may be agreed to on short notice before it is too late. And in real economic problems, the people who need to “meet”—perhaps to coordinate investments—do not even know the identity of the other key agents.⁸ However, our example does point up possibilities for improved prospects for development with the advent of modern computing and telecommunications technology. Of course, peasant farmers may not have access to cell phones or e-mail (but see the case study for Chapter 11 on the Grameen Bank).

4.2 Multiple Equilibria: A Diagrammatic Approach

Multiple equilibria A condition in which more than one equilibrium exists. These equilibria sometimes may be ranked, in the sense that one is preferred over another, but the unaided market will not move the economy to the preferred outcome.

The standard diagram to illustrate **multiple equilibria** with possible coordination failure is shown in Figure 4.1. This diagram, in one version or another, has become almost as ubiquitous in discussions of multiple equilibria as the famous supply-and-demand (“Marshallian scissors”) diagram in discussions of single equilibrium analysis.⁹

FIGURE 4.1 Multiple Equilibria



The basic idea reflected in the S-shaped function of Figure 4.1 is that the benefits an agent receives from taking an action depend positively on how many other agents are expected to take the action or on the extent of those actions. For example, the price a farmer can hope to receive for his produce depends on the number of middlemen who are active in the region, which in turn depends on the number of other farmers who specialize in the same product.

How do we find the equilibria in this type of problem? In the Marshallian supply-and-demand scissors diagram, equilibrium is found where the supply and demand curves cross. In the multiple-equilibria diagram, equilibrium is found where the “privately rational decision function” (the S-shaped curve in Figure 4.1) crosses the 45-degree line. This is because in these cases, agents observe what they expected to observe. Suppose that firms expected no other firms to make investments, but some firms did anyway (implying a positive vertical intercept in the diagram). But then, seeing that some firms did make investments, it would not be reasonable to continue to expect no investment! Firms would have to revise their expectations upward, matching their expectations to the level of investment they actually would see. But if firms now expected this higher level of investment, firms would want to invest even more. This process of adjustment of expectations would continue until the level of actual investment would just equal the level of expected investment: At that level, there would be no reason for firms to adjust their expectations any further. So the general idea of an equilibrium in such cases is one in which all participants are doing what is best for them, given what they expect others to do, which in turn matches what others are actually doing. This happens when the function crosses the 45-degree line. At these points, the values on the x -axis and y -axis are equal, implying in our example that the level of investment expected is equal to the level that all agents find best (e.g., the profit-maximizing level).

In the diagram, the function cuts the 45-degree line three times. Any of these points could be an equilibrium: That is what we mean by the possibility of multiple equilibria. Of the three, D_1 and D_3 are “stable” equilibria. They are stable because if expectations were slightly changed to a little above or below these levels, firms would adjust their behavior—increase or decrease their investment levels—in a way to bring us back to the original equilibrium. Note that in each of these two stable equilibria, the S-shaped function cuts the 45-degree line from above—a hallmark of a stable equilibrium.

At the middle equilibrium at D_2 , the function cuts the 45-degree line from below, and so it is unstable. This is because in our example, if a little less investment were expected, the equilibrium would be D_1 , and if a little more, were expected, the equilibrium would move to D_3 . D_2 could therefore be an equilibrium only by chance. Thus, in practice, we think of an unstable equilibrium such as D_2 as a way of dividing ranges of expectations over which a higher or lower stable equilibrium will hold sway.

Typically, the S-shaped “privately rational decision function” first increases at an increasing rate and then at a decreasing rate, as in the diagram. This shape reflects what is thought to be the typical nature of complementarities. In general, some agents may take the complementary action (such as investing) even if others in the economy do not, particularly when interactions are expected to be with foreigners, such as through exporting to other countries. If only a few agents take the action, each agent may be isolated from the others, so spillovers may be minimal. Thus, the curve does not rise quickly at first as more agents take the action. But after enough agents invest, there may be a snowball effect, in which many agents begin to provide spillover benefits to neighboring agents, and the curve increases at a much faster rate. Finally, after most potential investors have been positively affected and the most important gains have been realized, the rate of increase starts to slow down.

In many cases, the shape of the function in Figure 4.1 could be different, however. For example, a very “wobbly” curve could cut the 45-degree line several times. In the case of telephone service, getting on e-mail or instant messaging, or buying a fax machine, where the value of taking the action steadily increases with the number of others in the network, the function may only increase at an increasing rate (like a quadratic or exponential function). Depending on the slope of the function and whether it cuts the 45-degree line, there can be a single equilibrium or multiple equilibria, including cases in which either no one ever adopts a new technology or virtually everyone does. In general, the value (utility) of the various equilibria (two in this case) is not the same. For example, it is very possible that everyone is better off in the equilibrium in which more people use the network. In this case, we say the equilibria are Pareto-ranked, with the higher rank to the equilibrium giving higher utility to everyone; in other words, moving to this equilibrium represents a **Pareto improvement** over the equilibrium with fewer users.

The classic example of this problem in economic development concerns coordinating investment decisions when the value (rate of return) of one investment depends on the presence or extent of other investments. All are better off with more investors or higher rates of investment, but the market may not get us there without the influence of certain types of government policy (but note that we may also not arrive at the preferred solutions if we have the wrong kinds of government policy). The difficulties of investment

Pareto improvement A situation in which one or more persons may be made better off without making anyone worse off.

coordination give rise to various government-led strategies for industrialization that we consider both in this chapter and later in the text (see especially Chapter 12).

The investment coordination perspective helps clarify the nature and extent of problems posed when technology spillovers are present, such as seen in the Romer model described in Appendix 3.3.¹⁰ Given what was learned in examining endogenous growth theory about the possible relation between investment and growth, you can see that an economy can get stuck in a low growth rate largely because the economy is expected to have a low investment rate. Strategies for coordinating a change from a less productive to a more productive set of mutually reinforcing expectations can vary widely, as the example in Box 4.1 and the findings in Box 4.2 illustrate. However, changing expectations may not be sufficient if it is more profitable for



BOX 4.1 Synchronizing Expectations: Resetting “Latin American Time”

Kaushik Basu and Jorgen Weibull argue that while the importance of culture is undeniable, the inateness of culture is not. They present a model that shows that punctuality may be “simply an equilibrium response of individuals to what they expect others to do” and that the same society can benefit from a “punctual equilibrium” or get caught in a lateness equilibrium.

Estimates suggested that Ecuador lost between 4% and 10% of its GDP due to chronic lateness. As one commentator put it, “Tardiness feeds on itself, creating a vicious cycle of *mañana, mañana*.” Lately, Ecuador has tried to make up for lost time. Inspired by some in the younger generation who are fed up with “Latin American time,” government and business have joined in a private-sector-funded drive to get people to show up at their scheduled appointment times. The country has launched a national *campaña contra la impuntualidad* (campaign against lateness), coordinated by Participación Ciudadana (Citizen Participation). The result is a test of the idea that a society can consciously switch from a bad to a good equilibrium through a change in expectations.

The campaign is a timely one. A newspaper is publishing a list each day of officials who are late for public events. A popular poster for the campaign against lateness describes the disease and says, “Treatment: Inject yourself each morning with a dose of responsibility,

respect and discipline. Recommendation: Plan, organize activities and repair your watches.” Hundreds of public and private institutions have signed up to a promise to be punctual. A popular notice for meeting rooms in the style of hotel “Do Not Disturb” signs has been making the rounds. On one side it says, “Come in: You’re on time.” When the meeting begins at its scheduled time, it is turned around to the other side, which reads, “Do not enter: The meeting began on time.”

In Peru, a similar campaign is under way. If the campaign against lateness proves successful, it will be about more than time. If a social movement to change expectations about punctuality can be made to work, something similar might be tried around the world for fixing even more pernicious problems, such as public corruption.

Sources: Kaushik Basu and Jorgen Weibull, “Punctuality: A cultural trait as equilibrium,” in *Economics for an Imperfect World: Essays in Honor of Joseph Stiglitz*, ed. Richard Arnott et al. (Cambridge, Mass.: MIT Press, 2003); Scott Wilson, “In Ecuador, a timeout for tardiness drive promotes punctuality,” *Washington Post Foreign Service*, November 4, 2003, p. A22; “The price of lateness,” *Economist*, November 22, 2003, p. 67; “Punctuality pays,” *New Yorker*, April 5, 2004, p. 31. For an interesting critique, see Andrew M. Horowitz, “The punctuality prisoners’ dilemma: Can current punctuality initiatives in low-income countries succeed?” Paper presented at the Northeast Universities Development Consortium Conference, Harvard University, October 2007.

**BOX 4.2 FINDINGS** Village Coordination and Monitoring for Better Health Outcomes

Chapter 4 explains the important role of improved information, shared expectations, and coordination across agents in making development progress. Coordination across households potentially can improve outcomes, for example, by changing norms toward lower fertility and ending harmful practices, and enforcing noncorrupt and efficient public-service provisions. A recent study by Martina Björkman and Jakob Svensson shows how these mechanisms may work by drawing on evidence from a randomized control trial. The researchers found that initially, villagers had little information about the scope of health problems in their village compared with outside standards, nor about what to reasonably expect from government-funded health workers. The program provided villagers with the knowledge and resources to enable them to monitor health workers individually and through their community organization. This is important to do as a community because both information gathering and monitoring have features of public goods. The results suggest that such a program can improve the behavior of health workers and lead to measurably better health outcomes—all for apparently very modest cost outlays.

The study questions were whether the intervention *caused* an increased quantity and quality of health care provision; and whether this resulted in improved health outcomes. The researchers were checking for impacts along the hypothesized “accountability chain” that treatment communities became more involved in monitoring health workers and that the intervention changed the behavior of health workers. The initial intervention had three components: first, a meeting of villagers; second, a meeting with health care workers; and finally, a meeting including both groups. This was followed by a plan of action and monitoring organized by villagers.

Initially, a “report card” comparing performance of the local health facility with others was prepared. Then facilitators in conjunction with local community leaders and community-based organizations

organized a village meeting to hear and discuss the results and develop an action plan. (This is similar to the process of many community-based development activities in Africa and elsewhere.) Participation in the two-afternoon event was carefully planned to include—and hear from—diverse representatives to avoid elite capture. The facilitators “encouraged community members to develop a shared view on how to improve service delivery and monitor the provider,” which were “summarized in an action plan.” In these meetings, researchers observed some common concerns that “included high rates of absenteeism, long waiting-time, weak attention of health staff, and differential treatment.”

The health facility meeting was a one-afternoon, all-staff event where facilitators contrasted the facility’s information on service provision with findings from a household survey. Finally, an “interface meeting” was held with community representatives chosen at the community meetings and health workers, where rights, responsibilities, and suggestions for improvements were discussed, resulting in a “shared action plan...on what needs to be done, how, when and by whom.” Then, “after the initial meetings, the communities were themselves in charge of establishing ways of monitoring the provider.”

The program was associated with (and apparently caused) positive health outcomes, including relatively higher weights of infants, fewer deaths of children less than five years old, and greater utilization of health facilities. Evidence showed that as a result of the program, treatment practices also improved the “quality and quantity of health care provision,” suggesting that increases “are due to behavioral changes.” In particular, equipment (such as a thermometer) was used more often; waiting time was reduced; clinic cleanliness improved; better information was provided to patients; appropriate supplements and vaccines for children were provided more often; and absenteeism by health workers declined. The program was estimated to improve health outcomes to a degree similar

to findings from high-impact medical trials. However, such trials assume the health system is working fine and only benefits from improved procedures and medications; in contrast, this approach focused on getting health workers to do what they were supposed to do in the first place.

Some checks confirmed the program more likely had its impact through community participation rather than other mechanisms, but it is still possible that other mechanisms such as health workers responding to learning about patient rights rather than community pressure played some role; so we may not yet be certain how the program worked. This type of question is important to investigate because understanding mechanisms helps with designing other programs effectively.

Overall, the researchers surmised that “lack of relevant information and failure to agree on, or coordinate expectations of, what is reasonable to demand from the provider were holding back individual and group action to pressure and monitor the provider.”

The authors caution that: “Before scaling up, it is also important to subject the project to a cost-benefit analysis....A back-of-the-envelope calculation suggests that....The estimated cost of averting the death of a child under five is around \$300.” If this estimate holds up to more systematic analysis, it would be an unusually cost-effective program. The authors concluded by noting that “future research should address long-term effects, identify which mechanisms or combination of mechanisms that are important, and study the extent to which the results generalize to other social sectors.”

There remain some other questions. As hinted, it is uncertain whether these improvements can be sustained over time—at least without periodic outside facilitation—for example, if the initial interest for participants is in being part of a foreign-sponsored program and this motive fades over time, or if long-term threats to collective organization including free riding and capture rear their heads. So it would be valuable to return to these villages to look at conditions after a few years. It is not clear yet how well or how cost-effectively this approach would work elsewhere—the “external validity” question again. Even if the program does indeed work through the mechanism of empowerment, as seems quite likely, the real powers that be may not have allowed such outcomes if material interests of rulers were threatened by the program. Moreover, as the researchers note, an approach that combined more monitoring from the top of the health ministry in combination with the bottom-up monitoring of communities, as done in this program, could have even larger positive impacts. Finally, people and their communities have limited time; so inducing a shift of time to the health system monitoring activity in this program could cause a decrease in the amount of other valuable community activities.

But in sum, this is an exemplary design and evaluation of a community-based development program that provides substantive evidence of what can work to improve health (and empowerment) of villagers in a low-income rural area.

Sources: Martina Björkman and Jakob Svensson, “Power to the People: Evidence from a Randomized Field Experiment on Community-Based Monitoring in Uganda,” *Quarterly Journal of Economics*, 124 (2), pp 735–769, May 2009; and supplementary appendix.

a firm to wait for others to invest rather than to be a “pioneer” investor. In that case, government policy is generally needed in addition to a change of expectations. This explains why attention to the potential presence of multiple equilibria is so important. Market forces can generally bring us to one of the equilibria, but they are not sufficient to ensure that the best equilibrium will be achieved, and they offer no mechanism to become unstuck from a bad equilibrium and move toward a better one.

A similar multiple-equilibria situation will be encountered in our analysis of the Malthus population trap in Chapter 6. In this population trap, fertility decisions need in effect to be coordinated across families—all are

better off if the average fertility rate declines, but any one family may be worse off by being the only one to have fewer children. We also see coordination failures in processes of urbanization and other key elements of economic development.

In general, when jointly profitable investments may not be made without coordination, multiple equilibria may exist in which the same individuals with access to the same resources and technologies can find themselves in either a good or a bad situation. In the view of many development economists, it is very plausible that many of the least developed countries, including many in sub-Saharan Africa, are essentially caught in such circumstances. Of course, other problems are also present. For example, political pressures from potential losers in the modernization process can also prevent shifts to better equilibria. In addition, modern technology may not yet be available in the country. The technology transfer problem is another important concern in economic development. In fact, another problem illustrated by the graph in Figure 4.1 could be that the amount of effort each firm in a developing region expends to increase the rate of technology transfer depends on the effort undertaken by other firms; bringing in modern technology from abroad often has spillover effects for other firms. But the possibility of multiple equilibria shows that making better technology available is generally a necessary but not a sufficient condition for achieving development goals.

4.3 Starting Economic Development: The Big Push

Whether an economy has been growing sustainably for some time or has been stagnant seems to make a very big difference for subsequent development. If growth can be sustained for a substantial time, say, a generation or more, it is much more unusual for economic development to later get off track for long (though, of course, there will be setbacks over the business cycle as the economy is affected by temporary shocks). Certainly, we have had too many disappointing experiences to assume, with Rostow, that once economic development is under way, it can in effect never be stopped. As noted in the case study in Chapter 3, a century ago, Argentina was regarded as a future powerhouse of the world economy, yet it later experienced relative stagnation for more than half a century. A look at the record, however, allows us to agree with Rostow at least in that it is very difficult to get modern economic growth under way in the first place and much easier to maintain it once a track record has been established.

Why should it be so difficult to start modern growth? Many models of development that were influential in earlier years, such as the Lewis model examined in Chapter 3, assume perfectly competitive conditions in the industrial sector. Under perfect competition, it is not clear why starting development would be so difficult, provided at least that the needed human capital is developed, the technology transfer problem is adequately addressed, and government provides other essential services. But development seems hard to initiate even when better technologies are available—they often go unused. Apparently, people do not have the incentives to put the new technology to

work. Beyond this, perfect competition does not hold under conditions of increasing returns to scale. And yet, looking at the Industrial Revolution, it is clear that taking advantage of returns to scale has been key. Many development economists have concluded that several market failures work to make economic development difficult to initiate, notably **pecuniary externalities**, which are spillover effects on costs or revenues.

Perhaps the most famous coordination failures model in the development literature is that of the “big push,” pioneered by Paul Rosenstein-Rodan, who first raised some of the basic coordination issues.¹¹ He pointed out several problems associated with initiating industrialization in a subsistence economy, of the type introduced in Chapter 1. The problem is easiest to perceive if we start with the simplifying assumption that the economy is not able to export. In this case, the question becomes one of who will buy the goods produced by the first firm to industrialize. Starting from a subsistence economy, no workers have the money to buy the new goods. The first factory can sell some of its goods to its own workers, but no one spends all of one’s income on a single good. Each time an entrepreneur opens a factory, the workers spend some of their wages on other products. So the profitability of one factory depends on whether another one opens, which in turn depends on its own potential profitability, and that in turn depends on the profitability of still other factories. Such circular causation should now be a familiar pattern of a coordination failure problem. Moreover, the first factory has to train its workers, who are accustomed to a subsistence way of life. The cost of training puts a limit on how high a wage the factory can pay and still remain profitable. But once the first firm trains its workers, other entrepreneurs, not having to recoup training costs, can offer a slightly higher wage to attract the trained workers to their own new factories. However, the first entrepreneur, anticipating this likelihood, does not pay for training in the first place. No one is trained, and industrialization never gets under way.

The big push is a model of how the presence of market failures can lead to a need for a concerted economy-wide and probably public-policy-led effort to get the long process of economic development under way or to accelerate it. Put differently, coordination failure problems work against successful industrialization, a counterweight to the push for development. A big push may not always be needed, but it is helpful to find ways to characterize cases in which it will be.

Rosenstein-Rodan’s arguments became a major part of the way development economists thought about development problems in the 1950s and 1960s, and they have continued to be taught in development courses. But while some of the basic intuition has thus been around for decades, the approach received a huge boost following the 1989 publication of a technical paper by Kevin Murphy, Andrei Shleifer, and Robert Vishny, which for the first time demonstrated the formal logic of this approach more clearly.¹² Its recent appeal is also due in part to its perceived value in explaining the success of the East Asian miracle economies, notably that of South Korea. One value of using a formal model is to get a clearer sense of when the need for coordination is more likely to present a serious problem. The approach of these authors was in turn simplified and popularized by Paul Krugman in his 1995 monograph, *Development, Geography, and Economic Theory*, and became the classic model of the new development theories of coordination failure of the 1990s.¹³

Pecuniary externality A positive or negative spillover effect on an agent’s costs or revenues.

The Big Push: A Graphical Model

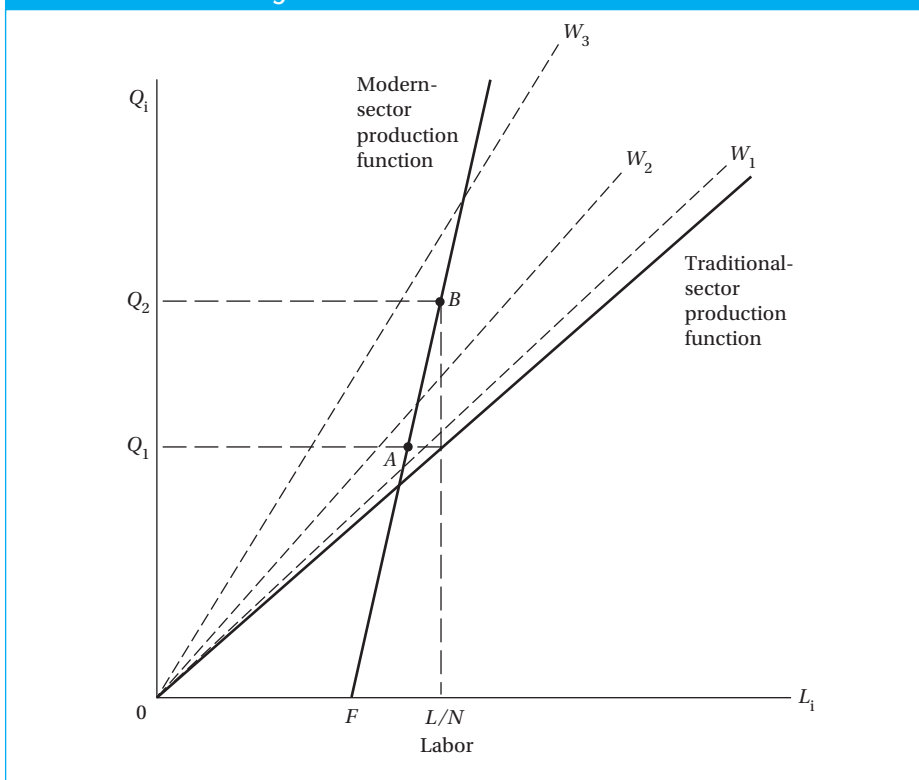
Assumptions In any model (indeed, in any careful thinking), we need to make some assumptions, sometimes seemingly large assumptions, to make any progress in our understanding. The analysis of the big push is no exception to this rule. The assumptions we use for the big push analysis here can be relaxed somewhat, though at the expense of requiring more mathematical technique, but it should be noted that we cannot relax our assumptions as much as we are accustomed to doing in simpler microeconomic problems, such as those that assume perfect competition. Here we cannot meaningfully assume perfect competition in the modern sector, where increasing returns to scale and hence natural monopoly, or at least monopolistic competition, prevail. To paraphrase Paul Krugman, if we think development has something significant to do with increasing returns to scale, then we will have to sacrifice some generality to address it. We will make six types of assumptions.

1. *Factors.* We assume that there is only one factor of production—labor. It has a fixed total supply, L .
2. *Factor payments.* The labor market has two sectors. We assume that workers in the traditional sector receive a wage of 1 (or normalized to 1, treating the wage as the numeraire; that is, if the wage is 19 pesos per day, we simply call this amount of money “1” to facilitate analysis using the geometry in Figure 4.2). Workers in the modern sector receive a wage $W > 1$ (that is, some wage that is greater than 1).

As a stylized fact, this wage differential is found in every developing country, even if it needs some explanation (see Chapter 7). The underlying reason for this differential *may be* a compensation for disutility of modern factory types of work. If so, in equilibrium, workers would receive no net utility benefits from switching sectors during industrialization; but if economic profits are generated, this will represent a Pareto improvement (in this case because investors are better off and no one is worse off), and average income would rise (there can also be income redistribution so that everyone may be made better off, not just no one worse off). Moreover, if there is surplus labor in the economy or if modern wages are higher than opportunity costs of labor for some other reason,¹⁴ the social benefits of industrialization are all the greater.¹⁵ Finally, note that we are examining one example of a model in which a driving force for an underdevelopment trap is the relatively high wages that have to be paid in the modern sector. We do this because it is an approach that is easy to characterize graphically and that has received a lot of attention. As will be described later, however, high modern wages is only one circumstance in which a coordination problem may exist. In fact, we will see that there may be coordination failure problems even if modern-sector wages are no higher than those in the traditional sector.

3. *Technology.* We assume that there are N types of products, where N is a large number.¹⁶ For each product in the traditional sector, one worker produces one unit of output (this is a less stringent assumption than it

FIGURE 4.2 The Big Push



appears because again we have a certain freedom in choosing our unit of measurement; if a worker produces three pairs of shoes per day, we call this quantity one unit). This is a very simple example of constant-returns-to-scale production. In the modern sector, there are increasing returns to scale. We want to introduce increasing returns in a very simple way. Assume that no product can be produced unless a minimum of, say, F workers are employed. This is a fixed cost. Because we are keeping things simple to facilitate analysis of the core issues, we have not put capital explicitly in the model; thus the only way to introduce a fixed cost is to require a minimum number of workers. After that, there is a linear production function in which workers are more productive than those in the traditional sector. Thus labor requirements for producing any product in the modern sector take the form $L = F + cQ$, where $c < 1$ is the marginal labor required for an extra unit of output. The trade-off is that modern workers are more productive, but only if a significant cost is paid up front. As this fixed cost is amortized over more units of output, average cost declines, which is the effect of increasing returns to scale. We assume symmetry: The same production function holds for producing any product in the modern sector.

4. *Domestic demand.* We assume that each good receives a constant and equal share of consumption out of national income. The model has only one

period and no assets; thus there is no saving in the conventional sense. As a result, if national income is Y , then consumers spend an equal amount, Y/N , on each good.¹⁷

5. *International supply and demand.* We assume that the economy is closed. This makes the model easy to develop. The most important conclusions will remain when trade is allowed, provided that there are advantages to having a domestic market. These advantages likely include initial economies of scale and learning to achieve sufficient quality, favorable product characteristics, and better customer support before having to produce for distant and unknown consumers. These are very realistic considerations: Evidence suggests that export-led economies such as South Korea have benefited enormously from the presence of a substantial domestic market to which early sales are directed.¹⁸ Moreover, export-led economies have benefited from an active industrial policy aimed at overcoming coordination failures (see Chapter 12). The points will also hold if there are necessary inputs that are not tradable, such as certain types of services. Alternative models focusing on infrastructure investments can also imply the need for a big push even with a fully open world economy.¹⁹
6. *Market structure.* We assume perfect competition in the traditional (cottage industry) sector, with free entry and no economic profits. Therefore, the price of each good will be 1, the marginal cost of labor (which is the only input). We assume that at most, one modern-sector firm can enter each market. This limitation is a consequence of increasing returns to scale. Given the assumptions about preferences, the monopolist faces unit-elastic demand, so if this monopolist *could* raise its price above 1, it would be profitable to do so.²⁰ However, if price is raised above 1, competition from the traditional-sector producers will cause the modern-sector firm to lose all of its business. Therefore, the monopolist will also charge a price of 1 if it decides to enter the market.²¹ Because the monopolist charges the same price, it will monopolize this particular market if it enters but will also produce the same quantity that was produced by the traditional producers. Because this firm is the only one using modern techniques and, in producing all other products, workers receive a wage of 1, national income will be essentially the same, so more units of output cannot be sold.²² We also assume that at the point the monopolist would choose to produce, it is able to produce at least as much output as the traditional producers for that same level of labor; otherwise, it would make no sense to switch out of the traditional techniques.

Conditions for Multiple Equilibria With these six assumptions, we can characterize cases that will require a big push. To begin, suppose that we have a traditional economy with no modern production in any market. A potential producer with modern technology (i.e., a technology like the one described previously, with fixed costs and increasing returns) considers whether it is profitable to enter the market. Given the size of the fixed cost, the answer depends on two considerations: (1) how much more efficient the modern

sector is than the traditional sector and (2) how much higher wages are in the modern sector than in the traditional sector.

In Figure 4.2, production functions are represented for the two types of firms for any industry.²³ The traditional producers use a linear technique with slope 1, with each worker producing one unit of output. The modern firm requires F workers before it can produce anything, but after that, it has a linear technique with slope $1/c > 1$. Price is 1, so revenues PQ can be read off the Q axis. For the traditional firm, the wage bill line lies coincident with the production line (both start at the origin and have a slope of 1). For the modern firm, the wage bill line has slope $W > 1$. At point A , we see the output that the modern firm will produce if it enters, provided there are traditional firms operating in the rest of the economy. Whether the modern firm enters depends, of course, on whether it is profitable to do so.

Using Figure 4.2, first consider a wage bill line like W_1 passing below point A . With this relatively low modern wage, revenues exceed costs, and the modern firm will pay the fixed cost F and enter the market. In general, this outcome is more likely if the firm has lower fixed costs or lower marginal labor requirements as well as if it pays a lower wage. By assumption, production functions are the same for each good, so if a modern firm finds it profitable to produce one good, the same incentives will be present for producing all goods, and the whole economy will industrialize through market forces alone; demand is now high enough that we end up at point B for each product. This shows that a coordination failure need not always happen: It depends on the technology and prices (including wages) prevailing in the economy.

If a wage bill line like W_2 holds, passing between points A and B , the firm would not enter if it were the only modern firm to do so in the economy because it would incur losses. But if modern firms enter in each of the markets, then wages are increased to the modern wage in all markets, and income expands. We may assume that price remains 1 after industrialization. Note that the traditional technique still exists and would be profitable with a price higher than 1. So to prevent traditional firms from entering, modern firms cannot raise prices above 1.²⁴ The modern firm can now sell all of its expanded output (at point B), produced by using all of its available labor allocation (L/N), because it has sufficient demand from workers and entrepreneurs in the other industrializing product sectors. As can be seen in Figure 4.2, with prevailing wage W_2 , point B is profitable after industrialization because it lies above the W_2 line. Workers are also at least as well off as when they worked in the traditional sector because they can afford to purchase an additional quantity of goods in proportion to their increased wage,²⁵ and they have changed sectors (from traditional to modern) voluntarily. All of the output is purchased because all of national income is spent on output; national income is equal to wages plus profits, the value of which is output of each product times the number of products N .²⁶

Thus, with a prevailing wage like W_2 , there are two equilibria: one in which producers with modern techniques enter in all markets, and profits, wages, and output are higher than before; and one in which no modern producer enters, and wages and output remain lower. The equilibrium with higher output is unambiguously better, but in general, the market will not get there by itself.

A final possibility is found in a wage bill line like W_3 , passing above point B . In this case, even if a modern producer entered in all product sectors, all of these firms would still lose money, so again the traditional technique would continue to be used. In general, whenever the wage bill line passes below point A , the market will lead the economy to modernize, and whenever it passes above A , it will not. The steeper (i.e., more efficient) the modern-sector production technique or the lower the fixed costs, the more likely it is that the wage bill will pass below the corresponding point A . If the line passes above B , it makes no sense to industrialize. But if the wage line passes between points A and B , it is efficient to industrialize, but the market will not achieve this on its own. Be sure to note that these are three different wages that might exist, depending on conditions in a particular economy at one point in time, not three wages that occur successively.

Again, the problematic cases occur when the wage bill line passes between A and B , thus creating two equilibria: one in which there is industrialization and the society is better off (point B) and one without industrialization (point A). However, the market will not get us from A to B because of a coordination failure.²⁷ In this case, there is a role for policy in starting economic development. There is no easy test to determine where a traditional economy, such as Mozambique, is located on this continuum. But at least we can begin to understand why development often has not gotten under way, even when technology is available.

Note that in general, it is not necessary for all product sectors to industrialize to get a sufficient push for some to do so. It is only necessary that a sufficient number industrialize in order to generate enough national income (through the higher industrial wage and positive profits from the industrialized product sectors) to make industrialization minimally profitable. Also note that each firm's failure to take into account the impact of its investments on demand for other firms' goods represents a very small distortion by itself. But when added up across all of the product sectors, the resulting distortion—namely, the failure to industrialize at all—is very large indeed.

We could also have cases of semi-industrialization, in which benefits or costs accrue in different amounts to different product sectors or in which there are different types of spillovers from firm to firm. For example, this is plausible when the level of required fixed costs declines the more product sectors industrialize, because there are more local examples from which to learn.²⁸ With this alternative type of externality, no wage premium is necessary for multiple equilibria to be present. In this case, if there are clusters of two or more firms that have large effects on each other's fixed costs, F , but not on firms outside of the cluster, the result can be an equilibrium in which only the industries in this cluster change to modern techniques. Thus, in this circumstance, we could have three or more equilibria; we could also have enclave economies, in which a modern sector exists side by side with traditional cottage industries in other product sectors.²⁹

Notice that this model has not assumed the existence of any type of **technological externality**, in which the presence of one advanced firm can, through "learning by watching" other firms' production methods or some similar effect, generate spillovers to other firms that can raise their productivity as well as lower their costs. This is another type of market failure that can

Technological externality A positive or negative spillover effect on a firm's production function through some means other than market exchange.

also lead to inefficiently low investment; we considered one such possibility when we examined the Romer endogenous growth model in Appendix 3.3.

Other Cases in Which a Big Push May Be Necessary

The need for a big push can result from four conditions beyond those described previously.

1. *Intertemporal effects.* Even if the industrial wage rate is 1 (i.e., the same as the traditional-sector wage), multiple equilibria can occur if investment must be undertaken in the current period to get a more efficient production process in the next period.³⁰ Investment in the first period depresses aggregate demand in the first period but increases it in the second (or later) period. But investment will be undertaken only if it is profitable, that is, if demand is expected to be high enough in the second period, and this may require that many product sectors invest simultaneously. Once again, however, the market does not ensure that industrialization will occur, even when it is (Pareto-)preferred, because of pecuniary externalities. Again the source of the multiple equilibria is that one firm's profits do not capture its external contribution to overall demand for modern-sector products because it also raises wage income in the future periods when other entering modern firms will be seeking to sell their own products. When there is a case for a big push, industrialization makes the society better off (is Pareto-preferred) because first-period income is decreased only by the fixed cost, but second-period income is sufficiently increased by both the wage and profits in other product sectors to more than offset this.³¹ Note once again that a part of the profits can, in principle, also be subject to income redistribution so that everyone may be made better off rather than just some people made better off and no one made worse off.
2. *Urbanization effects.* If some of the traditional cottage industry is rural and the increasing-returns-to-scale manufacturing is urban, urban dwellers' demand may be more concentrated in manufactured goods (e.g., foods must be processed to prevent spoilage due to the time needed for transportation and distribution). If this is the case, one needs a big push to urbanization to achieve industrialization.³²
3. *Infrastructure effects.* By using infrastructure, such as a railroad or a port, an investing modern firm helps defray the large fixed costs of that infrastructure. The existence of the infrastructure helps investing firms lower their own costs. But investing firms thereby contribute indirectly to lowering the costs of other firms (by lowering the average cost of infrastructure use). Infrastructure, such as roads, railroads, and ports, is not tradable; by definition, it is located in a particular region. And openness to foreign investment cannot always solve the problem because investors do not know whether firms will develop to make use of the infrastructure.³³ The critical point is that when one product sector industrializes, it increases the size of the market for the use of infrastructure services that would be used by other product sectors and so makes the provision of these services more profitable. But it is also possible that efficient industrialization

may not take place, even if the infrastructure is built, if other coordination problems are present.

4. *Training effects.* There is underinvestment in training facilities because entrepreneurs know that the workers they train may be enticed away with higher wages offered by rival firms that do not have to pay these training costs. There is also too little demand by workers for training because they do not know what skills to acquire. (In addition to not knowing whether firms will make investments requiring these skills, people are not born with perfect information about their comparative advantage; basic education helps workers discover it.) This is part of the economic case for mandatory public education. Note that in this case, openness to trade cannot resolve the coordination failure unless there is free mobility of labor across borders, which has yet to develop perfectly even within the European Union, where there are few formal barriers to such mobility, and is far from emerging for any developing country. In any case, relying on expatriate skilled workers is hardly an adequate solution to a country's own underdevelopment. Actually, infrastructure and trained workers are subsets of a general case of jointly used intermediate goods. Another example is joint research facilities for small firms in an "industrial district" (see Chapter 7).

Why the Problem Cannot Be Solved by a Super-Entrepreneur

Some readers may wonder, why can't one agent solve the coordination failure problems by capturing all the rent? In other words, why not have a super-entrepreneur who enters into all of the markets that need to be coordinated and receives the profits from all of them? For some types of coordination failures, this solution is ruled out in advance. For example, regarding education and skill development, there is a legal constraint on bonded labor. But in terms of our industrialization problem, why can't one agent become a super-entrepreneur in each of the N markets simultaneously? There are at least four significant theoretical answers and one decisive empirical answer.

First, there may be capital market failures. How could one agent assemble all the capital needed to play the super-entrepreneur role? Even if this were logistically imaginable, how would lenders have confidence in their investments? In particular, how could a penalty for default be imposed?

Second, there may be costs of monitoring managers and other agents and designing and implementing schemes to ensure compliance or provide incentives to follow the wishes of the employer; these are often referred to as **agency costs**. Monitoring is too expensive once the scale of a firm gets too large. Even if the plan is to sell off the industries, these industries must be developed simultaneously. The super-entrepreneur is likely to know more about the firms than the potential buyers do. In other words, if the firm is so profitable, why would its owners be selling? Thus, potential purchasers of the industries face a problem of **asymmetric information**, often known as the "lemons problem."³⁴

Third, there may be communication failures. Suppose someone says to you, "I am coordinating investments, so work with me." Should you do so?

Agency costs Costs of monitoring managers and other employees and of designing and implementing schemes to ensure compliance or provide incentives to follow the wishes of the employer.

Asymmetric information A situation in which one party to a potential transaction (often a buyer, seller, lender, or borrower) has more information than another party.

How do you know this person will eventually be the coordinator? There is a potentially huge profit to be made by assuming the super-entrepreneur role, so many agents might wish to play it. If many try to claim the role, with which one should you coordinate? Even if each agent personally encounters only one pretender to the super-entrepreneur role, that pretender may still not be the right one (i.e., the coordinator with whom you can make money).

Fourth, there are limits to knowledge. Even if we stipulate that the economy as a whole has access to modern technological ideas, this does not mean that one individual can gain sufficient knowledge to industrialize (or even gain enough knowledge about whom to hire to industrialize).

Finally, there is the empirical reason that no private agent has been observed playing the role of super-entrepreneur. Whether because of problems of monitoring, knowledge, capital markets, or other diseconomies of scope, “solving” problems with ever-larger firms clearly provides no answer. For example, it is rare enough to find a firm producing steel and even a significant fraction of the products using steel, let alone one firm owning all the industries backwardly linked from steel or forwardly linked from steel-using industries to industries further down the production chain. Nor can the problem be solved by direct government production (at least without unacceptable cost), as the extreme case of the former Soviet Union demonstrates. Rather, public coordination of actions of private investors is generally needed to solve the problem, a common interpretation of the role of industrial policy in East Asia.

In a Nutshell Thus we have seen that under some conditions, pecuniary externalities associated with the development process can lead to multiple equilibria, which may create a case for a big push policy. Our main example (the moderate wage premium case) and each of the other examples have as a common feature a process by which an investing (industrializing) firm captures only part of the contribution of its investment to the profits of other investing firms. In these examples, firms adopting increasing-returns-to-scale technologies are having one or more of the following effects: raising total demand, shifting demand toward manufactured goods, redistributing demand toward the (later) periods in which other industrializing firms sell, reducing the fixed costs of later entrants, or helping defray the fixed costs of an essential infrastructure. Each of these has external beneficial effects on other industrializing firms.

4.4 Further Problems of Multiple Equilibria

Inefficient Advantages of Incumbency

The presence of increasing returns in modern industries can also create another kind of bad equilibrium. Once a modern firm has entered, it has an advantage over any rivals because its large output gives it low average costs. So if an even better modern technology becomes available to a potential rival, it may not be easy for the new technology to supplant the old. Even though the new technique has a lower per-unit cost for any given level of output, the firm with the old technique has an advantage because its large output lets it

produce at a lower per-unit cost than that of the new technique, which starts out with a small customer base and a large fixed cost. As a result, firms may need access to significant amounts of capital to cover losses while they build their customer base. If capital markets do not work well, as they often do not in developing countries (see Chapter 15), the economy may be stuck with backward, less cost-effective industries.³⁵

Behavior and Norms

Movement to a better equilibrium is especially difficult when it involves many individuals changing their behavior from one of rent seeking or corruption to honesty and the value of building a reputation to reap the gains from cooperation (e.g., with business partners). Your choice of partner may determine much. If you naively cooperate with an opportunistic, predator type, you may be worse off than by going it alone. Only by cooperating with other good-willed cooperators may you reach the best outcome. Moreover, past experience may lead people to expect opportunistic behavior at least among certain groups of potential business partners, which in turn raises the incentives for the potential partners to actually act that way. If there is nothing to be gained and something to be lost by being honest, the incentives lie in being dishonest. On the other hand, in some settings, individuals take it on themselves to enforce norms rather than leaving this task to government. If many people work to enforce a norm such as honesty, each individual's enforcement burden is relatively low. You can have equilibria where most people resist corruption, and so corruption is rare; and you can have equilibria where few resist corruption, and corruption is common.

We cannot rely on good organizations to prevail in competition if the rules of the game tend to reward the bad organizations. Rather, the critical importance of policies for developing or reforming institutions is highlighted, such as reform of the framework of property rights, antitrust, clean government rules, and other laws, regulations, and industry association norms that set the rules of the game for economic life. Once the new behavior assumes the status of a norm, it is much easier to maintain. Some neoclassical theorists have at times implied that good institutions would be developed through the market mechanism. Bad institutions would be outcompeted by good institutions. But reform of institutions aiding and abetting coordination failure—for example, by permitting or encouraging corruption—is itself subject to coordination failure.

Once cooperative relationships (e.g., in business) become a norm, more people may adopt cooperative behavior. But norms of all kinds are subject to inertia. Although norms may have been adaptive when they originated, they are hard to change, even when they become dysfunctional. An example is a value such as that to be a good citizen (or a good Hindu, Muslim, Christian, animist, etc.) one must have a large number of children. This value may have been adaptive at a premodern stage, but today it inhibits development. Another example may be to distrust anyone who is not a member of your family. This may be helpful in a tribal context, and caution is always advisable, but this extreme injunction hardly encourages the formation of successful business partnerships in a modern economy.

Linkages

There are several ways to undertake a big push, encouraging the simultaneous expansion of the modern sector in many industries. One strategy for solving coordination problems is to focus government policy on encouraging the development of industries with key backward or forward **linkages**. This could mean subsidies or *quid pro quos* for domestic industries to enter these key industries, as was done in South Korea; it could mean incentives for multinational firms to enter in key industries and provide advanced training, a policy followed in Singapore; or it could mean establishing a few key public enterprises to act as pioneers in an industry (that could later be sold), as was done in South Korea and Taiwan.³⁶ The theory of linkages stresses that when certain industries are developed first, their interconnections or linkages with other industries will induce or at least facilitate the development of new industries. Backward linkages raise demand for an activity, while forward linkages lower the costs of using an industry's output; both may involve interactions between the size of the market and increasing returns to scale and hence pecuniary externalities. In other words, linkages are especially significant for industrialization strategy when one or more of the industries involved have increasing returns to scale, of which a larger market may take advantage. For example, when the manufacture of power looms expands, enabling a reduction in the price of power looms, there are forward linkage effects due to increased output of woven cloth made by the power looms. When increased demand for chemicals used in textile manufacture causes expansion of the chemical industry that enables it to produce at a larger scale and hence lower cost, a backward linkage can occur. Both examples illustrate a pecuniary externality effect (a lowering of cost) when there are increasing returns in the linked industry.

The linkage approach targets investment in a key linkage as a start to overcoming a coordination failure and generating positive feedback. Such a policy would select industries with a larger number of links to other industries and greater strength of those links. In choosing among industries with several strong links (and passing a cost-benefit test), one policy would generally select industries that have a smaller likelihood of private investment, because that is where the most intransigent bottlenecks are most likely to be found. If an investment is profitable, it is more likely that an entrepreneur will come along to fill that niche.³⁷ This observation provides a reason to interpret with some caution studies that show state-owned enterprises to be less efficient than private ones. If government systematically enters vital but less profitable industries because of their beneficial effects on development, it is unreasonable to hold these enterprises to the same profit standards as those of the private firms. This is certainly not to say that state-owned enterprises are generally as efficient as privately owned ones; in fact, there is much evidence to the contrary.³⁸ We can say, however, that a blanket statement, such as has often been made in publications from agencies such as the World Bank, that government should never be in the business of production, even temporarily or in any industry, is sometimes unreasonable in the light of linkages and other strategic complementarities that a developing economy needs to address.

Linkages Connections between firms based on sales. A backward linkage is one in which a firm buys a good from another firm to use as an input; a forward linkage is one in which a firm sells to another firm. Such linkages are especially significant for industrialization strategy when one or more of the industries (product areas) involved have increasing returns to scale that a larger market takes advantage of.

Inequality, Multiple Equilibria, and Growth

Other important work being done on growth and multiple equilibria addresses the impact of inequality on growth. The traditional view has been that some inequality may enhance growth because the savings of the rich are higher than those of the poor. If at least some savings to be mobilized for investment purposes must come from within a country, then according to this view, too high a degree of equality could compromise growth. However, the poor save at much higher rates than previously believed, when savings are properly measured to include expenditures on health, children's education, and improvements on a home.

Moreover, where inequality is great, the poor may not be able to obtain loans because they lack collateral; indeed, one definition of what it means to be poor is to be entirely or mostly lacking in a source of collateral. Poor persons unable to get a loan to start a business due to such capital market imperfections may get stuck in subsistence or wage employment, although they (and perhaps potential employees) could do much better if they had access to financing or if there were a more even distribution of income. For example, Abhijit Banerjee and Andrew Newman show that multiple equilibria, including equilibria involving outcomes with virtually all citizens enjoying high incomes and outcomes with predominantly low-income people, can exist when imperfect credit markets provide too few people with the opportunity to become entrepreneurs.³⁹

Similarly, if the poor lack access to credit, they may not be able to obtain loans to finance otherwise very productive schooling. If the poor are unable to bequeath much to their next generation, families can be trapped in poverty from generation to generation; however, if schooling could somehow be achieved, they could escape from this **poverty trap**. It is best to keep in mind a rather expansive definition of what is meant by a *transfer* from parents to be used for human capital accumulation by their children. It is more than tuition and more than forgone wages or work on the farm to help the family because it goes well beyond the cost of formal schooling and may be thought of as the building of a whole array of "capabilities" (see Chapter 1) that one acquires almost as a simple by-product of growing up in an affluent, educated family.

In a formal model of this problem, Oded Galor and Joseph Zeira examined the implications of missing credit markets for growth and the distribution of both income and human capital. They developed an endogenous growth model that points up the importance of both human capital and distribution, and of the interaction between the two, for economic growth and development as well as for more short-term macroeconomic adjustments. Their analysis contains two critical assumptions: (1) imperfect capital markets, which, as will be described in detail in Chapter 15, is a typical condition of these markets, and (2) indivisibilities in human capital investment, which means that markets treat investment in human capital as coming in discrete packages, such as a year of school, if not larger blocks, such as primary, secondary, and tertiary education. The second assumption does not seem unreasonable, both because of the nature of learning and because of the screening nature of markets for human capital. A threshold level of knowledge is necessary before an employer will be willing to pay for it. Further, because education acts as a screen for inherent ability, as will be discussed in Chapter 8, we have the well-known "sheepskin effect"; that is, there is a very large jump in the return

Poverty trap A bad equilibrium for a family, community, or nation, involving a vicious circle in which poverty and underdevelopment lead to more poverty and underdevelopment, often from one generation to the next.

to human capital when an individual passes primary school and again when the person obtains a secondary school diploma and so on. This is not because the last course taken conveys so much more knowledge than the ones preceding it but because the degree itself is what enables the individual to prove that an entire regimen of requirements has been met. Note that indivisibilities in amounts of investment imply a region of increasing returns to scale, as in the fixed costs of the big push model. Once again, increasing returns play a key role in generating multiple equilibria.⁴⁰ Empirically, many studies have found a negative impact of inequality on growth, especially for the period after 1980.⁴¹

4.5 Michael Kremer's O-Ring Theory of Economic Development

Another innovative and influential model that provides important insights into low-level equilibrium traps was provided by Michael Kremer.⁴² The notion is that modern production (especially in contrast to traditional crafts production) requires that many activities be done well together in order for any of them to amount to a high value. This is a form of strong complementarity and is a natural way of thinking about specialization and the division of labor, which along with economies of scale is another hallmark of developed economies in general and industrial production in particular. The name for Kremer's model is taken from the 1986 *Challenger* disaster, in which the failure of one small, inexpensive part caused the space shuttle to explode. The O-ring theory is interesting in part because it explains not only the existence of poverty traps but also the reasons that countries caught in such traps may have such exceptionally low incomes compared with high-income countries.

The O-Ring Model

The key feature of the O-ring model is the way it models production with strong complementarities among inputs. We start by thinking of the model as describing what is going on inside a firm, but as we will see, this model also provides valuable insights into the impact of complementarities across firms or industrial (product) sectors of the economy.

Suppose that a production process is broken down into n tasks. There are many ways of carrying out these tasks, which for simplicity we order strictly by level of skill, q , required, where $0 \leq q \leq 1$. The higher the skill is, the higher the probability that the task will be "successfully completed" (which may mean, for example, that the part created in this task will not fail). Kremer's concept of q is quite flexible. Other interpretations may include a quality index for characteristics of the good: Consumers would be willing to pay more for higher-quality characteristics. For example, suppose that $q = 0.95$. Among other interpretations, this can mean (1) that there is a 95% chance that the task is completed perfectly, so the product keeps maximum value, and a 5% chance that it is completed so poorly that it has no value; (2) that the task is always completed well enough that it keeps 95% of its maximum value; or (3) that the product has a 50% chance of having full value and a 50% chance of an error reducing the value of the product to 90%. For simplicity, assume that

the probability of mistakes by different workers is strictly independent. The production function assumed is a simple one: Output is given by multiplying the q values of each of the n tasks together, in turn multiplied by a term, say, B , that depends on the characteristics of the firm and is generally larger with a larger number of tasks. Suppose also that each firm hires only two workers. Then the **O-ring production function** looks like this:⁴³

$$BF(q_i q_j) = q_i q_j \quad (4.1)$$

That is, to make things simple, for this exposition we let the multiplier, B , equal 1. In addition to the form of the production function, we make three other significant types of simplifying assumptions: (1) Firms are risk-neutral, (2) labor markets are competitive, and (3) workers supply labor inelastically (i.e., they work regardless of the wage). If we consider capital markets, we assume that they are competitive as well. For now, we also assume that the economy is closed.

One of the most prominent features of this type of production function is what is termed *positive assortative matching*. This means that workers with high skills will work together and workers with low skills will work together. When we use the model to compare economies, this type of matching means that high-value products will be concentrated in countries with high-value skills. In this model, everyone will like to work with the more productive workers, because if your efforts are multiplied by those of someone else, as they are in Equation 4.1, you will be more productive when working with a more productive person. In competitive markets, your pay is based on how productive you are. A firm with a higher-productivity worker can more afford to pay a higher wage and has the incentive to bid higher to do so, because the value of output will be higher with two productive workers, say, than with one low- and one high-productivity worker. As a result, there will be a strong tendency for the most productive workers to work together.

This can be seen easily if we imagine a four-person economy. Suppose that this economy has two high-skill q_H workers and two low-skill q_L workers. The four workers can be arranged either as matched skill pairs or unmatched skill pairs. Total output will always be higher under a matching scheme because

$$q_H^2 + q_L^2 > 2q_H q_L \quad (4.2)$$

Recall that $(x - y)^2 > 0$ for any x that is not the same as y , so let x stand for q_H and y stand for q_L . Then $x^2 + y^2 > 2xy$, the same as in Equation 4.2. (Or try this by plugging in any values $q_H > q_L$.) This generalizes to larger numbers of workers in the firms and the economy; the result is that workers sort out by skill level.⁴⁴

Because total value is higher when skill matching rather than skill mixing takes place, the firm that starts with high-productivity workers can afford to bid more to get additional high-productivity workers, and it is profitable to do so. Of course, every firm would like to hire the most productive worker, but it would be in that worker's interest to team up with other high-productivity workers. Think of firms being formed while workers try to determine for which firm they want to work. After the high-productivity workers pair off, they are out of the picture. The less productive workers are then stuck with each other. If there are many classes of skill or productivity, first the highest-skill workers

O-ring production function

A production function with strong complementarities among inputs, based on the products (i.e., multiplying) of the input qualities.

get together, then the next highest, and so on, such that skill matching results as a cascading process. For example, a symphony orchestra will be adversely affected as a whole by hiring one single poor performer. So an otherwise excellent orchestra has every incentive to bid the most for an outstanding performer to replace the poor performer. Similarly, the best jazz performers play and record together rather than each leading a group of poorer players. The restaurant with the very best chef also hires mature, highly trained, full-time waiters, while a fast-food restaurant does not hire a famous chef.

This sorting process is perhaps most vividly easy to remember by analogy to Nobel laureate Gary Becker's famous "marriage market" model, which is a somewhat different case⁴⁵ but offers some additional intuition. If prospective spouses care only about attractiveness, every man wants to marry the most attractive woman, and every woman wants to marry the most attractive man, so the most attractive man and woman will marry. They are now out of the picture, so next, the second most attractive man and woman marry. This process continues until the least attractive man and woman marry. Of course, beauty is in the eye of the beholder, and most people care about things besides attractiveness in a mate such as kindness, intelligence, wealth, beliefs, interests, commitment, and sense of humor; but the marriage model serves as a memorable analogy. The result in the business world is that some firms and workers, even an entire low-income economy, can fall into a trap of low skill and low productivity, while others escape into higher productivity.

Although this model may seem abstract, a numerical example can show how the firms with high-skill workers can and will pay more to get other high-skill workers or will have more incentive to upgrade skills among existing workers. Suppose that there are six workers; three have $q = 0.4$ and are grouped together in equilibrium, while the other three have $q = 0.8$. Now suppose that the q of one of the workers in the first firm rises from 0.4 to 0.5 (perhaps due to training). Similarly, suppose the q of one worker in the second firm rises from 0.8 to 1.0. In each case, we have a 25% increase in the quality of one worker. As you may expect, a 25% increase in the quality of one worker leads to a 25% increase in output quality. But starting from a higher level of quality, that 25% clearly translates into a much larger point increase: In the example, the first firm goes from $(0.4)(0.4)(0.4) = 0.064$ to $(0.4)(0.4)(0.5) = 0.080$; this is a difference of $0.080 - 0.064$, which is a point change of 0.016; and $0.016/0.064 = 0.25$, which is a 25% increase. For the second firm, we move from $(0.8)(0.8)(0.8) = 0.512$ to $(0.8)(0.8)(1.0) = 0.640$; the change in this case is 0.128, which is again 25%. However, the point value of the increase is much greater—eight times greater—for a doubled point-value investment (0.2 in the second firm versus 0.1 in the first firm). If a firm can increase quality in percentage terms at constant marginal cost or even a not too quickly rising cost, there is a virtuous circle in that the more the firm upgrades overall, the more value it obtains by doing so. Accordingly, *wages will increase at an increasing rate as skill is steadily raised*. As Kremer shows, the O-ring model is consistent with competitive equilibrium.

The O-ring result of positive assortative matching relies on some rather strong assumptions. How important are each of these, and how much can they be relaxed? Two points are crucial: (1) Workers must be sufficiently imperfect substitutes for each other, and (2) we must have sufficient complementarity of tasks. As long as these conditions hold, the basic results will follow.

To see why workers must be imperfect substitutes, suppose they were perfect substitutes. Specifically, suppose there are two skill levels, q_L and $q_H = 2q_L$, so every q_H worker can be replaced by two q_L workers with no other change. Thus q_H workers will be paid twice the amount that q_L workers are paid. We can draw no predictions about what combination of worker skill levels a firm—or an economy—will use, so we can learn nothing about low-skill-level equilibrium traps. In fact, there is empirical evidence for imperfect substitutability across worker types in firms.

To see why we must have complementarity of tasks, suppose that there were two tasks indexed by g and h but with no complementarity between them. To be specific, suppose that our q_H worker is hired for the g task, and a q_L worker is hired for the h task; then

$$F(q_H q_L) = g(q_H) + h(q_L)$$

Here skills are imperfect substitutes for each other, because only one type of worker can be hired for each task (i.e., no two-for-one type of substitution is possible here). However, because tasks are not complementary, the optimal choice of skill for the g task is independent of that of the h task, and again no strategic complementarities are present.⁴⁶

Implications of the O-Ring Theory

The analysis has several important implications:

- Firms tend to employ workers with similar skills for their various tasks.
- Workers performing the same task earn higher wages in a high-skill firm than in a low-skill firm.
- Because wages increase in q at an increasing rate, wages will be more than proportionally higher in developed countries than would be predicted from standard measures of skill.
- If workers can improve their skill level and make such investments, and if it is in their interests to do so, they will consider the level of human capital investments made by other workers as a component of their own decision about how much skill to acquire. Put differently, when those around you have higher average skills, you have a greater *incentive* to acquire more skills. This type of complementarity should by now be a familiar condition in which multiple equilibria can emerge; it parallels issues raised in our analysis of the big push model. Kremer shows that a graph like Figure 4.1 can apply to choices about how much skill to acquire.
- One can get caught in economy-wide, low-production-quality traps. This will occur when there are (quite plausibly) O-ring effects across firms as well as within firms. Because there is an externality at work, there could thus be a case for an industrial policy to encourage quality upgrading, as some East Asian countries have undertaken in the past (see Chapter 12, section 12.6, and its end-of-chapter case study of South Korea). This could be relevant for a country trying to escape the middle-income trap.

- O-ring effects magnify the impact of local production bottlenecks because such bottlenecks have a multiplicative effect on other production.
- Bottlenecks also reduce the incentive for workers to invest in skills by lowering the expected return to these skills.

Following Kremer, consider a simple illustration of these bottleneck effects. Suppose that n tasks are required to produce a good. Let q be the standard skill level of these n tasks. But now let the actual skill level of two workers be cut in half in all firms. With an O-ring production function, output would fall by 75% (the result of cutting output in half once and then again). But then the marginal product of quality also falls by 75% for all the remaining $n - 2$ tasks, and thus so does the incentive to invest in increasing skill. The strong assumption of our simple O-ring production function may overstate the case, but the point that strategic complementarities can cause low-skill equilibria remains.

As workers reduce their planned skill investments, this further reduces the level of skill in the economy and thereby lowers further the incentive to invest in skill. To some extent, such bottlenecks could be ameliorated by international trade and investment, because foreign inputs and investors provide an alternative source of inputs from outside the bottlenecked economy. One explanation of why economies that have cut themselves off from the international economy, such as India or China before the 1980s, have not fared as well as those that are more integrated, such as South Korea, could well be their failure to take advantage of foreign inputs or investments; the O-ring analysis helps explain why the impact could be so great. Trade cannot solve all problems of industrialization, but the O-ring model helps explain why trade can play a key role as a part of an industrialization strategy.

The model also has implications for the choice of technology. When skill is scarce, a firm is less likely to choose a technique with higher value but complicated production technology with many tasks, because the costs of doing any one of those tasks poorly are magnified. In this way, the value of production is increasing in the complexity of the product, assuming that the product is completed successfully. Given positive assortative matching, firms producing products or using technologies that must be deployed at large scale or many steps will be induced to employ high-quality employees. Mistakes are costly to firms with large numbers of workers and production steps; therefore, such firms place exceptional value on high-quality, skilled workers who are unlikely to make mistakes.⁴⁷ This indicates one reason why rich countries with high-skill workers tend to have larger firms and specialize in more complex products; it also helps explain why firm size and wages are positively correlated within and across countries.

Finally, under some additional assumptions, the model can also help explain the international brain drain. It is often observed that when a worker of any given skill moves from a developing to a developed country, he or she immediately receives a higher wage for using those same skills. A version of the O-ring model is one way of explaining this.

Thus Kremer's O-ring model points out many of the implications of strong complementarities for economic development and the distribution of income across countries. As Kremer concludes, "If strategic complementarity is sufficiently strong, microeconomically identical nations or groups within nations could settle into equilibria with different levels of human capital."⁴⁸

4.6 Economic Development as Self-Discovery

In simple models with perfect information, it is assumed that firms, and developing economies as a whole, already know their comparative advantage. But individuals must discover their own comparative advantage in labor markets; for example, no one is born knowing they are well suited to become an economist or international development specialist. Somewhat analogously, nations must learn what activities are most advantageous to specialize in. As Ricardo Hausmann and Dani Rodrik show, this is a complex task—and one prone to market failure.⁴⁹ It is not enough to tell a developing nation to specialize in “labor-intensive products,” because even if this were always true, there are a vast number of such products in the world economy of today, and underlying costs of production of specific products can differ greatly from country to country. So it is socially valuable to discover that the true direct and indirect domestic costs of producing a particular product or service in a given country are low or can be brought down to a low level. It is valuable in part because once an activity is shown to be profitable, it can usually be imitated, at least after some lag, spawning a new domestic industry. An example is the ready-made garment industry in Bangladesh, which spread from the first pioneers as dozens of entrepreneurs entered the market. But as markets are eventually open to competing firms, they will take away potential profits from the original innovator. And since, due to this **information externality**, innovators do not reap the full returns generated by their search for profitable activities, there will be too little searching for the nation’s comparative advantage—too much time carrying on with business as usual and too little time devoted to “self-discovery.” The term *self-discovery* somewhat whimsically expresses the assumption that the products in question have already been discovered by someone else (either long ago, or recently in a developed economy); what remains to be discovered is which of these products a local economy is relatively good at making.

Hausmann and Rodrik also point out another market failure: There can be too much diversification after the point where the nation discovers its most advantageous products to specialize in. This is because there may be an extended period in which entry into the new activity is limited. Hausmann and Rodrik conclude that in the face of these market failures, government policy should counteract the distortions by encouraging broad investments in the modern sector in the discovery phase. In fact, they also argue that policy should in some cases work to rationalize production afterward, encouraging movement out of higher-cost activities and into the lower-cost activities, paring down industries to the ones with the most potential for the economy. The authors draw parallels with some of the successful export and industrial policy experiences of East Asia, a topic to which we will return in Chapter 12.

The authors note three “building blocks” of their theory: There is uncertainty about what products a country can produce efficiently; there is a need for local adaptation of imported technology so that it cannot be used productively “off the shelf”; and once these two obstacles have been overcome, imitation is often rapid (reducing the profitability of pioneers). They present a number of case examples that show the reasonableness of each of these assumptions

Information externality The spillover of information—such as knowledge of a production process—from one agent to another, without intermediation of a market transaction; reflects the public good characteristic of information (and susceptibility to free riding)—it is neither fully excludable from other uses, nor nonrival (one agent’s use of information does not prevent others from using it).

in practice, such as the unexpected emergence of the information technology industry in India and the surprising differences in the exports from various countries with similar apparent comparative advantages, such as Bangladesh (hats but not bedsheets) and Pakistan (bedsheets but not hats); the history of local adaptations of various types of Western technology in East Asia (such as shipbuilding in South Korea); and the rapid diffusion of new products and techniques in the local economy (often facilitated by the movement of personnel across firms), as seen in the growth of the cut-flower export industry in Colombia.

4.7 The Hausmann-Rodrik-Velasco Growth Diagnostics Framework

Encouraging efficient investment and widespread entrepreneurship plays a prominent role in accelerating growth and promoting development more broadly. But the once popular idea of finding a “one size fits all” policy for economic development is now generally recognized as a myth. Different countries face different binding constraints on achieving faster rates of growth and economic development. A key mission for economic development specialists is to help determine the nature of the constraints for each country. Ricardo Hausmann, Dani Rodrik, and Andrés Velasco (HRV) propose a **growth diagnostics** decision tree framework for zeroing in on a country’s most binding constraints on economic growth. HRV explain that targeting the most binding constraint has important advantages over other approaches to policy selection.⁵⁰

If a developing nation experiences a relatively low level of private investment and entrepreneurship, what steps should it take? The basic decision tree for addressing this question is seen in Figure 4.3, with arrows leading to the ten bottom boxes (that is, the boxes from which no arrows extend further). At the first stage of the tree, the analyst seeks to divide countries between those for which the main problem is a low underlying rate of return and those for which the problem is an abnormally high cost of finance. Let us consider the former case first, following the left arrow pointing to *Low return to economic activity*.

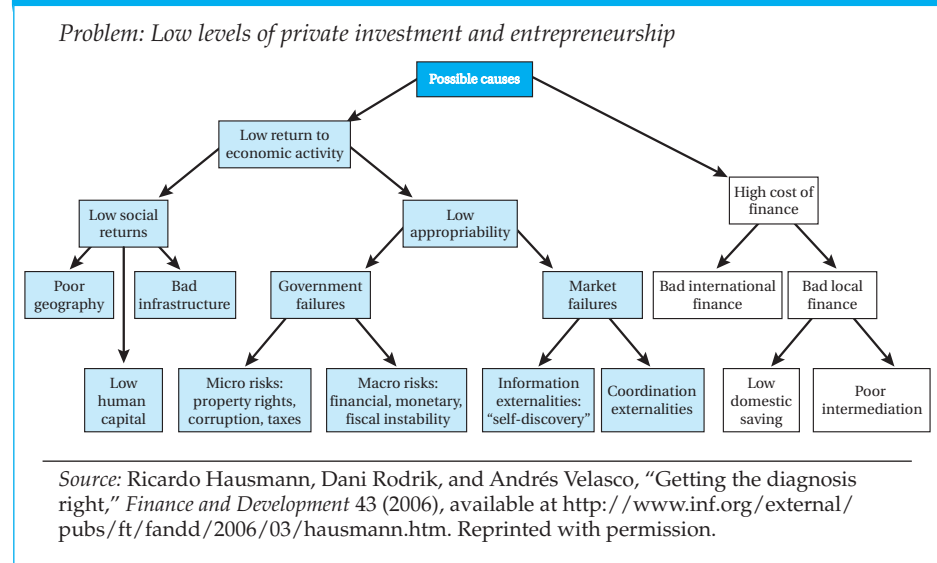
Low returns to investors may be due to the fact that there are intrinsically low underlying **social returns** to economic activities. Alternatively, low returns may be caused by what is termed *low private appropriability*, meaning limited ability of investors to reap an adequate share of the rewards of their otherwise profitable investments. Considering these cases in turn, *low social returns* may be caused by one of three factors.

First, as noted in Chapter 2, *poor geography* such as tropical pests, mountains, and other physical barriers, distance to world markets, and landlocked status (which may render port access politically dubious or economically costly) may limit the ability of a low-income country to initiate and sustain economic development, especially when other compounding factors are present. When these constraints are most binding, development policy must initially focus on strategies for overcoming them. Second, *low human capital*—skills and education as well as health of workers—are complementary with other factors in production, affecting the returns to economic activity. For

Growth diagnostics A decision tree framework for identifying a country’s most binding constraints on economic growth.

Social returns The profitability of an investment in which both costs and benefits are accounted for from the perspective of the society as a whole.

FIGURE 4.3 Hausmann-Rodrik-Velasco Growth Diagnostics Decision Tree



example, if economic returns are most affected by lack of literacy and numeracy, this becomes a development policy priority. (The importance of health and education was also stressed in Chapter 2, and this will be examined in depth in Chapter 8.) Third, every developing nation must provide the vital infrastructure needed to achieve and sustain a modern economy, beginning with basic physical structures such as roads, bridges, railroads, ports, telecommunications, and other utilities. With *bad infrastructure*, otherwise high-return economic activities may prove unprofitable. In some countries, inadequate and imbalanced infrastructure is the main factor preventing an acceleration of growth, and in such cases, policies focusing on providing it would boost investment and growth the most.

But the problem may lie not with the underlying social return to economic activities but with *low appropriability*, meaning that investors cannot reap an adequate share of returns to investment. We get to low appropriability from the right arrow emanating from Low return to economic activity. In turn, appropriability problems can be due to either *government failures* or *market failures*. In the HRV diagram, government failures are divided between *micro risks* and *macro risks*. Micro risks address fundamental institutional weaknesses such as inadequacy of property rights, government corruption, and excessively high effective taxation. That is, the return to economic activity may be high enough, but elites rather than investors may capture a large fraction of the returns and make investments unattractive. Despite the difficulty of effectively reforming institutions when reform threatens the interests of elites (see Chapter 2), such reform must become the development priority when micro risks are binding. As the case study of China at the end of this chapter

demonstrates, reform can sometimes be accomplished in stages through transitional institutions. Appropriability may also be limited by macro risks—the failure of government to provide financial, monetary, and fiscal stability.

The fundamental problem may also be large-scale market failures of the type stressed in this chapter. These may include the *self-discovery* problems pointed up by Hausmann and Rodrik and reviewed in section 4.6. They may also take the form of *coordination externalities*, such as seen in the big push model of underdevelopment, examined in section 4.3. Other types of market failure and government failure are examined in Chapter 11.

In yet other cases, the main problem may not be underlying low rates of return but rather an abnormally *high cost of finance*. The possibilities are outlined following the right arrow from the top box in Figure 4.3 to *High cost of finance*. Here the problem may be *bad international finance*—inadequate access to foreign sources of capital or problems with debt, examined in Chapter 13; or the problem may reside in *bad local finance*, due either to low availability of loanable funds through domestic financial markets, traced to low *domestic saving*, or to *poor intermediation* owing to an inadequate or overregulated banking system that is unable or unwilling to channel funds to the economic activities with high returns. These also lead to other policy challenges, examined in Chapter 15.

In sum, one size does not fit all in development policy. Economic development strategies focusing on resource mobilization through foreign assistance and other capital flows, along with increased domestic national saving, can be most effective when domestic returns are both high *and* privately appropriable. In contrast, strategies focusing on market liberalization and opening up the economy can be most effective when social returns are high and the most serious obstacle to private appropriation are government-imposed excessive taxes and restrictions. Finally, strategies focusing on industrial policy (elaborated on in Chapter 12) can be most effective when private returns are low, not because of what a government does (errors of commission), but because of what a government does not do (errors of omission).

HRV illustrate their approach with case studies of El Salvador, Brazil, and the Dominican Republic. They argue that each case exhibits a different “diagnostic signal” of the most binding constraint, as seen in Box 4.3. HRV stress that an approach to development strategy that determines one or two policy priorities on this diagnostic basis will be more effective than pursuing a long laundry list of institutional and governance reforms that may not be targeted toward the most binding constraints.

It is often difficult to observe a binding constraint directly. In practice, growth diagnostics usually involves some economic detective work. To evaluate whether a proposed constraint is binding, a growth diagnostician looks for evidence on its implications. If the constraint is excessive taxation, we can expect to see high movement into the informal sector or underground economy. If the constraint is infrastructure, we can expect to see significant congestion. If the constraint is education, we can expect to see high rates of return to education. In general, the analyst looks for economic behavior consistent with agents trying to get around a constraint.

Growth diagnostics is also subject to some limitations and criticisms. One implicit assumption is that development can be equated with growth, which



BOX 4.3 FINDINGS Three Country Case Study Applications of Growth Diagnostics

El Salvador

HRV argue that this economy is constrained by a lack of productive ideas. The binding constraint is a lack of innovation and demand for investment to replace the traditional cotton, coffee, and sugar sectors, or low “self-discovery.” So the best strategy focus for El Salvador would be to encourage more entrepreneurship and development of new business opportunities.

Brazil

HRV identify the country’s binding constraint as lack of sufficient funds to invest despite an abundance of productive ideas. They argued that private returns in Brazil are high, and therefore other flaws (inadequate business environment, a low supply of infrastructure, high taxes, high prices for public services, weak contract enforcement and property rights, and inadequate education) are not as binding in Brazil. So investment is instead constrained by Brazil’s inability to mobilize sufficient domestic and foreign savings to finance needed investments at reasonable interest rates. Although Brazil could increase national savings to a degree by reducing government expenditure, this might not be politically feasible. If so, HRV suggest that higher taxes and user fees and lower infrastructure and human capital subsidies might work. “If the country can move to a faster growth path and if waste does not grow with GDP, it may outgrow its burdens and gradually improve its tax and spending system as fiscal resources become more abundant.” In subse-

quent work, Hausmann has emphasized the importance of “creating a financially viable state that does not over-borrow, over-tax or under-invest” to successfully raise domestic savings.

Dominican Republic

HRV conclude that the Dominican Republic is constrained by core public goods in product sectors key for growth. The country began a new reform sequence during the 1980s, after it could no longer rely on sugar and gold exports. It followed a narrow strategy of investing in needed public goods for two emerging product (or service) sectors with high potential, tourism and *maquila* assembly manufacturing. The keys were security and infrastructure near the main tourist destinations and special trade policy benefits for the light manufacturing assembly (*maquila*) sector. As the economy grew from these sources, other constraints were hit, notably in the financial sector; getting past them (particularly a costly financial crisis) was bumpy, but the binding constraints stayed or became visible, so policymakers could focus on relaxing them to keep growth going.

Sources: Ricardo Hausmann, Dani Rodrik, and Andrés Velasco, “Growth diagnostics,” in *One Economics, Many Recipes: Globalization, Institutions, and Economic Growth*, by Dani Rodrik (Princeton, N.J.: Princeton University Press, 2007), ch. 2; Ricardo Hausmann, “In search of the chains that hold Brazil back,” October 31, 2008, http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1338262. An excellent practicum is found in “Doing Growth Diagnostics in Practice: A ‘Mindbook.’” See <http://www.cid.harvard.edu/cidwp/177.html>. The World Bank offers a set of growth diagnostics exercises at its Web site, <http://web.worldbank.org/>.

in turn is held back by investment. This is a useful analytical assumption for this and a range of other purposes, but it does not and cannot provide a complete understanding of development purposes, mechanisms, and constraints. And of course, it is often not a simple matter to find a single binding constraint. There can be uncertainty about the “position” of each constraint in the economy, so we can only make a probabilistic assessment of which one is binding. If there are important complementarities between two investments,

combining them (in some sense) should be considered. Further, the fact that one constraint is not binding today does not mean that we can neglect it when there are long gestation periods before current investments become productive. For example, consider investments in education: Students require several years of schooling followed by experience before these investments become productive. So although education may not be binding for a particular country such as Bolivia at a particular point in time, this does not mean that it will not become binding at a later time; in response, we may need to make investments today. Clearly, identifying and addressing constraints that are likely to become binding in the future is even more challenging than targeting today's more visible bottlenecks.

Growth diagnostics has already had an effect on the work of development agencies. For example, the Inter-American Development Bank (IDB), the regional development bank for the western hemisphere, has been commissioning growth diagnostic studies of many member economies while training staff and nationals in the skills needed to conduct their own growth diagnostics. World Bank economists have applied the method in a dozen country pilot studies in Africa, Asia, and Latin America. And developing country scholars have applied the approach to their own countries. Although growth diagnostics might be criticized as "more art than science," at the very least this new approach forces the analyst to focus on country-specific circumstances and thus to get to know the individual country very well. This is one of the reasons that growth diagnostics offers a valuable complement to econometric studies.

4.8 Conclusions

The important point is not that people keep doing inefficient things. This is not in itself very surprising. The deeper point is that people keep doing inefficient things because it is rational to keep doing them, and it will remain rational as long as others keep doing inefficient things. This leads to a fundamental problem of coordination failure. Sometimes firms and other economic agents will be able to coordinate to achieve a better equilibrium on their own. But in many cases, government policy and aid will be necessary to overcome the resulting vicious circles of underdevelopment.

The purpose of economic development theory is not only to understand underdevelopment but also to devise effective policies to redress it. The analysis of coordination failure problems in this chapter affirmed that early development theorists such as Paul Rosenstein-Rodan identified important potential problems that are ignored in conventional competitive equilibrium models.⁵¹ The new perspectives offer some important overall lessons for policy, but they are not simple lessons with easy applicability, and indeed they present something of a two-edged sword. On one side, the analysis shows that the potential for market failure, especially as it affects the prospects for economic development, is broader and deeper than had been fully appreciated in the past. Rather than the small "deadweight triangle losses" of conventional economic

analysis of monopoly, pollution externalities, and other market failures, coordination failure problems can have more far-reaching effects and consequently much greater costs.⁵² For example, the interactions of slightly distorted behaviors by potential investors failing to consider the income effects of the wages they pay may produce very large distortions, such as the outright failure to industrialize. This makes the potential benefit of an active role for government larger in the context of multiple equilibria.

The coordination failures that may arise in the presence of complementarities highlight potential policies for deep interventions that move the economy to a preferred equilibrium or even to a higher permanent rate of growth that can then be self-sustaining. For example, once a big push has been undertaken, government coordination may no longer be necessary. The unaided market can often maintain industrialization once it is achieved, even when it cannot initiate or complete the process of industrialization. For another example, we will see in Chapter 8 that in some cases, the presence of child labor represents a kind of bad equilibrium among the families with children who work, one that might be fixed with appropriate policy. After successfully abolishing child labor, it is possible that the regulations will not have to be actively enforced to keep child labor from making a resurgence (because most parents send their children to work only because they have to). If there is no incentive to go back to the behavior associated with the bad equilibrium, government has no need to continue the interventions. Instead, government can concentrate its efforts on other crucial problems in which it has an essential role (e.g., problems of public health). This onetime-fix character of some multiple-equilibria problems makes them worthy of special focus because they can make government policy much more powerful in addressing problems of economic development. Among other implications, the prospect of deep interventions can mean that the costs of implementing policy can be reduced and that carefully targeted development assistance could have more effective results.

The other edge of the sword, however, is that with deep interventions, the potential costs of a public role become much larger. Policy choices are more momentous because a bad policy today could push an economy into a bad equilibrium for years to come. This is because government can be a major part of the problem, playing a key role in perpetuating a bad equilibrium such as a high-corruption regime, in part because some government officials and politicians may benefit personally from it. Bad policy can even initiate a move to a worse equilibrium than a country began with. To expect government to be the source of reform that moves the economy to a better equilibrium in countries where government has been part of the complex nexus of a bad equilibrium can be naive. For example, as the 2001 Nobel laureate Joseph Stiglitz pointed out, development officials should have been more suspicious of corrupt government officials' embracing of the World Bank's doctrine of thoroughgoing privatization in the late 1980s and early 1990s. Why would corrupt officials have done so if they benefited from a stream of rents captured from public enterprises? The answer, Stiglitz suggests, is that these officials found that by corrupting the process of privatization, they could get not only a stream of corrupt rents from the annual operations of the enterprise but also

a share of the present discounted value of the whole future operations of the enterprise.⁵³ The results of corrupt privatization in Russia in particular have been devastating for its economy, preventing it from enjoying the benefits of the market and potentially keeping it in a suboptimal equilibrium for many years to come. Even when a government is not corrupt, the potential impact of a well-intentioned but flawed government policy is much greater when it can push the economy to a fundamentally different equilibrium, which may be difficult to reverse. This is all the more problematic in the many cases in which “history matters” in a developing economy—that is, when past conditions determine what is possible today.

Both government failure and market failure (including coordination problems and information externalities) are real, but public- and private-sector contributions to development are also vital. Therefore, we need to work toward the development of institutions in which actors in the public and private sectors have incentives to work productively together (directly and indirectly) in such a way as to create the conditions necessary to break out of poverty traps. In achieving this goal, the international community also has a vital role to play, providing ideas and models and serving as a catalyst for change, as well as providing some of the necessary funding.

The growth diagnostics approach is a valuable tool for domestic and international analysts who start with a detailed understanding of a developing country; it can be helpful in identifying binding constraints on national growth and the policy priorities to address them.

In sum, the contributions of the new theories of development reviewed in this chapter include a better understanding of the causes and effects of poverty traps, achieved by more precisely pinning down roles of different types of strategic complementarities, explaining the role of expectations, clarifying the importance of externalities, illuminating the potential scope for deep interventions, and improving our understanding of both the potential role of government and the constraints on the effectiveness of that role—when government itself becomes a player in an underdevelopment trap. Finally, the new approaches point out more clearly the real potential contributions of outside development assistance that extend beyond provision of capital to modeling new ways of doing things.

As democratic government spreads in the developing world, the new understandings of underdevelopment traps can make for a more effective guide to policy design than was available even a few years ago. As Karla Hoff has aptly summarized, “Governments fail, even in democracies, just as markets do. But a positive development of recent years is to try more limited interventions to harness the spillovers among agents, and to try to sequence policy reforms in a way that makes it more likely for good equilibria to emerge.”⁵⁴

In Parts Two and Three, as we consider pressing issues affecting developing countries today, we will be using the insights provided by both the classic theories and the new models of development and underdevelopment to inform our understanding of both the nature of the problems faced and the potential benefits and pitfalls of policies designed to help overcome them.

Case Study 4

Understanding a Development Miracle: China

An Extraordinary Performance

From 1978 to 2011, the economy of China grew at an average rate of close to 9% a year, an unprecedented achievement for any economy in history, let alone the world's most populous nation, with over 19% of global population. China's income per capita by 2012 was approaching *six times* what it was in 1978, when reforms began. Growth was three times the rate that would be considered respectable by the recent standards of most low-income countries.

China has also experienced the world's most dramatic reductions in poverty. The World Bank's most recent estimate is that just 12% of China's population lives on less than \$1.25 per day (27% below \$2 per day). This means that hundreds of millions fewer people were living in extreme poverty in a span of just three decades. Reductions in extreme poverty in China are far faster and greater than anywhere else in the world.

Debate on Sources of Success

For such a stunning record, the roots of China's success remain a source of disagreement. The Chinese experience seems to change everything—but does it? And if so, in what ways? Success has a thousand fathers, and all the major traditional and new schools of thought on development want to claim China as their most important case in point. China is hailed as an example of the benefits of markets, trade, and globalization. Yet by conventional measures, institutions in China remain quite weak. For example, the World Bank's 2013 "Ease of Doing Business" index ranks China poorly, at No. 96—worse than Russia, Mongolia, Zambia, or Serbia. Manufactured exports are a key to China's growth, and market incentives have played a primary motivational role in

business decisions. But China has also adopted activist industrial policies, pushing exports of increasingly higher skill and technology content, and it embarked on its period of rapid growth around 1980, more than a decade before significant trade liberalization. But often overlooked is that China's agricultural productivity growth was also very high. Moreover, much of China's growth in the 1980s and early 1990s was due to rural township and village enterprises, which had a quasi-cooperative and quasi-municipally owned character. There has been less privatization of state-owned enterprises than in most developing countries. In the meantime, countries in Africa, Latin America, and elsewhere that have most closely followed the free-market model have generally not done particularly well. While all schools may find something in China to let them claim it as vindication of their favored development policies, it is also clear that if China were performing dismally, each could (and likely would) find reasons why its own theories, including free-market theory, predicted such a failure.

There have been many special explanations for China's remarkable success. Many of them contain part of the truth, but such dramatic success is more than the sum of these parts. Let us review some of the explanations.

Regional "Demonstrations." The presence of regional "demonstration" models has been crucial. Japan was emulated by other countries in the East Asian region. Hong Kong provided an additional example for China, as did China's archrival Taiwan. Taiwan, Hong Kong, and South Korea focused on export-oriented industrialization strategy at a time when world trade was growing rapidly (see the end-of-chapter case studies for Chapters 12 and 13).

Leveraging the Lure of a Billion Consumers By the late 1980s, the locus of regional growth shifted to China as investors began to pour investments into China in large part because of the allure of its eventual market of more than 1.3 billion consumers. Government played off potential investors who wanted access to China's consumers, demanding and getting extensive technology transfer, public and private Chinese business partnerships, local content, and other concessions in exchange for the right to sell to Chinese citizens. Although the market was limited at first by both low incomes and government policies, early investors found high incentives to export from several special economic zones on the southeast coast. These investors discovered that China offered very cheap labor with unusually high skills and work habits for its income level.

Export-Led Investment and Growth Once early investments built up a sufficient critical mass, agglomeration benefits of concentrated economic activity kicked in (see Chapter 7). The more producers located in China, the greater the benefits for an increasing number of suppliers to operate there. At this point, investments started to feed on themselves in a cumulative causation. In the meantime, when wages began to rise, companies could set up production farther west, or migrants from the west could move to the new industrial centers. Given China's population of hundreds of millions of low-income farmers, expectations were formed that this process of wage restraint could continue for an extended time—although a string of wage increases beginning in 2010 began to challenge these expectations as financial analysts argued that the Lewis turning point had been reached (see Chapter 3).

Coordination After the bloody crackdown on Tiananmen Square protests in 1989, there was considerable doubt about whether the reforms would continue and therefore whether investment and growth would remain high (making other investments profitable). The Chinese leader Deng Xiaoping paid a 1991 visit to the southern China regions that had been leading in growth and reform and proclaimed, "You should be bolder and develop faster." A rapid burst of investment and growth, as well as policy reform, followed his speech and its subsequent publication. It has been suggested that in effect this served to coordinate expectations and

led to the shift from a lower-growth to a higher-growth equilibrium. But much more generally, the government of China has used its centralized authority to coordinate investments across industries. Moreover, government negotiation of licenses and other business agreements helped ensure that China got more favorable deals than many other developing countries that relied on private company-level business transactions, although in this, the role model lessons from South Korea was also a benefit.

Health and Education Investments The central planning of China's first decades after its 1949 Communist revolution were by most measures a failure. Industry was highly inefficient. As many as 30 million people died in a late-1950s famine caused by poor central planning decisions and political pressures that led party and government officials to regularly overstate the harvest prospects. As Amartya Sen stresses, famines rarely occur in democratic countries with a free press. Such disasters were only partly offset by the early and ongoing emphasis on basic health and education in China and then on reductions of fertility through China's one-child policy (see the case study for Chapter 6). But these basic first steps on education, health, and eventually fertility helped set the stage for growth and poverty reduction when later combined with market incentives. One of the results is the apparently higher educational and skill level of factory workers for given wages in China in comparison to its competitor countries.

Productivity Growth There has been considerable debate about whether rapid growth in other East Asian countries is the result of capital accumulation or productivity gains. Alwyn Young, Paul Krugman, and others have concluded that South Korea and other Asian Tigers grew more from investing heavily in capital assets such as machinery and factories than by improved worker efficiency. Wing Thye Woo concluded that most of China's growth came from the reallocation of labor, particularly from agriculture to other activities, and that sustainable total factor productivity progress was much lower, on the order of 2% per year.

But for the case of China, Zulu Hu and Mohsin Khan concluded that productivity gains explained more than 42% of China's growth in the formative

1979–1994 period and that productivity had overtaken investment by the early 1990s as the largest source of growth. This was considered surprising, in part because of the breathtaking pace of capital investments in China. But on the other hand, when China's rapid growth began in the late 1970s in the areas close to Hong Kong, while it was clear that a large volume of investment funds was flowing from capital-abundant Hong Kong (a British crown colony at the time) to capital-scarce China, the bigger story was the flow of productive ideas over the Hong Kong border, a barrier that had long prevented the transfer of both capital and know-how. Of these two factors, it often seemed that the ideas were more important than the finance.

There is widespread concern that by now, China has entered an investment bubble stage in which many investments are of dubious quality, particularly in real estate and some infrastructure and industrial sectors. Even so, the rapid pace of development in China has been unprecedented.

Recent research by Xiaodong Zhu, Loren Brandt, and their coauthors has provided new documentation that productivity growth, rather than mere factor accumulation, has been a very important source of China's rapid growth of output. In particular, Zhu has presented well-regarded evidence that productivity growth in the nonagricultural, non-state-owned sector is the most important source of growth in China. Noting that productivity is still well below that of the United States, he argues that there should still be significant opportunities for productivity to continue to grow rapidly in China by adopting foreign technology, learning best production practices, and improving institutions and policies, particularly to allocate capital more efficiently.

In another study, Ashoka Mody and Fang-Yi Wang of the World Bank examined the causes of industrial growth in China and concluded:

...much of the action came from region-specific influences and regional spillovers. Regional influences included the open-door policies and special economic zones that successfully attracted investments from overseas Chinese to particular locations. Existing regional strengths, especially high-quality human capital and infrastructure, also contributed to growth. Our results illuminate the interplay between conditions conducive for growth—for example, the contribution of foreign

expertise is greatly enhanced by available human capital. China made judicious use of the advantages of backwardness by targeting areas that were less developed and less encumbered by the legacy of existing institutions, although it was fortunate in this regard that the backward regions were in close proximity to Hong Kong and Taiwan.

Thus, the China case also illuminates complementarities, a recurrent theme of this chapter.

Reform on the Margin

As examined in detail in Chapter 2, developing inclusive institutions that protect property rights and enforce contracts, and place checks on executive authority and the power of elites such as through the rule of law, have demonstrated importance in long-term economic development. China appears to be an outlier, in that such protections are demonstrably weak. Yet it is extremely difficult to navigate the course from bad to good institutions. It is rarely possible to follow a straight line on the map, as a vortex of obstacles are encountered, and the ship of state itself may be the cause of many of the problems. The process of getting the institutions right is one of starting with a clear understanding of both formal and informal local rules, and moving toward an eventual goal even when it cannot be seen clearly—in the presence of initial and then newly emerging constraints and opportunities, chartering what may seem to outsiders as large deviations off-course. A metaphor used by the post-Mao paramount leader Deng Xiaoping may also reflect in part this type of step-by-step, graduated process—“crossing the river by feeling the stones.”

In China, the *way* that market incentives were introduced and used seems to have been almost as important as the fact that they were introduced at all. One of the most important features of the past quarter century of economic history in China has been the very gradual implementation of reforms. China's approach has been the opposite of that of many eastern European countries such as Russia and Poland, which opted for a “big bang,” a sudden comprehensive changeover to a free-market economy. (Hungary and Slovenia are two countries in that region that pursued a more gradualist strategy.) China has introduced new and transitional institutions that exist side by side with previous institutions of central planning for extended

periods. In the former Soviet Union and eastern Europe, central planning was abolished almost immediately, and economic depression, with drops in output of up to 50%, ensued before gradual recovery. In contrast, China kept the central planning system partially intact for an extended period. Previous quotas for buyers and sellers at fixed planned prices were maintained. Reform was instead introduced on the margin. After filling their quotas, producers were free to buy and sell at market-determined prices; resales were generally not prohibited. This “dual-track” system simulated the allocational efficiency of a more competitive market economy and created strong incentives for firms to improve efficiency and increase output, in a manner less threatening to the status quo.

Moreover, while in other transition and developing countries state-owned enterprises (SOEs) were sold off to private investors fairly quickly, in China these remained in government hands for an extended period. The government tried to reform them internally, with limited success. But at the same time, China has allowed and encouraged a new, more efficient sector to grow up around them. In recent years, China has privatized or closed many of the smaller SOEs. Many larger SOEs continue to operate in a relatively inefficient manner, and some economists have suspected for years that their accumulating indebtedness will eventually pose significant financial risks to the economy. But the counterargument proposes that if the economy can continue to grow rapidly, it is also possible that China may stay ahead of this problem without experiencing a financial crash. Eventually, as employment opportunities continue to expand, more of the larger SOEs can be privatized or closed.

Further, for the first nearly two decades of reform, from the late 1970s to the mid-1990s, at the local level, township and village enterprises (TVEs) were encouraged. The TVEs were vaguely owned by local government, but their private entrepreneurs and employees held “vaguely defined” property rights, as Martin L. Weitzman and Chenggang Xu termed them. These TVEs accounted for a very large share of industrial output growth in China. Finally, after the Chinese economy had grown nearly fourfold, the majority of these TVEs were privatized in the late 1990s—by this point the private entrepreneurs had triumphed (or their underlying control became

clarified). But the TVEs played a unique role in spurring growth and spreading the benefits of development to rural areas.

Reforms in the late 1970s and 1980s favored agriculture and entrepreneurship in the rural areas where most of the poor lived, and poverty fell as income rose. From at least the early to mid-1990s, the terms of trade shifted toward industry and urban areas. Yasheng Huang makes a strong case that this represented an important turning point, associated with growing inequality and other serious challenges.

Still, strong average growth continued through many changes. As outlined by Yingyi Qian, China’s transitional institutions have served a dual purpose: to improve efficiency while compensating the losers (and thereby preserving legitimacy or at least reducing the chance of political backlash). Provided that the quotas were enforced—and for the most part they seem to have been in the transition in China—the dual-track allocation system protected the interests of those who had benefited from and planned on receiving inputs at fixed, low prices. As a result, these agents did not oppose or undermine reforms and indeed could benefit further to the degree they could learn to produce more efficiently and operate in markets effectively. The system was largely phased out many years later, after the economic landscape had changed dramatically.

The vague local-government ownership of the TVEs provided protection for investors who feared government hostility toward private property and worried about expropriation. The impression that these companies were owned by the township or village protected the de facto private owners. Once reform proceeded to a certain point, these de facto owners were able to “take off the red hat,” as the saying went in China, and assume full ownership in exchange for considerations to local government, and taxes replaced direct revenue transfer out of the TVEs. Qian shows how similar arguments apply to fiscal and financial reforms. Under the reforms, local government continued to have a responsibility to provide revenue to the central government, but local government was allowed to keep a large share of collections on the margin before local and central revenue collection was fully separated. Government also allowed anonymous banking accounts for a long transition period, to credibly constrain

the ability of the government to arbitrarily impose high individual taxes on successful entrepreneurs; Qian judged the program a success despite the fact that this diverges from what is considered normal best practice in advanced Western countries.

Yingyi Qian's insightful explanation is:

The difference between China and Russia is not at all that China has established best-practice institutions and Russia has not. The difference lies in the institutions in transition....The real challenge in reform facing transition and developing countries is not so much knowing where to end up, but searching for a feasible path toward the goal. Therefore, it focuses on transitional institutions, not best-practice institutions....The general principle of efficiency-improving and interest-compatible institutional change is simple, but the specific forms and mechanisms of transitional institutions often are not. Successful institutional forms usually are not a straightforward copy of best-practice institutions. They need not be and sometimes should not be. They need not be because room exists for efficiency improvement that does not require fine tuning at the beginning. They should not be because the initial conditions are country- and context-specific, requiring special arrangements.... Understanding these mechanisms sometimes needs an appeal to the counterintuitive second best argument, which states that removing one distortion may be counterproductive in the presence of another distortion.

Finally, for peasants in parts of China where the rural sector has done well, earlier land reforms have been among the causes—with the revolution setting the stage and the late-1970s reforms giving greater incentives to individual farmers. Land reform has been notoriously difficult to implement in other parts of the world. Remittances from migrant workers have fueled a service-sector boom in some rural areas, and prices received by farmers have generally risen, particularly near urban areas.

China's Coming Challenges

China's successes do need to be kept in perspective. Since 1980, China has grown about 4½ times faster than the United States, as measured by per capita output. As a result, China has been closing the *relative* gap in living standards. In 1980, China's income per person was only 2% of that in the United States, but by 2012, it had grown to over 15%. But even if China's output per person continued to grow at its unprecedented recent rate of 8.4% and the United

States at its long-run rate of just 1.9%, China would still not catch up until close to 2040.

A high rate of domestic saving is associated with a trade surplus. Savings have been extremely high and rising in China. As of 2011, China was saving nearly half of its national income—an astounding and unprecedented rate compared to the country's own past rates (already a high 35% in 1990) and in relation to the high rates that have generally prevailed in East Asia. Such high rates are not consistent with the pivot toward increasing local consumption as an engine of growth.

It is now generally accepted in China and internationally that continuing to grow at such high rates is essentially impossible. Before China grew rapidly, South Korea did so, and before South Korea, Japan did. The later a country starts modern economic growth, the faster it can grow because the distance from traditional methods to the frontier technology of the day grows greater over time. But the pace of catch-up generally slows as an economy gets closer to the technology frontier and needs to innovate. Policymakers in China are actively preparing for this challenge. Despite its extraordinary record to date and considerable resources at its disposal, the substantial challenges that China faces in its attempt to reach developed country status should not be underestimated. There are some other limits and caveats to China's success and to the lessons that other countries can learn from it.

Poverty and Vulnerability Life can indeed be harder than ever for the millions remaining in extreme poverty, such as rural peasants in some parts of the country facing the loss of security; official corruption, including reports of official land grabs from peasants; rising local taxes; and minimal improvements in technology or skills. At the same time, despite the growth in average wages, inequality in China—once quite low—has been rising dramatically; inequality has now reached approximately the same level as in the United States, worst among the developed countries.

Environment and Pollution Moreover, the environmental crisis in China is reaching epic proportions. A majority of the most polluted cities in the world are located in China, and health problems are growing. Water resource problems, erosion, and loss of habitat undermine the prospects for sustainable development. The extreme air pollution is now

causing not just misery but deaths and other serious and growing health problems. This reached historic proportions in the so-called Beijing “airpocalypse” of January 2013, when pollution indicators exceeded 40 times World Health Organization standards; many other cities such as Tianjin and Harbin have been severely affected. There are very few historical precedents for prolonged pollution exposure of this magnitude. But a 2013 joint study by China, United States, and Israel university researchers estimated that air pollution in China has already decreased life expectancy north of the Huai River by an amazing 5.5 years, including increases in lung cancer, heart attack, and stroke.

Moreover, China’s looming water shortages threaten to curtail industry, coal production, and agriculture. Some of China’s environmental challenges result from global climate change; but many if not most result from poor national management of the environment. Although China produces about one-tenth of global output, it consumes nearly one-fifth of the world’s energy production. Coal accounts for more than 70% of China’s electricity production. Coal generates more greenhouse gases than any other significant energy source. Coal production also uses a lot of water. The rapid expansion of coal use is placing major demands on China’s increasingly scarce water supply, adding to the growing demands stemming from irrigation and expanding cities. China is now the world’s largest emitter of greenhouse gases such as CO₂, and emissions have been growing rapidly (see Chapter 10).

Product and worker safety Since 2007, highly publicized scandals concerning the safety of food, drugs, and other consumer products threatened the international public image of Chinese-made products. Indeed, product safety standards are low, and their regulation is lax. Foreign and local investors, and government, all share in the blame. China’s regulatory institutions will need to catch up with the progress made in other aspects of national economic development.

Avoiding the Middle-Income Trap Chinese officials and researchers are also concerned about susceptibility to the “middle-income trap” and are engaging discussions with Latin American countries on this topic; Huang Yiping and Jiang Tingsong stressed that what “really trapped many Latin America and Middle East middle-income countries was lack of innovation capability. They failed to move up

the industrial ladder beyond resource-based activities. This will also be the real test for China.” As the IMF concluded in its October 2013 *World Economic Outlook*, “There is strengthening conviction that China will grow more slowly over the medium term than in the recent past.” The alternative is probably wasteful and unsustainable investment that would result in serious economic crises. The question for China will be how it can maintain somewhat more modest but historically still high growth, of perhaps 6.5%, sustainably over the next three decades. An economy growing at this rate must have a different structure of investment than an economy growing at 10% (as China did in 2010). Making these adjustments will not be easy. Developing innovative capacity will be an important part of the answer; first steps are being taken, but better institutions may be needed to sustain the momentum.

Addressing Structural Imbalances There are several other imbalances in China’s economy that may lead to problems going forward. The World Bank pointed out in its 2013 *Global Economic Prospects* that “ongoing rebalancing efforts remain a priority, as does engineering a gradual decline in its unsustainably high investment rate.” The report also stressed that “should investments prove unprofitable, the servicing of existing loans could become problematic—potentially sparking a sharp uptick in nonperforming loans that could require state intervention.”

China’s very large export surplus has come under great criticism, as this was widely argued to be one of the underlying causes of the global financial crisis. One cause of the surpluses is probably the undervaluation of China’s exchange rate, estimated to be at least 20%. Undervaluation has been used by a number of East Asian economies as an industrial strategy for encouraging expansion of the manufacturing sector (notably in the 1960s and 1970s by South Korea and Taiwan; see Chapter 12), but those economies were much smaller than that of China. Note, however, that as recently as 2009 analysts estimated rates of overvaluation of up to 40%, approximately double the estimates of just four years later; and the external surplus as a share of GDP has decreased to a correspondingly degree since then (see Chapter 12 for details on measurement and analysis of international trade). Indeed, by 2013, some manufacturers found themselves struggling to adapt to a less overvalued currency.

Inevitably, more China-based firms will engage in direct foreign investment in their export destination countries such as the United States, just as Japan and South Korea did before them; but this will be a drawn-out process due to China's still relatively low (if strongly growing) average productivity level, and also probably national security worries arising in Europe and Japan as well as in the United States.

Another factor in the large trade surplus is China's high rate of savings, mentioned earlier, where the savings rate, long well above international averages, increased dramatically in the 1998–2010 period (when it peaked at approximately 49% of national income).

In parallel, investment as a share of GDP, long over 40%, reached an unprecedented 48% by 2010, before moderating slightly. Part of the uptick in recent years was due to an active response to the 2008 global economic crisis. The adjustment to sustainable investment and growth rates will be extremely difficult to accomplish without major and possibly prolonged disruptions. Yet in one sense the scope of the problem may also be somewhat exaggerated by the way national statistics are prepared, which as Jun Zhang and Tian Zhu argued in a 2013 study does not account for hidden consumption by the growing number of high-income citizens, the rent-equivalent consumption of owner-occupied housing, and reported corporate expenses that are actually more like private consumption. On the other hand, on the other side of the balance sheet, the extraordinarily high investment—with evidence showing that a significant amount of it is at very low productivity—has not been challenged, and these statistics (including international trade and finance data) must be considered and better understood as a whole.

The huge indebtedness of the state-owned enterprise (SOE) sector and other public debt (such as local government loans using land collateral) is thought by some financial commentators to be likely to eventually lead to a significant financial crisis—though other analysts argue that China can “grow its way out of” these problems.

For years, analysts have expressed concerns about the risk of “bubbles” (see Chapter 13) developing in financial and housing markets, due to very high rates of debt-financed investment. The potential problem has only worsened: just from 2008 to 2013, the over-

all credit to GDP ratio increased from about 120% in 2008 to close to 200%. This again connects to China's unprecedentedly high investment rate and low consumption rate; adjustment is now essential, and indeed has begun, but the extent of the imbalances suggests that the transition from investment-led to consumption-led growth will be unusually long and difficult, and is very unlikely to be entirely smooth.

Political Weaknesses There are also political weaknesses. On the one hand, some analysts make a case for the strengths of more authoritarian regimes, at least in early stages of development and when leadership fosters a developmental state. But on the other hand, this may make for a less flexible response to changing circumstances and difficulties in escaping a possible middle-income trap. Some leaders in China have called for urgent political reforms. And the dramatically worsened inequality in China may undermine not just political stability but ultimately opportunities for future growth (for details on the challenges of rising inequality for growth and development, see Chapter 5).

Relatedly, China will need to find a way to continue its ongoing institutional reforms, whether through implementing new and productive transitional institutions or more fundamental change. In their 2012 book, *Why Nations Fail*, Daron Acemoglu and James Robinson make an extraordinary argument that institutional weaknesses will ultimately stall development in China. In their argument, institutions in China closely resemble the “extractive” political systems of other failed states where crony capitalism is the norm, vested interests are protected, and potentially disruptive entrepreneurs are blocked. They conclude that growth in China will ultimately be “unlikely to translate into sustained economic development.” While relatively few analysts think the challenges are this steep, undoubtedly the needed reforms will be politically difficult to undertake.

The much-anticipated economic and social policy changes announced at the Third Plenum in November 2013 promised a further “unleashing” of market forces with their rhetoric promotion from a “basic” to “decisive” role—even if some details were left vague, and some predictions for reform were not realized (particularly in the field of finance). But left unambiguous was that the

Communist Party monopoly on political control remained unchallenged—and indeed seemed to have been reinforced.

Finally, despite the extraordinary economic growth in China, Richard Easterlin has found that improvements in happiness and satisfaction in the country simply have not kept pace, particularly among the bottom third.

Managing Urbanization The scope of urbanization in China has been called the largest migration in human history, and indeed it has been breathtaking. For the first time in its history, China has become a more urban than rural society, with the halfway mark believed to have been crossed sometime in 2011; as recently as 1980, more than 80% of Chinese citizens lived in rural areas. Before 2030, China may reach the “Urban Billion” mark. Chongqing featured in the vignette in Chapter 1, growing from 200,000 in the 1930s, to about 2 million during the Cultural Revolution of the 1970s, to now over 30 million people in the metropolitan area. In the south, Shenzhen was transformed from a fishing village near Hong Kong to another megacity in just a couple of decades. But conditions of ordinary people in many cities do not correspond to the media images of postmodern skyscrapers, as most are moving to large tracts of sometimes bleak, uniform apartment buildings, crawling in epic traffic jams through a vast urban sprawl—and indeed inhaling the “breathtaking” air pollution—in a picture simultaneously of public overinvestment in some areas and underinvestment in others.

Demographic Challenges

China also has a rapidly aging population. For the last decade of the twentieth century and first decade and a half of the twenty-first century, China has benefited from a *demographic dividend* (see Chapter 6), in which by global standards an unusually large fraction of its population has been of working age (neither too young nor too old to be active in the workforce). This “dividend” occurs in the process of economic development after the drop in births per woman but before the previous larger cohorts retire, allowing for rapid income growth. China is now entering a phase in which a large fraction of its working population will begin to retire. One challenge is the need to implement a modern pension system. Another is to respond to

a shrinking workforce and the need to support a large retired population. It is a challenge common to many modern societies but may be particularly acute in China due to its one-child policy that has been in effect since about 1980, which has greatly accelerated the demographic transition. There was a slight relaxation of this policy at the Third Plenum in November 2013, to allow urban families for which either husband or wife is an only child to have a second child (previously this was allowed only if each was an only child). But this change may have very limited impact on fertility because of the high cost of raising children in China’s cities. The very high ratio of males to females (see Chapter 8) remains another serious demographic challenge that may lead to continued distortions.

There are several explanations of China’s historically unprecedented high savings rates (approaching 50% by some measures), but many of them relate to the unusual demographic challenges; they include “life-cycle” saving for retirement by an aging population that lacks social security, precautionary savings due to increased income uncertainty because of fears about catastrophic family events such as major illnesses or layoffs, poor financial intermediation, and—in an influential new theory of Shang-Jin Wei and Xiaobo Zhang—competitive saving by parents of sons who now greatly outnumber daughters due to China’s growing sex-ratio imbalance and compete for prospective wives by offering larger houses and other wealth. High savings may be associated with the apparent property bubble that some economists in China believe has become dangerous—yet China has demonstrated a capacity for managing challenges, and considerable reserves for addressing crises.

Other Limits to Emulating China’s Policies

There are other limits to the lessons of China’s growth for other developing countries. China is quite homogeneous, overwhelmingly populated by members of the Han ethnic group. In Africa and other parts of the world, ethnic diversity is associated with slower growth, though only in countries that also have incomplete or nonexistent political freedoms. Clearly, China is lacking in many freedoms. There may be limits to the ability of other countries to carry out China’s brand of centrally

designed and implemented policies for transition and directed growth when either broader democratic freedoms are in place or greater ethnic diversity is present. Finally, China, like much of the rest of East Asia, has a relatively poor endowment of natural resources. Many development specialists have concluded that this lack is actually more of a benefit than a drawback. Natural resource abundance encourages political infighting for control over the revenues, while manufacturing success is more important when a country does not have natural resources to fall back on. It requires more initiative and more efforts to upgrade technology and skill. In terms of geographic advantages, East Asia is also much less plagued than Africa and other developing regions by problems such as malaria and other tropical diseases for which medicines are not readily available, the difficulties and disadvantages of tropical agriculture, and the problems of landlocked countries.

The experience of China assures us that the East Asian miracle is not a fluke due to special local factors in economies such as South Korea and Taiwan. It gives us much greater confidence when we say that “real development is possible.” On the other

hand, there are clear limits to the ability of other developing regions to emulate the success of China. Not only do other developing countries differ in geography, demography, institutions, and allure to foreign investors, but also other regions may find themselves starved for investments that are redirected to China while remaining unable to compete with China’s impressive combination of low wages, high skills and know-how, and agglomeration of economic activity. Some East Asian countries have greatly benefited from the surge in import demand from China. The commodity price boom of recent years, which has stimulated demand in several countries in Africa, is significantly attributable to growth in China. And China itself has a good chance of continued high, albeit moderated growth, provided it manages the next phase of its transition carefully. In the meantime, many developing countries that have hoped to rely more on manufactured exports view the success of China as much as a threat as an opportunity. Growth in China will continue to be a central theme in the global development drama—both in its huge economic impact and the policy debate spurred by its extraordinary achievements. ■

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Concepts for Review

Agency costs	Economic agent	Pareto improvement
Asymmetric information	Growth diagnostics	Pecuniary externality
Big push	Information externality	Poverty trap
Binding constraint	Linkages	Prisoners' dilemma
Complementarity	Middle-income trap	Social returns
Congestion	Multiple equilibria	Technological externality
Coordination failure	O-ring model	Underdevelopment trap
Deep intervention	O-ring production function	Where-to-meet dilemma

Questions for Discussion

1. Can you think of additional examples of complementarities from everyday life? Does the S-shaped curve of Figure 4.1 shed any light on them? Do you think your examples help as a metaphor for economic development problems?
2. What role do you think international trade and foreign investment can play in solving some of the problems identified in the big push model? In the O-ring model? What limitations to your arguments can you think of?
3. The word *trap* suggests that there may be a way to escape. Do you think developing countries can escape all of the traps described in this chapter? Which ones would be most difficult to escape? How could the developed world be of assistance in these cases? Could developed countries do more?
4. Why might high levels of inequality lead to lower rates of growth and development? Why might it be difficult to get out of this kind of trap?
5. Why is the government sometimes a part of the problem of coordination failure rather than the solution? Does this make the problem hopeless? What could be done in this case?
6. One of the characteristics of some developing economies is the relatively low level of trust of people outside one's extended family. How might the models explored in this chapter shed light on this problem?
7. Can you think of an example of O-ring production from everyday life? Do you think your example is a good metaphor for development problems?
8. Modern economic models sometimes require strong assumptions. What do you think are some of the trade-offs between a more rigorous, logically cohesive model with strong assumptions but clear inferences and a description of problems followed by a verbal discussion of possible implications? Do you think the two approaches can be used together to inform each other?
9. As you read later chapters, think about whether the models described in this chapter are useful in shedding additional light on the nature of the problems considered. Some of the later problems you might consider are child labor, poor health and nutrition among the poor, high fertility, environmental degradation, availability of credit for the poor, urbanization, protectionism in international trade by developed and developing countries, reform of government, and land reform.
10. Select a developing country that interests you and search for evidence suggesting which factors are the binding constraint on growth. (For inspiration, see the sources in Box 4.3.)
11. What kinds of market failures are present in the economic self-discovery framework, and how may they be overcome?
12. Consider the most recent economic performance in China. To what extent do you think it confirms, and to what extent calls for adjustments in, the analysis in the China case study?

Notes

1. See Karla Hoff and Joseph E. Stiglitz, "Modern economic theory and development," in *Frontiers in Development Economics*, eds. Gerald M. Meier and Joseph E. Stiglitz (New York: Oxford University Press, 2000). The Hoff and Stiglitz epigram (header quote) is drawn from this source, p. 390.
2. For example, the two approaches have converged when low-growth paths resulting from a coordination failure have been explicitly examined within an endogenous growth framework. See Oded Galor and Joseph Zeira, "Income distribution and macroeconomics," *Review of Economic Studies* 60 (1993): 35–52.
3. For an insightful discussion of how many of the perspectives of this approach are applied to "new economy" issues, see Carl Shapiro and Hal Varian, *Information Rules: A Strategic Guide to the Network Economy* (Boston: Harvard Business School Press, 1999).
4. The problems cannot be solved even by perfect labor contracting (which is generally impossible in any case) if there is a risk of involuntary separations between firms and their employees (e.g., firm bankruptcies or death or serious illness of an employee). For a particularly insightful formal model, see Daron Acemoglu, "Training and innovation in an imperfect labour market," *Review of Economic Studies* 64 (1997): 445–464.
5. For an interesting formal model of this problem with supporting empirical evidence from rural Bangladesh, see Shahe Emran and Forhad Shilpi, "Marketing externalities, multiple equilibria, and market development," a paper presented at the Northeast Universities Development Conference, Boston University, September 2001. See also Shahe Emran and Forhad Shilpi, "The extent of the market and stages of agricultural specialization," *Canadian Journal of Economics* 45, No. 3 (2012): 1125–1153.
6. Alicia Adsera and Debraj Ray, "History and coordination failure," *Journal of Economic Growth* 3 (1998): 267–276; Debraj Ray, *Development Economics* (Princeton, N.J.: Princeton University Press, 1998), ch. 5.
7. For an introductory overview of the prisoners' dilemma problem, see Robert Gibbons, *Game Theory for Applied Economists* (Princeton, N.J.: Princeton University Press, 1992), pp. 2–7.
8. Even under perfect information conditions, however, coordination can remain a problem.
9. Technically, Figure 4.1 assumes that agents are homogeneous and depicts a symmetrical Nash equilibrium, but this can be generalized to cases in which agents differ. An example of an upward-sloping supply curve intersecting a downward-sloping demand curve—to produce a single equilibrium—can be seen in Figure 5.5, for the case of a labor market.
10. Technically, what is depicted is a set of symmetrical Nash equilibria. The S-shaped curve is the reaction curve of a representative agent to the average behavior of the other agents.
11. Paul Rosenstein-Rodan, "Problems of industrialization of eastern and southeastern Europe," *Economic Journal* 53 (1943): 202–211.
12. Kevin M. Murphy, Andrei Shleifer, and Robert W. Vishny, "Industrialization and the big push," *Journal of Political Economy* 97 (1989): 1003–1026.
13. Paul Krugman, *Development, Geography, and Economic Theory* (Cambridge, Mass.: MIT Press, 1995), ch. 1. For an alternative exposition and an algebraic development of the model, see Kaushik Basu, *Analytical Development Economics* (Cambridge, Mass.: MIT Press, 1997), pp. 17–33.
14. One reason could be an efficiency wage effect, in which workers work harder to avoid being fired when paid a high wage, thereby raising productivity enough to pay for the higher wage.
15. We are assuming that modern-sector workers would be changing the sectors (from traditional to modern) in which they work voluntarily; that is, they are not slave labor.
16. In the formal model of Murphy, Shleifer, and Vishny, there is a continuum of products, but that need not concern us here.
17. This consumption pattern means that there is unit-elastic demand; this is the type of demand function

- that follows from a Cobb-Douglas utility function with equal preference weights for all goods, such as a utility function given by the products of the amounts of each type of good consumed. Technically, Murphy, Schleifer, and Vishny assume that there is one representative consumer who supplies all labor and receives all profits and, with their other assumptions, set up the model so that Figure 4.2 and other parts of the analysis can be thought of either as the economy as a whole or as any particular market, but these considerations need not concern us here.
18. See, for example, Hollis B. Chenery, Sherman Robinson, and Moshe Syrquin, *Industrialization and Growth: A Comparative Study* (New York: Oxford University Press, 1986).
 19. For work in this field, see, for example, Andrés Rodríguez-Clare, "The division of labor and economic development," *Journal of Development Economics* 49 (1996): 3–32. Rodríguez-Clare starts with three plausible conditions that have had wide theoretical and empirical support since Adam Smith in the first two cases and Alfred Marshall in the third: There are productivity gains from the division of labor, the division of labor is limited by the extent of the market, and, as explained in Chapter 7, efficiency gains are derived from the proximity of suppliers and users of certain inputs. Given these assumptions, Rodríguez-Clare then shows that a small, open economy may be caught in an underdevelopment trap in which a "shallow division of labor" (i.e., a low variety of specialized inputs) is self-reinforcing. This in turn leads to a low rate of return to capital, so foreign investment or domestic capital accumulation may not materialize to help solve the problem. For another illustration, see Dani Rodrik, "Coordination failures and government policy: A model with applications to East Asia and Eastern Europe," *Journal of International Economics* 40 (1996): 1–22. See also Murphy, Shleifer, and Vishny, "Industrialization," sec. 6.
 20. Recall from microeconomics that we can write marginal revenue as $P(Q)[1 - 1/\eta]$, where P is price and η is the (absolute value of) price elasticity of demand. With unit elasticity, $\eta = 1$; then note that this producer has positive constant marginal costs. Therefore, profits may be indefinitely increased by decreasing output and raising price accordingly.
 21. In other words, the producer acts as a limit-pricing monopolist.
 22. Wages have risen to w , but this product sector is by definition a very small part of the economy, so we can ignore income effects, which are negligible.
 23. The graph was suggested by Krugman. See *Development, Geography, and Economic Theory*.
 24. Thus conditions for monopoly limit pricing are still present.
 25. With a price of 1, the quantity of goods purchased by workers is equal to the wage bill.
 26. To see this, note that after the big push, total wages in the economy are $w_2(L/N)N$, and total profits are $[1Q_2 - w_2(L/N)]N$. Summing these, we get $1Q_2N$, the value of total output.
 27. Expressed differently, the problem is that market failure is present. In particular, as Krugman points out, the interaction between a firm's internal economies of scale and the existence of perfectly elastic labor supplies at low wages together generate pecuniary externalities that inhibit the entry of modern firms. In other words, by generating an increase in aggregate demand, each firm makes a contribution to a mutually profitable big push to industrialization, even though individually each firm would lose money by industrializing alone. Thus, although the economies of scale are internal to the firm, when combined with the presence of a traditional sector paying low wages, de facto external pecuniary positive externalities are generated. Again, this is because each firm's production has the effect of raising other firms' revenues, making them more profitable. A simple characterization of the conundrum is that if there is only one modern firm, profits are greater in the traditional sector, but if there is a modern firm in every activity, profits are greater in the modern sector.
 28. Formally, $F = F(N)$, where F is falling as N rises.
 29. For details of one insightful formal model that casts the big push model in relatively accessible algebraic terms, see Stefano Paternostro, "The poverty trap: The dual externality model and its policy implications," *World Development* 25 (1997): 2071–2081.
 30. Note that formally, in this case, *efficient* means "laborsaving," but the point is more general.
 31. As Murphy, Schleifer, and Vishny show, there is also a plausible equilibrium condition that an increased interest-rate effect is not too large.

32. Openness to trade will not resolve this problem because the development of cities in *other* countries does not generally assist with national development. Urbanization is discussed further in Chapter 7.
33. In principle, if it is known that a sufficient number of modern firms will enter, the infrastructure problem can be solved by using perfect price discrimination, but if firms have different fixed costs that are not observable by the infrastructure provider or if perfect price discrimination is not possible for some other reason, the infrastructure may not be built, even when it is efficient to do so. See Murphy, Shleifer, and Vishny, "Industrialization," sec. 6. For an accessible algebraic derivation using a diagram similar to Figure 4.2, see Pranab Bardhan and Chris Udry, *Development Microeconomics* (New York: Oxford University Press, 1999), pp. 208–211.
34. The term *lemons* derives from poor-quality used cars. As is well known, new cars lose a significant part of their value as soon as they leave the showroom. This is because the mere fact that a car is offered for sale is taken as valuable information about the car in itself. People wanting to buy a car are generally not expert mechanics, so they need to search for some shorthand information to help them decide what a car is worth; obviously, owners of a poor-quality car are more likely to offer it for sale. Analogies to this "lemons problem" have many other applications in economics, such as in financial markets (see Chapter 15). Also see George Akerlof, "The market for lemons," *Quarterly Journal of Economics* 84 (1970): 488–500.
35. For an excellent survey of some of the new developments covered in this section, see Hoff and Stiglitz, "Modern economic theory and development." Another good discussion of this and related topics is found in Ray, *Development Economics*, ch. 5.
36. See Alice Amsden, *Asia's Next Giant: South Korea and Late Industrialization* (Oxford: Oxford University Press, 1989) and *The Rise of the Rest* (New York: Oxford University Press, 2001); Carl J. Dahlman, Bruce Ross-Larson, and Larry E. Westphal, "Managing technical development: Lessons from the newly industrializing countries," *World Development* 15 (1987): 759–775; Richard Luedde-Neurath, *Import Controls and Export-Oriented Development: A Reassessment of the South Korean Case* (Boulder, Colo.: Westview Press, 1986); Howard Pack and Larry E. Westphal, "Industrial strategy and technological change: Theory versus reality," *Journal of Development Economics* 22 (1986): 87–128; Joseph Stern et al., *Industrialization and the State: The Korean Heavy and Chemical Industry Drive* (Cambridge, Mass.: Harvard University Press, 1995); Gordon White, ed., *Developmental States in East Asia* (New York: St. Martin's Press, 1988); and Stephen C. Smith, "Industrial policy and export success: Third World development strategies reconsidered," in *U.S. Trade Policy and Global Growth*, ed. Robert Blecker (New York: Sharpe, 1996), pp. 267–298. On linkages, see also Masahisa Fujita, Paul Krugman, and Anthony J. Venables, *The Spatial Economy: Cities, Regions, and International Trade* (Cambridge, Mass.: MIT Press 1999).
37. This perspective helps account for the popularity of input-output analysis in development planning and policy formulation, especially in earlier years, although it is an imperfect tool for this purpose (see Chapter 11).
38. For some evidence, see William L. Megginson and Jeffrey M. Netter, "From state to market: A survey of empirical studies on privatization," *Journal of Economic Literature* 39 (2001): 321–390.
39. See Abhijit V. Banerjee and Andrew F. Newman, "Occupational choice and the process of development," *Journal of Political Economy* 101 (1993): 274–298.
40. Galor and Zeira's model rests on an alternative way to characterize imperfect capital markets—that the rate of interest for borrowers is greater than that for lenders. One can verify the reasonableness of this assumption with a brief visit to any bank. The model is a simple two-period, overlapping-generations model. See Galor and Zeira, "Income distribution and macroeconomics."
41. Torsten Persson and Guido Tabellini, "Is inequality harmful for growth?" *American Economic Review* 84 (1994): 600–621; see also Chapter 5 of this text.
42. Michael Kremer, "The O-ring theory of economic development," *Quarterly Journal of Economics* 108 (1993): 551–575. A good exposition of the model, which provides alternative proofs to the ones found in Kremer, is found in Basu, *Analytical Development Economics*.
43. More generally, there are n tasks; for simplicity, we continue to assume that one, and only one, worker must perform each of the n tasks,

but conceptually, n should be thought of as tasks rather than number of workers. If, and only if, all tasks are performed successfully, output per worker is given by B , which is given in value terms (or if thought of in quantity terms, price is normalized to 1). Conventional capital, k , may also be used (if not, simply set $k = 1$), which is introduced in the formula, with diminishing returns (of course, capital might also be of varying quality). Expected output y is given by

$$E(y) = K^\alpha \left(\prod_{i=1}^n q_i \right) nB$$

In general, we must multiply by n because otherwise the firm can only lose value by adding more differentiated tasks. In the O-ring theory, Kremer analyzes what happens when $B = B(n)$, where $B'(n) > 0$, as a way of endogenizing technology choice.

44. For a more formal and more general demonstration that firms would choose to employ workers of the same skill level (or as close to identical as possible), let us continue the example from note 43. A necessary condition for a maximum with respect to each of the labor qualities q is

$$\frac{dw(q_i)}{dq_i} \equiv \frac{dy}{dq_i} = \left(\prod_{j \neq i} q_j \right) nBK^\alpha$$

This equation tells us that in equilibrium, the value of the marginal product of skill is equal to the marginal cost of skill in wage payments. In other words, the firm finds that the added value of replacing one worker with another with higher skill while leaving the skill levels of all other workers constant is equal to the resulting increase in the wage bill. Next, note that the second derivative, or the derivative of the marginal product of skill for the i th worker with respect to the skill level of the other workers, is positive; that is,

$$\frac{d^2y}{dq_i d} = \left(\prod_{j \neq i} q_j \right) = nBK^\alpha > 0$$

This positive cross-derivative indicates that firms with high-skilled workers in all but one task receive

the greatest benefits from having a high-skilled worker in the remaining task, and so they can and would bid the most for high-skilled workers.

45. Technically, this type of marriage market matching process does not depend on the presence of positive cross-derivatives, as in note 44, but results only from individual preferences, along with the assumption of nontransferable utility (meaning that there can be no side payments). Thus there are two types of situations in which positive assortative matching may occur.
46. See Michael Kremer and Eric Maskin, "Wage inequality and segregation by skill," NBER Working Paper No. 5718, 1996.
47. See Kremer, "O-ring theory," for a formal statement of this result and for extensions to cases of endogenous skill investments under imperfect information.
48. Ibid., p. 574. The multiple equilibrium analysis is found on pp. 564–571.
49. Ricardo Hausmann and Dani Rodrik, "Economic development as self-discovery," *Journal of Development Economics* 72 (2003): 603–633. A related and insightful earlier analysis was provided by Karla Hoff, "Bayesian learning in an infant industry model," *Journal of International Economics* 43 (1997): 409–436.
50. Ricardo Hausmann, Dani Rodrik, and Andrés Velasco, "Growth diagnostics," in *One Economics, Many Recipes: Globalization, Institutions, and Economic Growth*, by Dani Rodrik (Princeton, N.J.: Princeton University Press, 2007), ch. 2.
51. Paul Krugman, *Development, Geography, and Economic Theory*, (Cambridge: MIT Press, 1995.)
52. Hoff and Stiglitz, "Modern economic theory and development."
53. Seminar presentation by Joseph E. Stiglitz at the World Bank, May 27, 1999; and *ibid.*, p. 421.
54. Karla Hoff, "Beyond Rosenstein-Rodan: The modern theory of coordination problems in development," in *Annual World Bank Conference on Development Economics, 1999* (Washington, D.C.: World Bank, 2000), p. 146.

PART TWO

Problems and Policies: Domestic



5

Poverty, Inequality, and Development

No society can surely be flourishing and happy, of which by far the greater part of the numbers are poor and miserable.

—*Adam Smith, 1776*

Viewed through the lens of human development, the global village appears deeply divided between the streets of the haves and those of the have-nots.

—*United Nations Development Programme, Human Development Report, 2006*

Social protection directly reduces poverty and helps make growth more pro-poor.

—*Organization for Economic Cooperation and Development, 2010*

The coincidence of severe and persistent poverty and hunger indicates the presence of poverty traps—conditions from which individuals or groups cannot emerge without the help of others.

—*International Food Policy Research Institute, 2007*

The World Bank Group has adopted two new goals: end extreme poverty by 2030 and boost shared prosperity by maximizing income growth for the poorest 40 percent in every country.

—*Jim Yong Kim, President, World Bank, 2013*

Chapters 1 and 2 introduced the problem that despite significant improvements over the past half century, extreme poverty remains widespread in the developing world. In 2010, more than 1.2 billion people lived on less than \$1.25 per day at 2005 U.S. purchasing power parity (2013 World Bank estimate). Some 2.4 billion—more than one-third of the world's population—lived on less than \$2 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 meager living on small and marginal farms (or as day laborers) 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, many developing countries that had experienced relatively high rates of economic growth by historical standards discovered that such growth often brought little in the way of significant benefits to their poor.

Because the elimination of widespread poverty and high and even growing income inequality are at the core of all development problems and in fact define for many people the principal objective of development policy, we begin Part Two by focusing on the nature of the poverty and inequality problem in developing countries. Although our main focus is on economic poverty and inequalities in the distribution of incomes 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 or even greater importance are inequalities of power, prestige, status, gender, job satisfaction, conditions of work, degree of participation, freedom of choice, and many other dimensions of the problem that relate more to our second and third components of the meaning of development, self-esteem, and freedom to choose. 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. A thorough understanding of these two fundamental economic manifestations of underdevelopment provides the basis for analysis in subsequent chapters of more specific development issues, including population growth, education, health, rural development, environmental degradation and climate change, and foreign assistance.

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 so bad about extreme inequality?
8. What kinds of policies are required to reduce the magnitude and extent of absolute poverty?

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. 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 programs that have worked well in practice. We conclude the chapter with a comparative case study of Ghana and Côte d’Ivoire, which illustrates, issues of the quality of growth and the difficulties of achieving it.

5.1 Measuring Inequality

In this section, we define the dimensions of the income distribution and poverty problems and identify some similar elements that characterize 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.

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.

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.

Size Distributions

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

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

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 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 through 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.

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

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

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%.

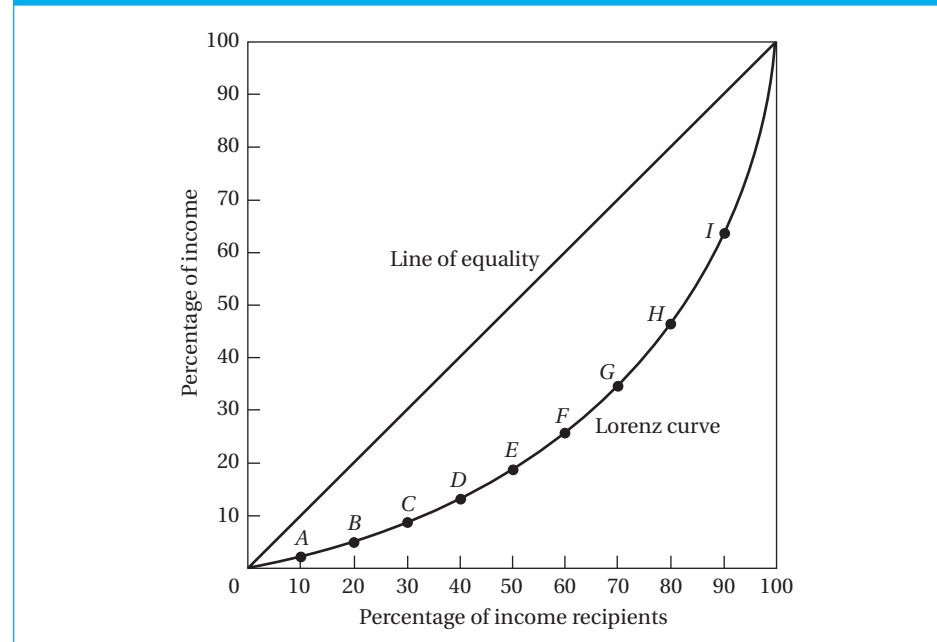
Lorenz Curves

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

Another common way to analyze 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

FIGURE 5.1 The Lorenz Curve

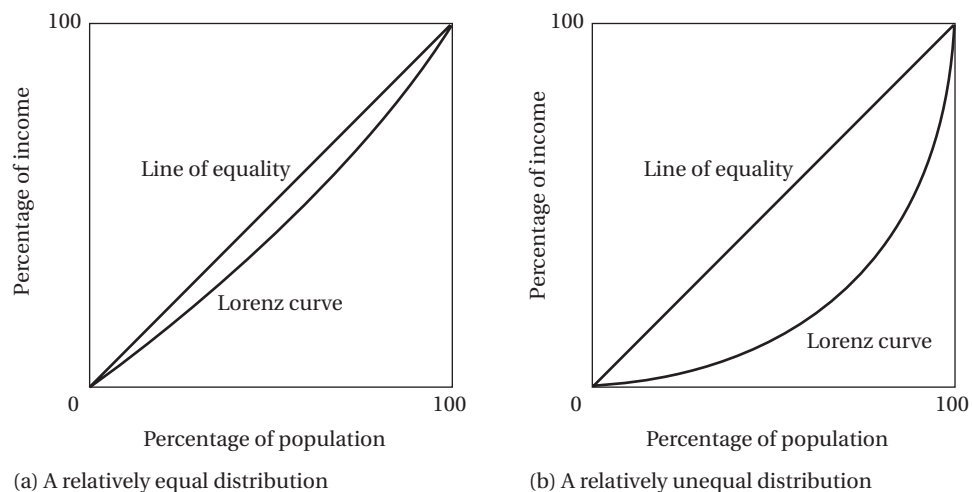


that same percentage of the total income; for example, the bottom 40% receives 40% of the income, while the top 5% receives only 5% of the total income.²

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



Gini Coefficients and Aggregate Measures of Inequality

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 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 is, the higher the inequality of income distribution; the lower it is, the more equal the distribution of income.

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 others might start with the assumption that

FIGURE 5.3 Estimating the Gini Coefficient

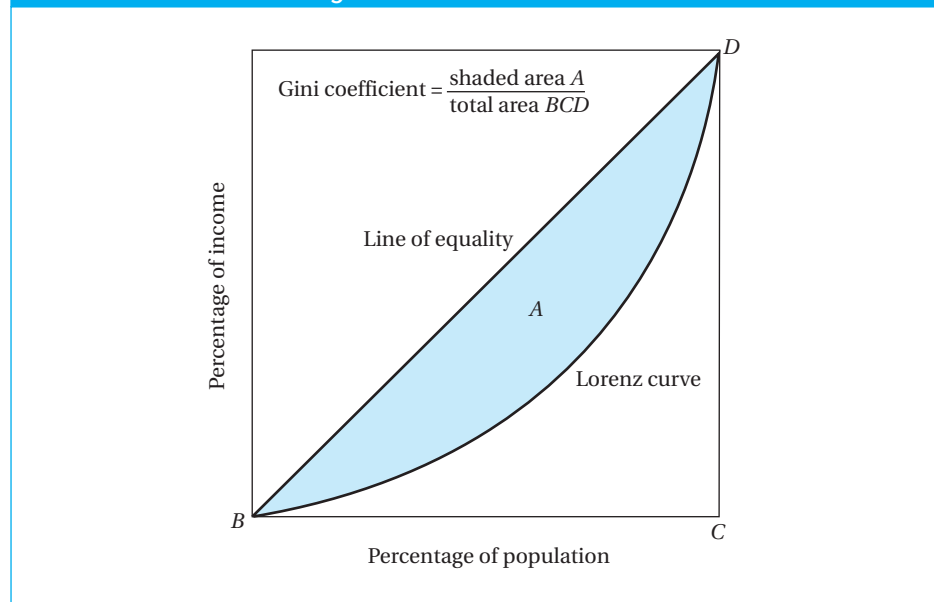
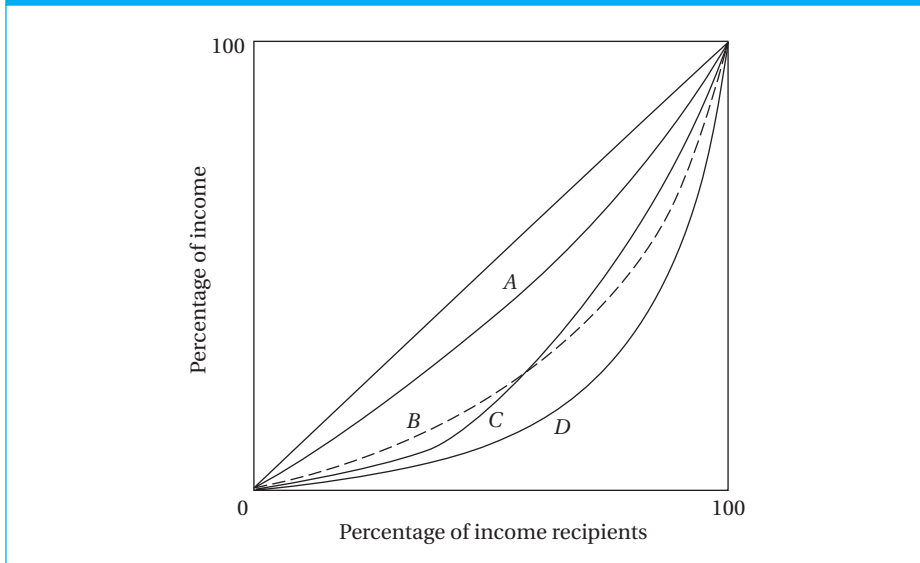


FIGURE 5.4 Four Possible Lorenz Curves



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.

Functional Distributions

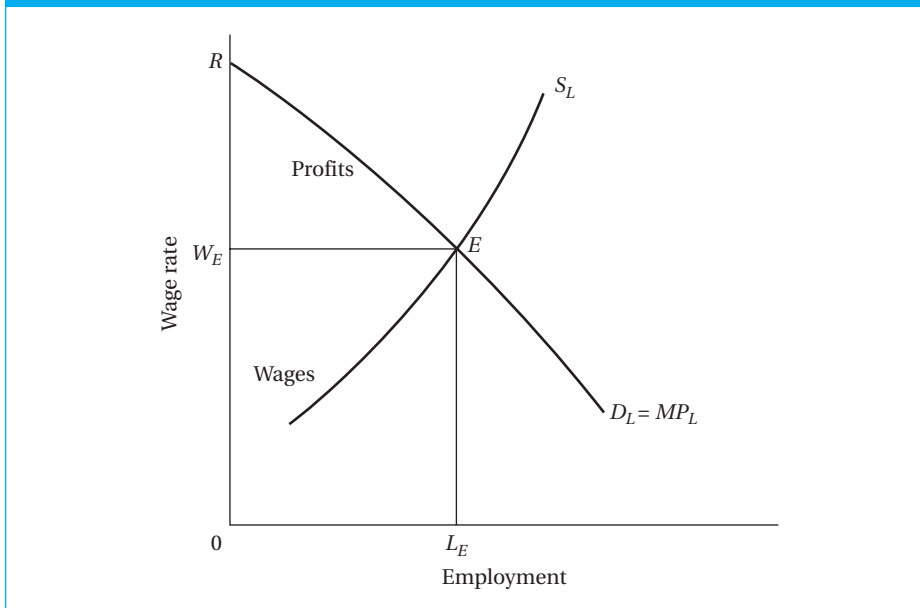
Functional distribution of income (factor share distribution of income) The distribution of income to factors of production without regard to the ownership of the factors.

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

The second common measure of income distribution used by economists, the **functional** or **factor share distribution of income**, attempts to explain the share of total national income that each of the **factors of production** (land, labor, and capital) receives. Instead of looking at individuals as separate entities, the theory of functional income distribution inquires into the percentage that labor 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 sizable body of theoretical literature has been built up around 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. 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 utilization, we get a measure of the total payment to each factor. For example, the supply of and demand for labor 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 5.5 provides a simple diagrammatic illustration of the traditional theory of functional income distribution. We assume that there are only two factors of production: capital, which is a fixed (given) factor, and labor, which is the only variable factor. Under competitive market assumptions, the demand for labor will be determined by labor'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 labor will be a declining function of the numbers employed. Such a negatively sloped labor demand curve is shown by line D_L in Figure 5.5. With a traditional, neoclassical, upward-sloping labor 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 $OREL_E$.⁵ This national income will be distributed in two shares: OW_EEL_E going to workers in the form of wages and $W_ER E$ remaining as capitalist profits (the return to owners of capital). Hence, in a competitive market economy with constant-returns-to-scale

FIGURE 5.5 Functional Income Distribution in a Market Economy: An Illustration

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—laborers 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.

Unfortunately, the relevance of the functional theory is greatly 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, the role of collective bargaining between employers and trade unions in the setting of modern-sector wage rates, and the power of monopolists and wealthy landowners to manipulate prices on capital, land, and output to their own personal advantage. Appendix 5.1 examines the economic implications of factor price distortions, and we return to consider their implications for policy at the end of this chapter.

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.

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 \$1.25 a day or \$2 per day 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.

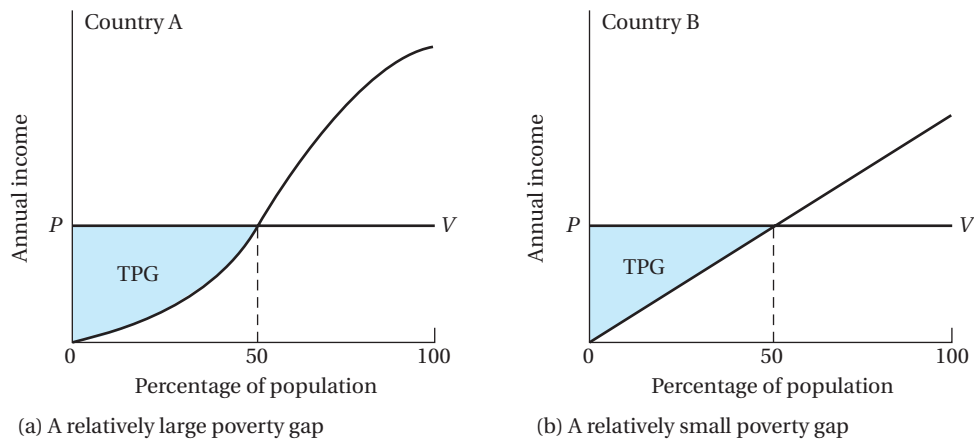
Headcount index The proportion of a country's population living below the poverty line.

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 \$1.25 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 \$1.25 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 U.S. \$450 per person, it makes a big difference whether most of the absolute

FIGURE 5.6 Measuring the Total Poverty Gap



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 5.6 illustrates how we can measure the total 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:

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

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:

$$\text{APG} = \frac{\text{TPG}}{N} \quad (5.2)$$

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 *normalized poverty gap (NPG)*: $\text{NPG} = \text{APG}/Y_p$; this measure lies between 0 and 1 and so can be useful when we want a unitless measure of the gap for easier comparisons.

Total poverty gap (TPG)

The sum of the difference between the poverty line and actual income levels of all people living below that line.

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 *normalized 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.⁶ 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.

A well-known poverty index that in certain forms satisfies all four criteria is the **Foster-Greer-Thorbecke (FGT) index**, often called the P_α class of poverty measures.⁷ The P_α index is given by

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

where Y_i is the income of the i th 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 $\alpha = 0$, the numerator is equal to H , and 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 normalized (per capita) poverty gap. An alternative formula that can be derived for P_1 is given by $P_1 = (H/N) \cdot (NIS)$, that is, the headcount ratio (H/N) times the normalized income shortfall (NIS). So, P_1 has

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

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 $\alpha = 2$, the resulting measure, P_2 , can be rewritten as⁸

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

As Equation 5.4 shows, P_2 contains the CV_p measure, and it satisfies all four of the poverty axioms.⁹ 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 normalized 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 programs for the poor (in particular in the Progresa/Oportunidades Program, described at the end of Chapter 8), in accordance with the regional intensity of poverty.¹⁰

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 5.6 later in this chapter.

Person-Equivalent Headcounts Although P_1 and P_2 are more informative measures, which provide better incentives to poverty programs than P_0 , many agencies (including U.S. 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.¹¹

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.¹²

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 \$1.25 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_α index, the multidimensional M_α 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 normalized 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 wisely used application is the Women’s Empowerment in Agriculture Index, referred to in Chapter 9.

5.3 Poverty, Inequality, and Social Welfare

What’s So Bad about Extreme Inequality?

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 civilized 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 emphasized 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 is, 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, jewelry, 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.¹³ 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—characterized 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.¹⁴

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 favorable 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 behaviors, 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 sum, 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).¹⁵

Finally, extreme inequality is generally viewed as unfair. The philosopher John Rawls proposed a thought experiment to help clarify why this is so.¹⁶ 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.

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

$$W = W(Y, I, P) \quad (5.5)$$

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. (A similar framework can be applied to health and education.)

Dualistic Development and Shifting Lorenz Curves: Some Stylized Typologies

As introduced by Gary Fields, Lorenz curves may be used to analyze three limiting cases of dualistic development:¹⁷

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 5.7.
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.

FIGURE 5.7 Improved Income Distribution under the Traditional-Sector Enrichment Growth Typology

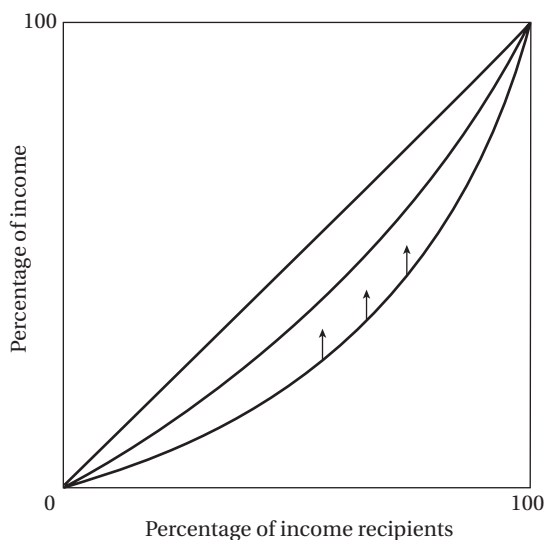
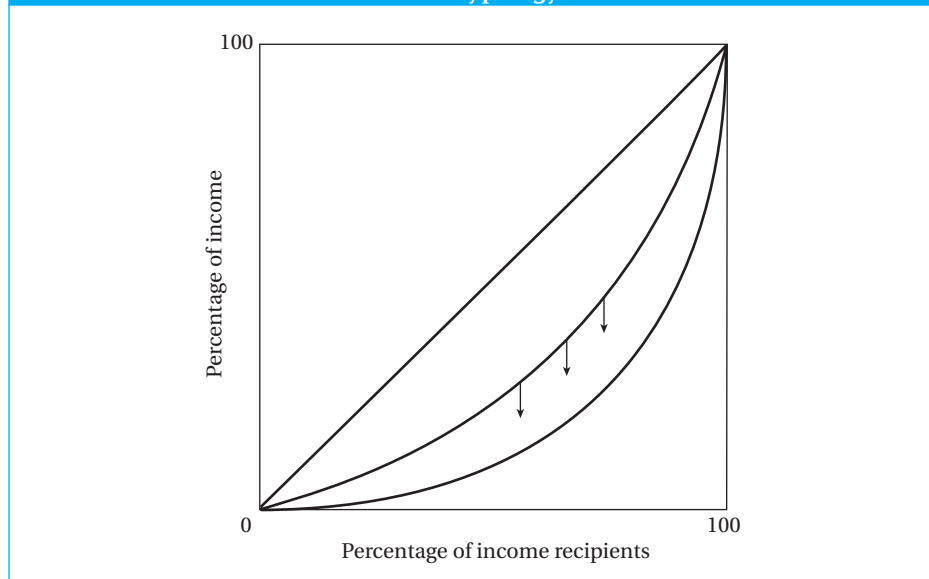


FIGURE 5.8 Worsened Income Distribution under the Modern-Sector Enrichment Growth Typology

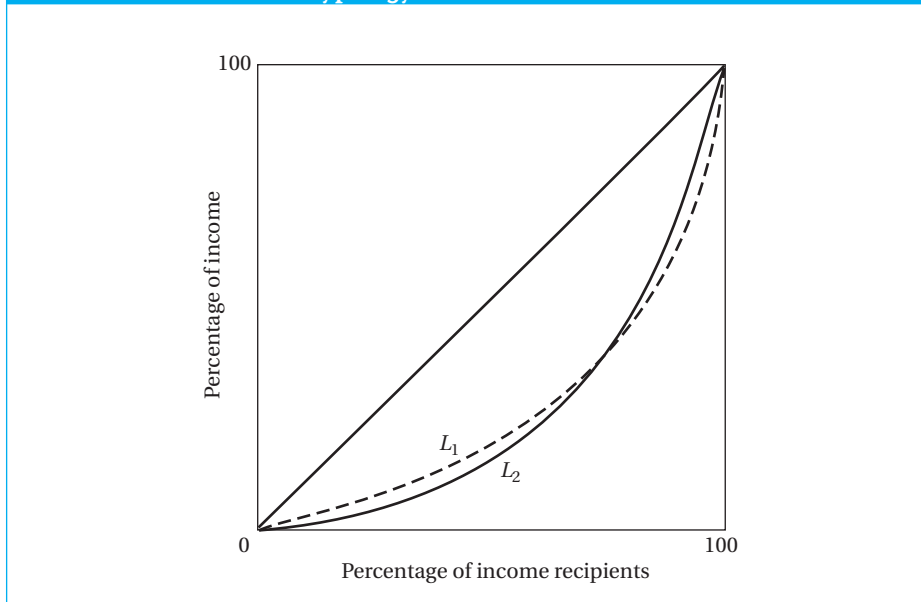


Modern-sector enrichment growth causes the Lorenz curve to shift downward and farther from the line of equality, as shown in Figure 5.8.

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 5.9.

The explanation for the crossing in Figure 5.9 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.¹⁸

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;¹⁹ if this admittedly highly stylized 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

FIGURE 5.9 Crossing Lorenz Curves in the Modern-Sector Enlargement Growth Typology

process in which citizens are, one by one, achieving incomes above the absolute poverty line.²⁰

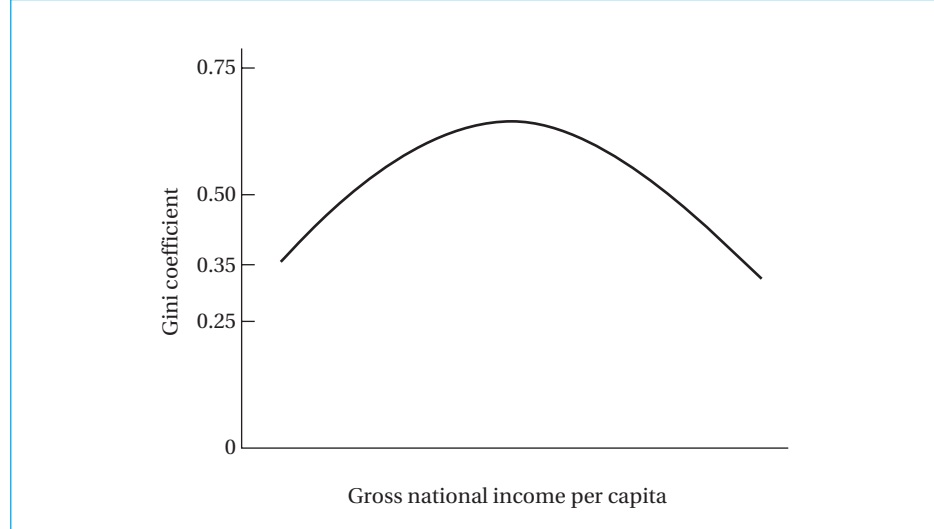
These observations tell us that we have to qualify our conclusion that a rise in inequality is inherently bad. In some cases, inequality may increase on a temporary basis due to causes that will eventually make everyone better off and ultimately lower inequality. However, with modern-sector enrichment growth, the increase in inequality is not later reversed, and the poor do not escape their poverty.²¹ 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. 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.

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.²² This observation came to be characterized 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 5.10.

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.

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

FIGURE 5.10 The “Inverted-U” Kuznets Curve

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 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 like 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.

TABLE 5.2 Selected Income Distribution Estimates

Country	Lowest 10%	Quintile					Highest 10%	Year
		1st	2nd	3rd	4th	5th		
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.

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 on page 240 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 Ethiopia, may have low inequality simply because there is so little income. But even very poor countries such as Mozambique and Zambia 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 low inequality. High-income countries do tend to be somewhat more equal than middle-income countries, but again, there is wide variation in inequality levels. 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.²³ In fact, for many



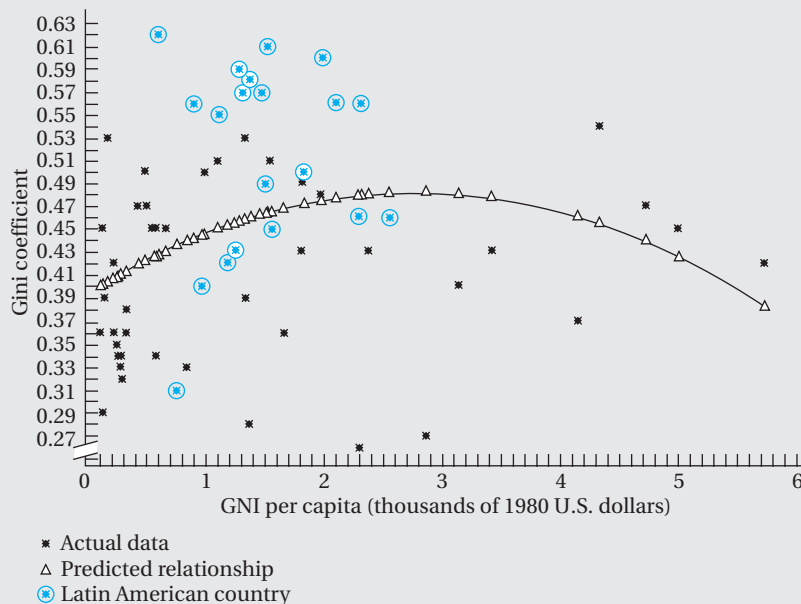
BOX 5.1 The Latin America Effect

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 5.11 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 5.11 tends to disappear in this data set and others as well.²⁴

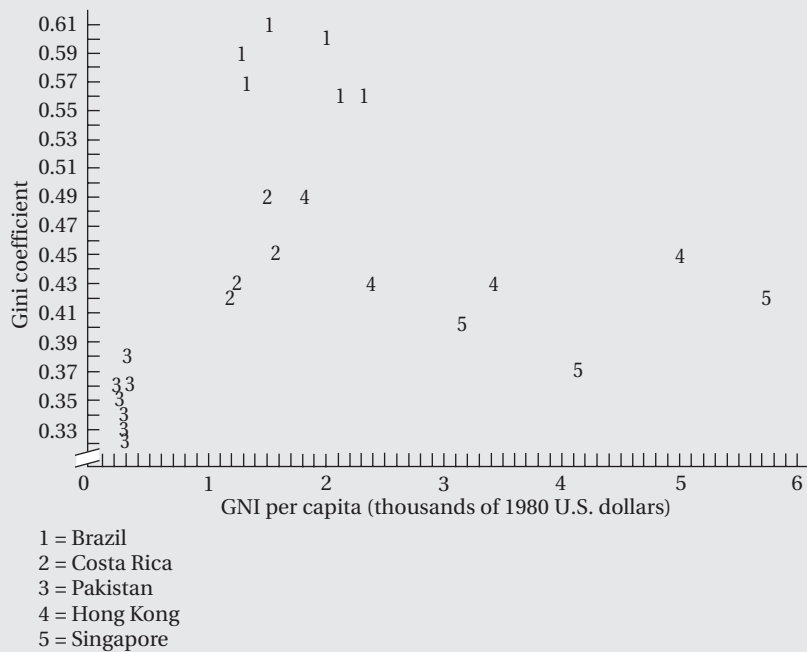
So the question is, what happens over time? In Figure 5.12 on page 239, selected countries from the data in Figure 5.11 have been isolated. As can be seen, the data from Brazil, which have the label 1 in the diagram, do plainly show an inverted-U pattern. Data from Hong Kong and Singapore, in contrast, labeled 4 and 5 in the diagram, appear to reflect a U-shaped pattern. 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 Kuznets Curve with Latin American Countries Identified



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

FIGURE 5.12 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.

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 U.S. 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.

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

TABLE 5.3 Income and Inequality in Selected Countries

Country	Income Per Capita (U.S. \$, 2008)	Gini Coefficient	Survey Year for Gini Calculation
Low Income			
Ethiopia	280	29.8	2005
Mozambique	380	47.1	2003
Nepal	400	47.3	2004
Cambodia	640	40.7	2007
Zambia	950	50.7	2005
Lower Middle Income			
India	1,040	36.8	2005
Cameroon	1,150	44.6	2001
Bolivia	1,460	57.2	2007
Egypt	1,800	32.1	2005
Indonesia	1,880	37.6	2007
Upper Middle Income			
Namibia	4,210	74.3	1993
Bulgaria	5,490	29.2	2003
South Africa	5,820	57.8	2000
Argentina	7,190	48.8	2006
Brazil	7,300	55.0	2007
Mexico	9,990	51.6	2008
Upper Income			
Hungary	12,810	30.0	2004
Spain	31,930	34.7	2000
Germany	42,710	28.3	2000
United States	47,930	40.8	2000
Norway	87,340	25.8	2000

Source: data from World Bank, *World Development Indicators, 2010* (Washington, D.C.: World Bank, 2010), tabs. 1.1 and 2.9.

Character of economic growth

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

also the **character of economic growth** (how it is achieved, who participates, which sectors are given priority, what institutional arrangements are designed and emphasized, 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.

5.4 Absolute Poverty: Extent and Magnitude

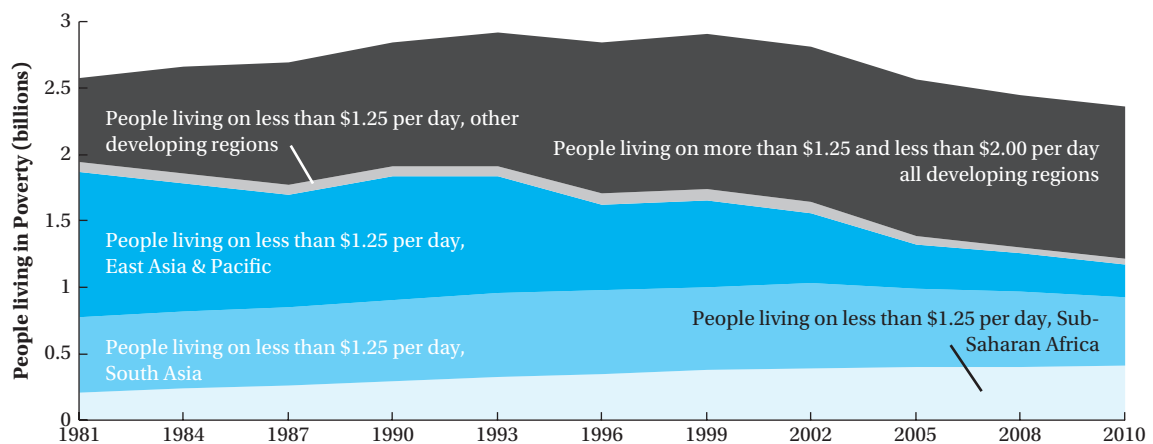
Like so much in economic development, the critical problem of eradicating absolute poverty is one of bad news and good news—of a glass that may be seen as either half empty or half full.

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 U.S. purchasing power parity. In 2008, the equivalent line was reset at \$1.25 at 2005 U.S. purchasing power. This (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 as 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 early 2014) show that in 2010 some 1.22 billion people lived below \$1.25 per day, and some 2.36 billion below \$2 per day (see Figure 5.13). The number of people living in \$1.25 per day income poverty fell from about 1.94 billion in 1981 – 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 \$1.25 per day, though still remained below \$2 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) living on less than \$1.25 per day fell to about 18% by 2010 – approaching half (55%) of its 1990 level of 33%. Thus, the MDG of halving \$1.25 per day poverty was close to having been met by 2010; and preliminary estimates show that this goal had been met – and indeed exceeded – by the end of 2013. Global and regional poverty trends are summarized in Figure 5.13. 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.

FIGURE 5.13 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>.

TABLE 5.4 Regional Poverty Incidence, 2010

Region	Headcount Ratio (P_0)	Poverty Gap (P_1)	Squared Poverty Gap (P_2)
Regional Aggregation at \$1.25 per Day			
East Asia and the Pacific	12.48	2.82	0.93
Europe and Central Asia	0.66	0.21	0.13
Latin America and the Caribbean	5.53	2.89	2.12
Middle East and North Africa	2.41	0.55	0.23
South Asia	31.03	7.09	2.36
Sub-Saharan Africa	48.47	20.95	11.85
Total	20.63	6.3	2.92
Regional Aggregation at \$2 per Day			
East Asia and the Pacific	29.14	9.42	4.05
Europe and Central Asia	2.27	0.64	0.3
Latin America and the Caribbean	10.18	4.67	3.13
Middle East and North Africa	11.55	2.66	0.99
South Asia	65.8	22.86	10.19
Sub-Saharan Africa	69.31	35.22	22.03
Total	40.08	15.32	7.79

Source: data from World Bank, "PovcalNet," <http://iresearch.worldbank.org/PovcalNet>, accessed 13 February 2014.

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 some survey-based poverty estimates by region at the \$1.25 and \$2 poverty lines. As can be seen, poverty incidence is very high in both South Asia, with about 40% below \$1.25 per day, and in sub-Saharan Africa, with 51% below. But poverty severity is far higher in sub-Saharan Africa, with a squared poverty gap index P_2 (in percentage terms) at 11.05, far above that of South Asia at 3.64. Table 5.5 provides estimates for some specific countries in Africa, Asia, and Latin America at the \$1.25 and \$2 poverty lines. It can be seen that about 44% of India's 2004 rural population lived below the \$1.25-a-day poverty line, while almost 80% lived on less than \$2 per day. In contrast, less than 36% of its urban population lived on less than \$1.25 per day, although about 66% still lived on less than \$2 per day.

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.

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.

TABLE 5.5 Income Poverty Incidence in Selected Countries

Country	Year	Per Capita Monthly Income (2005 PPP)	Headcount Ratio (%)	Poverty Gap (%)	Squared Poverty Gap (%)	Gini Index (%)
Incidence at \$1.25 a Day; Poverty Line at 38 (monthly equivalent)						
Bangladesh	2005	48.27	50.47	14.17	5.20	33.22
Benin	2003	52.77	47.33	15.73	6.97	38.62
Brazil	2007	346.64	5.21	1.26	0.44	55.02
Burkina Faso	2003	46.85	56.54	20.27	9.38	39.6
China—Rural	2005	71.34	26.11	6.46	2.26	35.85
China—Urban	2005	161.83	1.71	0.45	0.24	34.8
Côte d'Ivoire	2002	101.11	23.34	6.82	2.87	48.39
Guatemala*	2006	191.7	12.65	3.83	1.63	53.69
Honduras*	2006	184.45	18.19	8.19	5.00	55.31
India—Rural	2004	49.93	43.83	10.66	3.65	30.46
India—Urban	2004	62.43	36.16	10.16	3.80	37.59
Indonesia—Rural	2005	62.79	24.01	5.03	1.61	29.52
Indonesia—Urban	2005	89.1	18.67	4.06	1.29	39.93
Madagascar	2005	44.82	67.83	26.52	13.23	47.24
Mexico	2006	330.37	0.65	0.13	0.05	48.11
Mozambique	2002	36.58	74.69	35.4	20.48	47.11
Nicaragua*	2005	151.18	15.81	5.23	2.54	52.33
Nigeria	2003	39.46	64.41	29.57	17.2	42.93
Pakistan	2004	65.76	22.59	4.35	1.28	31.18
Peru	2006	216.82	7.94	1.86	0.61	49.55
Philippines	2006	98.99	22.62	5.48	1.74	44.04
Rwanda	2000	33.76	76.56	38.21	22.94	46.68
Senegal	2005	66.86	33.5	10.8	4.67	39.19
Incidence at \$2 a Day; Poverty Line at 60.84 (monthly equivalent)						
Bangladesh	2005	48.27	80.32	34.35	17.55	33.22
Benin	2003	52.77	75.33	33.51	18.25	38.62
Brazil	2007	346.64	12.70	4.15	1.85	55.02
Burkina Faso	2003	46.85	81.22	39.26	22.58	39.60
China—Rural	2005	71.34	55.63	19.47	8.94	35.85
China—Urban	2005	161.83	9.38	2.12	0.81	34.8
Côte d'Ivoire	2002	101.11	46.79	17.62	8.78	48.39
Guatemala*	2006	191.7	25.71	9.63	4.84	53.69
Honduras*	2006	184.45	29.73	14.15	8.91	55.31
India—Rural	2004	49.93	79.53	30.89	14.69	30.46
India—Urban	2004	62.43	65.85	25.99	12.92	37.59
Indonesia—Rural	2005	62.79	61.19	19.55	8.27	29.52
Indonesia—Urban	2005	89.1	45.85	14.85	6.39	39.93
Madagascar	2005	44.82	89.62	46.94	28.5	47.24
Mexico	2006	330.37	4.79	0.96	0.31	48.11
Mozambique	2002	36.58	90.03	53.56	36.00	48.07
Nicaragua*	2005	151.18	31.87	12.26	6.44	52.33
Nigeria	2003	39.46	83.92	46.89	30.8	42.93
Pakistan	2004	65.76	60.32	18.75	7.66	31.18
Peru	2006	216.82	18.51	5.95	2.54	49.55
Philippines	2006	98.99	45.05	16.36	7.58	44.04
Rwanda	2000	33.76	90.3	55.69	38.5	44.11
Senegal	2005	66.86	60.37	24.67	12.98	39.19

Source: data from World Bank, "PovcalNet," <http://iresearch.worldbank.org/PovcalNet>.

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*²⁶ from 1997 to 2009.

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 percent of weighted indicators for which poor households are deprived on average.

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 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.

With respect to health, two indicators—whether any child has died in the family and whether any adult or child in the family is malnourished—are weighted equally (so each counts one-sixth toward the maximum possible deprivation in the MPI). Regarding education also, two indicators—whether not even one household member has completed five years of schooling and whether any school-age child is out of school for grades one through eight—are given equal weight (so again, each counts one-sixth toward the MPI). Finally, in terms of standard of living, equal weight is placed on six deprivations (each counting one-eighteenth toward the maximum possible): lack of electricity, insufficiently safe drinking water, inadequate sanitation, inadequate flooring, unimproved cooking fuel, and lack of more than one of five assets—telephone, radio, television, bicycle, and motorbike or similar vehicle.

Calculating deprivation in this way, individuals are then identified as “multidimensionally poor” when their family is deprived by a “weighted sum” of 0.3 or more (3 out of 10 points as calculated in practice). 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 only three 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 which 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 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, $H_M A$, is a special case of the broader class of multidimensional poverty measures developed by Sabira Alkire and James Foster introduced earlier; $H_M A$ is readily calculated, and it also satisfies some desirable properties, including *dimensional monotonicity*, meaning that when a person deemed poor becomes deprived in another indicator, he or she is deemed even poorer.²⁷

In its 2013 *Human Development Report*, the UNDP presents the MPI for 104 developing countries, based on the currently available data; some examples are given in Table 5.6. Brazil and Mexico have very low MPI levels of just 0.011 and 0.015, respectively, while the world's most impoverished country for which data were available to compute the MPI, Niger, ranks 104th, with an MPI value of 0.642. The UNDP reports that there are nearly 1.6 billion people living in multidimensional poverty—several hundred million more than the estimated number living on an income of less than \$1.25 per day. At the broadest level, the results are not out of line with what one might expect; sub-Saharan Africa has the highest *proportion* of people living in poverty, and South Asia has the largest *number* of people living in poverty.

The poorest country is Niger, the only country with an MPI higher than 0.6. Six other countries had an MPI higher than 0.5, all in sub-Saharan Africa: Ethiopia, Mali, Burkina Faso, Burundi, Mozambique, and Guinea (available earlier data also show Angola, the Central African Republic, and Somalia with an MPI greater than 0.5).

Countries outside Africa with high levels of multidimensional poverty for their regions include Bangladesh (with an MPI of 0.292), Cambodia (0.212), Haiti (0.299), Honduras (0.159), India (0.283), Lao PRD (0.267), Nepal (0.217) Pakistan (0.264), Timor-Leste (0.360), and Yemen (0.283).

The results show that knowing income poverty is not enough if our concern is with multidimensional poverty. 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 2). 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. 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.²⁸

Different regions in the same country can have very different MPIs. In Kenya, the MPI for Nairobi is close to that of Brazil. Central Kenya's MPI is similar to

TABLE 5.6 Multidimensional Poverty Index, Data for 2007–2011

Country and Survey Year	MPI	Percent Poor	Thousands Poor	Poverty Intensity (A)
Bangladesh 2007 (D)	0.292	57.8	83,207	50.4
Brazil 2006 (N)	0.011	2.7	5,075	39.3
Burundi 2005 (M)	0.530	84.5	6,128	62.7
Bolivia, PS 2008 (D)	0.089	20.5	1,972	43.7
Burkina Faso 2010 (D)	0.535	84.0	13,834	63.7
Cambodia 2010 (D)	0.212	45.9	6,415	46.1
Colombia 2010 (D)	0.022	5.4	2,500	40.9
Congo, DR 2010 (M)	0.392	74.0	48,815	53.0
Côte d'Ivoire 2005 (D)	0.353	61.5	11,083	57.4
Dominican Republic 2007 (D)	0.018	4.6	439	39.4
Egypt 2008 (D)	0.024	6.0	4,699	40.7
Ethiopia 2011 (D)	0.564	87.3	72,415	64.6
Ghana 2008 (D)	0.144	31.2	7,258	46.2
Guinea 2005 (D)	0.506	82.5	7,459	61.3
Haiti 2005/2006 (D)	0.299	56.4	5,346	53.0
Honduras 2005/2006 (D)	0.159	32.5	2,281	48.9
India 2005/2006 (D)	0.283	53.7	612,203	52.7
Indonesia 2007 (D)	0.095	20.8	48,352	45.9
Kenya 2008/2009 (D)	0.229	47.8	18,863	48.0
Lao PRD 2006 (M)	0.267	47.2	2,757	56.5
Liberia 2007 (D)	0.485	83.9	3,218	57.7
Mali 2006 (D)	0.558	86.6	11,771	64.4
Mexico 2006 (N)	0.015	4.0	4,313	38.9
Madagascar 2008/2009 (D)	0.357	66.9	13,463	53.3
Malawi 2010 (D)	0.334	66.7	9,633	50.1
Mozambique 2009 (D)	0.512	79.3	18,127	64.6
Nepal 2011 (D)	0.217	44.2	13,242	49.0
Niger 2006 (D)	0.642	92.4	12,437	69.4
Nigeria 2008 (D)	0.310	54.1	83,578	57.3
Pakistan 2006/2007 (D)	0.264 d	49.4 d	81,236 d	53.4 d
Peru 2008 (D)	0.066	15.7	4,422	42.2
Philippines 2008 (D)	0.064	13.4	12,083	47.4
Rwanda 2010 (D)	0.350	69.0	6,900	50.8
Senegal 2010/2011 (D)	0.439	74.4	7,642	58.9
Sierra Leone 2008 (D)	0.439	77.0	4,321	57.0
South Africa 2008 (N)	0.057	13.4	6,609	42.3
Tanzania, 2010 (D)	0.332	65.6	28,552	50.7
Timor-Leste 2009/2010 (D)	0.360	68.1	749	52.9
Uganda 2011 (D)	0.367	69.9	24,122	52.5
Vietnam 2010/2011 (M)	0.017	4.2	3,690	39.5
Yemen 2006 (M)	0.283	52.5	11,176	53.9

Key: D indicates data are from Demographic and Health Surveys, M indicates data are from Multiple Indicator Cluster Surveys, d indicates lower bound estimate, and N indicates data are from national surveys. Not all indicators were available for all countries; caution should thus be used in cross-country comparisons.

Where data are missing, indicator weights are adjusted to total 100%.

Source: UNDP, *Human Development Report, 2013*, pp. 160–161.

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 are 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 is 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 labeled nondeprived if data are missing, so the numbers may understate poverty somewhat. Education considers only inputs such as enrolling or attending for five years, not outputs such as being able to read. And the choice of basic assets is questionable; for example, even where a radio and a simple bicycle are present, a woman may have just one dress and the children may sleep on a rough concrete floor.

The MPI provides 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. Ultimately, this should assist with better design and targeting of programs and policies and help us evaluate their performance more quickly and effectively.

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.²⁹

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).³⁰ 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 programs have often not reached the ultra-poor. 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 concluded:

poverty just below \$1 a day has fallen faster than poverty below 50 cents a day, suggesting that it has been easier to reach those living closer to the dollar-a-day line rather than those living well below it. . . .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.³¹

Some NGOs have responded to this problem, such as BRAC's Targeting the Ultra-Poor Program and Grameen's Beggars Program, 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 programs and the quality of those programs.

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 marginalized 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 of 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.³² (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 like 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.³³

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.³⁴ We can conclude, therefore, that promoting rapid economic growth and reducing poverty are not mutually conflicting objectives.³⁵

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. Over the past 30 years, China has 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 programs 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.³⁶

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.

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 is, 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 programs to attack poverty at its source, we need some specific knowledge of these high-poverty groups and their economic characteristics.³⁷

Rural Poverty

Perhaps the most valid generalizations about the poor are that they are disproportionately located in rural areas, that they are primarily engaged in agricultural and associated activities, that they are more likely to be women and children than adult males, and that they are often concentrated among minority ethnic groups and indigenous peoples. Data from a broad cross section of developing nations support these generalizations. We find, for example, that about two-thirds of the very poor scratch out their livelihood from subsistence agriculture either as small farmers or as low-paid farmworkers. Some of the remaining one-third are also located in rural areas but engaged in petty services, and others are located on the fringes and in marginal areas of urban centers, where they engage in various forms of self-employment such as street hawking, trading, petty services, and small-scale commerce. On the average, we may conclude that in Africa and Asia, about 80% of all target poverty groups are located in the rural areas, as are about 50% in Latin America. Some data for specific countries are provided in Table 5.7.

TABLE 5.7 Poverty: Rural versus Urban

Region and Country	Survey Year	Percentage below National Poverty Line		
		Rural Population	Urban Population	National Population
Sub-Saharan Africa				
Benin	2003	46.0	29.0	39.0
Burkina Faso	2003	52.4	19.2	46.4
Cameroon	2007	55.0	12.2	29.9
Malawi	2005	55.9	25.4	52.4
Tanzania	2001	38.7	29.5	35.7
Uganda	2006	34.2	13.7	31.1
Zambia	2004	72.0	53.0	68.0
Asia				
Bangladesh	2005	43.8	28.4	40.0
India	2000	30.2	24.7	28.6
Indonesia	2004	20.1	12.1	16.7
Uzbekistan	2003	29.8	22.6	27.2
Vietnam	2002	35.6	6.6	28.9
Latin America				
Bolivia	2007	63.9	23.7	37.7
Brazil	2003	41.0	17.5	21.5
Dominican Republic	2007	54.1	45.4	48.5
Guatemala	2006	72.0	28.0	51.0
Honduras	2004	70.4	29.5	50.7
Mexico	2004	56.9	41.0	47.0
Peru	2004	72.5	40.3	51.6

Source: data from World Bank, *World Development Indicators, 2010* (Washington, D.C.: World Bank, 2010), tab. 2.7.

It is interesting to note, in light of the rural concentration of absolute poverty, that the majority of government expenditures in most developing countries over the past several decades has been directed toward the urban area and especially toward the relatively affluent modern manufacturing and commercial sectors. Whether in the realm of directly productive economic investments or in the fields of education, health, housing, and other social services, this urban modern-sector bias in government expenditures is at the core of many of the development problems that will be discussed in succeeding chapters. We need only point out here that in view of the disproportionate number of the very poor who reside in rural areas, any policy designed to alleviate poverty must necessarily be directed to a large extent toward rural development in general and the agricultural sector in particular (we will discuss this matter in detail in Chapter 9).

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.³⁸ 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 programs. These facts combine to ensure that poor women's financial resources are meager and unstable relative to men's.

A 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. With a few notable exceptions, government employment or income-enhancing programs 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.

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.”³⁹ The favor 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.

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 programs 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.

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 labor 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 unrecognized. 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 programs to alleviate poverty frequently work almost exclusively with men, they tend to exacerbate these inequalities. In urban areas, training programs to increase earning potential and formal-sector employment are generally geared to men, while agricultural extension programs 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


BOX 5.2 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 into development programs. 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 programs, formal-sector employment, and agricultural extension programs. 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 programs. Legalizing informal-sector employment where the majority of the female labor 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 recognized 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 perhaps the most important 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 programs cannot simply "add women and stir." Women-centered 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.

Ethnic Minorities, Indigenous Populations, and Poverty

A final generalization about the incidence of poverty in the developing world is that it falls especially heavily on minority ethnic groups and indigenous populations. We pointed out in Chapter 2 that some 40% of the world's nation-states have more than five sizable ethnic populations, one or more of which faces serious economic, political, and social discrimination. 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. The poverty problem is even more serious for indigenous peoples, whose numbers exceed 300 million in over 5,000 different groups in more than 70 countries.⁴⁰

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.⁴¹ The results clearly demonstrate that a majority of indigenous groups live in extreme poverty and that being 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 5.8 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, Karens in Myanmar, Untouchables in India, or Tibetans in China, the poverty plight of minorities is as serious as that of indigenous peoples.

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,

TABLE 5.8 Indigenous Poverty in Latin America

Country	Population below the Poverty Line (%), Early 1990s		Period	Change in Poverty (%), Various Periods	
	Indigenous	Nonindigenous		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 George Psacharopoulos and Harry A. Patrinos, "Indigenous people and poverty in Latin America," *Finance and Development* 31 (1994): 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).

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 8% of its population living on less than \$1.25 per day. Income poverty, malnutrition, low school attendance, and child labor in Brazil finally showed a substantial decline after the turn of this century, when antipoverty and social safety net programs were greatly expanded (see the case study at the end of Chapter 1). 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 Policy Options on Income Inequality and Poverty: Some Basic Considerations

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 programs 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 labor, land, and capital as determined by factor prices, utilization 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 labor 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 that 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 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.

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

Altering the Functional Distribution of Income through Relative Factor Prices

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 labor 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 labor. From this it is argued that measures designed to reduce the price of labor relative to capital (e.g., through market-determined wages in the public sector or public wage subsidies to employers) will cause employers to substitute labor 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 labor 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.⁴² 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.

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, subsidized 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 utilization of the abundant supply of labor 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 labor 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 labor-intensive production methods as the relative price of labor 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 all minimum wages cause increases in poverty in all circumstances.

Modifying the Size Distribution through Increasing Assets of the Poor

Given correct resource prices and utilization levels for each type of productive factor (labor, 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.

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 characterize 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, fertilizers, 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 at least in developing countries that are growing 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.” Whether such a gradual redistribution from growth is any more possible than a redistribution of existing assets is a moot point, especially in the context of very unequal power structures. But some form of asset redistribution, whether static or dynamic, seems to be a necessary condition for any significant reduction of poverty and inequality in most developing countries.

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 (for girls as well as boys) 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 capitalize 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 utilize 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 programs 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.

Redistribution policies

Policies geared to reducing income inequality and expanding economic opportunities in order 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.

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

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.

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

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 program 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 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.)

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 programs, and the provision of clean water and electrification to remote rural areas. Direct money transfers and subsidized food programs 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**.

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 program; 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 program 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 emphasize goods that nonpoor people do not consume. This helps conserve resources for the program and minimizes efforts by nonpoor people to benefit from the program. For example, nutritional supplements can be provided for any woman who brings her baby to the neighborhood poverty program center located in villages and neighborhoods with a high incidence of absolute poverty. Although more affluent mothers could use the program, few would risk the stigma of venturing into the poorer villages and neighborhoods, let alone the center 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 is done in the well-known Bangladesh Food for Work Program and in the Maharashtra Employment Guarantee Scheme in India. More recently, the government of India has introduced a nationwide program to guarantee 100 days of employment to at least one family member each year; early reports suggest that the program has provided substantial benefits. In programs 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 program. 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 programs**. These requirements also help preserve the program’s political sustainability: When people see that the poor are getting “a hand up rather than a handout,” the programs tend to attract wider public support.

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

- The program 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 program.
- 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 program).
- There is higher opportunity cost of time for nonpoor workers (so they won’t avail themselves of the benefits).

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

- The fraction of the population living in poverty is smaller (so the extra costs of a universal welfare program would be high).
- There is less social stigma attached to participating in a workfare program, 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 program).⁴³

The poor often have low bargaining power in their communities, and while it is difficult politically to increase this power, well-designed programs can accomplish this indirectly by providing improved “outside options” such as guaranteed public employment programs 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 programs to increase the capabilities and human and social capital of the poor. An important example centers 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 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) programs that transfer incomes to poor families conditional on behaviors such as keeping their children in school; these approaches are considered in Chapter 8 and its case study. Finally, strategies to assist the development of the urban informal sector are examined in Chapter 7.

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

To summarize 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.⁴⁴

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, labor-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 programs. 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 programs 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 programs, as described throughout this text. These can be carried out either by government or by nongovernmental organizations 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 through 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 13 through 15. But when it is not inclusive, growth by itself is insufficient to eliminate extreme poverty, at least in any time frame 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 programs 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.”⁴⁵

Case Study 5

Institutions, Inequality, and Incomes: Ghana and Côte d'Ivoire

Ghana's development has exceeded expectations—at least after many disappointments. Côte d'Ivoire (CIV) started with many apparent advantages, but on many economic measures, Ghana has closed the development gap that existed between itself and CIV at independence.

It is recommended that you read Chapters 2 and 5 in conjunction with this case. These country illustrations provide further interpretation of the more general research discussed in those chapters.

A Natural Comparative Case Study

Ghana and Côte d'Ivoire border each other in West Africa. Their land area is similar in size at 92,456 square miles (239,450 km²) and 124,502 square miles (322,458 km²), respectively. Their populations are also similar, with 25.5 million people in Ghana and 20.6 million in Côte d'Ivoire in 2012. Becoming independent within three years of each other and also sharing similar geographies, these adjoining countries make for a natural comparison. One of the most striking differences is that Ghana was part of the British Empire from 1821 to 1957, and CIV was a French colony from 1842 until 1960. (Note, however, that full colonial rule took a long time to become established throughout the territories of these countries; the French were still fighting to extend their presence into the early years of the twentieth century.)

How did these colonial histories matter? Did their influences extend after independence, affecting later development policies for good or ill? Or have other, internal factors been more decisive? Can this help us to better understand why it is so challenging to sustain high growth, eliminate poverty and hunger, and to achieve other Millennium Development Goals?

The experiences of a half-century after independence illustrate some of the opportunities for and threats to development. This case study raises thought-provoking questions and presents the types of information one would weigh in addressing this and other comparative country studies. This case illustrates how the frameworks and many-country statistical studies of Chapters 2 and 5 can be applied to understanding development experiences in comparative perspective. The richness of culture and nuances of complex political histories are abstracted to feature some broad approaches and findings in development economics in a short space. Readers are encouraged to explore these leading African nations in detail.

Poverty and Human Development As reported in the UNDP's 2013 *Human Development Report*, Ghana is considered a medium human development country, with a New Human Development Index (NHDI) value of 0.558, while CIV is considered a low human development country, with an NHDI of just 0.432. Ghana's performance is 22 positions higher than predicted by income, while CIV's is 9 positions lower. In the 1990 *Human Development Report*, when the original HDI was introduced, the numbers were 0.393 for CIV and 0.360 for Ghana. Both made progress, but Ghana much more so. CIV's Multidimensional Poverty Index (MPI) as reported in the 2013 *Human Development Report* is very high at 0.353, while Ghana's MPI is substantially lower at 0.144. And the 2009 *Human Development Report* Human Poverty Index (see note 11) for CIV was 0.374, ranking 29 places lower in the country rankings based on human poverty than income poverty (the fraction under \$1.25 per day). This suggested that what the UNDP termed *human poverty* is relatively worse in CIV than even

its income poverty would suggest. Ghana's HPI was significantly better, at 0.281 (with its ranking as predicted by its income poverty).

These outcomes would have surprised many who wrote at the time of independence. In 1960, Ghana had a real GDP per capita of just \$594, far behind CIV's \$1,675; but in 2007, according to the *Penn World Table*, Ghana had reached \$1,653—a gain of 278% and nearly enough to close its original deficit—while CIV increased to \$2,228, a modest gain of just 33% after 47 years. In 2011, Ghana's estimated income per capita PPP of \$1,830 surpassed CIV's level of \$1,780 (2013 World Development Indicators).

Ghana has a life expectancy of 64, while that of CIV is only 55 (2012 PRB estimates); in 1960, life expectancy in CIV was 51, to Ghana's 46, a dramatic reversal. In 2011, under-5 mortality was 115 in CIV and a still high but significantly lower 78 in Ghana.

Aysit Tansel showed that by 1987, Ghana was well ahead of CIV in mean years of schooling by each gender and across age groups. By 2008, the adult literacy rate reached 65.0% in Ghana versus 48.7% in CIV.

Highly credible information on the extent of extreme poverty in these countries is difficult to find, but it is not doubted that at the time of independence, poverty was far higher in Ghana. Using 1987 surveys, the World Bank put dollar-a-day poverty at just 3.28% in CIV that year but 46.51% in Ghana; a comparable figure for Ghana (from a 1998 study) was 36% and for CIV (2002) was 16%. The most recent available World Bank estimates are 28.6% below \$1.25 per day in Ghana (2006 survey) and 23.8% (2008 survey) in CIV (2013 World Development Indicators). It appears that over time, poverty has fallen in Ghana and risen in CIV.

Progress in both countries is small in comparison to East Asia; but the differences between these countries are substantial. How can we begin to understand such differences? Sometimes even recent changes in the patterns of development can have long historical roots, and we consider this first.

Long-Run Factors in Comparative Development

The Colonial Impact and the Legacy of Institutions The Portuguese built a fortress on the coast of Ghana in 1482 and named it Elmina ("The Mine"). Later, the British named this area the Gold Coast, as it was known until independence in 1957.

Côte d'Ivoire (Ivory Coast) received its name from the French. These names apparently reflect how the colonial powers viewed the territories: as "coasts" rather than nations; as commodities for trade rather than people, or simply as a mine. The colonialists' priority of resources over people could not have been more obvious. Ghana suffered earlier and more from the impact of the slave trade. But CIV also suffered ill treatment, including a brutal campaign by the French to subdue the "interior" in the late nineteenth and early twentieth centuries and impose forced labor. How do we understand this terrible colonial experience and its possible aftermath? Settler mortality rates, which is correlated with the establishment of extractive institutions by the colonial power with long-term pernicious effects (see Chapter 2, section 2.7), was stunningly high in these two countries, each with an estimated 668 deaths per 1,000 per year, among the highest in the study by Acemoglu, Johnson, and Robinson (AJR); for comparison, the rate was just 15.5 in South Africa.*

Institutional Quality The expectation is that inherited institutions should be particularly bad in these two countries because colonialists would have had little incentive to protect property rights, encourage investment, or allow broad access to economic opportunities or political participation; instead, in stark terms, the incentive was to steal or have others steal for you. In their data for current institutional quality, the "average protection against expropriate risk" was 6.27 in Ghana and 7.00 in CIV, compared to a range from 3.50 in the Democratic Republic of Congo (known as Zaire at the time) to 10.00 in the United States—better, though not spectacularly better, investor protection. But a range of recent studies give higher marks to Ghana. Although all-country rankings of institutional quality should be used with caution, as they

*According to the AJR dataset, which is based on the work of the historian Philip Curtin, the other highest-mortality colonies were Togo, Gambia, Mali, and Nigeria. By contrast, the death rate was just 14.9 in Hong Kong, and 17.7 in Malaysia and Singapore. Settler mortality was used as an instrument for early institutions in the literature (see Chapter 2), and we examine two countries with identical settler mortalities giving attention to additional elements. (Conclusions of the research cited here are based on multicountry statistical analysis, not on case studies; we are taking such research as a starting point for issues to consider when conducting more in-depth comparative case studies).

can contain subjective elements; when a group of independently produced indicators with different focuses all point in the same direction, they become suggestive (though still never substituting for careful country-specific appraisal). Regarding corruption perceptions, according to Transparency International, in 2012 Ghana ranked 64th and CIV 130th out of 176 countries ranked. Regarding “ease of doing business,” the World Bank–International Finance Corporation 2010 rankings of 183 countries listed Ghana as 92nd (7th in sub-Saharan Africa) and CIV as 168th (32nd in the region). Regarding democracy, for 2012 the *Economist* listed Ghana (ranked 78th of 167) as a “flawed democracy” (two steps above authoritarian) and CIV (ranked 136th) as authoritarian. And on current property rights protections, a 2013 ranking sponsored by the *Wall Street Journal* and Heritage Foundation placed Ghana at 50 on a scale of 100 and CIV just 25. Critics point out limits and flaws of these various rankings, but they are consistent. So this, too, must be better understood. Is it because things had gotten so bad in Ghana that reform became the only option?

Ethnolinguistic Fractionalization Another feature associated in the economics literature with low incomes and growth is ethnolinguistic fractionalization, with some social scientists also pointing out the potential dangers of religious fractionalization. In fact, both countries are fairly highly fractionalized, but CIV more so. Both countries have an Akan majority (45% in Ghana and 42% in CIV) and many smaller groups. In Ghana, the population is 69% Christian and 16% Muslim, but in CIV, adherents are much more evenly divided, with 39% Muslim and 33% Christian. Although scholars debate the proper way to measure fractionalization, seven main measures are used, with CIV higher on six, in some cases substantially higher.* CIV was torn by civil war in 2002, which has split the country, and the opportunistic use of fractionalization by political figures is an important factor.

Population Patterns of population growth are often considered an important aspect of development, as discussed in Chapter 6. At independence in 1960,

the population of CIV was just 3.6 million, so it grew about 5½ times by 2007. In contrast, Ghana’s population was already nearly 7 million in 1960, so it grew by less than 3⅓ times in the same period. Even now, the total fertility rate is a high 4.0 in Ghana but significantly higher at 4.9 in CIV, with one extra birth per woman. While just 8% of married women of childbearing age use modern contraceptives in CIV, 17% do in Ghana—still a small fraction but more than twice the incidence of CIV (the gap remains, at 24% to 13%, when considering both traditional and modern methods). High birth rates generally hinder economic development. Faster population growth is associated with slower per capita income growth and slower improvement in other development indicators; lower fertility increases family incentives and resources for education. But the geographic distribution of population does not seem to have particularly strong political implications. For example, Jeffrey Herbst classifies both Ghana and CIV as among just 7 of 40 sub-Saharan African countries with a “neutral political geography.”

Extreme Inequality As explained in Chapter 5 (and introduced in Chapter 2), extreme inequality can retard the development process. The most recent World Bank Gini coefficient estimates for CIV and Ghana do not differ significantly (at 0.42 and 0.43). But Arnim Langer points out that the combination of relatively high and rising inequality in CIV, coupled with rising ethnic tensions that political actors had deliberately made worse, led to the conflict that broke out there in the early 2000s (ethnic inequalities as a factor in conflict is considered in Chapter 14, section 14.5).

Common Law versus Civil Law? As a former British colony, Ghana’s legal system is based on common law, while the legal system in CIV is based on French civil law. Since the late 1990s, the view that common law legal systems provide a better foundation than civil law systems for the development of the financial system has been very influential. Authors in this literature such as Rafael La Porta and his colleagues argue either that common law better protects property rights, better enforces contracts, offers more predictability, or that it is better able to adapt to changes in economic conditions. Investment is generally necessary for economic growth (Chapters 3 and 4), and the development of an effective financial system encourages investment

*For example, according to the 1997 basic Easterly-Levine (ELF) measure, CIV was rated 0.86 and Ghana 0.71, with the range in Africa from 0.04 for Burundi to 0.9 for Congo and Uganda. On the widely cited 2003 Alesina et al. alternative measure, CIV is 0.82 and Ghana 0.67 in a range from 0 to 0.93. These are the usual baseline measures, but one measure of the seven points in the other direction: the 1999 measure of Fearon, on which CIV is 0.78 and Ghana 0.85.

(Chapter 15). Some evidence supports the prediction that civil law countries will experience less financial development and lower rates of investment. But differences between French and British institutions besides the legal system may be important.

French versus British Rule? The British Empire is commonly considered to have preferred indirect rule, relying on its ability to dominate local traditional political systems rather than to create new ones (possibly related to common law tradition). In contrast, the French are said to have tended to employ direct rule of their colonies, introducing their own centralized administrative structures, perhaps related to their own legal and historical traditions. Tactics might well have been similar regardless of the colonizer if conditions strongly favored central rule or indirect rule. But where starting conditions were similar in both colonies and when local advantages of either centralization or decentralization were not strong, a centralized French strategy and a decentralized British strategy might plausibly have been expected.

The evidence does reflect a more decentralized rule in British Ghana and more centralized rule in French Côte d'Ivoire. But if centralized rule is then transmitted to the postcolonial regime, the result can be a state with too few checks and balances. Decentralized rule, in contrast, provides better incentives and checks against large-scale government corruption (see Chapter 11). The postcolonial record is complex but shows continued strong tendencies toward centralization in CIV, although the aftermath of civil strife increases uncertainty about the future course (indeed there is some risk that CIV may face a prolonged period as a failed state). As Catherine Boone notes in her richly detailed study of both countries, the case of Ghana is subtle with initial but far from fully successful postcolonial government attempts at more centralization, probably in part to wrest a larger share of agricultural revenues, but in 1992 there was a reinstatement of at least a ceremonial role—and unofficially a much larger role—for chiefs and other traditional village governance. This built on long traditions that were not systematically undermined under the British the way they were under the French.

Finally, some observers view postindependence CIV as having a more dependent relationship with France. Besides colonial rule having negative effects in general, close CIV dependence on its former co-

lonial ruler may have been a hindrance to its economic and political growth and development over the long run. In contrast, Ghana diversified more of its international relations, perhaps giving it somewhat higher bargaining power in pursuing its national development interests.

Education Some scholars consider education of central importance in explaining economic growth; Edward Glaeser and coauthors even argue that improved education can result in improved institutions. Educational attainment was abysmal in both nations at the time of independence. One of the most striking postcolonial differences between the countries is the higher level of educational attainment in Ghana, where there have been greater investments in education. In the early years after independence, there was strong policy attention to providing basic education in some of the poorer areas in Ghana. In 2010, according to the 2013 Human Development Report (HDR), the mean years of schooling was almost 3 years higher in Ghana (at 7.0) than in CIV (at 4.2). Moreover, expected schooling is now 11.4 years in Ghana, compared with only 6.5 years in CIV. Education is intrinsically valuable, as reflected in the HDI; it has apparently been a factor in faster growth and may even figure in later institutional improvements. Ghana has also had recent success scaling up basic health insurance.

Development Policies Development policies are often framed by a country's underlying economic institutions; this can place constraints on the types of beneficial reforms and policies that a country can successfully implement. The failure of a country to implement otherwise obvious policies (such as investing in quality primary education) may not reflect failures of understanding as much as the realities of political constraints. But when achieved, well-designed and implemented policies can have very positive effects on development outcomes; bad policies can have disastrous consequences.

Policies in Ghana Both nations started as (and still are) largely agrarian economies, with over half of the labor force working in rural areas. But the two countries have had somewhat different policy trajectories. The general scholarly view is that in the first quarter century after independence, Ghana chose many poorly conceived and often corrupt interventionist policies. Early policies have been described as oriented toward urban industry,

with inefficiently implemented import substitution to replace manufactured imports with locally produced ones (see Chapter 12). But one policy associated with the early rule of Kwame Nkrumah through 1966 was an emphasis on basic education, which may have left an enduring legacy through difficult subsequent swings. After disastrous policies and extreme instability, including coups in the mid-1960s to early 1980s, Ghana underwent a policy transformation to become a favorite country of liberalization promoters in the World Bank and elsewhere in the 1980s.

The development process is complex and rarely proceeds linearly. In Ghana, there was relative deterioration from independence until the early 1980s; much of its economic growth took place from the mid-1980s to the present. For example, cocoa had long been an important part of Ghana's economy, but it went into decline when state marketing boards (described in Chapter 9) limited the price farmers received for cocoa, so as to subsidize industrialization. After farmers were allowed to receive a much higher price and technical assistance was offered, output greatly increased, particularly in two spurts in the late 1980s and early 2000s. Fertilizer use and improved varieties have diffused among farmers (diffusion in Ghana for the case of pineapples is examined in Findings Box 9.1 in Chapter 9). Cocoa growing now provides a basic livelihood for over 700,000 farmers in Ghana.

By the early 1990s, World Bank analysts such as Ishrat Husain were pointing to Ghana as a country that had been doing a better job at following and implementing more of its recommended market-friendly policies than countries such as CIV.

A reason given for large-scale reform in Ghana (and in explaining other countries as well) is that things got so bad that there became no choice but to embrace reform. Naturally, when according to local conditions things become so bad that continued resistance to change is futile, *something* changes—perhaps not always for the better. Ghana became a classic example for proponents of the controversial view that duress “causes” reform. A criticism, to paraphrase Dani Rodrik, is that it is not clear how much duress is enough to “cause” reform; and as a result, it is not very convincing when analysts

simply claim that a reform did not happen because the situation must not have been bad enough.

Policies in Côte d’Ivoire In contrast, CIV experienced relatively faster growth in the 1960s and 1970s and then decline from 1980 to the present (recently more pronounced due to civil conflict). Institutions that appear to perform serviceably for two decades can have underlying weaknesses that later emerge—for example, politicians treat weaknesses as a political opportunity or the system proves to have too little flexibility as new challenges emerge.

CIV is widely viewed as having started down a more market-based, export-oriented path in a way that should have helped the rural agricultural sector, where most of the population and most people living in poverty were located. But this did not prevent elites from extracting what they could from the rural areas. In fact, there were a number of policy lurches. An apparently favorable tactic might have been an early policy of effectively trying to keep all the ethnic groups engaged in and benefiting from growth in the national economy. There were large migrations into CIV, for example, including the forced labor brought into CIV from Burkina Faso (Upper Volta) by the French in the early 1940s. A more ethnically based politics in the late 1990s is viewed by specialists in the politics of CIV as helping to precipitate the disaster of regional and ethnic conflict in the 2000s.

Enduring Questions By 1990, Ghana was already being deemed a “success story” by the World Bank and others. Is it because the nation followed the right policies? And if so, what explains why Ghana chose good policies and CIV did not? How much benefit can be attributed to the volume of aid itself?

CIV fell into a period of severe conflict in 2002–2007; many lives were lost, and resources continue to be diverted into managing the problems, with perceptions of prospects still damaged. French military involvement reflected France’s ongoing unique relationship with CIV. In contrast, Ghana has so far remained stable. Why? And can it continue to remain stable? It remains to be seen how well Ghana comes through its recent discovery and production of oil. In principle, new resources can help reduce poverty, directly and indirectly. But for many countries, a “resource curse” has resulted

from political conflict over resource revenues and an overspecialized or even “hollowed out” economy (see Chapter 14).

Have leadership differences mattered for development of these countries? Socialist Kwame Nkrumah constructively supported education but diverted resources from cocoa exports to local industry, leading to economic disaster; under duress, socialist Jerry Rawlings embraced market-oriented policy reforms that led to short-term pain but long-term gain. Subsequent leaders have been pragmatic and at least have done relatively little harm and perhaps some good. CIV’s capitalist President Félix Houphouët-Boigny, backed by France (“*Françafrique*”), seemed early on to be leading his country to economic success but stole billions from the public purse and led the country to ruin while clinging to power for 33 years until his death in 1993. Subsequent leadership has impressed few observers. Of course, extraordinary leadership in government or civil society can play a decisive role in the course of development—think of Nelson Mandela in South Africa or Muhammad Yunus in Bangladesh. But in ordinary experience, is leadership the key, or is it underlying institutions? Or popular movements? Education? Imported ideas and technology? These remain enduring questions, and answers may depend on local circumstances.

As an examination of just two countries to illustrate more general evidence in the literature, it cannot be concluded beyond doubt that institutions set up by Great Britain in Ghana and France

in Côte d’Ivoire had a dominant effect on the successes and failures of these nations in subsequent poverty reduction and economic growth. But there is support for factors identified in the large-sample statistical studies introduced in Chapter 2, notably institutions, inequality, and at least indirectly education. Colonial institutions apparently had negative effects, and within colonization, the degree of decentralization under colonial rule apparently also mattered. The reemergence of more decentralized governance in Ghana since 1992 may be related to less damaging British governance practices in this respect. At the same time, history is not destiny; Ghana has made progress that was not well predicted by instruments for colonial institutions. Nor are things necessarily bleak for CIV. Institutions and inequality are highly resistant to change. But the global trend is toward continued progress in human development, and other African nations such as Rwanda have made enormous economic strides that were very difficult to imagine just a few years earlier. But in CIV, the standoff following contaminated presidential elections in 2010 led to what has been called the Second Ivorian Civil War. Rather than simply blame CIV, it may be possible to trace the shape of policymaking to underlying institutions—doing so may be a way to help address deeper constraints. It is to be hoped that the international community can play a constructive role in facilitating improvements in CIV’s underlying institutions, as well as to help secure the peace.

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The authors would like to thank Gina Lambright, David Shinn, and Jennifer Spencer for their comments on the first draft of this case study, and Andrew Klein and Kevin Salador for their research assistance.

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Concepts for Review

Absolute poverty	Functional distribution of income	Personal distribution of income
Asset ownership	Gini coefficient	Progressive income tax
Character of economic growth	Headcount index	Public consumption
Decile	Income inequality	Quintile
Disposable income	Indirect taxes	Redistribution policies
Elasticity of factor substitution (Appendix 5.1)	Kuznets curve	Regressive tax
Factor price distortions (Appendix 5.1)	Land reform	Subsidy
Factors of production	Lorenz curve	Total poverty gap (TPG)
Foster-Greer-Thorbecke (FGT) index	Multidimensional poverty index (MPI)	Workfare programs
	Neoclassical price incentive model (Appendix 5.1)	

Questions for Discussion

- 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.
- Distinguish between size and functional distributions of income in a nation. Which do you conclude is the more appropriate concept? Explain your answer.
- What is meant by absolute poverty? What measures of income poverty are favored 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?
- 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?
- Describe Kuznets's inverted-U hypothesis. Discuss the conceptual merits and limitations of this hypothesis for contemporary developing countries.
- 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?
- 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.
- "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.
- Are rapid economic growth (as measured by either GNI or per capita GNI) and a more equal distribution of personal income necessarily conflicting objectives? Summarize the arguments both for and against the presumed conflict of objectives, and state and explain your own view.
- How might inequality lead to faster growth or development? How might it lead to slower growth or development?
- Is progress being made in the fight against poverty? Why or why not?
- What types of poverty policies have proved effective?
- 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?
- 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.

Appendix 5.1

Appropriate Technology and Employment Generation: The Price Incentive Model

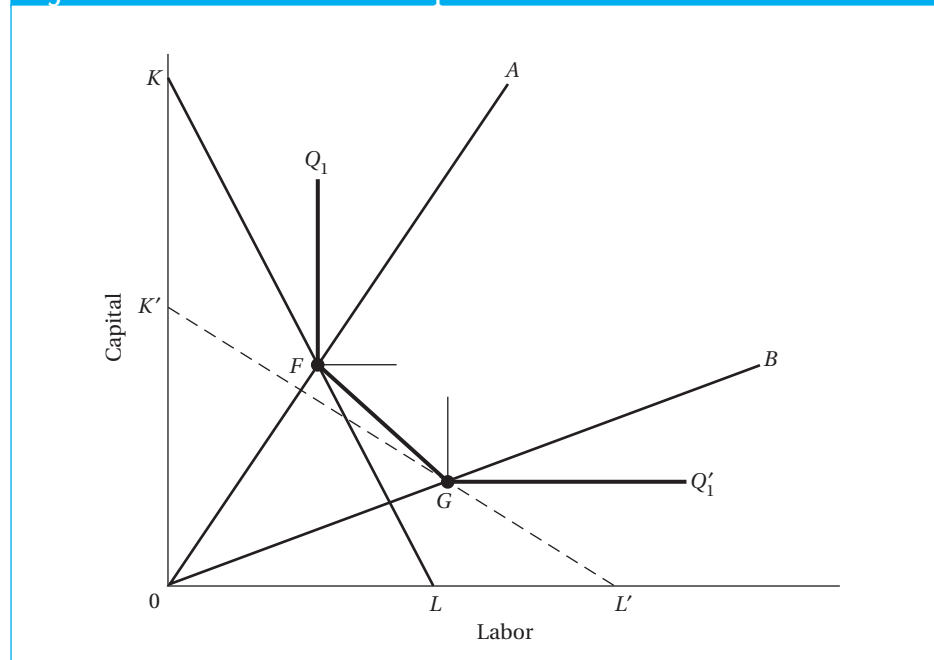
Choice of Techniques: An Illustration

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 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 labor) and to use the combination of capital and labor that minimizes 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 labor-intensive to highly capital-intensive methods. Thus, if the price of capital is very expensive relative to the price of labor, a relatively labor-intensive process will be chosen. Conversely, if labor is relatively expensive, our economizing firm or farm will use a more capital-intensive method of production—it will economize on the use of the expensive factor, which in this case is labor.

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 OA , which requires larger inputs of (homogeneous) capital relative to (homogeneous) labor, and technique or process OB , which is relatively labor-intensive. Points F and G

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



represent *unit* output levels for each process, and the line $Q_1 FGQ'_1$ 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-labor combinations (efficient or appropriate technologies) are determined by relative factor prices. Assume for the moment that market prices of capital and labor 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 labor (price line KL), production will occur at point F using capital-intensive process OA . Alternatively, if the market prices of labor and capital are such that labor is the relatively cheap (abundant) factor (line $K' L'$), optimal production will occur at point G , with the labor-intensive technique, OB , chosen. It follows that for any technique of production currently in use, a fall in the relative price of labor, all other things being equal, will lead to a substitution of labor for capital in an optimal production strategy. (Note that if capital-intensive process OA “dominates” labor-intensive process OB —that is, if technology OA requires less labor and less capital than OB 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 labor but possess very little financial or physical capital, we would naturally expect production methods to be relatively labor-intensive. But in fact we often find production techniques in both agriculture and industry to be heavily mechanized 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 labor 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 13).

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-minimizing 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 underutilized capital, and especially labor, 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 utilization of scarce capital resources through the adoption of more appropriate technologies of production.

The Possibilities of Labor-Capital Substitution

The actual employment impact of removing factor price distortions will depend on the degree to which labor 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 labor used relative to capital (labor-capital or L/K ratio) compared to a given percentage change in the price of capital relative to labor (P_K/P_L). Algebraically, the elasticity of substitution, η_{LK} can be defined as follows:

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

For example, if the relative price of capital rises by 1% in the manufacturing sector and the labor-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 utilization. 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.

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.

Appendix 5.2

The Ahluwalia-Chenery Welfare Index

The necessity of reorienting development priorities away from an exclusive preoccupation with maximizing 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 recognized 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 9 individuals with no income before and still no income now ($1.20 \times 0 = 0$), 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

$$G = w_1g_1 + w_2g_2 + w_3g_3 + w_4g_4 + w_5g_5 \quad (\text{A5.2.1})$$

where G = a weighted index of growth of social welfare, g_i = the growth rate of income of the i th quintile (where the i quintiles are ordered 1, 2, 3, 4, and 5 in our example), and w_i = the “welfare weight” of the i th 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

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

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

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

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 maximize social welfare growth is to maximize 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

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

or, inserting growth rates for g_1 , through g_5 ,

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

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

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

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

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

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 judgments 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 flavor 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 like 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.

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

Country	Income Growth			Annual Increase in Welfare		
	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.

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.

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. 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: $GNI = f(L, \bar{K}); MP_L = f'(L)$.
6. 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.
7. For technical details, see James Foster, Joel Greer, and Erik Thorbecke, "A class of decomposable poverty measures," *Econometrica* 52 (1984): 761–766.
8. 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.
9. It is similar in spirit to the Sen index, $S = (H/N) [NIS + (1 - NIS)G_p]$, 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.*
10. For the same reason, the P_2 measure has now become part of the Mexican constitution (chap. 5, art. 34). Interview with Erik Thorbecke, *Cornell Chronicle*, May 11, 2000.
11. 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. 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 Poverty Measures," paper presented at the Brookings Institution, February 12, 2013.
12. 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.

13. 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): 113–144.
14. 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.
15. See, for example, Torsten Persson and Guido Tabellini, "Is inequality harmful for growth?" *American Economic Review* 84 (1994): 600–621, 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.
16. John Rawls, *A Theory of Justice* (Cambridge, Mass.: Belknap Press, 1971).
17. This approach was developed by Gary S. Fields, *Poverty, Inequality and Development* (Cambridge: Cambridge University Press, 1980), pp. 46–56.
18. *Ibid.*, p. 52.
19. This can perhaps be visualized 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 \$1.25 per day, all are in absolute poverty. Then modernization begins, and the modern sector absorbs workers one by one, where the wage is, say, \$2 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 curves as this process takes place for an eight-person economy.) This exercise is adapted from Fields, *ibid.*
20. 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.
21. 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.
22. 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.
23. 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).
24. *Ibid.*, p. 35.
25. 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.
26. 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.
 27. 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," in *Oxford Poverty and Human Development Initiative*, Working Paper 07, 2008. Forthcoming *Journal of Public Economics*.
 28. UNDP *Human Development Report*, 2010.
 29. See Chronic Poverty Research Centre, *Chronic Poverty Report, 2004–05*, 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.
 30. 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 ultrapovertry differs.
 31. See International Food Policy Research Institute, *The World's Most Deprived* (Washington: D.C.: IFPRI, 2007).
 32. Partha Dasgupta and Debraj Ray, "Inequality as a determinant of malnutrition and unemployment policy," *Economic Journal* 97 (1987): 177–188.
 33. An empirical study of variables explaining growth in developing countries during the 1960–1973 period provide 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): 985–994.
 34. 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.
 35. 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.
36. 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 summarized 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 criticized, 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 time frame, so targeted policies are generally also needed.
 37. For a classic overview of the nature, magnitude, and incidence of poverty in the developing world, see World Bank, *World Development Report, 2000/2001*.
 38. 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.
 39. Amartya Sen, "Missing women," *British Medical Journal* 304 (1992): 587–588. A well-regarded 2003 analysis conclude 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.
 40. 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>.
 41. 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).
 42. 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>.
 43. 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.
 44. For other discussions of poverty policies, see Arne Bigsten, "Poverty, inequality and development,"

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T. N. Srinivasan (Amsterdam: Elsevier, 1989), pp. 982–996; and Paul P. Streeten, *Strategies for Human Development: Global Poverty and Unemployment* (Copenhagen: Handelshøjskølen Forlag, 1994).

45. James Speth, “Foreword,” in United Nations Development Programme, *Human Development Report, 1997*, p. iii.