6

Population Growth and Economic Development: Causes, Consequences, and Controversies

Economic development may be far from "the best contraceptive" [that it is sometimes described as]…. On the other hand, social development—especially women's education and employment—can be very effective indeed.

—Amartya Sen, Nobel laureate in economics

6.1 The Basic Issue: Population Growth and the Quality of Life

In 2013, the world's population reached about 7.2 billion people. In that year, the United Nations Population Division projected that population would rise to about 8.1 billion in 2025 and reach about 9.6 billion by the year 2050. The overwhelming majority of that population will inhabit the developing world. What will be the economic and social implications for development if such projections are realized? Is this scenario inevitable, or will it depend on the success or failure of development efforts? Finally, even more significant, is rapid population growth per se as serious a problem as many people believe, or is it a manifestation of more fundamental problems of underdevelopment and the unequal utilization of global resources between rich and poor nations, as others argue?

In this chapter, we examine many of the issues relating population growth to economic development. We begin, however, by looking at historical and recent population trends and the changing geographic distribution of the world's people. After explaining basic demographic concepts, we present some well-known economic models and hypotheses regarding the causes and consequences of rapid population growth in contemporary developing countries. Controversies surrounding the significance of the population factor in general and these models and hypotheses in particular are then explored.

Finally, we evaluate a range of alternative policy options that developing countries may wish to adopt to influence the size and growth of their populations, as well as ways in which industrialized countries can contribute to a more manageable global population and resource environment. Population policies in China and India, the nations with the largest populations in the world, are the focus of this chapter's case study.

Every year, more than 75 million people are being added to the world's population. Almost all of this net population increase—97%—is in developing countries. Increases of such magnitude are unprecedented. But the problem of population growth is not simply a problem of numbers. It is a problem of human welfare and of development, as defined in Chapter 1. Rapid population growth can have serious consequences for the well-being of all humanity. If development entails the improvement in people's levels of living—their incomes, health, education, and general well-being—and if it also encompasses their capabilities, self-esteem, respect, dignity, and freedom to choose, then the really important question about population growth is this: How does the contemporary population situation in many developing countries contribute to or detract from their chances of realizing the goals of development, not only for the current generation but also for future generations? In addressing this central issue, we examine the reasons and consequences for the positive relationship between poverty and family size. More broadly, we examine what drives high population growth in developing (particularly low-income) countries, why population growth in general subsequently falls as countries grow and develop, and the causes and implications of these patterns.

6.2 Population Growth: Past, Present, and Future

World Population Growth throughout History

For most of human existence on earth, humanity's numbers have been few. When people first started to cultivate food through agriculture some 12,000 years ago, the estimated world population was no more than 5 million (see Table 6.1). Two thousand years ago, world population had grown to nearly 250 million, less than a fifth of the population of China today. From year 1 on our calendar to the beginning of the Industrial Revolution around 1750, it tripled to 728 million people, less than three-quarters of the total number living in India today. During the next 200 years (1750–1950), an additional 1.7 billion people were added to the planet's numbers. But in just four decades thereafter (1950–1990), the earth's human population more than doubled again, bringing the total figure to around 5.3 billion. The world entered the twenty-first century with over 6 billion people.

As seen in Figure 6.1, in 1950 about 1.7 billion people lived in developing countries, representing about two-thirds of the world total; by 2050, the population of less developed countries will reach over 8 billion, nearly seven-eighths of the world's population. In the corresponding period,

TABLE 6.1 Estimated World Population Growth

Year	Estimated Population (millions)	Estimated Annual Increase in the Intervening Period (%)	Doubling Time (years)
10,000 B.C.E.	5		
1 C.E.	250	0.04	1,733
1650	545	0.04	1,733
1750	728	0.29	239
1800	906	0.45	154
1850	1,171	0.53	130
1900	1,608	0.65	106
1950	2,576	0.91	76
1970	3,698	2.09	33
1980	4,448	1.76	39
1990	5,292	1.73	40
2000	6,090	1.48	47
2010	6,892	1.22	57
2050 (projected)	9,600	0.98	71

Sources: Population Reference Bureau, *World Population Data Sheet* (Washington, D.C.: Population Reference Bureau, 2010 and previous annuals); Warren S. Thompson and David T. Lewis, *Population Problems*, 5th ed. (New York: McGraw-Hill, 1965), p. 384; United Nations, *Demographic Yearbook for 1971* (New York: United Nations, 1971); United Nations, *Report on the World Social Situation, 1997* (New York: United Nations, 1997), p. 14; and United Nations Population Division, *World Population Prospects: The 2012 Revision*. New York: United Nations (2013). An alternate system of broadly comparable and earlier estimates is found in Michael Kremer, "Population growth and technological change: One million B.C. to 1990," *Quarterly Journal of Economics* 108 (1993): 681–716.

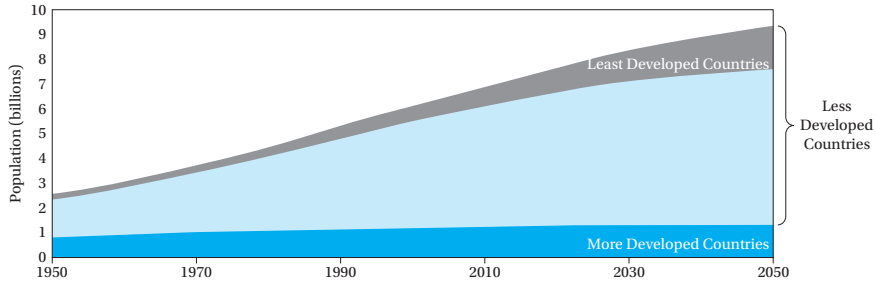
the population of the least developed countries will increase by tenfold, from about 200 million to 2 billion people. In contrast, the population of the developed countries will grow very little between now and 2050, even accounting for immigration from developing countries.

Turning from absolute numbers to percentage growth rates, for almost the whole of human existence on earth until approximately 300 years ago, population grew at an annual rate not much greater than zero (0.002%, or 20 per million). Naturally, this overall rate was not steady; there were many ups and downs as a result of natural catastrophes and variations in growth rates among regions. By 1750, the population growth rate had accelerated to 0.3% per year. By the 1950s, the rate had again accelerated, tripling to about 1.0% per year. It continued to accelerate until around 1970, when it peaked at 2.35%.[1] Today the world's population growth rate remains at a historically high rate of nearly 1.2% per year, but the rate of increase is slowing. However, the population growth rate in Africa is still an extremely high 2.3% per year. (Note that estimates of population numbers and growth rates differ according to research methods, but the broad trends are similar across major studies.)

Doubling time Period that a given population or other quantity takes to increase by its present size.

The relationship between annual percentage increases and the time it takes for a population to double in size, or **doubling time**,[2] is shown in the rightmost column of Table 6.1 (calculation of doubling time is explained in endnote 2). We see that before 1650, it took nearly 36,000 years, or about

FIGURE 6.1 World Population Growth, 1950–2050



Source: Population Reference Bureau World Population Data Sheet 2012, page 4; data are drawn from United Nations Population Division, World Population Prospects: The 2010 Revision (2011), medium-variant estimates.

1,400 generations, for the world population to double. Today it would take about 58 years, or two generations, for world population to double at current growth rates. Moreover, whereas it took 1,750 years to add 480 million people to the world's population between year 1 and the onset of the Industrial Revolution, this same number of people is today being added in less than 7 years.

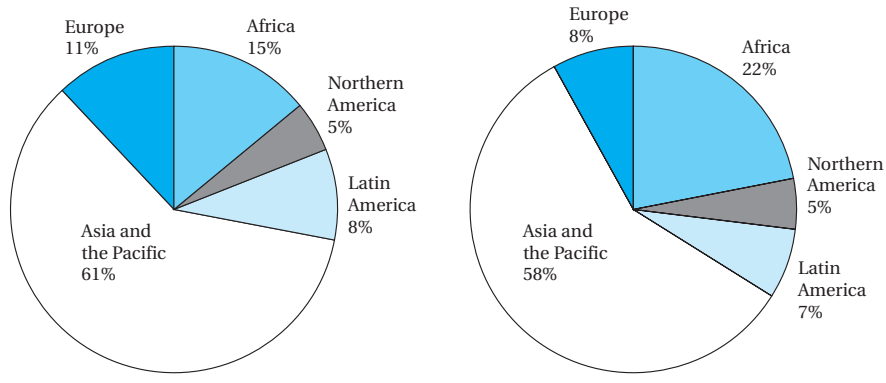
The reason for the sudden change in overall population trends is that for almost all of recorded history, the rate of population change, whether up or down, had been strongly influenced by the combined effects of famine, disease, malnutrition, plague, and war—conditions that resulted in high and fluctuating death rates. In the twentieth century, such conditions came increasingly under technological and economic control. As a result, human mortality (the death rate) is now lower than at any other point in human existence. It is this decline in mortality resulting from rapid technological advances in modern medicine, improved nutrition, and the spread of modern sanitation measures throughout the world, particularly within the past half-century, that has resulted in the unprecedented increases in world population growth, especially in developing countries. In short, population growth today is primarily the result of a rapid transition from a long historical era characterized by high birth and death rates to one in which death rates have fallen sharply but birth rates, especially in the least developed countries, have fallen more slowly from their historically high levels.

Structure of the World's Population

The world's population is very unevenly distributed by geographic region, by fertility and mortality levels, and by age structures.

Geographic Region More than three-quarters of the world's people live in developing countries; fewer than one person in four lives in an economically developed nation. Figure 6.2 shows the regional distribution of the world's population as it existed in 2010 and as it is projected for 2050.

FIGURE 6.2 World Population Distribution by Region, 2010 and 2050



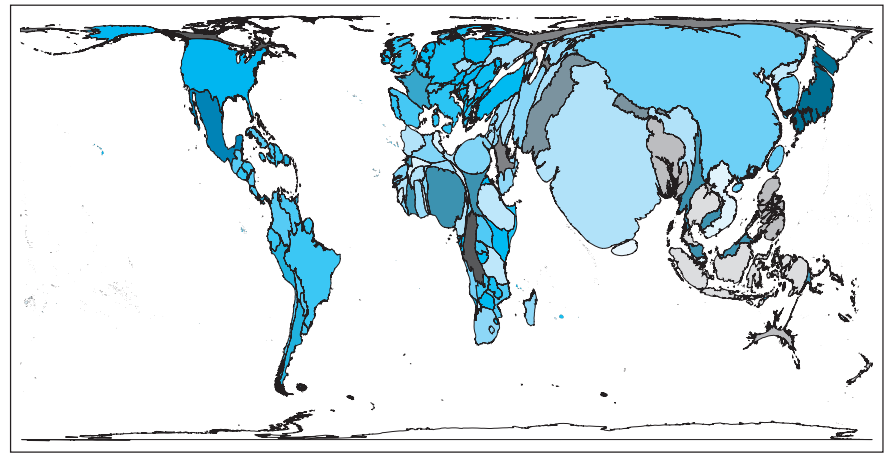
(a) Total population 2010: 6.89 billion

(b) Total population 2050: 9.5 billion

Source: Data from Population Reference Bureau, *World Population DataSheet*, 2010.

World population distribution is put into dramatic perspective by the map in Figure 6.3. Attention is drawn to the large size of India in comparison with Europe. China is bordered on the north and west by a thin strip of land that represents Russia. Mexico looms very large in comparison with Canada—a dramatic reversal of conventional maps; taken together, even the Caribbean islands are larger than Canada. Bangladesh, smaller in size than the state of Wisconsin, is larger than Germany and France combined. In Africa, the prominence of Nigeria stands out. Indonesia, which gets comparatively little

FIGURE 6.3 Map with Country Sizes Proportional to Their Fraction of World Population



Source: worldmapper.org:http://www.worldmapper.org/display.php?selected=2).

international attention, dwarfs its neighbor Australia while appearing nearly as large as the United States.

Fertility and Mortality Trends The **rate of population increase** is quantitatively measured as the percentage yearly net relative increase (or decrease, in which case it is negative) in population size due to **natural increase** and **net international migration**. Natural increase simply measures the excess of births over deaths or, in more technical terms, the difference between fertility and mortality. Net international migration is of very limited, though growing, importance today (although in the nineteenth and early twentieth centuries it was an extremely important source of population increase in North America, Australia, and New Zealand and corresponding relative decrease in western Europe). Population increases in developing countries therefore depend almost entirely on the difference between their **crude birth rates** (or simply **birth rates**) and **death rates**.

Rate of population increase The growth rate of a population, calculated as the natural increase after adjusting for immigration and emigration.

Natural increase The difference between the birth rate and the death rate of a given population.

Net international migration The excess of persons migrating into a country over those who emigrate from that country.

Crude birth rate The number of children born alive each year per 1,000 population (often shortened to *birth rate*).

Death rate The number of deaths each year per 1,000 population.

Total fertility rate (TFR) The number of children that would be born to a woman if she were to live to the end of her childbearing years and bear children in accordance with the prevailing age-specific fertility rates.

Recall from Chapter 2 that most developing nations have birth rates ranging from 15 to 45 per 1,000. By contrast, in almost all developed countries, the rate is less than 15 per 1,000. Moreover, developing country birth rates today are still often higher than they were in preindustrial western Europe. But there has been a substantial decline in fertility over the past three decades, not only in countries like Taiwan, South Korea, and China, where rapid economic and social development have taken place, but also in nations where economic growth has been less rapid, including Mexico and Bangladesh, and in some where growth has stagnated, such as Zimbabwe. The **total fertility rate (TFR)**—the average number of children a woman would have, assuming that current age-specific birth rates remain constant throughout her childbearing years—has fallen dramatically in many countries since 1970, as the examples in Table 6.2 demonstrate, but remains high in sub-Saharan Africa (5.1 in 2012) and western Asia (2.9). Niger with 7.1 and Afghanistan with 6.2 were among the highest in the world.[3]

Modern vaccination campaigns against malaria, smallpox, yellow fever, and cholera as well as the proliferation of public health facilities, clean water supplies, improved nutrition, and public education have all worked together over the past three decades to lower death rates by as much as 50% in parts of Asia and Latin America and by over 30% in much of Africa and the Middle East. Death rates have fallen for all age groups. Nevertheless, the average life span remains about 12 years greater in the developed countries. This gap has been sharply reduced in recent decades. For example, in 1950, **life expectancy at birth** for people in developing countries averaged 35 to 40 years, compared with 62 to 65 years in the developed world. Considerable progress has been made on reducing the **under-5 mortality rate**. For example, according to UN compilations between 1990 and 2008, it fell from 121 per 1,000 to 74 per 1,000 in South Asia, from 73 to 38 per 1,000 in Southeast Asia and from 52 to 23 per 1,000 in Latin America and the Caribbean. Although the under-5 mortality rate declined from 184 to 144 per 1,000 in sub-Saharan Africa in this period, progress in the region continued to lag. In 2009, because of still relatively high under-5 mortality rates and the AIDS epidemic, sub-Saharan Africa had the lowest life expectancy, 51 years, while in the high-income countries, life expectancy at birth averaged nearly 78 years. In East Asia and Latin America, life

Life expectancy at birth The number of years a newborn child would live if subjected to the mortality risks prevailing for the population at the time of the child's birth.

Under-5 mortality rate Deaths among children between birth and 5 years of age per 1,000 live births.

TABLE 6.2 Fertility Rate for Selected Countries, 1970 and 2009

Country	Total Fertility Rate	
	1970	2012
Bangladesh	7.0	2.3
Colombia	5.3	2.1
Indonesia	5.5	2.3
Jamaica	5.3	2.1
Mexico	4.9	2.3
Thailand	5.5	1.6
Zimbabwe	7.7	4.1

Sources: World Bank, *World Development Report, 1994* (New York: Oxford University Press, 1994), tab. 26; Population Reference Bureau, *World Population Data Sheet* (Washington, D.C.: Population Reference Bureau, 2012).

expectancies have now reached an impressive 74 and 73 years, respectively. Finally, note that there remains a biological susceptibility for old people to die at higher rates than young people due to aging. Although death rates of children and younger people are higher on average in a developing country with rapid population growth, the fact that their populations are so youthful on average explains why they may have an overall population-average death rate that is lower than that of a developed country with a much older average population. You may notice this possibly unexpected relationship when you look at demographic statistics.

Some of the striking population projections issued by the United Nations in 2013 are reported in Box 6.1.

Age Structure and Dependency Burdens Population is relatively youthful in the developing world. As of 2011, children under the age of 15 constitute more than 40% of the total population of the low-income countries, 32% of the lower-middle income countries, but just 17% of high-income countries.[4] In countries with such an age structure, the **youth dependency ratio**—the proportion of youths (under age 15) to economically active adults (ages 15 to 64)—is very high. Thus, the workforce in developing countries must support almost twice as many children as it does in the wealthier countries. In the United Sates, the workforce age group (15 to 64) amounts to about 67% of the total population, with 20% under age 15 and 13% over age 65 as of 2011; the corresponding ratios in the United Kingdom are similar: 66%, 18%, and 17% respectively. In the euro area, some 19% of the population is over age 65; and in Japan nearly one-quarter of the population already has reached age 65. The main problems in more developed countries relate more to their low population growth and old-age dependents (over age 65). By contrast, in sub-Saharan Africa, the economically active workforce makes up about 54% of the total population (just 3% of the population is over age 65) as of 2011. In general, the more rapid the population growth rate is, the greater the proportion of dependent children in the total population and the more difficult it is for people who

Youth dependency ratio The proportion of young people under age 15 to the working population aged 16 to 64 in a country.

BOX 6.1 FINDINGS The 2012 Revised United Nations Population Projections

Here is a summary of some of the main findings found in the UN's *World Population Prospects 2012 Revision,* published in June 2013.

- World population is now projected at 8.1 billion by 2025; and 9.6 billion by 2050.
- Most population growth will continue to occur in developing regions where population will grow from 5.9 billion in 2013 to about 8.2 billion in 2050.
- "Give or take a billion": The projections depend on assumptions—the 2050 population could turn out to be as little as 8.3 billion or as many as 10.9 billion.
- Most population growth will occur in Africa.
- The 49 least developed countries are projected to double in size from 900 million in 2013 to 1.8 billion in 2050.
- Beyond Africa, projected population growth in the rest of world is just over 10% for 2013–2100.
- New projected total population is higher, particularly after 2075 because:
  - Current fertility level estimates are higher in some countries with better information (in particular, in 15 high-fertility sub-Saharan African countries, estimated births per woman were adjusted upwards more than 5%).
  - In some cases, the actual level of fertility appears to have risen in recent years.
  - In other cases, the previous estimate was too low.
- Other projections include:
  - Developed region population will be little changed at 1.3 billion–even with immigration.
  - India will become the world's most populous country, passing China around 2028, when each will have about 1.45 billion people.
  - The population of Nigeria could pass that of the United States by 2050; by 2100 it could rival China as the second most populous country.
  - By 2100, several other countries are projected to have populations over 200 million: Indonesia Tanzania, Pakistan, Congo, Ethiopia, Uganda, and Niger.

Source: United Nations Population Division, World Population Prospects: The 2012 Revision. New York: United Nations, Department of Economic and Social Affairs, 13 June 2013; downloaded from www.unpopulation.org. For a summary see http://www.un.org/apps/news/story.asp?NewsID=45165#.UlAkZmRVRz0.

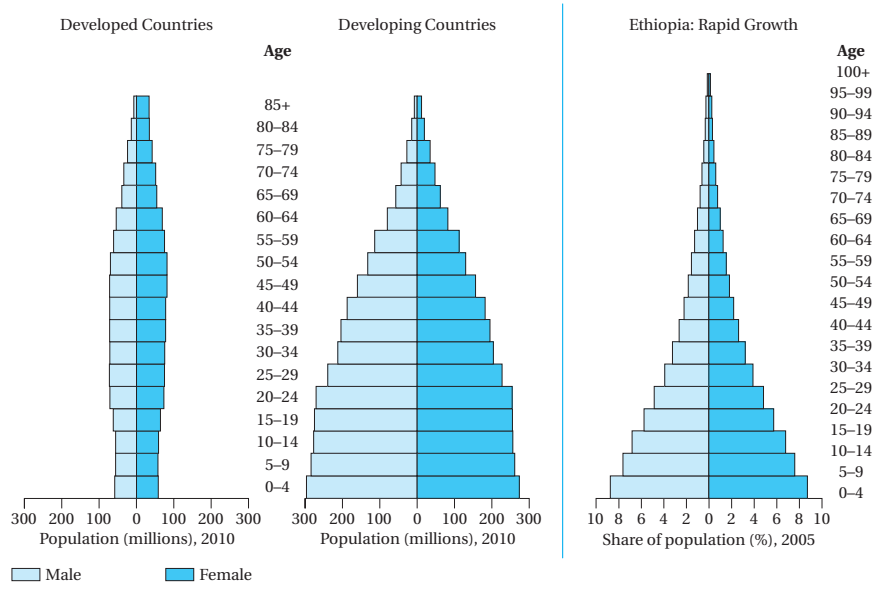
are working to support those who are not. This phenomenon of youth dependency also leads to an important concept, the **hidden momentum of population growth**.

Hidden momentum of population growth The phenomenon whereby population continues to increase even after a fall in birth rates because the large existing youthful population expands the population's base of potential parents.

The Hidden Momentum of Population Growth

Perhaps the least understood aspect of population growth is its tendency to continue even after birth rates have declined substantially. Population growth has a built-in tendency to continue, a powerful momentum that, like a speeding automobile when the brakes are applied, tends to keep going for some time before coming to a stop. In the case of population growth, this momentum can persist for decades after birth rates drop.

FIGURE 6.4 Population Pyramids: All Developed and Developing Countries and the Case of Ethiopia



Source: Graphs detailing Developed Countries from *World Population Data Sheet of the Population Reference Bureau, Inc.,* by Population Reference Bureau. Copyright 2010 by Population Reference Bureau, Inc. Reproduced with permission of Population Reference Bureau, Inc., via Copyright Clearance Center. Graph detailing Ethiopia from *Population Bulletin* 62 (2007), p. 6. Reprinted with permission from Population Reference Bureau, Inc.

There are two basic reasons for this. First, high birth rates cannot be altered substantially overnight. The social, economic, and institutional forces that have influenced fertility rates over the course of centuries do not simply evaporate at the urging of national leaders. We know from the experience of European nations that such reductions in birth rates can take many decades. Consequently, even if developing countries assign top priority to the limitation of population growth, it will still take many years to lower national fertility to desired levels.

The second and less obvious reason for the hidden momentum of population growth relates to the age structure of many developing countries' populations. Figure 6.4 illustrates the great difference between age structures in less developed and more developed countries by means of two **population pyramids** for 2010. Each pyramid rises by five-year age intervals for both males and females, with the total number in each age cohort measured on the horizontal axis. Panel A (the left and middle panels) show population pyramids for developed and developing countries, respectively (the age scale is that listed between these two figures). Expressed in millions of people, rather than percentages, the figure clearly reveals that most future population growth will take place in the developing world. The steeper bottom rungs for the developing world as a whole, in contrast to a very low-income country such as Ethiopia (right panel),

Population pyramid A graphic depiction of the age structure of the population, with age cohorts plotted on the vertical axis and either population shares or numbers of males and females in each cohort on the horizontal axis.

reflect the large declines in population growth in lower-middle income developing countries over the past quarter century, and particularly in China (see the case study at the end of this chapter). For developed countries, in the contemporary period the population in middle cohorts is typically greater than that of young cohorts; this is partly but certainly not exclusively viewed as a transitional feature of a period in which women have been delaying births until later in life.

From the Ethiopia pyramid (Panel B) expressed as share of population, young people greatly outnumber their parents (the age scale in this case is found to the right of the figure). When their generation reaches adulthood, the number of potential parents will inevitably be much larger than at present. It follows that even if these new parents have only enough children to replace themselves (two per couple, as compared with their parents, who may have had four or more children), the fact that the total number of couples having two children is much greater than the number of couples who previously had more children means that the total population will still increase substantially before leveling off.[5]

Panel A also focuses attention on the fact that some age brackets are increasing in size in some countries, while they are decreasing in others. This reflects that in the demographic transition, the fraction of the population of working age first rises and then falls. On the one hand, countries where the fraction of prime working-age citizens is rising face a potential crisis if many remain unemployed, as this is associated with inequality and (especially among males) social unrest, not to mention the potential output loss. On the other hand, this rise is also an important window of opportunity for strong income and productivity gains, referred to as the *demographic dividend*—a period in which there are fewer children to support, a larger fraction of women join or remain in the workforce for longer periods of time, and there are more available resources to invest in human capital (see Chapter 8).

In contrast, where the fraction of people of working age is falling as a result of population aging, the resources needed for old-age support are increasing. This is already a challenge for most high-income countries. Leading up to this period, a higher savings rate is required; but then allowing more immigration can also help. The transition is likely to pose an even greater challenge for some middle-income countries with big drops in fertility ahead of previous historical patterns, most notably China (see the case study at the end of the chapter), but also in several other Asian countries.[6]

6.3 The Demographic Transition

The process by which fertility rates eventually decline to low and stable levels has been portrayed by a famous concept in economic demography called the **demographic transition**.

Demographic transition The phasing-out process of population growth rates from a virtually stagnant growth stage, characterized by high birth rates and death rates through a rapid-growth stage with high birth rates and low death rates to a stable, low-growth stage in which both birth and death rates are low.

The demographic transition attempts to explain why all contemporary developed nations have more or less passed through the same three stages of modern population history. Before their economic modernization, these countries for centuries had stable or very slow-growing populations as a result of a combination of high birth rates and almost equally high death rates. This was stage 1. Stage 2 began when modernization, associated with better

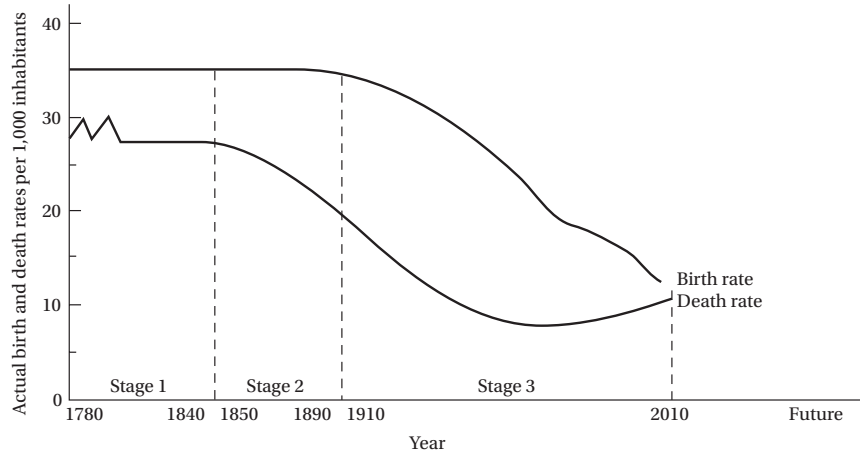
public health methods, healthier diets, higher incomes, and other improvements led to a marked reduction in mortality that gradually raised life expectancy from under 40 years to over 60 years. However, the decline in death rates was not immediately accompanied by a decline in fertility. As a result, the growing divergence between high birth rates and falling death rates led to sharp increases in population growth compared to past centuries. Stage 2 thus marks the beginning of the demographic transition (the transition from stable or slow-growing populations first to rapidly increasing numbers and then to declining rates). Finally, stage 3 was entered when the forces and influences of modernization and development caused the beginning of a decline in fertility; eventually, falling birth rates converged with lower death rates, leaving little or no population growth.

Replacement fertility The number of births per woman that would result in stable population levels.

This process implies movement from a relatively high number of births per woman to a population **replacement fertility** level that can be calculated to reach about 2.05 to 2.1 births per woman when nearly all women survive to the mean age of childbearing, as they do in developed countries. In developing countries with much lower survival rates, replacement fertility can be well over 3 births per woman.[7]

Figure 6.5 depicts the three historical stages of the demographic transition in western Europe. Before the early nineteenth century, birth rates hovered around 35 per 1,000, while death rates fluctuated around 30 per 1,000. This resulted in population growth rates of around 5 per 1,000, or less than 0.5% per year. Stage 2, the beginning of western Europe's demographic transition, was initiated around the first quarter of the nineteenth century by slowly falling death rates as a result of improving economic conditions and the gradual development of disease and death control through modern medical and public health technologies. The decline in birth rates (stage 3) did not really begin until late in the nineteenth century, with most of the reduction many decades occurring after modern economic growth had begun and long after death rates began their descent. But since the initial level of birth rates was generally low

FIGURE 6.5 The Demographic Transition in Western Europe



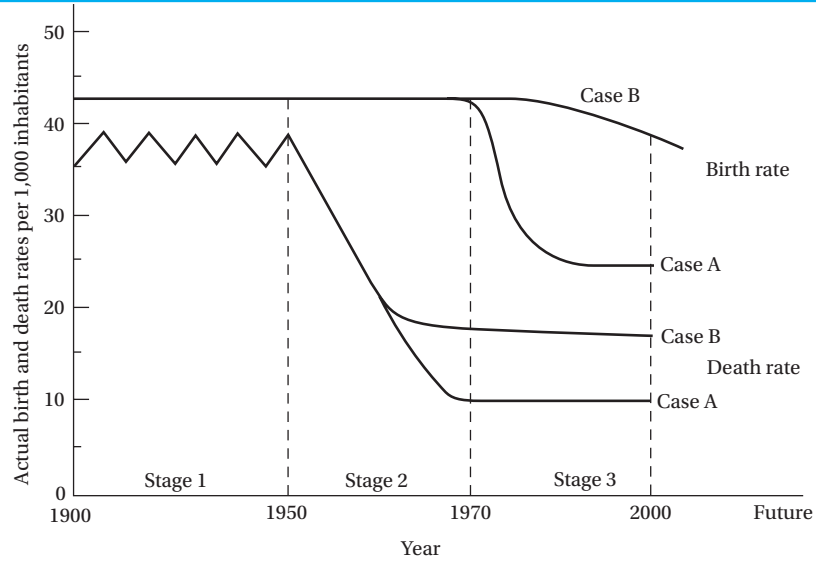
in western Europe as a result of either late marriage or celibacy, overall rates of population growth seldom exceeded the 1% level, even at their peak. By the end of western Europe's demographic transition in the second half of the twentieth century, the relationship between birth and death rates that marked the early 1800s had reversed, with birth rates fluctuating and death rates remaining fairly stable or rising slightly. This latter phenomenon was simply due to the older age distributions of contemporary European populations. The patterns of the demographic transition in Europe are clear, though research continues to better identify the causal factors at work.[8]

Figure 6.6 shows the population histories of contemporary developing countries, which contrast with those of western Europe and fall into two patterns.

Birth rates in many developing countries today are considerably higher than they were in preindustrial western Europe. This is because women tend to marry at an earlier age. As a result, there are both more families for a given population size and more years in which to have children. In the 1950s and 1960s, stage 2 of the demographic transition occurred throughout most of the developing world. The application of highly effective imported modern medical and public health technologies caused death rates in developing countries to fall much more rapidly than in nineteenth-century Europe. Given their historically high birth rates (still over 35 per 1,000 in many countries), this has meant that stage 2 of the demographic transition has been characterized by peak population growth rates well in excess of 2.0% per annum in most developing countries.

With regard to stage 3, we can distinguish between two broad classes of developing countries. In case A in Figure 6.6, modern methods of death

FIGURE 6.6 The Demographic Transition in Developing Countries



Source: Based on National Academy of Sciences, *The Growth of World Population* (Washington, D.C.: National Academy of Sciences, 1963), p. 15.

control, combined with rapid and widely distributed rises in levels of living, have resulted in death rates falling as low as 10 per 1,000 and birth rates also falling rapidly, to levels between 12 and 25 per 1,000. These countries, including Taiwan, South Korea, Costa Rica, China, Cuba, Chile, and Sri Lanka, have thus entered stage 3 of their demographic transition and have experienced rapidly falling rates of overall population growth.

But some developing countries fall into case B of Figure 6.6. After an initial period of rapid decline, death rates have failed to drop further, largely because of the persistence of widespread absolute poverty and low levels of living and more recently because of the AIDS epidemic. Moreover, the continuance of still quite high birth rates as a result of these low levels of living causes overall population growth rates to remain relatively high. These countries, including many of those in sub-Saharan Africa and the Middle East, are still in stage 2 of their demographic transition. Though fertility is declining, it remains very high in these parts of the world.

The important question, therefore, is this: When and under what conditions are developing nations likely to experience falling birth rates and a slower expansion of population? To answer this question, we need to ask a prior one. What are the principal determinants or causes of high fertility rates in developing countries, and can these determinants of the "demand" for children be influenced by government policy? To try to answer this critical question, we turn to a very old and famous classical macroeconomic and demographic model, the Malthusian "population trap," and a contemporary and highly influential neoclassical microeconomic model, the household theory of fertility.

6.4 The Causes of High Fertility in Developing Countries: The Malthusian and Household Models

The Malthusian Population Trap

More than two centuries ago, the Reverend Thomas Malthus put forward a theory of the relationship between population growth and economic development that is influential today. Writing in his 1798 *Essay on the Principle of Population* and drawing on the concept of diminishing returns, Malthus postulated a universal tendency for the population of a country, unless checked by dwindling food supplies, to grow at a geometric rate, doubling every 30 to 40 years.[9] At the same time, because of diminishing returns to the fixed factor, land, food supplies could expand only at a roughly arithmetic rate. In fact, as each member of the population would have less land to work, his or her marginal contribution to food production would actually start to decline. Because the growth in food supplies could not keep pace with the burgeoning population, per capita incomes (defined in an agrarian society simply as per capita food production) would have a tendency to fall so low as to lead to a stable population existing barely at or slightly above the subsistence

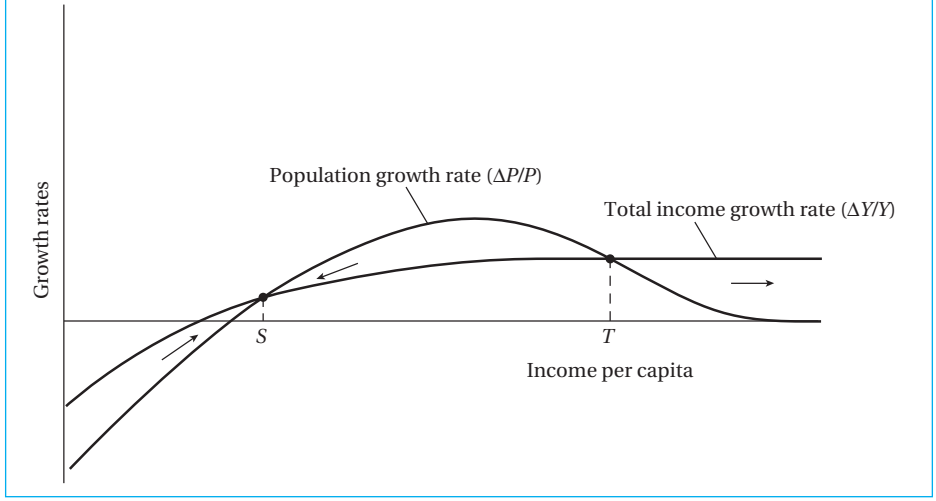
level. Malthus therefore contended that the only way to avoid this condition of chronic low levels of living or absolute poverty was for people to engage in "moral restraint" and limit the number of their progeny. Hence, we might regard Malthus, indirectly and inadvertently, as the father of the modern birth control movement.

Modern economists have given a name to the Malthusian idea of a population inexorably forced to live at subsistence levels of income. They have called it the *low-level equilibrium population trap* or, more simply, the **Malthusian population trap**. Diagrammatically, the basic Malthusian model can be illustrated by comparing the shape and position of curves representing population growth rates and aggregate income growth rates when these two curves are each plotted against levels of per capita income. An example of this is presented in Figure 6.7.

Malthusian population trap The threshold population level anticipated by Thomas Malthus (1766–1834) at which population increase was bound to stop because life-sustaining resources, which increase at an arithmetic rate, would be insufficient to support human population, which would increase at a geometric rate.

On the vertical axis, we plot numerical percentage changes, both positive and negative, in the two principal variables under consideration (total population and aggregate income). On the horizontal axis are levels of per capita income. Figure 6.7 depicts the basic ideas. The x-axis shows the level of income per capita. The y-axis shows two rates—of population growth and of total income growth. Per capita income growth is, by definition, the difference between income growth and population growth—hence the vertical difference between these two curves. Thus, as we saw in Chapter 3 in our discussion of the Harrod-Domar (or AK) model, whenever the rate of total income growth is greater than the rate of population growth, income per capita is rising; this corresponds to moving to the right along the x-axis. Conversely, whenever the rate of total income growth is less than the rate of population growth, income per capita is falling, moving to the left along the x-axis. When these rates are equal, income per capita is unchanging. We can then explore the shapes of population growth and growth of income to understand potential implications of this relationship.

FIGURE 6.7 The Malthusian Population Trap



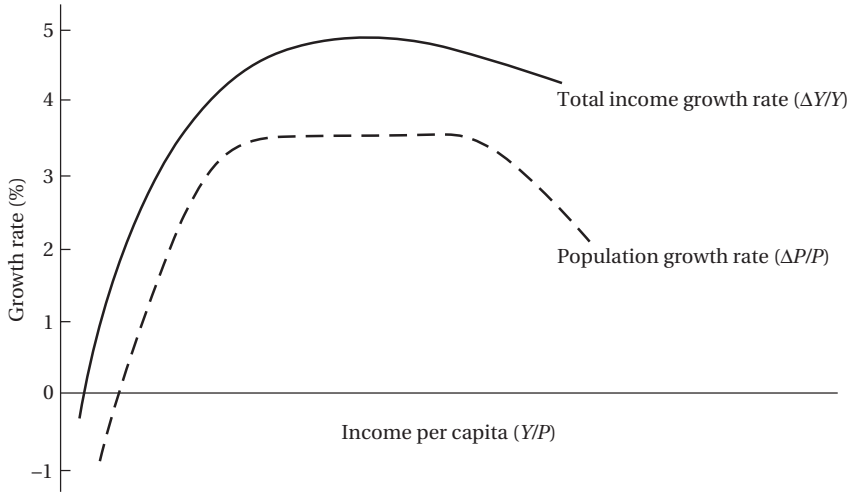
First consider population growth. When income is very low, say, below $250 per year at purchasing power parity, nutrition is so poor that people become susceptible to fatal infectious diseases; pregnancy and nursing become problematic; and, ultimately, outright starvation may occur. This is shown on the left in Figure 6.7. But after this minimum level of income per capita is reached, population begins to grow, eventually reaching a peak rate (perhaps at 3% to 4% per year); and then the population growth rate begins to fall until at last a fairly stable population is reached (a growth rate close to zero). Note that this pattern of population growth first increasing and then decreasing as per capita income rises corresponds to the pattern of the demographic transition, explained in section 6.3.

In Figure 6.7, total income growth becomes greater as the economy develops (and income per capita rises). An economic reason for this positive relationship is the assumption that savings vary positively with income per capita. Countries with higher per capita incomes are assumed to be capable of generating higher savings rates and thus more investment. Again, given a Harrod-Domar-type model of economic growth (see Chapter 3), higher savings rates mean higher rates of aggregate income growth. Eventually, however, growth levels off at a maximum. (Incomes of middle-income countries might grow fastest as they borrow technology to catch up—not shown in this diagram—but these higher rates cannot be continued once the technology frontier is reached.)

As drawn, the curves first cross at a low level of income, labeled S (for subsistence). This is a stable equilibrium: If per capita income levels become somewhat larger than (to the right of) S, it is assumed that population size will begin to increase in part because higher incomes improve nutrition and reduce death rates. But then, as shown in the figure, population is growing faster than income (the $\Delta P/P$ curve is vertically higher than the $\Delta Y/Y$ curve), so income per capita is falling, and we move to the left along the x-axis. The arrow pointing in the direction of S from the right therefore shows per capita income falling back to this very low level. On the other hand, if income per capita were a little less than S, the total income curve would be above the population growth curve and so income per capita would be rising. This corresponds to a move to the right along the x-axis. Thus, our conclusion is that point S represents a stable equilibrium (much as in our study of stable equilibria in Figure 4.1). This very low population growth rate along with a very low income per person is consistent with the experience of most of human history prior to the modern era.[10]

According to modern-day neo-Malthusians, poor nations will never be able to rise much above their subsistence levels of per capita income unless they initiate preventive checks (birth control) on their population growth. In the absence of such preventive checks, Malthusian positive checks (starvation, disease, wars) on population growth will inevitably provide the restraining force. However, if per capita income can somehow reach a threshold level, labeled T in Figure 6.7, from that point population growth is less than total income growth, and thus per capita income grows continually, at a rate such as 2% per year (the approximate U.S. per capita growth rate from 1870 to 2010).

FIGURE 6.8 How Technological and Social Progress Allows Nations to Avoid the Population Trap



Countries or regions in such a population trap can also escape it by achieving technological progress that shifts the income growth rate curve up at any level of per capita income. And it may be able to achieve changes in economic institutions and culture ("social progress") that shifts the population growth curve down. In this way, the population trap equilibrium is eliminated altogether, and the economy is able to proceed with self-sustaining growth. An example of such a result is depicted in Figure 6.8. Total income growth is now greater than population growth at each level of per capita income. As a result, income per capita now grows steadily.

We have examined strategies for accelerating income growth in Chapters 3 (including its appendices) and 4, and we will examine specific growth policies further in Chapters 7, 9, 12, and 14. The main focus of the remainder of this chapter is on changes in economic institutions, economic power in households, and cultural norms, to reduce fertility to maintain population growth below income growth, and eventually to achieve population stability.

In addition to the classic Malthusian model, the multiple equilibrium analysis of Chapter 4, Figure 4.1, is also relevant to understanding high-fertility traps. In the diagram, we can take the x-axis to represent (expected) fertility and the y-axis, the family's own fertility decision. The upward-sloping response (along the S-shaped curve) of the individual family fertility decision to average fertility may be caused by at least two important complementarities—a basis for possible multiple equilibria. First, if others have high fertility, this may increase the number of formal-sector job seekers without (proportionally) increasing the number of (higher-paying) formal-sector jobs. Each family may feel it needs a larger number of children to raise the probability that at least

one child will get a modern job. In addition, families often follow local social norms about fertility and tend to model their own behavior on the behavior of others in their community.

It is plausible that the resulting positively sloped response curve also has an S-shape, similar to the one in Figure 4.1[10a]. If the fertility response curve cuts the 45-degree line from above at least twice, then there are at least two stable equilibria (see Chapter 4, section 4.2): one with high and another with low levels of average fertility.[11] Some findings on the effects of changing norms on fertility decisions is presented in Box 6.2.

BOX 6.2 FINDINGS Social Norms and the Changing Patterns of Fertility in Bangladesh

In this chapter, we describe an idea—presented in part by Partha Dasgupta—that social norms play a role in setting an equilibrium fertility rate: If families followed local customs about fertility—modeling their own behavior on that of their neighbors—the community might be trapped at a higher fertility rate than would prevail if they could manage a change in social expectations. The idea was also a starting point for empirical research by Kaivan Munshi and Jacques Myaux on the uneven transition to lower fertility in rural developing areas.

Munshi and Myaux applied their research to the experience of the Matlab area of Bangladesh. Fertility reduction varied greatly across apparently similar villages. In addition, response to the same family-planning program also varied greatly in the magnitude of their effects and time lags before these effects were realized. Data on fertility collected twice annually over an 11-year period offered a unique chance to learn about this process. (The data set included contraceptive use and demographic and socioeconomic characteristics for all women living in all 70 villages in the Matlab area who took part in the program and were followed throughout the 11-year period.)

Munshi and Myaux offered an explanation for widely varying local patterns: "Most societies have traditionally put norms into place to regulate fertility. When the economic environment changes, individuals gradually learn through their social interactions about the new reproductive equilibrium that will emerge in their community." In this case, the change was in the availability of modern contraception. There is likely some proportion of people who will be perpetually resistant to contraception; the remainder will be open-minded about it but may not want to behave too differently than local norms dictate. Until this process plays out, people will not know how many of their neighbors will be firmly resistant to change and thus whether contraceptive use will ultimately be socially acceptable overall. Munshi and Myaux propose that families' uncertainty about what potential new equilibrium (what level of contraceptive prevalence) in their villages will emerge leads to caution, giving rise to slow and different rates of fertility transition in otherwise apparently similar villages. They developed a model to demonstrate the underlying logic of this explanation and concluded that social norms do make a difference; the process of moving to a better equilibrium can be slow. In some cases, movement out of the high fertility equilibrium (too high for many who are stuck there) can be prevented indefinitely.

In rural Bangladesh, which has a large majority Muslim population but also a minority Hindu population, social norms correspond to religious groups. Women are secluded generally (through purdah) and almost never interact with anyone (including women) from another religious group.

In this context, the researchers studied an "exogenous economic intervention"—a thorough, long-term family-planning program introduced throughout the village areas, studied and promoted door to door to each religious group with equal intensity. This is the kind of quasi experiment needed to understand the effects of social interactions, a process of wide importance in development economics and one that presents great challenges for econometrics (statistical analysis). The authors examined the data and showed that a woman's contraception use "respond[s] strongly to contraceptive prevalence within their own religious group in the village, cross-religion effects are entirely absent in the data." This held despite the fact that "all individuals in the village have access to the same family-planning inputs" and even when the people are otherwise very similar. Thus, the findings are "consistent with the view that changing social norms are driving changes in reproductive behavior in these communities. "As in the model, uncertainty about the ultimate prevalence of contraception use "is slowly resolved over time as women in the village interact sequentially with each other from one period to the next, which explains the gradual change in contraceptive prevalence that we see in the data, as well as the convergence to different levels of contraceptive use across communities."

As societies gain the possibility of modern economic development, advantages of smaller family sizes grow both for families and for the societies of which they are a part. But multiple equilibria are possible. Many in communities with full knowledge of and access to contraception may still perpetuate high fertility rates when social norms and sanctions to contrary behavior prevail. Addressing situations like these requires attention to social aspects of the development process.

Source: Kaivan Munshi and Jacques Myaux, "Social norms and the fertility transition," *Journal of Development Economics* 80 (2006): 1–38. For further background on the issues involved, see also Partha Dasgupta, *An Inquiry into Well-Being and Destitution* (New York: Oxford University Press, 1993).

Criticisms of the Malthusian Model

The Malthusian population trap provides a theory of the relationship between population growth and economic development. Unfortunately, it is based on a number of simplistic assumptions and hypotheses that do not stand the test of empirical verification. We can criticize the population trap on two major grounds.

First, the model ignores the enormous impact of technological progress in offsetting the growth-inhibiting forces of rapid population increases. As we saw in Chapter 2, the history of modern economic growth has been closely associated with rapid technological progress in the form of a continuous series of scientific, technological, and social inventions and innovations. Increasing rather than decreasing returns to scale have been a distinguishing feature of the modern growth epoch. While Malthus was basically correct in assuming a limited supply of land, he did not—and in fairness could not at that time—anticipate the manner in which technological progress could augment the availability of land by raising its quality (its productivity) even though its quantity might remain roughly the same.

In terms of the population trap, rapid and continuing technological progress can be represented by an upward shift of the income growth (total product) curve so that at *all* levels of per capita income, it is vertically higher than

the population growth curve. This is shown in Figure 6.8. As a result, per capita income will continue to grow over time. All countries therefore have the potential of escaping the Malthusian population trap.

The second basic criticism of the trap focuses on its assumption that national rates of population increase are directly (positively) related to the level of national per capita income. According to this assumption, at relatively low levels of per capita income, we should expect to find population growth rates increasing with increasing per capita income. But research indicates that there appears to be no clear correlation between population growth rates and levels of per capita income. As a result of modern medicine and public health programs, death rates have fallen rapidly and have become less dependent on the level of per capita income. Moreover, birth rates seem to show no rigid relationship with per capita income levels. Fertility rates vary widely for countries with the same per capita income, especially below $1,000. It is not so much the aggregate level of per capita income that matters for population growth but rather how that income is distributed. It is the level of household income, not the level of per capita income, that seems to matter most.

In sum, Malthusian and neo-Malthusian theories as applied to contemporary developing nations have severely limited relevance for the following reasons:

1. They do not take adequate account of the role and impact of technological progress.
2. They are based on a hypothesis about a macro relationship between population growth and levels of per capita income that does not stand up to empirical testing of the modern period.
3. They focus on the wrong variable, per capita income, as the principal determinant of population growth rates. A much better and more valid approach to the question of population and development centers on the microeconomics of family size decision making in which individual, and not aggregate, levels of living become the principal determinant of a family's decision to have more or fewer children.

We continue to study the Malthusian trap even though evidence shows that it is not currently relevant for three main reasons: First, because many people still believe it holds in poor countries today, despite the recent evidence; and people working in the development field should understand the model and the elements of it that do not currently apply so that they can engage the debate effectively. Second, because it seems clear that such traps have occurred in the historical past and may have been factors in population collapses, including in the pre-Columbian Americas. Third—as we will explore in the remainder of this chapter—the fact that this model no longer applies underlines the importance of factors that can prevent its emergence. These include efforts to continue steady and sustainable rises in agricultural productivity; moreover, they encompass increases in women's empowerment and freedom to choose—along with their incomes—which reduce the old-age security motive behind high fertility.

The Microeconomic Household Theory of Fertility

In recent years, economists have begun to look more closely at the microeconomic determinants of family fertility in an attempt to provide a better theoretical and empirical explanation for the observed falling birth rates associated with stage 3 of the demographic transition. In doing this, they have drawn on the traditional neoclassical theory of household and consumer behavior for their basic analytical model and have used the principles of economics and optimization to explain family size decisions.

The conventional theory of consumer behavior assumes that an individual with a given set of tastes or preferences for a range of goods (a "utility function") tries to maximize the satisfaction derived from consuming these goods subject to his or her own income constraint and the relative prices of all goods. In the application of this theory to fertility analysis, children are considered as a special kind of consumption (and in developing countries, particularly low-income countries, investment) good so that fertility becomes a rational economic response to the consumer's (family's) demand for children relative to other goods. The usual income and substitution effects are assumed to apply. That is, if other factors are held constant, the desired number of children can be expected to vary directly with household income (this direct relationship may not hold for poor societies; it depends on the strength of demand for children relative to other consumer goods and to the sources of increased income, such as female employment), inversely with the price (cost) of children, and inversely with the strength of tastes for other goods relative to children. Mathematically, these relationships can be expressed as follows:

$$C_d = f(Y, P_c, P_x, t_x), x = 1, \ldots, n \tag{6.1}$$

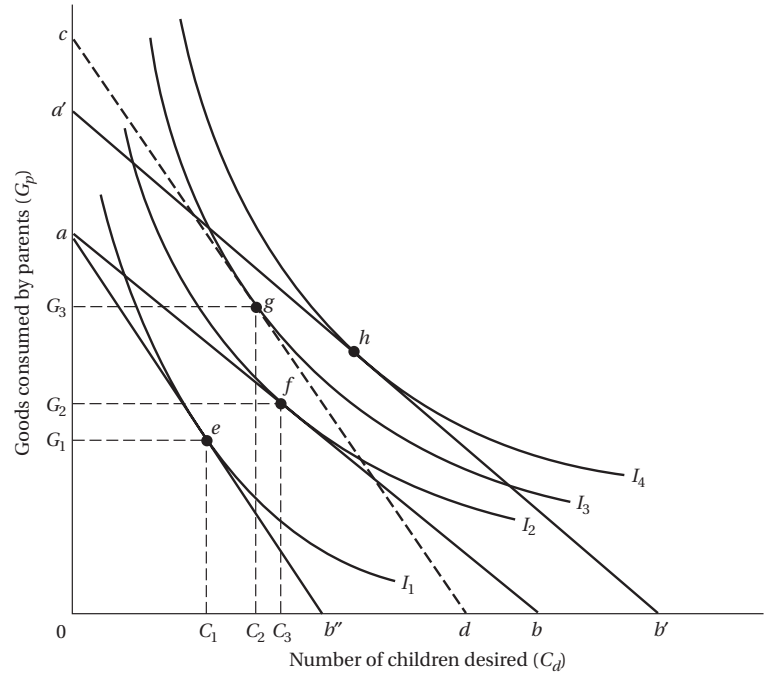
where C_d, the demand for surviving children (an important consideration in low-income societies where infant mortality rates are high), is a function of the given level of household income (Y), the "net" price of children (the difference between anticipated costs, mostly the opportunity cost of a mother's time, and benefits, potential child income and old-age support, P_c), the prices of all other goods (P_x), and the tastes for goods relative to children (t_x). Under standard neoclassical conditions, we would expect the following (expressed both mathematically and in words):

$\partial C_d/\partial Y > 0$	The higher the household income, the greater the demand for children.
$\partial C_d/\partial P_c < 0$	The higher the net price of children, the lower the quantity demanded.
$\partial C_d/\partial P_x > 0$	The higher the prices of all other goods relative to children, the greater the quantity of children demanded.
$\partial C_d/\partial t_x < 0$	The greater the strength of tastes for goods relative to children, the fewer children demanded.

Microeconomic theory of fertility The theory that family formation has costs and benefits that determine the size of families formed.

Figure 6.9 provides a simplified diagrammatic presentation of the **microeconomic theory of fertility**. The number of desired (surviving) children, C_d, is

FIGURE 6.9 Microeconomic Theory of Fertility: An Illustration



measured along the horizontal axis, and the total quantity of goods consumed by the parents, G_p, is measured on the vertical axis.

Household desires for children are expressed in terms of an indifference map representing the subjective degree of satisfaction derived by the parents for all possible combinations of commodities and children. Each individual indifference curve portrays a locus of commodity-child combinations that yield the same amount of satisfaction. Any point (or combination of goods and children) on a "higher" indifference curve—that is, on a curve farther out from the origin—represents a higher level of satisfaction than any point on a lower indifference curve. But each indifference curve is a "constant satisfaction" locus.

In Figure 6.9, only four indifference curves, I_1 to I_4, are shown; in theory, there is an infinite set of such curves, filling the whole quadrant and covering all possible commodity-child combinations. The household's ability to "purchase" alternative combinations of goods and children is shown by the budget constraint line, *ab*. Thus, all combinations on or below line *ab* (within the triangular area 0*ab*) are financially attainable by the household on the basis of its perceived income prospects and the relative prices of children and goods, as represented by the slope of the *ab* budget constraint. The steeper the slope of the budget line, the higher the price of children relative to goods.

According to the demand-based theory of fertility, the household chooses from among all attainable combinations the one combination of goods and children that maximizes family satisfaction on the basis of its subjectively determined preferences. Diagrammatically, this optimal combination is represented by point *f*, the tangency point between the budget constraint, *ab*, and indifference curve, I_2. Therefore, C_3 children and G_2 goods will be demanded.

A rise in family income, represented in Figure 6.9 by the parallel outward shift of the budget line from *ab* to *a′b′*, enables the household to attain a higher level of satisfaction (point *h* on curve I_4) by consuming more of *both* commodities and children—that is, if children, like most commodities, are assumed to be normal goods (demand for them rises with income), an important if in low-income countries where children are often in demand primarily as a source of future financial security. Note that as income rises, parents may spend more on each child, preferring a smaller number of children, each of higher "quality," for example, healthier and better educated.

Similarly, an increase in the price (opportunity cost) of children relative to other goods will cause households to substitute commodities for children. Other factors (namely, income and tastes) being constant, a rise in the relative price of children causes the household utility-maximizing consumption combination to occur on a lower indifference curve, as shown by the movement of the equilibrium point from *f* to *e* when the budget line rotates around point *a* to *ab″*.

Note, finally, that if there is a simultaneous increase in household income and net child price as a result of, say, expanding female employment opportunities and a rise in wages, coupled with a tax on children beyond a certain number per family, there will be *both* an outward shift and downward rotation of the budget constraint line of Figure 6.9 to, say, dashed line *cd*. The result is a new utility-maximizing combination that includes fewer children per family (point *g* compared with point *f*). In other words, higher levels of living for low-income families in combination with a relative increase in the price of children (whether brought about directly by fiscal measures or indirectly by expanded female employment opportunities) will motivate households to have fewer children while still improving their welfare. This is just one example of how the economic theory of fertility can shed light on the relationship between economic development and population growth as well as suggest possible lines of policy.

The Demand for Children in Developing Countries

The economic theory of fertility assumes that the household demand for children is determined by family preferences for a certain number of surviving (usually male) children (i.e., in regions of high mortality, parents may produce more children than they actually desire in the expectation that some will not survive), by the price or "opportunity cost" of rearing these children, and by levels of family income. Children in poor societies are seen partly as economic investment goods in that there is an expected return in the form of both child labor and the provision of financial support for parents in old age.[12] However, in many developing countries, there is a strong intrinsic psychological and cultural determinant of family size, so the first two or three children should be viewed as "consumer" goods for which demand may not be very responsive to relative price changes.

The choice mechanism in the economic theory of fertility as applied to developing countries is assumed, therefore, to exist primarily with regard to the additional ("marginal") children who are considered as investments. In deciding whether or not to have *additional* children, parents are assumed to weigh private economic benefits against private costs, where the principal benefits are the expected income from child labor, usually on the farm, and eventual financial support for elderly parents. Balanced against these benefits are the two principal elements of cost: the opportunity cost of the mother's

time (the income she could earn if she were not at home caring for her children) and the cost of educating children—the financial trade-off between having fewer "high-quality," high-cost, educated children with high-income-earning potential versus more "low-quality," low-cost, uneducated children with much lower earning prospects.

Using the same thought processes as in the traditional theory of consumer behavior, the theory of family fertility concludes that when the price or cost of children rises as a result of, say, increased educational and employment opportunities for women or a rise in school fees or the establishment of minimum-age child labor laws or the provision of publicly financed old-age social security schemes, parents will demand fewer additional children, substituting, perhaps, quality for quantity or a mother's employment income for her child-rearing activities. It follows that one way to induce families to desire fewer children is to raise the price of child rearing by, say, providing greater educational opportunities and a wider range of higher-paying jobs for young women.

Recent research on household behavior has led to a major improvement of this theory. Households in developing countries generally do not act in a "unitary" manner, depicted with this traditional model. Instead, men and women have different objective functions; for example, husbands may prefer to have more children than wives. Household behavior is then explained as a result of *bargaining* between husbands and wives. Although the broad impacts we have just described continue to hold, the process includes increased bargaining power of women. Nonunitary, bargaining-based models of household behavior also improve our understanding of otherwise puzzlingly inefficient household behaviors, such as higher investment in husbands' farm plots than wives' farm plots even when a more even investment could lead to higher family incomes.[13]

Some Empirical Evidence Statistical studies in a broad spectrum of developing countries have provided support for the economic theory of fertility.[14] For example, it has been found that high female employment opportunities outside the home and greater female school attendance, especially at the primary and secondary levels, are associated with significantly lower levels of fertility. As women become better educated, they tend to earn a larger share of household income and to produce fewer children. Moreover, these studies have confirmed the strong association between declines in child mortality and the subsequent decline in fertility. Assuming that households desire a target number of surviving children, increased female education and higher levels of income can decrease child mortality and therefore increase the chances that the firstborn will survive. As a result, fewer births may be necessary to attain the same number of surviving children. This fact alone underlines the importance of educating women and improving public health and child nutrition programs in reducing fertility levels.

Implications for Development and Fertility

All of the foregoing can be summarized by saying that the effect of social and economic progress in lowering fertility in developing countries will be

the greatest when the majority of the population and especially the very poor share in its benefits. Specifically, birth rates among the very poor are likely to fall where the following socioeconomic changes come to pass:

1. An increase in the education of women and a consequent improvement in their role and status
2. An increase in female nonagricultural wage employment opportunities, which raises the price or cost of their traditional child-rearing activities
3. A rise in family income levels through the increased direct employment and earnings of a husband and wife or through the redistribution of income and assets from rich to poor
4. A reduction in infant mortality through expanded public health programs and better nutritional status for both mother and child, and better medical care
5. The development of old-age and other social security systems outside the extended family network to lessen the economic dependence of parents, especially women, on their offspring
6. Expanded schooling opportunities so that parents can better substitute child "quality" for large numbers of children

In short, expanded efforts to make jobs, education, and health more broadly available to poverty groups in general and women in particular will not only contribute to their economic and psychic well-being (i.e., to their development) but also contribute substantially to their motivation for smaller families (i.e., their freedom to choose), which is vital to reducing population growth rates. Where such motivation exists, well-executed **family-planning programs** can then be an effective tool.[15] But before discussing policy issues and what government might or might not do, we should point out that while there seems to be considerable agreement regarding the determinants or causes of population growth, substantial disagreement and controversy remain regarding its consequences.

Family-planning programs Public programs designed to help parents plan and regulate their family size.

6.5 The Consequences of High Fertility: Some Conflicting Perspectives

For many years, development economists and other social scientists have debated the seriousness of the consequences of rapid population growth.[16] On the one hand, we must recognize that population growth is not the only, or even the primary, source of low levels of living, eroding self-esteem, and limited freedom in developing nations. On the other hand, it would be equally naive to think that rapid population growth in many countries and regions is not a serious intensifier and multiplier of those integral components of underdevelopment, especially the first and third. The following discussion summarizes some of the main arguments for and against the idea that the consequences of rapid population growth lead to serious development problems. It then

considers whether some consensus can be reached so that specific policy goals and objectives can be postulated.[17]

It's Not a Real Problem

We can identify three general lines of argument on the part of people who assert that population growth is not a cause for concern:

- The problem is not population growth but other issues.
- Population growth is a false issue deliberately created by dominant rich-country agencies and institutions to keep developing countries in their dependent condition.
- For many developing countries and regions, population growth is in fact desirable.

Other Issues Many observers from both rich and poor nations argue that the real problem is not population growth per se but one or all of the following four issues.

1. ***Underdevelopment.*** If correct strategies are pursued and lead to higher levels of living, greater self-esteem, and expanded freedom, population will take care of itself. Eventually, it will disappear as a problem, as it has in all of the present economically advanced nations. According to this argument, underdevelopment is the real problem, and development should be the only goal. With it will come economic progress and social mechanisms that will more or less automatically regulate population growth and distribution. As long as people in developing countries remain impoverished, uneducated, and unhealthy and the social safety net remains weak, the large family will constitute the only real source of social security (i.e., parents will continue to be denied the freedom to choose a small family if they so desire). Some proponents of the underdevelopment argument then conclude that birth control programs will surely fail, as they have in the past, when there is no motivation on the part of poor families to limit their size.
2. ***World Resource Depletion and Environmental Destruction.*** Population can only be an economic problem in relation to the availability and utilization of scarce natural and material resources. The fact is that developed countries, with less than one-quarter of the world's population, consume almost 80% of the world's resources. In terms of the depletion of the world's limited resources, therefore, the addition of another child in the developed countries is as significant as the birth of many times as many additional children in the underdeveloped countries. According to this argument, developed nations should curtail their excessively high consumption standards instead of asking less developed nations to restrict their population growth. The latter's high fertility is really due to their low levels of living, which are in turn largely the result of the overconsumption of the world's scarce resources by rich nations. This combination of rising affluence and extravagant consumption habits in rich

countries and among rich people in poor countries, and not population growth, should be the major world concern. We will analyze issues of the environment and development in Chapter 10.

3. ***Population Distribution.*** According to this third argument, it is not the number of people per se that is causing population problems but their distribution in space. Many regions of the world (e.g., parts of sub-Saharan Africa) and many regions within countries (e.g., the northeastern and Amazon regions of Brazil) are viewed as underpopulated in terms of available or potential resources. Others simply have too many people concentrated in too small an area (e.g., central Java or most urban concentrations). Governments should therefore strive not to moderate the rate of population growth but rather to bring about a more natural spatial distribution of the population in terms of available land and other productive resources.
4. ***Subordination of Women.*** Perhaps most important, as noted previously, women often bear the disproportionate burdens of poverty, poor education, and limited social mobility. In many cases, their inferior roles, low status, and restricted access to birth control are manifested in their high fertility. According to this argument, population growth is a natural outcome of women's lack of economic opportunity. If women's health, education, and economic well-being are improved along with their role and status in both the family and the community, this empowerment of women will inevitably lead to smaller families and lower population growth.

It's a Deliberately Contrived False Issue

The second main line of argument denying the significance of population growth as a major development problem is closely allied to the neocolonial dependence theory of underdevelopment discussed in Chapter 3. Basically, it is argued that the overconcern in the rich nations with the population growth of poor nations is really an attempt by the former to hold down the development of the latter in order to maintain an international status quo that is favorable to the rich nations' self-interests. Rich nations are pressuring poor nations to adopt aggressive population control programs, even though they themselves went through a period of sizable population increase that accelerated their own development processes.

A radical neo-Marxist version of this argument views population control efforts by rich countries and their allied international agencies as racist or genocidal attempts to reduce the relative or absolute size of the poor, largely nonwhite populations of the world who may someday pose a serious threat to the welfare of the rich, predominantly white societies. Worldwide birth control campaigns are seen as manifestations of the fears of the developed world in the face of a possible radical challenge to the international order by the people who are its first victims.

It's a Desirable Phenomenon

A more conventional economic argument is that of population growth as an essential ingredient to stimulate economic development. Larger populations

provide the needed consumer demand to generate favorable economies of scale in production, to lower production costs, and to provide a sufficient and low-cost labor supply to achieve higher output levels. Population "revisionist" economists of the neoclassical counterrevolution school argue, for example, that free markets will always adjust to any scarcities created by population pressures.[18] Such scarcities will drive up prices and signal the need for new cost-saving production technologies. In the end, free markets and human ingenuity (Julian Simon's "genius" as the "ultimate resource") will solve any and all problems arising from population growth. This revisionist viewpoint was clearly in contrast with the traditional "orthodox" argument that rapid population growth had serious economic consequences that, if left uncorrected, would slow economic development.

At the other end of the political spectrum, it has been argued by some developing-world neo-Marxist pronatalists that many rural regions in developing countries are in reality underpopulated in the sense that much unused but arable land could yield large increases in agricultural output if only more people were available to cultivate it. Many regions of tropical Africa and Latin America and even parts of Asia are said to be in this situation. With respect to Africa, for example, some observers have noted that many regions had larger populations in the remote past than after independence.[19] Their rural depopulation resulted not only from the slave trade but also from compulsory military service, confinement to reservations, and the forced-labor policies of former colonial governments. For example, the sixteenth-century Kongo kingdom is said to have had a population of approximately 2 million. But by the time of the colonial conquest, which followed 300 years of slave trade, the population of the region had fallen to less than one-third of that figure. After independence, parts of the Democratic Republic of Congo (formerly known as the Belgian Congo and later as Zaire) had barely caught up to the sixteenth-century numbers.[20] Other regions of western and eastern Africa provide similar examples—at least in the eyes of advocates of rapid population growth in Africa.

In terms of ratios of population to arable land (land under cultivation, fallow land, pastures, and forests), Africa south of the Sahara is said by these supporters of population expansion to have a total of 1.4 billion arable hectares. Land actually being cultivated amounts to only a fraction of this potential. Thus, only 12% of all potential arable land is under cultivation, and this low rural population density is viewed as a serious drawback to raising agricultural output.[21] Similar arguments have been expounded with regard to such Latin American countries as Brazil and Argentina.

Three other noneconomic arguments, each found to some degree in a wide range of developing countries, complete the "population growth is desirable" viewpoint. First, many countries claim a need for population growth to protect currently underpopulated border regions against the expansionist intentions of neighboring nations. Second, there are many ethnic, racial, and religious groups in less developed countries whose attitudes favoring large family size have to be protected for both moral and political reasons. Finally, military and political power are often seen as dependent on a large and youthful population.

Many of these arguments have a certain realism about them—if not in fact, then at least in the perceptions of vocal and influential individuals in both the developed and developing worlds. The important point is that they represent

a considerable range of opinions and viewpoints and therefore need to be seriously weighed against the counterarguments of theorists who believe that rapid population growth is indeed a real and important problem for underdeveloped countries. Let us now look at some of these counterarguments.

It *Is* a Real Problem

Positions supporting the need to curtail population growth because of the negative economic, social, and environmental consequences are typically based on one of the following three arguments.

The Extremist Argument: Population and Global Crisis The extreme version of the population-as-problem position attempts to attribute almost all of the world's economic and social evils to excessive population growth. Unrestrained population increase is seen as the major crisis facing humankind today. It is regarded as the principal cause of poverty, low levels of living, malnutrition, ill health, environmental degradation, and a wide array of other social problems. Value-laden and incendiary terms such as *population bomb* and *population explosion* are tossed around. Indeed, dire predictions of world food catastrophes and ecological disaster are often attributed almost entirely to the growth in population numbers.[22] Such an extreme position leads some of its advocates to assert that "world" (i.e., developing country) population stabilization or even decline is the most urgent contemporary task, even if it requires severe and coercive measures such as compulsory sterilization to control family size in some of the most densely populated developing countries, such as India and Bangladesh.

The Theoretical Argument: Population-Poverty Cycles and the Need for Family-Planning Programs The **population-poverty cycle** theory is the main argument advanced by economists who hold that too rapid population growth yields negative economic consequences and thus should be a real concern for developing countries. Advocates start from the basic proposition that population growth intensifies and exacerbates the economic, social, and psychological problems associated with the condition of underdevelopment. Population growth is believed to retard the prospects for a better life for the already born by reducing savings rates at the household and national levels. It also severely draws down limited government revenues simply to provide the most rudimentary economic, health, and social services to the additional people. This, in turn, further reduces the prospects for any improvement in the levels of living of the existing generation and helps transmit poverty to future generations of low-income families.

Population-poverty cycle A theory to explain how poverty and high population growth become reinforcing.

Because widespread absolute poverty and low levels of living are thus seen as a major cause of large family size, and large families retard economic growth, it follows that economic and social development is a necessary condition for bringing about an eventual slowing or cessation of population growth at low levels of fertility and mortality. But according to this argument, it is not a sufficient condition—that is, development provides people with the incentives and motivations to limit their family size, but family-planning programs

are needed to provide them with the technological means to avoid unwanted pregnancies. Even though countries such as France, Japan, the United States, Great Britain, and, more recently, Taiwan and South Korea were able to reduce their population growth rates without widespread family-planning clinics, it is argued that the provision of these services will enable other countries desiring to control excessive population growth to do so more rapidly than if these family-planning services were not available.

A Simple Model A basic model that economists use to demonstrate these adverse consequences of rapid population growth is a simplification of the standard Solow-type neoclassical growth equation.[23] Using the standard production function, $Y = f(K,L,R,T)$—that is, output is a function of capital, labor, resources, and technology—and holding the resource base fixed, we can derive the result that

$$y - l = \alpha(k - l) + t \tag{6.2}$$

where y = rate of GNI growth $\Delta Y/Y$, l = rate of labor force (population) growth $\Delta L/L$, k = rate of growth of the capital stock $\Delta K/K$, α = capital elasticity of output (usually found to be constant), and t = the effect of technological change (the Solow residual in empirical studies of sources of economic growth).

Assuming constant returns to scale, Equation 6.2 simply states that the rate of per capita income growth $(y - l)$ is directly proportional to the rate of growth of the capital-labor ratio $(k - l)$ plus the residual effects of technological progress (including improved human and physical capital). Therefore, in the absence of technological change, the higher the rate of population growth (l), the more rapid the rate of capital stock growth (k) must be and thus the greater the concomitant savings and investment rate just to maintain constant levels of per capita income. Moreover, because k may not be independent of l, as is traditionally assumed in neoclassical growth models, but may in fact be inversely related due to the reduced savings impact implied by the higher dependency burden effects of rapid population growth, it follows that the negative economic impact of population growth may even be greater than these models imply. Finally, if low incomes induce poor families to have more children as a source of cheap labor and old-age security, then we have another vicious circle in progress—poor people have large families partly to compensate for their poverty, but large families mean greater population growth, higher dependency burdens, lower savings, less investment, slower economic growth, and ultimately greater poverty. In an extreme case, a neo-Malthusian population trap can emerge. Population growth is thus seen as both a cause and a consequence of underdevelopment!

However, keep in mind that, as you saw in Chapters 3 and 4, population growth can tell only part of the story of economic growth. In this regard, William Easterly argued that "even if population growth lowered per capita growth one for one (the general view of the population alarmists), this would explain only about one-third of the variation in per capita growth."[24] Growth in productivity, especially as spurred by structural transformation of the economy (Chapter 3), is usually more important in economic development outcomes.

Other Empirical Arguments: Seven Negative Consequences of Population Growth According to the latest empirical research, the potential negative consequences of population growth for economic development can be divided into seven categories: its impact on economic growth, poverty and inequality, education, health, food, the environment, and international migration.[25]

1. ***Economic Growth.*** Evidence shows that although it is not the culprit behind economic stagnation, rapid population growth lowers per capita income growth in most developing countries, especially those that are already poor, dependent on agriculture, and experiencing pressures on land and natural resources.

2. ***Poverty and Inequality.*** Even though aggregate statistical correlations between measures of poverty and population growth at the national level are often inconclusive, at the household level the evidence is strong and compelling. The negative consequences of rapid population growth fall most heavily on the poor because they are the ones who are made landless, suffer first from cuts in government health and education programs, and bear the brunt of environmental damage. Poor women once again bear the greatest burden of government austerity programs, and another vicious circle ensues. To the extent that large families perpetuate poverty, they also exacerbate inequality.

3. ***Education.*** Although the data are sometimes ambiguous on this point, it is generally agreed that large family size and low incomes restrict the opportunities of parents to educate all their children. At the national level, rapid population growth causes educational expenditures to be spread more thinly, lowering quality for the sake of quantity. This in turn feeds back on economic growth because the stock of human capital is reduced by rapid population growth.

4. ***Health.*** High fertility harms the health of mothers and children. It increases the health risks of pregnancy, and closely spaced births have been shown to reduce birth weight and increase child mortality rates.

5. ***Food.*** Feeding the world's population is made more difficult by rapid population growth—a large fraction of developing country food requirements are the result of population increases. New technologies of production must be introduced more rapidly, as the best lands have already been cultivated. International food relief programs become more widespread.

6. ***Environment.*** Rapid population growth contributes to environmental degradation in the form of forest encroachment, deforestation, fuelwood depletion, soil erosion, declining fish and animal stocks, inadequate and unsafe water, air pollution, and urban congestion (see Chapter 10).

7. ***International Migration.*** Many observers consider the increase in international migration, both legal and illegal, to be one of the major consequences of developing countries' population growth. Though many factors spur migration (see Chapter 7), an excess of job seekers (caused by rapid

population growth) over job opportunities is surely one of them. However, unlike the first six consequences listed here, some of the economic and social costs of international migration fall on recipient countries, increasingly in the developed world. It is not surprising, therefore, that this issue has recently taken on political importance in North America and Europe (see Chapter 2).

Goals and Objectives: Toward a Consensus

In spite of what may appear to be seriously conflicting arguments about the positive and negative consequences of population growth, a common ground has emerged on which many people on both sides of the debate can agree. This position is characterized succinctly by Robert Cassen:

> After decades of controversy over the issue of population policy, there is a new international consensus among and between industrial and developing countries that individuals, countries, and the world at large would be better off if population were to grow more slowly. The consequences of rapid population growth should be neither exaggerated nor minimized. Some past expressions of alarm have been counterproductive, alienating the very audiences they were intended to persuade; at the same time, claims that population growth was not all that important have had the effect of diminishing a proper concern for the subject.[26]

The following three propositions constitute the essential components of this intermediate or consensus opinion.

1. Population growth is not the primary cause of low levels of living, extreme inequalities, or the limited freedom of choice that characterize much of the developing world. The fundamental causes of these problems must be sought, rather, in the plight of poor families, especially women, and the failure of other aspects of domestic and international development policy.
2. The problem of population is not simply one of numbers but involves the quality of life and material well-being. Thus, developing country population size must be viewed in conjunction with developed-country affluence in relation to the quantity, distribution, and utilization of world resources, not just in relation to developing countries' indigenous resources.
3. Rapid population growth does serve to intensify problems of underdevelopment and to make prospects for development that much more remote. As noted, the momentum of growth means that, barring catastrophe, the population of developing countries will increase dramatically over the coming decades, no matter what fertility control measures are adopted now. It follows that high population growth rates, though not the principal cause of underdevelopment, are nevertheless important contributing factors in specific countries and regions of the world.

In view of these three propositions, we may conclude that the following three policy goals and objectives might be included in any realistic approach to the issue of population growth in developing countries.

1. In countries or regions where population size, distribution, and growth are viewed as an existing or potential problem, the primary objective of any strategy to limit further growth must deal not only with the population variable per se but also with the underlying social and economic conditions of underdevelopment. Problems such as absolute poverty, gross inequality, widespread unemployment (especially among women), limited female access to education, malnutrition, and poor health facilities must be given high priority. Their amelioration is both a necessary concomitant of development and a fundamental motivational basis for the expanded freedom of the individual to choose an optimal—and in many cases, smaller—family size.
2. To bring about smaller families through development-induced motivations, family-planning programs providing both the education and the technological means to regulate fertility for people who wish to regulate it should be established.
3. Developed countries should help developing countries achieve their lowered fertility and mortality objectives, not only by providing contraceptives and funding family-planning clinics, but also, even more important, by curtailing their own excessive depletion of nonrenewable world resources through programs designed to cut back on the unnecessary consumption of products that intensively use such resources; by making genuine commitments to eradicating poverty, illiteracy, disease, and malnutrition in developing countries as well as their own; and by recognizing in both their rhetoric and their international economic and social dealings that development is the real issue, not simply population control.

6.6 Some Policy Approaches

In view of these broad goals and objectives, what kinds of economic and social policies might developing and developed-country governments and international assistance agencies consider to bring about long-term reductions in the overall rate of world population growth? Three areas of policy can have important direct and indirect influences on the well-being of present and future world populations:

1. General and specific policies that developing country governments can initiate to influence and perhaps even control their population growth and distribution
2. General and specific policies that developed-country governments can initiate in their own countries to lessen their disproportionate consumption of limited world resources and promote a more equitable distribution of the benefits of global economic progress
3. General and specific policies that developed-country governments and international assistance agencies can initiate to help developing countries achieve their population objectives

Let us deal with each of these areas in turn.

What Developing Countries Can Do

Earlier discussions have led to the conclusion that the principal variables influencing the demand for children at the family level are the ones most closely associated with the concept of development as we have defined it in Chapter 1. Thus, certain development policies are particularly crucial in the transition from a high-growth to a low-growth population. These policies aim at eliminating absolute poverty; lessening income inequalities; expanding educational opportunities, especially for women; providing increased job opportunities for both men and women; bringing the benefits of modern preventive medicine and public health programs, especially the provision of clean water and sanitation, to the rural and urban poor; improving maternal and child health through more food, better diets, and improved nutrition so as to lower infant mortality; and creating a more equitable provision of other social services to wide segments of the population. Again, it is not numbers per se or parental irrationality that is at the root of the "population problem." Rather, it is the pervasiveness of absolute poverty and low levels of living that provide the economic rationale for large families and burgeoning populations. And it is the spillover effects or negative social externalities of these private parental decisions (e.g., for education, health care, food supplies, environment and resource degradation, job creation, overall growth, and income distribution) that provide the strictly economic efficiency justification (in terms of "market failure" arguments) for government intervention in population matters. Clearly, there are noneconomic justifications as well.

Although long-run development policies of the kind just outlined are essential to ultimate population stabilization, there are five more specific policies that developing country governments might try to adopt to lower birth rates in the short run.[27]

First, they can try to *persuade people* to have smaller families through the media and the educational process, both formal (school system) and informal (adult education).

Second, they can *enhance family-planning programs* to provide health and contraceptive services to encourage the desired behavior. Such publicly sponsored or officially supported programs now exist in most developing countries. Today only a few countries do not have such publicly sponsored or officially endorsed family-planning programs. However, there remains substantial unmet demand for contraceptives, as seen in Box 6.3.

Third, they can deliberately *manipulate economic incentives and disincentives* for having children—for example, through the elimination or reduction of maternity leaves and benefits, the reduction or elimination of financial incentives, or the imposition of financial penalties for having children beyond a certain number; the establishment of old-age social security provisions and minimum-age child labor laws; the raising of fees and elimination of heavy public subsidies for higher education; and the subsidization of smaller families through direct money payments. Although some form of population-related *incentive or disincentive schemes* now exist in over 30 developing countries, Singapore, India, Bangladesh, South Korea, and China have been especially prominent in experimenting with policies to reduce family size. For example, Singapore allocated scarce public housing without giving consideration to

BOX 6.3 FINDINGS Contraceptives Need and Use in Developing Countries, 2003 to 2012

Jacqueline Darroch and Susheela Singh analyzed the use and need for contraceptives in developing countries, using data from comparable national surveys for married and unmarried women ages 15 to 49 in 2003, 2008, and 2012. Darroch and Singh estimated numbers and percentages of women wanting to avoid pregnancy, according to whether they were using modern contraceptives, or using either no method or only a traditional method. They found that "the number of women wanting to avoid pregnancy and therefore needing effective contraception increased substantially," from 716 million in 2003 to 867 million in 2012. Most of the increase corresponded to population growth. The percentage of women wishing to avoid pregnancy also rose, from 54% in 2003 to 57% in 2012. At the same time, the "use of modern contraceptive methods also increased, and the overall proportion" of all women ages 15-49 "with "unmet need for modern methods among those wanting to avoid pregnancy decreased," from 29% in 2003, to 26% in 2012 (although the number rose from 210 million to 222 million). The unmet need for modern contraceptives among those wanting to avoid pregnancy remained very high, "especially in sub-Saharan Africa (53 million [60%] of 89 million), south Asia (83 million [34%] of 246 million), and western Asia (14 million [50%] of 27 million)." The authors maintained that, "to meet the unmet need for modern contraception, countries need to increase resources, improve access to contraceptive services and supplies, and provide high-quality services and large-scale public education interventions to reduce social barriers."

Source: Jacqueline Darroch and Susheela Singh. "Trends in contraceptive need and use in developing countries in 2003, 2008, and 2012: An analysis of national surveys." *The Lancet* 381 (May 18, 2013): 1756–1762.

family size. It also limited paid maternity leave to a maximum of two children, scaling the delivery fee according to number of children and reducing income tax relief from five to three children. In 1984, it even went so far as to give special priority in school admission to all children born to women with university degrees while penalizing non-degree-holding women with more than two children. The presumed but dubious rationale was that educated women have brighter children whose births should be encouraged while discouraging the less educated (and presumably less intelligent) women from bearing more children. But fertility fell so dramatically that by 2004, the city-state had introduced incentives to *increase* fertility (as with Japan and Europe, relaxed controls on immigration would be more cost-effective). China has by far the most comprehensive set of state-enforced incentives and disincentives; they are described in the case study at the end of this chapter.

Fourth, governments can attempt to *coerce people* into having smaller families through the power of state legislation and penalties. For obvious reasons, few governments would attempt to engage in such coercion; not only is it often morally repugnant and politically unacceptable, but it is also almost always extremely difficult to administer. The defeat of Indian Prime Minister Indira Gandhi's government in 1977 was largely due to popular resentment of the government's forced-sterilization program.

Finally, no policy measures will be successful in controlling fertility unless efforts are made to *raise the social and economic status of women* and hence create

conditions favorable to delayed marriage and lower marital fertility.[28] A crucial ingredient in any program designed to lower fertility rates is the increased education of women, followed by the creation of jobs for them outside the home. The availability of income-earning opportunities can lead young women to delay marriage by enabling them to become economically self-sufficient and therefore in a better position to exercise control over their choice of partner and the timing of marriage. It can also reduce family pressures for early marriage by allowing women to make a contribution to parental household income. An independent source of income also secures a stronger position for married women in the household, reducing their dependence on other family members, particularly male offspring, for economic security. Furthermore, it enables women to consider the opportunity costs of additional children when childbearing competes with income-generating activities. In general, the availability of outside sources of income offers women genuine alternatives to early marriage and frequent childbearing, which are often motivated by their lack of resources. An additional benefit of employment outside the home is that it reduces women's isolation, which is often an impediment to the provision of family-planning services, and can increase their household bargaining power.[29]

The importance of these policies to improve the role and status of women was underlined at the 1994 Cairo International Conference on Population and Development, where emphasis was placed on the general empowerment of women, especially in the area of **reproductive choice**. The Cairo Program of Action summarized this position in the following manner:

Reproductive choice The concept that women should be able to determine on an equal status with their husbands and for themselves how many children they want and what methods to use to achieve their desired family size.

> The empowerment and autonomy of women and the improvement of their political, social, economic and health status . . . [are] essential for the achievement of sustainable development and . . . for the long-term success of population programs. Experience shows that population and development programs are most effective when steps have simultaneously been taken to improve the status of women.[30]

What the Developed Countries Can Do

When we view the problems of population from the perspective of global resources and the environment, as we should, the question of the relationship between population size and distribution and the depletion of many nonrenewable resources in developed and underdeveloped countries assumes major importance. In a world where 4.5% of the population, located in one country, the United States, accounts for nearly one-fifth of the annual world total energy use, we are clearly not dealing only or even primarily with a problem of population numbers when it comes to environment and resources. We must also be concerned with the impact of rising affluence and the very unequal worldwide distribution of incomes on the depletion of many nonrenewable resources such as petroleum, certain basic metals, and other raw materials essential for economic growth. The use of fossil fuel energy to power private automobiles, operate home and office air conditioners, and so on in the developed nations remains the major contributor of carbon dioxide (CO_2) gases into the atmosphere and to the phenomenon of greenhouse global warming (see Chapter 10).[31] It also means that there is potentially that much less to fertilize

small family farms in the less developed nations. Alternatively, it means that poor families will have to pay more to obtain these valuable resource inputs.

Many similar examples could be given of the gross inequalities in global resource use. Perhaps more important, one could cite innumerable instances of the unnecessary and costly waste of many scarce and nonrenewable resources by the affluent developed nations. The point, therefore, is that any worldwide program designed to engender a better balance between resources and people by limiting developing-country population growth through social intervention and family planning must also include the responsibility of rich nations to simplify their own consumption demands and lifestyles. Such changes would free resources that could then be used by poor nations to generate the social and economic development essential to slowing population growth.

In addition to simplifying lifestyles and consumption habits, one other positive (if unlikely) internal policy that rich nations could adopt to mitigate current world population problems would be to liberalize the legal conditions for the international immigration of poor, unskilled workers and their families from Africa, Asia, and Latin America to North America, Europe, Japan, and Australia. The international migration of peasants from Europe to North America, Australia, and New Zealand in the nineteenth and early twentieth centuries was a major factor in moderating the problems of underdevelopment and population pressure in European countries. No such safety valve or outlet exists today for developing countries. In fact, what few outlets existed have over the past two decades been progressively closed. Yet clearly, many labor-scarce societies could benefit economically from international migration, and the benefits to developing countries would be enormous. For example, the United Nations has estimated that legal barriers to international migration from the developing to the developed world cost developing nations at least $250 billion a year.[32]

How Developed Countries Can Help Developing Countries with Their Population Programs

There are a number of ways in which the governments of rich countries and multilateral donor agencies can help the governments of developing countries achieve their population policy objectives sooner. The most important of these concerns the willingness of rich countries to be of genuine assistance to poor countries in their development efforts, particularly in sub-Saharan Africa. Such genuine support would consist not only of expanded public and private financial assistance but also of improved trade relations, such as tariff- and quota-free access to developed-country markets, more appropriate technology transfers, assistance in developing indigenous scientific research capacities, better international commodity-pricing policies, and a more equitable sharing of the world's scarce natural resources. (These and other areas of international economic relations between rich and poor countries will be examined in Part Three.)

There are two other activities more directly related to fertility moderation in which rich-country governments, international donor agencies, and private nongovernmental organizations (NGOs) can play an important assisting role. The first is the area of research into the technology of fertility control, the

contraceptive pill, modern intrauterine devices (IUDs), voluntary sterilization procedures, and, particularly in the age of AIDS, effective barrier contraception. Research has been going on in this area for a number of years, almost all of it financed by international donor organizations, private foundations, and aid agencies of developed countries. Further efforts to improve the effectiveness of this low-cost contraceptive technology while minimizing the health risks should be encouraged.

The second area includes financial assistance from developed countries for family-planning programs, public education, and national population policy research activities in the developing countries. This has traditionally been the primary area of developed-country assistance in the field of population. Total resources devoted to these activities have risen dramatically. It remains an open question, however, whether such resources (especially those allocated to premature family-planning programs) might not have been more effectively used to achieve their fertility goals had they instead been devoted directly to helping low-income countries to raise the levels of living of their poorest people. As pointed out earlier, it is of little value to have sophisticated family-planning programs when people are not motivated to reduce family size.

We conclude with a note of optimism. Fertility rates in many of the poorest countries, such as Bangladesh and most of the countries in sub-Saharan Africa, have experienced an impressive decline. Population experts have lowered their estimates of world population growth for coming decades. In no small part, this decline is the result of more widespread availability of family planning. This change helps set the stage for an opportunity for successful development efforts in the coming years, but developed countries need to do their part in providing expanded development assistance, especially efforts focused on the need and opportunity to greatly reduce the incidence of poverty, which remains the biggest cause of high rates of fertility.

Case Study 6

Population, Poverty, and Development: China and India

Two of the world's fastest growing economies, China and India, also happen to be the world's two most populous nations, with some 1.35 billion and 1.22 billion people, respectively. Both countries continue to grow, albeit at slower paces. According to the 2012 UN Population Division's medium-variant projections, by 2030 India will become the world's most populous nation, with 1.48 billion people. The United Nations projects a population of 1.45 billion in China by 2030, which is then projected to fall to about 1.28 billion by about 2065. In contrast, India's population is projected to continue growing until about 2065, reaching a peak of about 1.64 billion around 2065 before its population finally starts to decline.

India's 2013 population of more than 1.2 billion is well over triple the number at independence, despite introducing the world's first family-planning policy in 1950. At 1.35 billion, China's population remains larger, but its highly restrictive one-child policy, despite being fairly successful at slowing fertility, has apparently been less successful than approaches based on women's empowerment and education in some parts of India, such as the state of Kerala. What can we learn about population and development from the world's most populous countries?

In India, it is common to hear the view that "everything is growing faster in China than India, except for population." India, which had well under two-thirds of China's population half a century ago, is projected to surpass China's population by 200 million people by 2050. Like most developing countries, both countries' populations grew rapidly when their mortality rates fell and their birth rates fell much more slowly. Both countries have viewed population pressures as threatening prospects for future development.

It is well known that as incomes rise, fertility falls, due largely to the increased opportunity cost of women's time. The causality between fertility and growth runs in both directions. China's rapid economic growth since about 1980 has also been attributed in part to its lower fertility rate. India's increased growth rate since about 1990 may also be related to its more moderate decline in fertility. Both may reflect in part the "demographic dividend" examined earlier in the chapter. Thus, population policy can potentially play an important role in setting the stage for growth. Moreover, to the degree that we accept Nobel economics laureate Amartya Sen's view that development is freedom, the greater opportunities available to young women when fertility is reduced or delayed is itself a key indicator of development success, and population policy can help realize these goals.

Population Policy in China

China has been the world's most populous nation for centuries. After the Communist takeover in 1949, Chinese leaders led by Mao Zedong took a broadly pronatalist stance, believing that a communist society could solve any population problems and that a larger population would mean a more powerful country. Mao (whom China's leaders still call "60% right" about policy) went so far as to send advocates of population control to jail. However, in the face of famine in the late 1950s, these policies moderated.

In 1980, China initiated a tough new drive to deter births, with a goal of lowering the annual birth rate to 1% during the decade. Stringent and often

draconian measures to achieve that goal were introduced in 1982 and 1983 as the Chinese government adopted a policy of one child per family. Social and political pressures to limit family size to one child included requiring women to appeal to the neighborhood committee or council for formal permission to become pregnant. Although first births were routinely approved, second births were usually approved only if the first child had a serious birth defect or if the woman had remarried. Economic incentives included giving priority to one-child families in housing, medical care, and education. Mothers of two or more children were often denied promotions, and steep fines, sometimes in excess of 10 times China's per capita income, were levied for second and third children. Although a growing number of exceptions have been introduced in recent years, notably allowing a second child if the first child is a girl, and allowing a second child if *both* parents are themselves only children; at the Third Plenum in 2013, it was announced that the policy would be relaxed further, with a second child permitted if *either* parent is an only child (subject to verification by the government). Despite these adjustments, the policy remains probably the most restrictive in the world.

Given such rigid national policies and a strong cultural preference for boys, it is not surprising that there have been many reports of girls receiving less medical attention and also of selective abortion of female fetuses and even female infanticide ("gendercide").

Male-to-female ratios are higher than the normal level in many Asian countries, and gender bias is at least partly to blame. Amartya Sen's pioneering 1992 research estimated that 44 to 50 million women were already "missing" in China, depending on whether the comparison is to Western countries or to Africa. The most recent data confirm that these trends have continued, with Stephan Klasen and Claudia Wink calculating that well over 6% of women are "missing" in China. It is estimated that in 2010, there were 106 males for every 100 females in China overall; and in a trend pointing to a worsening of the problem, close to 118 boys were born for every 100 girls. Such balance is all but unprecedented in recorded world history. Of course, these current cultural preferences may change with further economic development. In fact, this ratio is now falling, albeit very, slightly, from a recent peak ratio of 120 boys to 100 girls, according to official government data.

The full impact of China's population control programs is uncertain. Only time will tell whether the benefits of reduced population growth achieved through severe social and economic pressures for one-child families will be worth the cost of a harsh break with traditional family norms and perceptions regarding the value of children. Resistance in rural areas, where well over 60% of the population still resides, was apparently so widespread that in August 1988, when the Chinese government discovered to its surprise that the population had already passed the 1 billion mark, it decided to increase its enforcement of the one-child norm in rural as well as urban areas. However, popular opposition again caused it to relax its stringent controls slightly and to focus more on elevating the status of women and providing greater old-age security.

By the mid-1990s, China's fertility rate reached 1.9 births per woman, and it fell further to below 1.6 by 2013. This rate is below replacement level and is consistent with a slow long-term decline in population growth. Because of population momentum, China's population has continued to grow as larger, younger cohorts replace smaller, older ones. However, the country's largest cohorts are now passing out of their childbearing years. The population growth rate has slowed dramatically, and the population is not expected to exceed 1.4 billion at its peak before starting to fall.

In practice, many families have two children rather than one, and others in rural areas, including ethnic minorities exempted from the one-child policy, have more than two children. But fertility rates are extremely low in the urban areas to which an increasing share of the rural population is moving. Typical estimates suggest that upward of 250 million fewer people were born in China than would have been born without the one-child policy—an enormous impact. There are now concerns that China will have to reevaluate the policy to prevent too high a dependency ratio of retired to working adults.

The apparent success of China's tough fertility policies has led some observers to see advantages of dictatorship rather than democracy in spurring development. But in fact there are several ways

in which the lack of a free press in particular and democracy more generally has held back China's development. In Mao's "Great Leap Forward," at least 30 million people died due to poor government decisions and incentives for bureaucrats to send overly optimistic reports from the field. Democratic India, by contrast, has not had a famine since independence in 1947. Amartya Sen attributes China's lead in economic growth to its massive investments in health and education, which India has lacked. Dictatorship can be good or bad for fertility programs or any other aspects of development. But the risks of a very bad outcome are probably much lower with democracy.

Successful population control in China comes with its own risks and unintended consequences as well as substantial rewards. By 2050, China will have almost twice as many people above age 50 as below age 20. In addition, while fertility has fallen, preference for boys over girls has actually intensified. Many Chinese families seem to feel that if they are to have only one child, it should be a boy, to carry on the family name and help support the parents in their old age. A 2007 report from China's State Population and Family Planning Commission concluded that the country may have about 30 million more men than women of marriageable age by 2020 and warned that the result could be social instability. A 2009 study by economists Shang-Jin Wei and Xiaobo Zhang provided robust evidence that China's recent new surge in savings is caused in large part by competitive investments in housing and other wealth accumulation by families seeking to attract brides for their sons. Such a savings surge even has potential implications for global imbalances (see Chapters 12 and 13).

The high fraction of the population now of working age has provided, in China's case at least, a "demographic dividend." But the next phase of the demographic transition is likely to pose major challenges for China, with its big drops in fertility ahead of historical patterns in other countries; hence the saying that "China must get rich before it gets old." But as far as is known, no society has ever faced such rapid population aging. By 2013, the labor force in China had already begun to slowly shrink.

In sum, although rapid economic growth and coercion and incentives in family planning account for part of China's drop in fertility, other factors include female literacy, improved child health, and greater economic opportunities for women. These have also been factors in the strong success in fertility reduction in the Indian state of Kerala.

Population Policy in India

In 1949, India became the first country to implement a national family-planning program. It has proved to be relatively ineffective and has proceeded in fits and starts. By the early 1970s, observers were becoming increasingly alarmed by the very high rate of population growth in India.

When Prime Minister Indira Gandhi tried to implement drastic population control in 1975–1977, a period during which she seized dictatorial powers, it was a failure. Reports of forced sterilizations, sometimes in mass "sterilization camps," and other coercive measures ended up giving family planning a bad reputation in many areas of the country. Indeed, public revulsion toward these coercive fertility policies helped bring the "emergency" period to an end more quickly, and when elections were held in 1977, Gandhi was voted out of office. Her return to power in the elections of 1980 was made possible in part by her commitment not to reintroduce coercive birth control policies. Years later, villagers in some parts of India avoided health workers out of fear of forced sterilization.

However, family planning did become more widely practiced. Some of the acceptance of limits on family size reflected rising income among the close to 250 million middle-class Indians and somewhat improved conditions among a significant fraction of the poor. Some of it reflected modest moves back to policy incentives to encourage smaller families. There have been variations from state to state. In Madhya Pradesh, individuals who had a third or subsequent child after January 2001 were banned from running for election to village council posts, spurring considerable controversy. In 2004, an uproar over reported higher fertility among Muslims than among Hindus—reports that turned out to be greatly exaggerated—revealed the continuing political sensitivity of the issue.

As fertility has fallen, a preference for boys over girls has developed, particularly in the "Hindi belt" in northern India. The result is a "missing women" problem parallel to China's. Stronger male bias is

actually found in the better-off states of India, and researchers Jean Drèze, Anne-Catherine Guio, and Mamta Murthi found that "female disadvantage in child survival is significantly lower in districts with higher poverty levels."

P. N. Mari Bhat and A. J. Francis Zavier analyzed data from the National Family Health Survey and estimated that "in northern India, girls currently constitute about 60% of the unwanted births and that the elimination of unwanted fertility has the potential to raise the sex ratio at birth to 130 boys per 100 girls." Such a dramatic imbalance seems likely to lead to future social stress. As of 2010, the ratio of males to females in India as a whole had reached 108 to 100, one of the highest in the world; the ratio at birth is now approximately 112 to 100. But this imbalance is not inevitable—social development can make all the difference.

Kerala, a state on India's southwest coast that has emphasized poverty reduction and human development, is an important case in point. By the mid-1990s, Kerala's fertility rate had fallen to just 1.7 births per woman and has remained low—still 1.7 in 2010 (Indian Planning Commission)—implying a slowly falling population over time (in the absence of in-migration). Thus, Kerala's fertility rate was until recently less than that of China, but unlike China, the dramatic reductions in fertility in Kerala were achieved without coercion, let alone China's huge direct economic incentives for lowered fertility. In India overall, the fertility rate is 2.5, and in Bihar, a socially backward state, the fertility rate in 2010 was 3.7, similar to that of Pakistan. Overall, there are actually slightly more females than males in Kerala.

Norms of behavior can be highly influential, and multiple equilibria resulting from different expected norms of behavior are possible, as explored in Chapter 4 and applied to population norms in this chapter in section 6.4. There has been a slow but steady movement in attitudes toward the notion that a happy family is a small family in the India of today. Amartya Sen has observed that sharp declines in the rate of fertility in India in literate states, particularly Kerala and Tamil Nadu, was greatly influenced by public discourse on the negative impacts of high fertility. Discussions have emphasized problems caused both for young women and for communities as a whole.

In addition, and especially more recently, greater awareness on the part of rural women of urban norms of women's empowerment, facilitated by village television and the Internet, may have made a big impact, proving that cultural awareness can be powerful. Robert Jensen and Emily Oster provide some evidence on the power of television in India.

While television, billboard, and other advertising in India has promoted family planning, and there is some evidence that these campaigns can have some positive impact on their own, such efforts have been far more successful when the social climate has changed enough to be receptive to the message. This helps explain why nongovernmental organizations working for comprehensive rural development have often apparently had more success than many government programs. In Kerala, if the official campaigns supporting small families have seemed more effective than elsewhere, it is largely because both social and economic conditions on the ground changed previously or simultaneously. More than 85% of women in Kerala are literate, which means they have more power in the household and opportunities in the workforce as well as the ability to read print materials about fertility and family planning. Some of Kerala's success is due to the traditionally higher status of women in the local culture. But there is no reason that Kerala's success cannot be duplicated elsewhere in India if there is the political and social will.

Sen concluded that Kerala's impressive results in fertility reduction were achieved through active public dialogue that resulted ultimately in the emergence of new social attitudes and values—and that such dialogues on this sensitive subject were possible only because of the very high level of female literacy in the state. Indeed, Sen pointed out that female literacy in Kerala was unmatched by any of China's provinces.

The success of Kerala suggests that fertility reduction may depend not on rapid economic growth or even, in its absence, on draconian governmental policies but rather on grassroots human development that emphasizes women's empowerment, in which civil society plays a leading role. ■

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Concepts for Review

Crude birth rate
Death rate
Demographic transition
Doubling time
Family-planning programs
Hidden momentum of population growth
Life expectancy at birth
Malthusian population trap
Microeconomic theory of fertility
Natural increase
Net international migration
Population-poverty cycle
Population pyramid
Rate of population increase
Replacement fertility
Reproductive choice
Total fertility rate (TFR)
Under-5 mortality rate
Youth dependency ratio

Questions for Discussion

1. Population growth in developing nations has proceeded at unprecedented rates over the past few decades. Compare and contrast the present rate of population growth in less developed countries with that of the modern developed nations during their early growth years. What has been the major factor contributing to rapid developing country population growth since the Second World War? Explain your answer.
2. What is the relationship between the age structure of a population and its dependency burden? Is the dependency burden higher or lower in developing countries? Why?
3. Explain the notion of the hidden momentum of population growth. Why is this an important concept for projecting future population trends in different developing nations?
4. Describe briefly the theory of the demographic transition. At what stage in this transition do most developing countries seem to be? Explain your answer.
5. How does the microeconomic theory of fertility relate to the theory of consumer choice? Do you think that economic incentives and disincentives influence family size decisions? Explain your answer, giving some specific examples of such incentives and disincentives.
6. "The world population problem is not just a matter of expanding numbers but also one of rising affluence and limited resources. It is as much a problem caused by developed nations as it is one deriving from developing countries." Comment on this statement.
7. List and briefly describe the principal causes of high population growth in developing countries and the major consequences.
8. Explain why fertility rates are falling much more rapidly in some developing countries than in others.
9. Outline and comment briefly on some of the arguments *against* the idea that population growth is a serious problem in developing nations.
10. Outline and comment briefly on some of the arguments *in support of* the idea that population growth is a serious problem in developing nations.
11. Outline and comment briefly on the various policy options available to developing countries' governments in their attempt to modify or limit the rate of population growth.
12. Suppose that a study finds that there is complementarity in fertility decisions. What would this mean? What are the possible implications?
13. What aspects of population policy alternatives—including their strengths and weaknesses—are illustrated by the cases of China and India?

Notes

1. The 1970s marked the apogee in the history of world population growth. By the end of the decade, rates had begun to decline in a large number of developing countries, and it became clear that the pace of world population growth had peaked. For some evidence of this turning point, see Bernard Berelson, W. Parker Mauldin, and Sheldon Segal, "Population: Current status and policy options," *Social Science and Medicine* 14c (1980): 71–97, and World Bank, *World Development Report, 1984* (New York: Oxford University Press, 1984), ch. 4.
2. A convenient shorthand method of calculating doubling time is simply to divide any growth rate into the number 70. For example, something (an asset, population, GNI, etc.) growing at 2% per year will double its value in approximately 35 years. You may recall from algebra that the doubling time of a value (such as the real GNI of an economy) growing at rate p% per year may be found with the formula $[1+p/100]^{T} = 2$. Taking natural logs of each side, $T\ ln[1+p/100]\ ln\ 2$. The natural log of 2 is approximately 0.7. On the

left- hand side, for small p, $ln[1+p/100]$ is approximately equal to $p/100$. Substituting, $Tp/100 = 0.7$, or $T = 70/p$. For example, for reasonably small values of growth such as 4%, simply divide 70 by the percentage growth: After about $70/4 = 17.5$ years, national income would double. As an additional approximation, to find the growth of income per capita, simply subtract the rate of population growth. So if population is growing at 2% per year, in this example, income per capita would be growing at 4% – 2% = 2% per year, and income per capita would double in approximately $70/2 = 35$ years.

3. Population Reference Bureau, *World Population Data Sheet, 2012* (Washington, D.C.: Population Reference Bureau, 2012).
4. The World Bank, *World Bank World Development Indicators 2013* (Washington, D.C.: The World Bank), tab. 2.1.
5. For more discussion, see John Bongaarts, "Population policy options in the developing world," *Science* 263 (1994): 771–776.
6. For an interesting reverse-population-alarmist perspective, see Philip Longman, "Think again: Global aging," *Foreign Policy* (2012).
7. Replacement fertility may be approximated by the value of TFRR $\approx (1+SRB)/p(A_M)$, where TFRR represents the replacement value for the total fertility rate, SRB represents the ratio of male to female births, and $p(A_M)$ represents the probability of surviving to the mean age of the fertility schedule. See Samuel Preston, Patrick Heuveline, and Michel Guillo, *Demography: Measuring and Modeling Population Processes* (Oxford: Blackwell, 2001). Note that with gender balance and high female survival to mean fertility schedule (close to 30 years of age), the TFRR is close to 2.1. But when survival proportions are among the lowest in the world—close to 0.60 in the cases of Afghanistan, Burundi, and Sierra Leone; replacement total fertility rates above 3.3 are implied. Under these conditions, a fertility rate of 2.1 would actually result in population decline. See Thomas J. Espenshade, Juan Carlos Guzman, and Charles F. Westoff, "The surprising global variation in replacement fertility," *Population Research and Policy Review* 22, No. 5-6 (2003): 575–583, who calculate that the replacement rate across countries ranges from 2.05 to 3.43.
8. See Timothy W. Guinnane, "The historical fertility transition: A guide for economists," *Journal of Economic Literature* 49, No. 3 (2011): 589–614.
9. A geometric progression is simply a doubling (or some other multiple) of each previous number, as in 1, 2, 4, 8, 16, 32, 64, 128, 256, 512, 1,024, and so on. Like compound interest, geometric progressions have a way of reaching large numbers very rapidly.
10. Recent supporting evidence is found in Quamrul Ashraf and Oded Galor, "Dynamics and stagnation in the Malthusian epoch,"*American Economic Review* 101, No. 5 (2011): 2003–2041. The authors find that "technological superiority and higher land productivity had significant positive effects on population density but insignificant effects on the standard of living, during the time period 1–1500 CE."

10a. At lower levels of expected fertility, the slope of the S-shaped curve may increase at an *increasing* rate due to the presence of older children who can take care of younger siblings, together with a stronger family response to the negative impact of average fertility on wages and/or the decreased probability that any one child will gain formal-sector employment. But at higher levels of expected fertility, the slope of the S-shaped curve may increase at a *decreasing* rate due to worsening availability of education and health and increasing costs of raising additional children in relation to the benefits of doing so.

11. This interpretation is from Partha Dasgupta, *An Inquiry into Well-Being and Destitution* (New York: Oxford University Press, 1993), and is discussed in Pranab Bardhan and Chris Udry, *Development Microeconomics* (New York: Oxford University Press, 1999), p. 25.
12. The classic contribution is Simon Kuznets, *Fertility Differentials between Less Developed and Developed Regions: Components and Implications* (New Haven, Conn.: Economic Growth Center, Yale University, 1974).
13. See Chapter 9, and see Christopher Udry, "Gender, agricultural production, and the theory of the household," *Journal of Political Economy* 104 (1996): 1010–1046.

14. See, for example, Nancy Birdsall, "Economic approaches to population growth," in *Handbook of Development Economics*, vol. 1, eds. Hollis B. Chenery and T. N. Srinwasan (Amsterdam: Elsevier, 1988), pp. 478–542; Jean Drèze, Anne-Catherine Guio, and Mamta Murthi, "Mortality, fertility, and gender bias in India: A district-level analysis," *Population and Development Review* 21 (1995): 745–782; and Partha Dasgupta, "The population problem: Theory and evidence," *Journal of Economic Literature* 33 (1995): 1879–1902.
15. For empirical evidence that low fertility results mostly from economic, social, cultural, and educational improvements in a population and only slightly from the availability of family-planning programs, see Lant H. Pritchett, "Desired fertility and the impact of population policies," *Population and Development Review* 20 (1994): 1–55.
16. For an analysis of this conflict, see Jason L. Finkle and Barbara Crane, "The politics of Bucharest: Population, development, and the new international economic order," *Population and Development Review* 1 (1975): 87–114. Although this conflict was less visible in the Second World Population Conference held in Mexico City in August 1984 and was a minor issue beneath that of reproductive choice and the empowerment of women at the Third Conference held in Cairo in 1994, it remained prominent in the discussions of many developing-world delegates.
17. For a more detailed discussion of these divergent opinions, see Michael S. Teitelbaum, "Population and development: Is a consensus possible?" *Foreign Affairs* 52 (1974): 749–757. See also Timothy King and Allen Kelley, *The New Population Debate: Two Views on Population Growth and Economic Development* (Washington, D.C.: Population Reference Bureau, 1985), and Robert H. Cassen, *Population Policy: A New Consensus* (Washington, D.C.: Overseas Development Council, 1994).
18. See, for example, Colin Clark, "The 'population explosion' myth," *Bulletin of the Institute of Development Studies* 1 (1969); Julian Simon, *The Ultimate Resource* (Princeton, N.J.: Princeton University Press, 1981); Nick Eberstadt, "Population and economic growth," *Wilson Quarterly* (Winter 1986), pp. 95–129; and National Research Council, *Population Growth and Economic Development: Policy Questions* (Washington, D.C.: National Academy Press, 1986).
19. Samir Amin, "Underpopulated Africa," paper presented at the African Population Conference, Accra, Ghana, December 1971.
20. Ibid., fn. 2.
21. Ibid., p. 3. Of course, in the decades after these arguments were promulgated, population did dramatically increase in these regions. For another perspective on long-run benefits of greater population density via faster technological progress, see Michael Kremer, "Population growth and technological change: One million B.C. to 1990," *Quarterly Journal of Economics* 108 (1993): 681–716.
22. For example, see Paul R. Ehrlich and Anne H. Ehrlich, *Population, Resources, and Environment: Issues in Human Ecology*, 2nd ed. (New York: Freeman, 1972); Lester R. Brown, *In the Human Interest: A Strategy to Stabilize World Population* (New York: Norton, 1974); and Paul R. Ehrlich and Anne H. Ehrlich, *The Population Explosion* (New York: Simon & Schuster, 1990).
23. We are grateful to Professor Harold Votey for suggesting this illustration. Details on the Solow model are found in Chapter 3 and Appendix 3.2.
24. William Easterly made the very basic argument in 1999 that "population growth does not vary enough across countries to explain variations in per capita growth. GDP per capita growth varies between -2 and $+7$ percent for all countries between 1960 and 1992. Population growth varies only between 1 and 4 percent." Easterly, *The Elusive Quest for Growth* (Cambridge, Mass.: MIT Press, 1999), p. 92.
25. For a detailed review of this evidence, see Cassen, *Population Policy*, pp. 14–22; Dennis A. Ahlburg et al., *Population and Economic Development: A Report to the Government of the Commonwealth of Australia* (Canberra: Australian International Development Assistance Bureau, 1994); and Geoffrey McNicoll, "Effects of population growth: Visions and revisions," *Population and Development Review* 21 (1995): 307–340. As the Ahlburg report demonstrates, not all of these consequences are unambiguously negative. Much depends on the particular country and its demographic situation.

26. Robert Cassen, *Population Policy*, p. 12.
27. See Birdsall, "Economic approaches to population growth," pp. 523–529.
28. Sousan Abadian, "Women's autonomy and its impact on fertility," *World Development* 24 (1996): 1793–1809. See also Shireen J. Jeejeebhoy, *Women's Education, Autonomy, and Reproductive Behavior: Experiences from Developing Countries* (Oxford: Clarendon Press, 1995).
29. See Fenohasina Maret-Rakotondrazaka, "The effect of working outside the home on women's empowerment in Nigeria," Working Paper, George Washington University, 2014.
30. United Nations, *International Conference*, para. 4.1. See also Nancy Folbre, "Engendering economics: New perspectives on women, work, and demographic change," in *Proceedings of the World Bank Annual Conference on Development Economics, 1995*, eds. Michael Bruno and Boris Pleskovic (Washington, D.C.: World Bank, 1996).
31. The United Nations Population Fund's *State of the World's Population* 2009 edition (New York: United Nations, 2009) examines relationships between population and climate change. Cited energy data are from World Resources Institute, *World Resources, 2005* (New York: Oxford University Press, 2005), tab. 7.
32. More detail on the scale and benefits of remittances from international migration is provided in Chapter 14.

7

Urbanization and Rural-Urban Migration: Theory and Policy

Cities will increasingly become the main players in the global economy.
—*Kofi Annan, former secretary general of the United Nations and Nobel laureate for Peace*

The global economy is led by metropolitan economies.
—*Brookings Institution,* Global MetroMonitor, 2010

More than one billion persons are living in slums. With rapid urbanization it is expected that in the next two decades there will be nearly two billion new urban residents, 90% of them in developing countries.
—*World Bank,* Addressing the Urbanization Challenge, 2013

Any strategy for a less desperate and more deliberate urbanization must include efforts to improve public services in rural areas.
—*World Bank,* World Development Report, 2009

In this chapter, we focus on one of the most complex and nuanced dilemmas of the development process: the phenomenon of massive and historically unprecedented movements of people from the rural countryside to the burgeoning cities of Africa, Asia, and Latin America. In Chapter 6, we documented the extraordinary increase in world and especially developing-country populations over the past few decades. According to a 2013 UN estimate, by 2050 the world population is expected to reach 9.6 billion people, and nowhere will population growth be more dramatic than in the cities of the developing world. Indeed, according to estimates by the UN Population Division, for the first time in human history, in 2009 globally "the number of people living in urban areas (3.42 billion) had surpassed the number living in rural areas (3.41 billion)." The global urban majority is now widening with each passing year.[1]

After reviewing trends and prospects for overall urban population growth, we examine in this chapter the potential role of cities—both the modern sector and the urban informal sector—in fostering economic development. We then turn to a well-known theoretical model of rural-urban labor transfer in the context of rapid growth and high urban unemployment. In the final section, we evaluate various policy options that governments in developing countries may wish to pursue in their attempts to moderate the heavy flow of rural-to-urban migration and to ameliorate the serious unemployment problems that continue to plague their crowded cities. We also examine how the great potential dynamism and productivity of developing cities can be better harnessed for

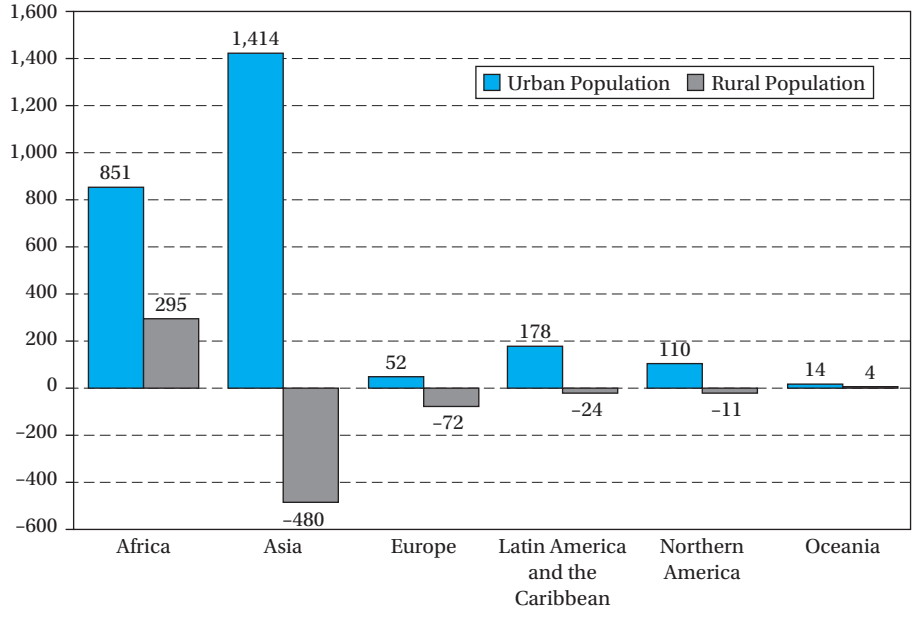
rapid and more inclusive economic development. This chapter's case study looks at patterns of migration in India and Botswana.

7.1 Urbanization: Trends and Living Conditions

While the world as a whole became majority urban in 2009, even the developing world is expected to become majority urban before 2020 (although the United Nations projects that the least developed countries will not reach this milestone until after 2050). Currently, most urban growth has occurred in cities in Asia and Africa. Indeed, in 2012 the United Nations projected that the urban population of Africa will grow from 414 million in 2012 to over 1.2 billion by 2050; and the urban population of Asia will grow from 1.9 billion to 3.3 billion. Thus taken together, the United Nations projects that Asia and Africa will account for some 86% of the global urban population increase in this period. In fact, there will be so much rural-to-urban migration in Asia that its rural population will actually decline in this period, as seen in Figure 7.1.[2]

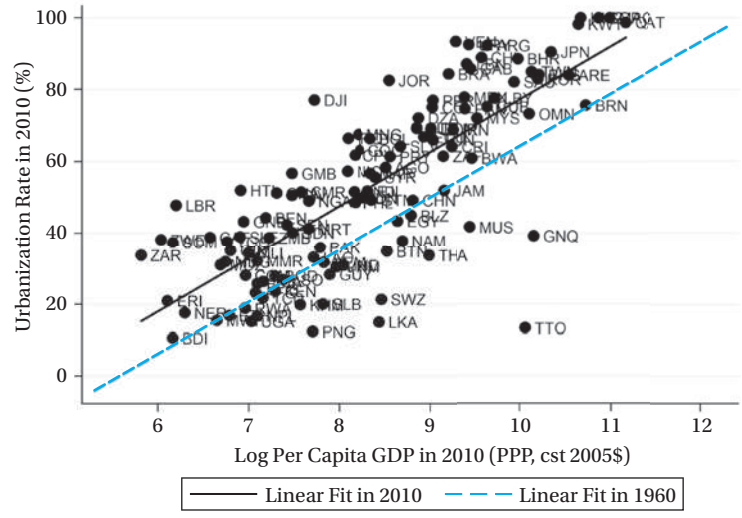
Urbanization rates increase whenever urban population growth exceeds rural population growth. The positive association between urbanization and

FIGURE 7.1 Changes in Urban and Rural Population by Major Areas between 2011 and 2050 (in millions)



Source: United Nations, "Africa and Asia to lead urban population growth in the next four decades,"press release, http://esa.un.org/unup/pdf/WUP2011_Press-Release.pdf. Reproduced by permission of United Nations Publications.

FIGURE 7.2 Relationship between Urbanization and Per Capita GDP, 2010 with Comparison to Relationship in 1960

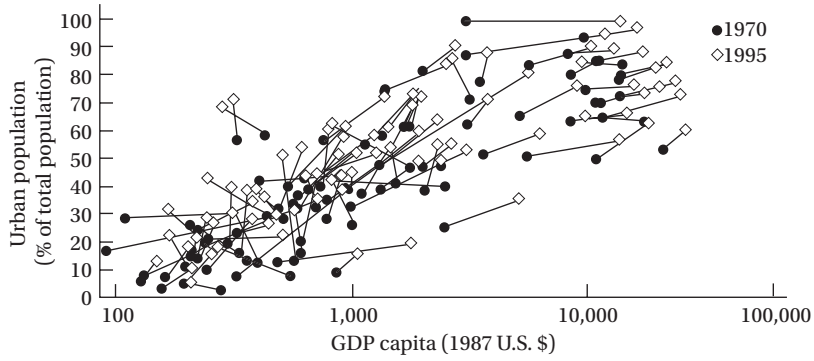


Sources: Luc Christiaensen, Remi Jedwab, Peter Lanjouw, and Harris Selod, "Urbanization and Poverty Reduction," draft working paper, 2014 – special thanks to Remi Jedwab. Data sources: Maddison (2008), United Nations (2011) and World Bank (2013).
Note: This figure shows the relationship between the urbanization rate and the log per capita of GDP, in 2005 PPP, for 119 developing countries in 2010. The solid line is a linear fit for the data in 2010. The dashed line is a linear fit for the data in 1960 (the scatter plot is not shown for 1960).

per capita income is one of the most obvious and striking "stylized facts" of the development process. Urbanization rates increase whenever urban population growth exceeds rural population growth. Generally, the more developed the country, measured by per capita income, the greater the share of population living in urban areas. The black linear fit line in Figure 7.2 shows urbanization versus the log of 2010 GNI per capita; the highest-income countries, such as Japan, are also among the most urbanized, while the very poorest countries, such as Burundi, are among the least urbanized. Urbanization is proceeding rapidly. According to UN projections, there will be almost 5 billion urban dwellers by 2030, nearly five-eighths of projected world population for that year. The projected 2030 urban population of Africa of 748 million will be larger than the entire 685 million population of Europe.

At the same time, while individual countries become more urbanized as they develop, today's poorest countries are far more urbanized than today's developed countries were when they were at a comparable level of development, as measured by income per capita. Returning to Figure 7.2, the dashed blue linear fit line shows the relationship between income per capita and urbanization that prevailed in 1960. A comparison of the two lines reveals that for any given income in 2010, a country that had the identical income in 1960 was significantly less urbanized.

FIGURE 7.3 Proportion of Urban Population by Region, 1970–1995



Source: The United Nations is the author of the original material. *World Urbanization Prospects: The 2009 Revision*. © 2009 United Nations. Reproduced with permission.

In recent decades urbanization has continued in nearly all developing countries, even those that have experienced only minimal industrialization. Figure 7.3 shows urbanization over time and across income levels over the quarter century from 1970 to 1995. Each line segment represents the trajectory of one country, starting from the solid dots, which represent the 1970 income and urbanization level for a given country and ending at the end of the line segments (marked by a diamond), which represent the corresponding 1995 income and urbanization level for the same country. Although the World Bank caption to the figure stated that "urbanization is closely associated with economic growth," the figure may also be interpreted as showing that urbanization is occurring everywhere, at high and low levels of income and whether growth is positive or negative. Even when the lines point to the left, indicating shrinking incomes per capita over the period, they still generally point upward, indicating that urbanization continued. In short, urbanization is happening everywhere in the world, although at differing rates.

Thus, it becomes clear that urbanization is not driven solely by income. In addition, some countries with approximately the same income level are significantly more or less urbanized, partly due to differing domestic policies. So we need to consider urbanization carefully—is it only correlated with economic development, or is causation also at work?

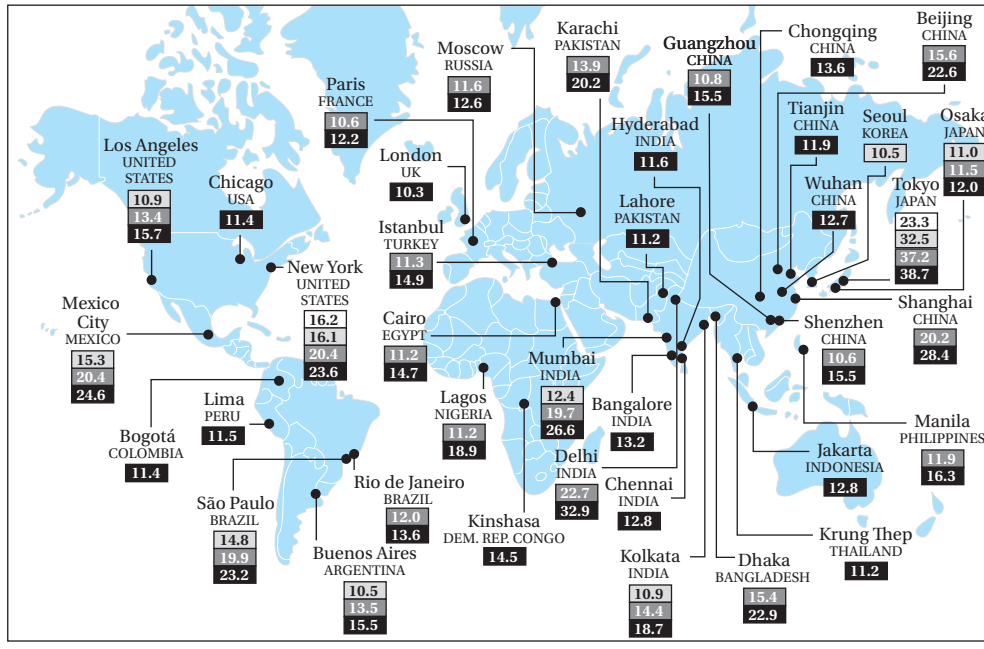
Indeed, one of the most significant of all modern demographic phenomena is the rapid growth of cities in developing countries. In 1950, some 275 million people were living in cities in the developing world, 38% of the 724 million total urban population; by 2010, the world's urban population had surpassed 3.4 billion, with over three-quarters of all urban dwellers living in metropolitan areas of low- and middle-income countries.

While in a significant number of cases the speed at which the share of urban population has increased in developing countries in the late twentieth and early twenty-first century is not much faster than in many of the developed countries when they were urbanizing in the late nineteenth century,

nonetheless shares of urban population are being reached, particularly in Africa, at lower levels of per capita income than at a comparable stage in developed countries (again see Figure 7.2). Relatedly, urbanization in Africa is not associated with industrialization, as it was in the now-developed countries. Moreover, in most regions of the developing world, because population is so much larger, the sheer numbers of people coming into the city is unprecedented. Also unprecedented are the very large sizes of individual cities at such low levels of income per capita. The largest cities in developed countries in the past were much smaller than the large cities of developing countries today.

Although a majority of developing-country urban growth will be found in cities of less than 5 million people, it is also the case that population growth in cities of over 5 million in population is more rapid than growth of smaller cities (under 500,000) in the developing world. In fact, according to the UN, by 2025, only about half the urban population will be in cities with less than a half million people, the lowest fraction ever. Moreover, the developing world is also coming to dominate the world's largest cities, including the megacities with over 10 million inhabitants. Figure 7.4 provides a map locating megacities, the

FIGURE 7.4 Megacities: Cities with 10 Million or More Inhabitants



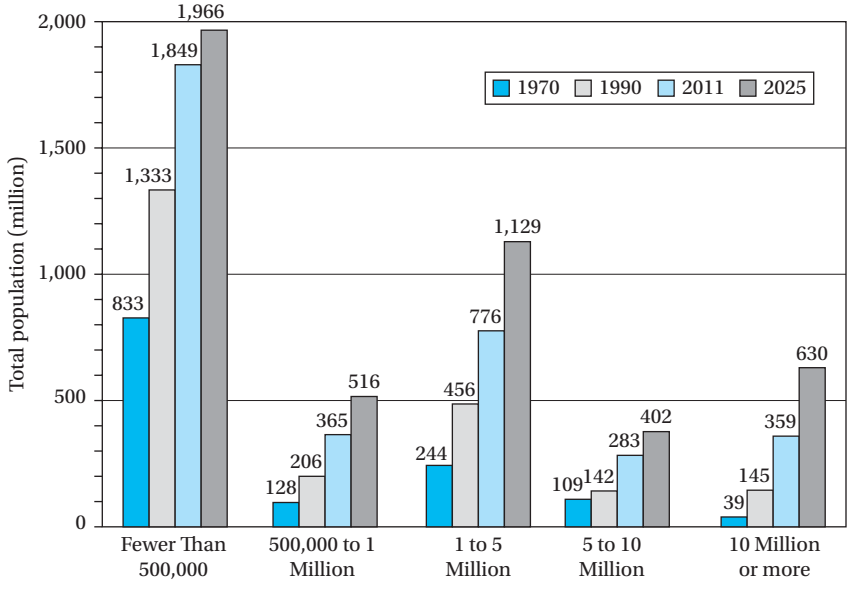
Source: Data drawn from United Nations Population Division, World Urbanization Prospects: The 2011 Revision (New York: United Nations, 2011), at http://esa.un.org/unup/pdf/WUP2011_Highlights.pdf

largest urban agglomerations in the world containing a population of at least 10 million people. As the figure shows, in 1970, there were only 2 megacities, but by 1990, there were 10, and by 2011, there were 23 such metropolises. Of these, 18 (over three-quarters) were located in the developing world. By 2025, 30 of the 37 megacities (more than 80%) will be in developing countries.

Based on numbers of people, the small and medium cities in developing countries have added more residents than the megacities. But while the number living in cities of fewer than 500,000 will more than double (grow by 2.4 times) from 1970 to 2025, the number in megacities will increase by *16 times*, from 39 million to 630 million. Figure 7.5 presents total urban populations in millions by different city sizes for 1970, 1990, and 2011, with projections to 2025. In 2011, more people lived in megacities of over 10 million than in cities from 5 to 10 million people in size. In principle, a megacity could offer large agglomeration economies, although congestion costs may rise rapidly. Another potential downside is that megacities tend to be more capital intensive, which does not match with the comparative advantage of most developing countries. Megacities, particularly in low-income countries, may also have outsized social and health problems. The relative balance of these factors is likely to differ across countries depending on the forces that led these cities to reach their megascales.

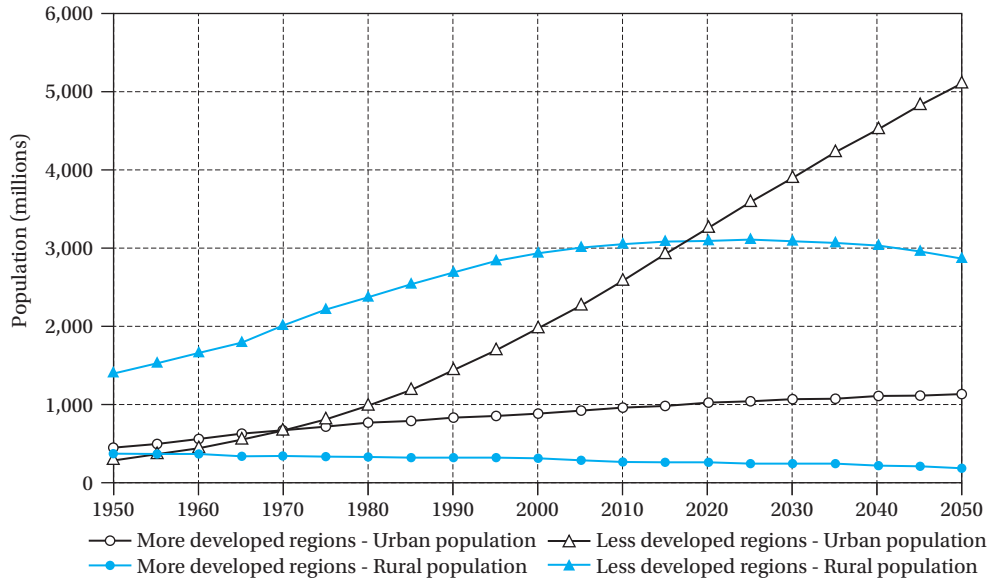
Moreover, as Figure 7.6 shows, going forward almost all of the increments to the world's population will be accounted for by the growth of urban areas as migrants continue to stream into the cities from rural areas and as

FIGURE 7.5 Total Population in Millions by City Size Class, 1970, 1990, 2011 and 2025



Source: United Nations Population Division, *World Urbanization Prospects: The 2011 Revision* (New York: United Nations, 2011), http://esa.un.org/unup/pdf/WUP2011_Highlights.pdf.

FIGURE 7.6 Estimated and Projected Urban and Rural Population of the More and Less Developed Regions, 1950–2050



Source: Millennium Development Goal Report 2010. © 2010 United Nations. Reproduced with permission of United Nations Publications.

urbanization rates in the developing world continue to approach those of the developed world.

A central question related to the unprecedented size of these urban agglomerations is how these cities will cope—economically, environmentally, and politically—with such high and rapidly rising concentrations of people. While it is true that cities offer the cost-reducing advantages of agglomeration economies and economies of scale and proximity, as well as numerous economic and social externalities (e.g., skilled workers, cheap transport, social and cultural amenities), for many analysts the social costs of increasingly overloading of housing and social services, not to mention increased crime, pollution, and congestion, can outweigh these historical urban advantages.[3]

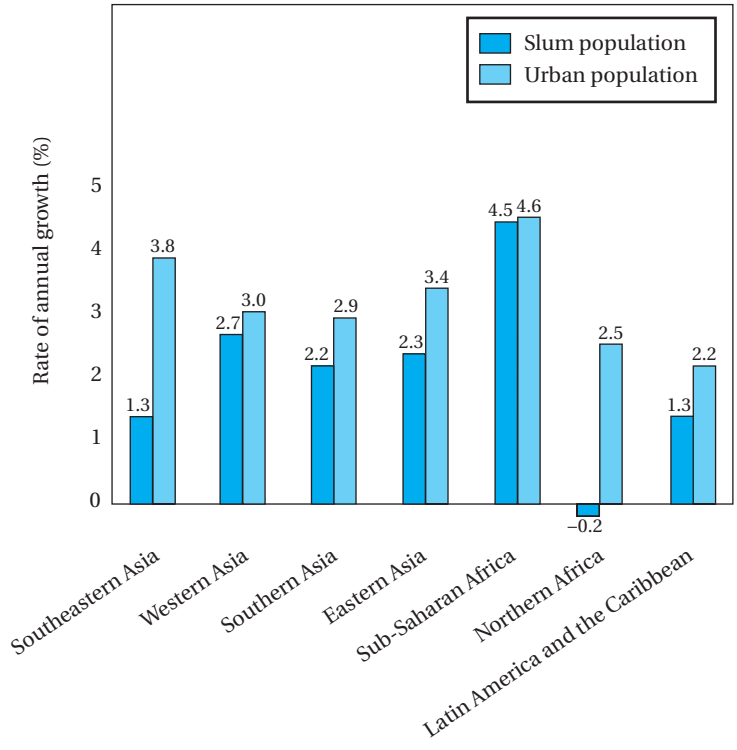
Urban bias The notion that most governments in developing countries favor the urban sector in their development policies, thereby creating a widening gap between the urban and rural economies.

Along with the rapid spread of urbanization and the **urban bias** in development strategies has come this prolific growth of huge slums and shantytowns. From the *favelas* of Rio de Janeiro and the *pueblos jovenes* of Lima to the *bustees* of Kolkata and the *bidonvilles* of Dakar, such makeshift communities have been growing rapidly. Today, at least one billion people live in urban slum settlements, representing nearly one-third of the urban population in all developing countries.

Figure 7.7 shows the annual growth of urban and slum populations in the 1990–2001 period, drawn from the 2006 UN *Millennium Development Goals Report*. As the *Report* summarized:

> Sub-Saharan Africa is the world's most rapidly urbanizing region, and almost all of this growth has been in slums, where new city residents face overcrowding,

FIGURE 7.7 Annual Growth of Urban and Slum Populations, 1990–2001



Source: Adapted from United Nations, *Millennium Development Goals Report, 2006* (New York: United Nations, 2006), p. 20. Reproduced by permission of United Nations Publications.

inadequate housing, and a lack of water and sanitation. In Western Asia, as well, most of the urban growth is occurring in slums. The rapid expansion of urban areas in Southern and Eastern Asia is creating cities of unprecedented size and complexity and new challenges for providing a decent environment for the poor. Northern Africa is the only developing region where the quality of urban life is improving."

The importance of addressing this problem has been enshrined in the Millennium Development Goals (MDGs —see Chapter 1), in which Target 11 of Goal 7 commits "to improve the lives of at least 100 million slum dwellers by the year 2020." Yet even though this number seems likely to be met, it represents only about one-tenth of all urban slum dwellers as of 2013! It is extremely difficult to provide reliable projections of slum populations further into the future because much depends on uncertain future policies and economic growth rates, as well as the extent of migration that occurs in response to growth and policy change. Allowing that simple extrapolation of trends would tend to significantly overstate the problem, UN-Habitat has noted that such trends would point to a slum population of as large as 3 billion people in 2050.

Rural-urban migration The movement of people from rural villages, towns, and farms to urban centers (cities) in search of jobs.

Although population growth and accelerated **rural-urban migration** are chiefly responsible for the explosion in urban shantytowns, part of the blame rests with governments. Their misguided urban-planning policies and outmoded building codes often mean that a majority of new urban housing is "illegal." For example, colonial-era building codes in Nairobi, Kenya, made it impossible to build an "official" house for less than $3,500. The law has also required every dwelling to be accessible by car. As a result, two-thirds of Nairobi's land has been occupied by 10% of the population, while many slum dwellings cannot legally be improved. Similarly, in Manila, Philippines, a large majority of the population has historically been too poor to be able to buy or rent an officially "legal" house.[4] In fact, a widely held belief in some developing countries is that governments have intentionally sought to make the lives of new migrants as miserable as possible, hoping this will be an effective deterrent to prospective migrants; but when people come to cities anyway, slums are the inevitable result. But often even government's best efforts to neglect, discriminate against, or even destroy slums are not enough to cancel out the many other distortions in disregarded, economically stagnant, or socially oppressive rural areas.

Statistics show that rural migrants constitute anywhere from 35% to 60% of recorded urban population growth. About three-quarters of developing countries responding to UN surveys indicated that they had initiated policies to slow down or reverse their accelerating trends in rural-urban migration, and/or desire to do so.[5]

A critical issue that needs to be addressed is the extent to which national governments can formulate development policies that can have a definite impact on trends in and the character of urban growth. It is clear that the emphasis on industrial modernization, technological sophistication, and metropolitan growth created a substantial geographic imbalance in economic opportunities and contributed significantly to the accelerating influx of rural migrants into urban areas. Is it possible or even desirable now to attempt to influence these trends by pursuing a different set of population and development policies? With birth rates declining in many developing countries, rapid urban growth and accelerated rural-urban migration will undoubtedly be one of the most important development and demographic issues of the coming decades. And in urban areas, the growth and development of the informal sector, as well as its role and limitations for labor absorption and economic progress, will assume increasing importance.

Before examining other problems and policy approaches in developing-country cities more closely, let us first consider the potential advantages offered by cities. Urban areas have played a highly constructive role in the economies of today's developed countries, and they offer huge and still largely untapped potential to do the same for developing countries. A detailed look at the informal sector in developing cities will give an idea of its potential as an engine of growth. We also consider in more detail what has been different—and what has gone wrong—with urban development and the excessively rapid pace of rural-urban migration in many developing countries. We conclude with a look at constructive policies to help cities foster successful urban development while at the same time giving more balanced treatment to development in rural areas.

7.2 The Role of Cities

What explains the strong association between urbanization and development? To a large degree, cities are formed because they provide cost advantages to producers and consumers through what are called **agglomeration economies**. As noted by Walter Isard, these agglomeration economies come in two forms. **Urbanization economies** are effects associated with the general growth of a concentrated geographic region. **Localization economies** are effects captured by particular sectors of the economy, such as finance or automobiles, as they grow within an area. Localization economies often take the form of backward and forward linkages of the type introduced in Chapter 4. When transportation costs are significant, users of the outputs of an industry may benefit from a nearby location to save on these costs. This benefit is a type of forward linkage. In addition, firms of the same or related industries may benefit from being located in the same city, so they can all draw on a large pool of workers with the specific skills used in that sector or from specialized infrastructure. This is a type of backward linkage. Workers with specialized skills appropriate to the industry prefer to be located there as well so that they can easily find a new job or be in a position to take advantage of better opportunities.

Agglomeration economies
Cost advantages to producers and consumers from location in cities and towns, which take the forms of urbanization economies and localization economies.

Urbanization economies
Agglomeration effects associated with the general growth of a concentrated geographic region.

Localization economies
Agglomeration effects captured by particular sectors of the economy, such as finance or autos, as they grow within an area.

Industrial Districts

An economic definition of a city is "an area with relatively high population density that contains a set of closely related activities." Firms often also prefer to be located where they can learn from other firms doing similar work. Learning takes place in both formal relationships, such as joint ventures, and informal ones, such as from tips learned in evening social clubs or over lunch. These spillovers are also agglomeration economies, part of the benefits of what Alfred Marshall called "industrial districts," and they play a big role in Michael Porter's "clusters" theory of competitive advantage.[6] Firms located in such industrial districts also benefit from the opportunity to contract out work easily when an unusually large order materializes. Thus, a firm of modest size does not have to turn down a big job due to lack of capacity, an arrangement that provides "flexible specialization."[7] Further, firms may wish to operate in well-known districts for the marketing advantages of locating where company procurers and household consumers of their goods know to shop to get the best selection.

It may not matter as much where such industrial districts are located as that they somehow got an early start there, perhaps because of a historical accident. For example, in the United States, many innovative computer firms located in Silicon Valley, California, simply because other such firms were already located there. Analogously, suppliers to shoe firms located in the Sinos Valley in southern Brazil and in Guadalajara in Mexico because so many shoe firms located in those regions. Some of the benefits are gained simply by the fact of location—Khalid Nadvi has termed this "passive collective efficiency"—but other benefits must be achieved through collective action, such as developing training facilities or lobbying government for needed infrastructure as an industry rather than as individual firms ("active collective efficiency").[8]

A growing body of evidence shows that industrial clusters are increasingly common in developing countries, at stages of industrial development ranging from cottage industry to advanced manufacturing techniques, and appear to be significant factors in emerging industrial competitiveness. Nevertheless, the dynamism of these clusters has varied widely. Some of the identified districts are traditional clusters of artisans that have shown little ability to innovate, export, or expand. But such groupings often remain one-family microenterprises with little division of labor or use of modern techniques. Producers in a village are better off sharing a common specialization than producing a random assortment of goods, in part because intermediaries work with villages with a high concentration of producers in their sector. But such traditional producers sometimes benefit little from "internal" divisions of labor within the firm, producing a largely complete product within the household and remaining at very low productivity and incomes. For example, a small town in Kenya may have a dozen or more families fabricating wheelbarrows, each family starting with timber and a few simple purchased metal inputs and producing a final product for sale. Nevertheless, clustering can generate more specialized employment in the rural nonfarm sector, as in the rural hand-loom weaver clusters of Ethiopia, in which microentrepreneurs share a work space, take part in a finer division of labor, and benefit from trade credits for working capital. Researchers also found that better electricity reliability and other infrastructure that are available to a cluster lead to better firm performance; in particular, "producers in electrified towns work longer hours than those in towns without electricity."[9]

In some cases, traditional township specializations have evolved into more developed clusters, with still modest-size but somewhat larger firms using a more detailed division of labor, such as a group of wheelbarrow producers with some specialization, each employing a few workers. Eventually, the cluster might expand in scope and become a low-tech metal products industrial district selling products throughout the country as the town grows into a small city. These clusters are reminiscent of the industrial districts of developed countries but require that sufficient financing be gathered to invest in core firms using somewhat larger-scale capital goods. But note that clusters of some sophistication can emerge in an otherwise fairly rural but densely populated area. As manufacturing has progressed in China, there has been a dramatic emergence of specialized clusters, to the point where they have now become pervasive, as detailed in Box 7.1.

As Hermine Weijland found in her study of Java, Indonesia, "It needs only a few fortunate years of market expansion to create gains from externalities and joint action."[10] She cites as examples local clusters that have upgraded and now competitively produce such goods as roof tiles, rattan furniture, cast metal, and textiles. Similarly, Dorothy McCormick concluded from a study of six representative clusters in Africa that "groundwork clusters prepare the way; industrializing clusters begin the process of specialization, differentiation, and technological development; and complex industrial clusters produce competitively for wider markets."[11] In some cases, the evidence suggests that coordination failures are not overcome, and so there may be a role for government policy in encouraging the upgrading of clusters. In other cases, it is the government itself that shares blame for cluster stagnation when it enforces

irrational and stifling regulations, which are far more damaging than the usual policy of benign neglect toward nascent clusters in the informal sector. Examples of clusters in developing countries that are widely considered successful include surgical instruments in Sialkot, Pakistan, and software in the Bengaluru (Bangalore) area in India. Clusters of all kinds, however, and particularly those producing for the local market, face substantial challenges from globalization and trade liberalization.

BOX 7.1 FINDINGS The Emergence of Industrial Districts or Clusters in China

Prior to the 1980s, industry in China was stateowned, and factories were dispersed geographically for military defense. Beginning in 1980, Special Economic Zones such as Shenzhen were created to attract foreign firms in many industries; domestic firms sold inputs to them, but not as clusters. Township and village enterprises (TVEs) then emerged, initiated outside of local governments but "vaguely owned" by them. TVE managers usually tried a variety of activities, and early 1990s field research found little evidence that firms in the same or related industries were locating in close proximity to each other. But starting in the mid-1990s, TVEs rapidly privatized, and a combination of competition, responses to credit constraints, an abundance of entrepreneurial talent, and supportive local policies led to the emergence of localized industrial clusters. But like other Chinese institutions (see the case study in Chapter 4), some may ultimately prove "transitional."

The Zhili Township children's garment cluster studied by Fleisher and colleagues saw "a significant rise in specialization and outsourcing among firms." Median investment to start a business more than doubled, but bank loans remained unnecessary as many entrepreneurs generated sufficient savings. Accordingly, many firms entered, and after 2000, wages rose and profitability fell. In response, firms selling directly to markets sought to "signal their commitment to product quality"—nearly half by establishing trademarks and nearly a fifth achieving International Organization for Standardization (ISO) certification. Meanwhile, quality of subcontractors was "monitored by their outsourcing partners." Social capital is critical, Fleisher and colleagues concluded: "Clustering within established communities where long-time relationships among family and neighbors prevail offers an institutional substitute for court enforcement of contractual relationships among borrowers and lenders and between outsourcing firms and their subcontractors." They also reported that "township government has imposed safety regulations in response to major industrial accidents" and helped "prevent a destructive 'race to the bottom' in terms of product quality and employee safety" where markets failed to do so.

From firm surveys in the Puyuan cashmere sweater district, Ruan and Zhang found that state-owned banks rarely gave loans to small and medium-size enterprises. But small firms borrowed from relatives and friends and gave and received credit from buyers and sellers, so clusters lowered "capital barriers to entry through the division of labor, enabling individuals to choose the appropriate type of specialization according to their capital portfolio," while a deeper division of labor allowed "people with different talents and endowments to find their own positions." Similar conclusions followed from a study of the world's largest footwear cluster in Wenzhou.

With a detailed analysis of 1995 and 2004 firm census data, Long and Zhang confirmed that "China's rapid industrialization is marked by increased clustering." Their research supported the conclusion that clustering of firms relaxed credit constraints through "two mechanisms: (1) within a cluster, finer division of labor lowers the capital barriers to entry, and (2) closer

proximity makes the provision of trade credit among firms easier." They found that clusters use more "entrepreneurs and labor, and less . . . capital, compared to nonclustered large factories" and thus followed comparative advantage. They noted that clusters could be useful in countries facing a "scarcity of capital and an inefficient financial system." However, they cautioned, "clustering may be a second-best solution to the financing problem when the local conditions do not permit easy access to regular financing." Thus clustering, like TVEs, might be a transitional form until financial markets deepened, formal contract enforcement could be provided, and larger investments would be needed.

Sources: Fleisher, Belton, Dinghuan Hu, William McGuire, and Xiaobo Zhang. "The evolution of an industrial cluster in China." *China Economic Review* 21, No. 3 (September 2010): 456–469; Huang, Zuhui, Xiaobo Zhang, and Yunwei Zhu. "The role of clustering in rural industrialization: A case study of Wenzhou's footwear industry." *China Economic Review* 19 (2008): 409–420; Long, Cheryl, and Xiaobo Zhang. "Cluster-based industrialization in China: Financing and performance." IFPRI Discussion Paper No. 937. Washington, D.C.: International Food Policy Research Institute, 2009; Ruan, Jianqing, and Xiaobo Zhang. "Credit constraints, organizational choice, and returns to capital: Evidence from a rural industrial cluster in China." IFPRI Discussion Paper No. 830. Washington, D.C.: International Food Policy Research Institute, 2008; Ruan, Jianqing, and Xiaobo Zhang. "Finance and cluster-based industrial development in China." *Economic Development and Cultural Change* 58 (2009): 143–164.

Social capital The productive value of a set of social institutions and norms, including group trust, expected cooperative behaviors with predictable punishments for deviations, and a shared history of successful collective action, that raises expectations for participation in future cooperative behavior.

Again, not all of the collective efficiency advantages of an industrial district are realized through passive location. Others are actively created by joint investments and promotional activities of the firms in the district. One factor determining the dynamism of a district is the ability of its firms to find a mechanism for such collective action. While the government can provide financial and other important services to facilitate cluster development, **social capital** is also critical, especially group trust and a shared history of successful collective action, which requires time to develop. Government can help by bringing parties together and helping them gain experience in cooperating on more modest goals before tackling larger ones, but social capital normally grows organically in an economic community and cannot be created by fiat. Even with collective action to supplement passive benefits of agglomeration, traditional clusters may not survive in their current form into more advanced stages of industrialization. Nonetheless, as Hubert Schmitz and Khalid Nadvi note, even if transitional, districts in the informal sector may still play a crucial role in mobilizing underused human and financial resources. They argue that clustering enables entrepreneurs to focus on selected stages of the production process, while other producers focus on their own specialized stages. Thus, even though the overall capital needs of a cluster may be too large for individual investors, each small producer individually needs only raise rather modest quantities of investment and working capital.[12]

Statistical estimates show that benefits of agglomeration can be quite substantial in practice. For example, studies have demonstrated that "if a plant moves from a location shared by 1,000 workers employed by firms in the same industry to one with 10,000 such workers, output will increase an average of 15%, largely because the pool of specialized workers and inputs deepens." Moreover, "productivity rises with city size, so much so that a typical firm will see its productivity climb 5% to 10% if city size and the scale of local industry double."[13]

Efficient Urban Scale

Localization economies do not imply that it would be efficient for all of a country's industries to be located together in a single city. These economies extend across closely related industries, such as those with strong backward and forward linkages, but there are fewer productivity benefits for unrelated industries to locate together. One notable exception is the potential spillover from technological progress in one industry to its adaptation for different uses in another industry. But there are also some important **congestion** costs. The higher the urban density, the higher the costs of real estate. It is much more expensive to build vertically than horizontally, increasingly so as skyscraper scale is reached, so that when market forces work properly, tall buildings are built primarily when urban land costs become high. (Note that skyscrapers and other buildings of monumental scale are sometimes built for political show rather than for economic efficiency, such as the world's tallest buildings in Dubai, United Arab Emirates; Shanghai, China; Mecca, Saudi Arabia; Taipei, Taiwan; and Kuala Lumpur, Malaysia.) In large urban areas, workers may find themselves with longer and longer commutes and greater transportation costs and may demand higher wages to cover these costs. In addition, the costs of infrastructure such as water and sewer systems are higher in concentrated urban areas. In theory, if costs of transportation of finished goods are high and consumers wish to be located in the largest city to avoid paying those transportation costs as much as possible, economic activity could become indefinitely concentrated within a city (called the "black hole" effect), but it is generally much less costly to improve the transportation system of a country than to pay the costs of maintaining a gargantuan urban complex. Under competitive forces, and other things being equal, if workers are mobile, a worker in a large city with higher wages but higher costs of living (such as higher housing prices) is no better off in real material terms than a worker with comparable education, experience, ability, and health in a small city who has lower wages and lower costs of living.[14]

Congestion An action taken by one agent that decreases the incentives for other agents to take similar actions. Compare to the opposite effect of a complementarity.

Thus, the concentrating, or "centripetal," forces of urban agglomeration economies are opposed by the dispersing, or "centrifugal," forces of diseconomies featuring increasing costs with greater concentration, because some of the factors of production, most obviously land, are not mobile. We can "create" more central city land by building skyscrapers, but only to a certain scale and only at substantial cost. Thus, it is normal for an economy to have a range of cities, with sizes dependent on the scale of the industries it sponsors and the extent of agglomeration economies found for that industry or cluster of industries.

Two well-known theories of city size are the urban hierarchy model (central place theory) and the differentiated plane model.[15] In the urban hierarchy model, originated by August Losch and Walter Christaller, plants in various industries have a characteristic market radius that results from the interplay of three factors: economies of scale in production, transportation costs, and the way the demand for land is spread over space. The larger the economies of scale in production and the lower the transportation costs, the larger the radius of territory that will be served by that industry to minimize costs. In contrast, if the price of real estate is bid up to high levels in the resulting cities, this will tend to create smaller radii. As a result, small cities contain activities

with short market radii, while large cities emerge to contain activities of both small and large radii. Generally speaking, activities of a national scope, such as government and finance, will be located in a single city (though not necessarily the same large city because of the effect of congestion costs). Clearly, the urban hierarchy approach applies better to nonexport industries than to export industries. When countries have different specializations in the international market or are at different stages of economic development, the size distribution of cities may potentially differ. For example, a developing country that still overwhelmingly specializes in agriculture might reasonably have one or two large cities serving national industries such as finance and government and many smaller towns serving local agricultural areas. A country with a highly differentiated manufacturing and service base might have a large number of medium-size cities.

In the differentiated plane model, originated by Alfred Weber, Walter Isard, and Leon Moses, the limited number of transportation routes linking the industries within an economy plays a key role. The model predicts urban concentrations at the points where the scarce transportation routes cross, called "internal nodes." The hierarchy of urban sizes depends on the pattern of nodes and the industrial mix. Primary processing industries have few inputs and are usually located near the source of the primary resource. However, there will also be incentives for industries with strong backward or forward linkages to locate in the same city.

Of course, there is nothing inherently wrong with very large cities per se—even megacities have some special productive advantages in a global economy.[15a] But the *distortions* that have led to the outsize cities prevalent in developing countries have been costly and problematic.

7.3 The Urban Giantism Problem

In the case of developing countries, the main transportation routes are often a legacy of colonialism. Theorists of the dependence school (see Chapter 3) have compared colonial transportation networks to drainage systems, emphasizing ease of extraction of the country's natural resources. In many cases, the capital city will be located near the outlet of this system on the seacoast. This type of transportation system is also called a "hub-and-spoke system," which is especially visible when the capital city is located in the interior of the country. Many nations inherited a hub-and-spoke system from colonial times, including many in Africa and Latin America, which also facilitated movement of troops from the capital to the outlying towns to suppress revolts.

The differentiated plane approach emphasizes the lasting impact of historical accidents. In this case, it helps explain where the most oversized cities are found in the developing world and suggests where policies of urban decentralization may be most helpful. Note that not all countries inherited such a hub-and-spoke system; Germany did not; the United States did not, in part because it is the result of the merger of 13 separate British colonies, which retained some measure of local autonomy, as do the federal states of Germany. The recent development of the United States makes the emergence of cities such as Atlanta from the crossing of transportation routes especially clear, but the

same principle has applied elsewhere over longer historical periods. Of course, as nations become wealthy, they generally build better transportation systems.

Sometimes one urban core becomes too large to keep the costs of the industries located there to a minimum. In developed countries, other cores are often developed within the broad metropolitan region, enabling the region as a whole to continue to receive benefits of agglomeration while lowering some of the costs; or new cities may develop in entirely different parts of the country. But this creation of new urban cores does not happen automatically if there are advantages to locating where other firms and residents are already present. This is another chicken-and-egg coordination problem of the type described in Chapter 4. Who will be the pioneer if it is less costly to stay where you are and wait for other pioneers to settle in the new city first? In economic terms, the agglomeration economies of cities are externalities, which must somehow be internalized or the market will fail. How can this be done?

In the United States, developers frequently internalize the externality by creating a new "edge city" within a metropolitan area, financing and building a new center where land is still relatively inexpensive, perhaps 10 to 50 kilometers from the original urban core. This takes place within a context of public oversight in the form of zoning regulations and inducements such as tax breaks. In developing countries, however, capital markets generally do not work well enough for this process of development to take place. In Europe, the public sector plays a much larger role in coordinating new towns and large developments.

In developing countries, however, governments are less involved in the dispersal of economic activity to more manageable sizes or, if they are involved, are often less effective. For example, government may seek to disperse industry without regard to the nature of agglomeration economies, giving incentives for dispersal but no attention to clustering relevant industries together, a problem seen in industrial parks in Pakistan. And all too often, the incentives are for firms to concentrate in the capital city or other "urban giants." A key problem of countries such as Peru and Argentina is that their giant capitals suffer from enormous levels of congestion, but adequate midsize cities that might provide alternative locations for growth are lacking. A well-designed infrastructure development program, including more efficient links between medium-size cities and better roads, utilities, and telecommunications within these cities, can help alleviate this problem.

A more detailed comparison of North and South America is instructive. The largest urban area in the United States, the New York metropolitan area, has about 6% of the national population. Toronto, the largest metropolitan area in Canada, has about 5 million residents, some 15% of the Canadian population. But Mexico City holds nearly one-fifth of the population of Mexico, Montevideo nearly half of the population of Uruguay, Lima over one-quarter of the population of Peru, and Buenos Aires and Santiago close to a third of the populations of Argentina and Chile, respectively.[16]

First-City Bias

A form of urban bias that has often caused considerable distortions might be termed *first-city bias*. The country's largest or first ("first-place") city receives a

disproportionately large share of public investment and incentives for private investment in relation to the country's second-largest city and other smaller cities. As a result, the first city receives a disproportionately—and inefficiently—large share of population and economic activity.

Table 7.1 shows the largest and second-largest cities in the United States, Canada, and major Latin American countries. Notice that in all of the outsized capital cities—Buenos Aires, Santiago, Mexico City, and Lima—the first city also serves as the capital. Some other developing countries have remarkably outsized first cities, notably Thailand, where Bangkok has a population about 20 times the size of the second city. Further examples can be found in the Philippines (where Manila has over 7 times the population of the second city) and Congo (where Kinshasa has more than 5 times the second city's population). There are at least 10 other examples of relatively large first (primate) cities in developing nations with sizable populations.[17]

Causes of Urban Giantism

Why have first cities often swelled to such a large multiple of second cities in developing countries? Overall, urban giantism probably results from a combination of a hub-and-spoke transportation system and the location of the political capital in the largest city. This is further reinforced by a political culture of rent seeking and the capital market failures that make the creation of new urban centers a task that markets cannot complete. Other more detailed explanations also generally involve unfortunate consequences of political economy (see Chapter 11). One argument, featured in the work of Paul Krugman, stresses that under import substitution industrialization (see Chapter 12), with a high level of protection, there is much less international trade, and population and economic activity have an incentive to concentrate in a single city, largely to avoid transportation costs. Thus, firms wish to set up operations in the city where the most consumers already live, which attracts more people to the region in search of jobs and perhaps lower prices (made possible because there are fewer transport costs to be passed on to consumers and perhaps by economies of larger store size and specialized sales districts);

TABLE 7.1 Population of the Largest and Second-Largest Cities in Selected Countries (Millions)

Country	Largest-City Population	Second-Largest-City Population	Ratio
Canada	Toronto, 5.035	Montreal, 3.603	1.40
United States	New York, 18.727	Los Angeles, 12.303	1.52
Argentina	Buenos Aires, 12.551	Cordoba, 1.423	8.82
Brazil	São Paulo, 18.647	Rio de Janeiro, 11.368	1.64
Chile	Santiago, 5.605	Valparaiso, 0.837	6.70
Mexico	Mexico City, 18.735	Guadalajara, 4.057	4.62
Peru	Lima, 8.081	Arequipa, 0.732	11.04

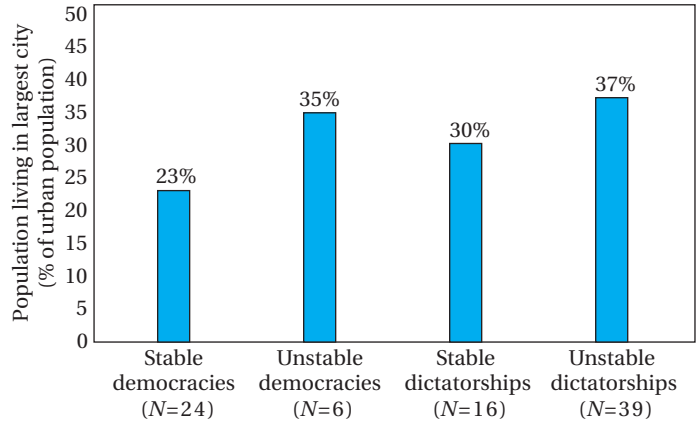
Note: Definitions of city size differ across studies.
Source: From *UN World Urbanization Prospects 2009 Revision*.

this concentration in turn attracts still more firms and consumers in a circle of causation. However, when trade barriers are reduced, the incentive to focus production on the home market is also reduced, and exporters and their suppliers have much less incentive to be located in the country's biggest population center. This moves production toward ports and borders, or elsewhere in the country, to escape the excessive congestion costs of the largest city.[18]

Another explanation for urban giants focuses on the consequences of dictators' efforts to remain in power. As Figure 7.8 shows, on average, a much larger share of a country's urbanized population (37%) lives in the first city in unstable dictatorships than in stable democracies (23%). In interpreting this finding, Alberto Ades and Edward Glaeser argue that unstable dictatorships (fearing overthrow) must provide "bread and circuses" for the first city (usually the capital) to prevent unrest; this extreme urban bias in turn attracts more migrants to the favored city and a still larger need for bread and circuses. It should be noted that although the authors attempt to control for reverse causality, it may still be the case that unstable dictatorships also tend to emerge in countries with high first-city concentrations.[19]

In the developing world, until recently, relatively few countries were effective democracies. Until the democratization waves beginning in the 1980s, most developing countries had authoritarian governments of one form or another. To remain in power and prevent popular uprisings and coups, which were generally thought to be most threatening when launched from the capital city, governments had an incentive to "buy off" the population of the largest city. This focus of national government spending on the capital city is the bread-and-circuses effect, recalling the phrasing of "rent-sharing" policies in ancient Rome in its period of expansion. The availability of better opportunities, whether the equivalent of the grain handouts in ancient Rome or jobs, wages, infrastructure,

FIGURE 7.8 Politics and Urban Concentration



Source: Data from Alberto F. Ades and Edward L. Glaeser, "Trade and circuses: Explaining urban giants," *Quarterly Journal of Economics* 110 (1995): 196. Copyright © 1995 by the President and Fellows of Harvard College and the Massachusetts Institute of Technology.
Note: *N* = number of countries in group.

and other government services concentrated in the capital city of many of today's developing countries, attracts an ever-growing migrant population, in turn leading to larger precautionary government spending as the fear of political instability grows.

Another political economy factor contributes to capital city giantism: It becomes advantageous for firms to be located where they have easy access to government officials, to curry political favor from a regime that can be induced to give companies special favors for a price or that simply demands bribes to function at all. The resulting first-city giantism may be viewed as a form of underdevelopment trap, which may be escaped fully only with a return to democratic rule together with a better balance of incentives to compete for exports as well as home consumption. Democracy does not eliminate political benefits of location in the national capital, but while lobbyists still congregate in the political capital, there may be less incentive for production to become overconcentrated there. Moreover, a free press tends to expose corruption and generate public pressure to root it out, as recent experience in many democratizing countries in Latin America and East Asia makes clear.

The explanations for urban giantism—production for the home market in the face of high protection and transport costs, few adequate smaller cities as alternative locations for firms reflecting infrastructure patterns, location of the capital in the largest city, and the political logic of unstable dictatorships—are complementary and help explain some of the advantages of democracies with more balanced economic policies, including well-planned investments in infrastructure. Such countries are able to avoid some of the costs of urban giantism.

Finally, special factors may lead to high costs of doing business elsewhere in the country. There is an incentive to locate in the capital where personal security is highest in countries in or emerging from conflict such as the Democratic Republic of Congo. And firms may be responding primarily to costs and risks resulting from extortion, greater corruption, or civil unrest in rural areas and small cities, as well as bad infrastructure. The swelling of the urban giant can therefore also be a symptom of binding constraints on development elsewhere in the country that growth diagnosticians can learn from (see Chapter 4). This may suggest priority policies to help overcome a nation's particular problems of high costs of operating outside the primate city. In recent years Mexico City has been growing more slowly than the Mexican population as a whole, so that its share of the national population is also slowly becoming reduced.

With our better understanding of the causes of outsized primate cities, it becomes clear that this feature is not inevitable. Indeed, if trends toward greater democracy, reduced incidence of coups, increased outward-looking policies, and improved prospects of solving and preventing civil conflicts are maintained, the ratios of largest to second-largest cities where urban giantism has prevailed are likely to continue to decrease.

7.4 The Urban Informal Sector

As noted in Chapter 3, a focus of development theory has been on the dualistic nature of developing countries' national economies—the existence of a modern urban capitalist sector geared toward capital-intensive, large-scale

production and a traditional rural subsistence sector geared toward labor-intensive, small-scale production. This dualistic analysis has also been applied specifically to the urban economy, which has been decomposed into a formal and an informal sector.

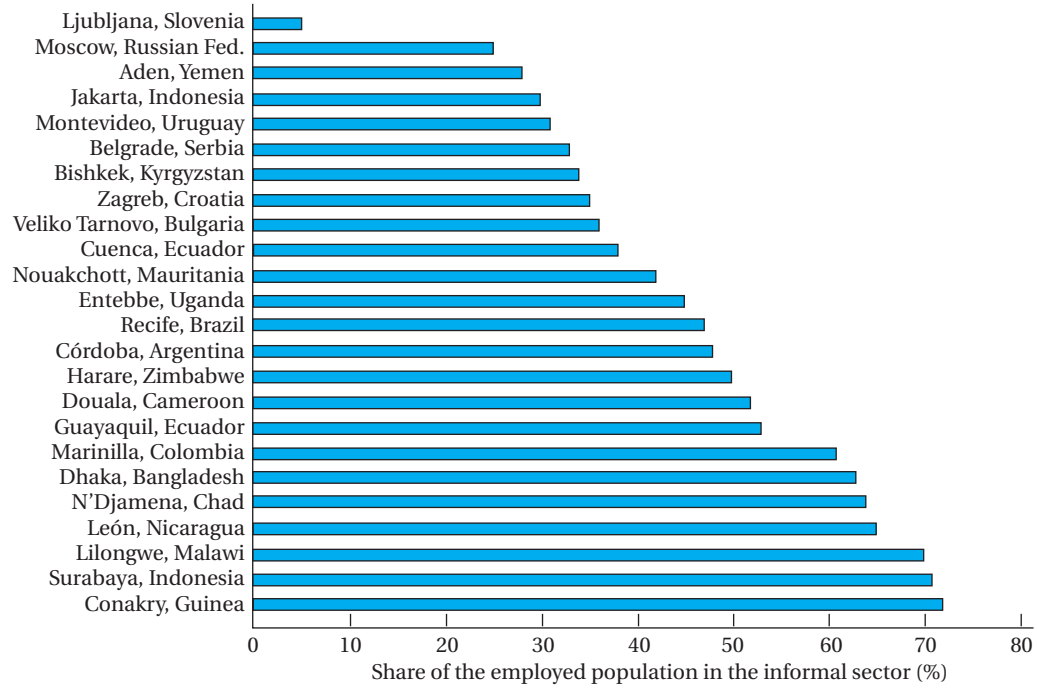
The existence of an unorganized, unregulated, and mostly legal but unregistered **informal sector** was recognized in the 1970s, following observations in several developing countries that massive additions to the urban labor force failed to show up in formal modern-sector unemployment statistics. The bulk of new entrants to the urban labor force seemed to create their own employment or to work for small-scale family-owned enterprises. The self-employed were engaged in a remarkable array of activities, ranging from hawking, street vending, letter writing, knife sharpening, and junk collecting to selling fireworks, prostitution, drug peddling, and snake charming. Others found jobs as mechanics, carpenters, small artisans, barbers, and personal servants. Still others were highly successful small-scale entrepreneurs with several employees (mostly relatives) and higher incomes. Some could even eventually graduate to the formal sector, where they became legally registered, licensed, and subject to government labor regulations. With the unprecedented rate of growth of the urban population in developing countries expected to continue and with the increasing failure of the rural and urban formal sectors to absorb additions to the labor force, more attention is being devoted to the role of the informal sector in serving as a panacea for the growing unemployment problem.

Informal sector The part of the urban economy of developing countries characterized by small competitive individual or family firms, petty retail trade and services, labor-intensive methods, free entry, and market-determined factor and product prices.

The informal sector continues to play an important role in developing countries, despite decades of benign neglect and even outright hostility. In many developing countries, about half of the employed urban population works in the informal sector. Figure 7.9 shows the relative importance of informal unemployment in selected cities. Most of these cities reflect the typical range of informal-sector employment share, from about 30% to 70%. (The only exception is Ljubljana, a virtually developed city near Austria and Italy.) We find a similar pattern of high informal-sector employment in cities throughout the developing world. For example, in India, the urban informal sector comprises 28.5% of employment in Kolkata, 46.5% in Ahmedabad, 49.5% in Mumbai, 53.8% in Chennai, 61.4% in Delhi, and 65.5% in Bangaluru.

The informal sector is characterized by a large number of small-scale production and service activities that are individually or family-owned and use simple, labor-intensive technology. They tend to operate like monopolistically competitive firms with ease of entry, excess capacity, and competition driving profits (incomes) down to the average supply price of labor of potential new entrants. The usually self-employed workers in this sector have less formal education, are generally unskilled, and lack access to financial capital. As a result, worker productivity and income tend to be lower in the informal sector than in the formal sector. Moreover, workers in the informal sector do not enjoy the measure of protection afforded by the formal modern sector in terms of job security, decent working conditions, and old-age pensions. Many workers entering this sector are recent migrants from rural areas unable to find employment in the formal sector. Their motivation is often to obtain sufficient income for survival, relying on their own indigenous resources to create work. As many members of the household as possible are involved in income-generating activities, including women and children, and they often work very long

FIGURE 7.9 Importance of Informal Employment in Selected Cities



Source: UN-Habitat, "State of the World's Cities, 2001," http://www.unchs.org/Istanbul+5/statereport.htm. Reprinted with permission.

hours. A large fraction inhabit shacks and small cinder-block houses that they themselves have built in slums and squatter settlements, which generally lack minimal public services such as electricity, water, drainage, transportation, and educational and health services. Many are vulnerable to cyclones (hurricanes), storm surges, mudslides, and other disasters caused by extreme weather—of the type predicted to substantially worsen with climate change (see Chapter 10). Others are even less fortunate, homeless, and living on the pavements. They find sporadic temporary employment in the informal sector as day laborers and hawkers, but their incomes are insufficient to provide even the most rudimentary shelter.

Policies for the Urban Informal Sector

In terms of its relationship with other sectors, the informal sector is linked with the rural sector in that it allows excess labor to escape from extreme rural poverty and underemployment, although under living and working conditions and for incomes that are often not much better. It is closely connected with the formal urban sector: The formal sector depends on the informal sector for cheap inputs and wage goods for its workers, and the informal sector in turn depends on the growth of the formal sector for a good portion of its income and clientele.

Informal-sector incomes have remained persistently higher than those in the poorest rural regions, despite the continued flow of rural-urban migration. The Nobel laureate Sir Arthur Lewis in the 1950s viewed traditional-sector workers, petty traders such as newspaper hawkers, as unproductive and essentially engaged in distractions from the main urban work of industrialization. But if wages are persistently higher in very competitive activities such as urban informal work than in rural work, this likely reflects higher productivities as well. Consequently, a revisionist view espousing the constructive role of cities (that includes their informal sectors) in economic development has taken hold. This approach has been championed by the Dar es Salaam–based UN-Habitat, in its "State of the World's Cities" reports.[20] The 2001 report systematically criticized what it termed the "anti-urban bias of the development agencies." Acting on the strong development tradition beginning with the Lewis skepticism of the urban informal sector, developed with the Todaro migration model (examined later in this chapter) emphasizing the negative consequences of urban bias for both efficiency and equity, continuing with the influential work of the integrated rural development school of the 1970s and recast and reemphasized under the Wolfensohn and subsequent presidencies at the World Bank, development agencies have indeed stressed rural development rhetorically. Many scholars have concluded, however, that this rhetoric often goes untranslated into real resources for the rural areas so that any pro-rural bias of development agencies is typically little more than a partial correction to the overriding forces for urban bias. However, the renewed focus on the development role of cities is an important trend. Besides UN-Habitat, the World Bank and other agencies have placed increasing emphasis on improved urban development.[21] The new focus is on how to make cities in developing countries more dynamic engines of growth and more livable environments, and it promises to be one of the more important streams of emerging research and policy analysis in economic development in coming years. In any case, while medium-size cities undoubtedly deserve greater attention for the constructive role they play in the development process, this does not obviate the problem of overconcentration of activities in first-city urban giantism.

The important role that the informal sector plays in providing income opportunities for the poor is clear. There is some question, however, as to whether the informal sector is merely a holding ground for people awaiting entry into the formal sector and as such is a transitional phase that must be made as comfortable as possible without perpetuating its existence until it is itself absorbed by the formal sector or whether it is here to stay and should in fact be promoted as a major source of employment and income for the urban labor force, or some combination. The answer is likely to differ by country. A 2012 study by Isabel Günther and Andrey Launov found that for the case of Cote d'Ivoire, about half of those working in the informal sector fell into each category of "opportunity" or "last resort."[22]

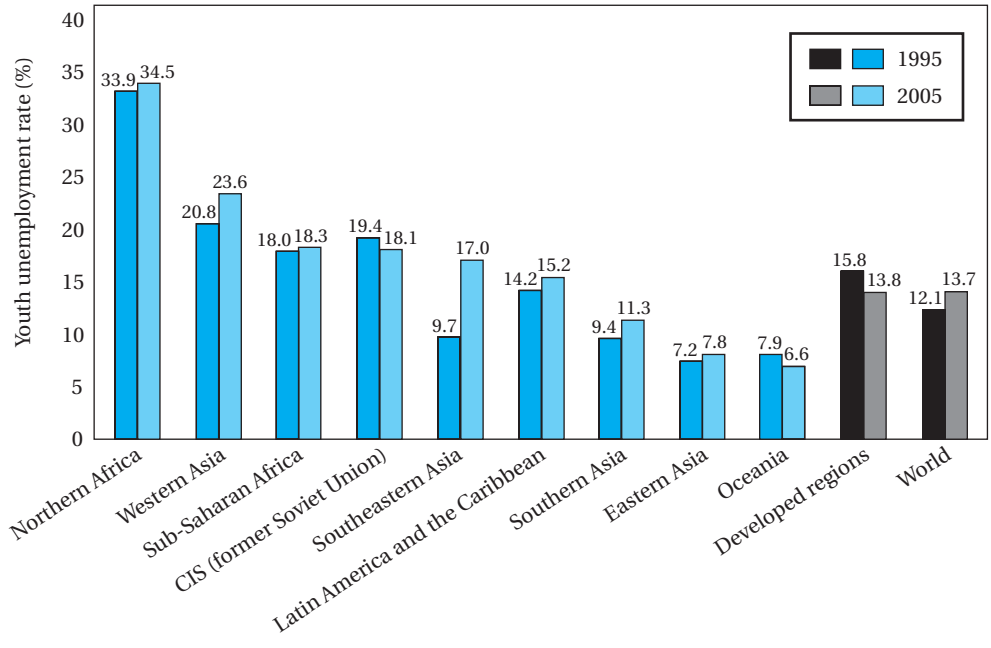
In support of the latter view, the formal sector in developing countries often has a small base in terms of output and employment. To absorb future additions to the urban labor force, the formal sector must be able to generate employment at a very high rate. This means that output must grow at an even faster rate, since employment in this sector increases less than proportionately in relation to output. This sort of growth seems highly unlikely in

view of current trends. Thus, the burden on the informal sector to absorb more labor will continue to grow unless other solutions to the urban unemployment problem are provided. But young people face increasingly difficult job prospects, as can be seen in Figure 7.10.

The informal sector has demonstrated its ability to generate employment and income for the urban labor force. As pointed out earlier, it is already absorbing an average of 50% of the urban labor force. Some studies have shown the informal sector generating almost one-third of urban income.

Several other arguments can be made in favor of promoting the informal sector. First, scattered evidence indicates that the informal sector generates surpluses even in a hostile policy environment that denies it access to the advantages offered to the formal sector, such as credit, foreign exchange, and tax concessions. Thus, the informal sector's surplus could provide an impetus to growth in the urban economy. Second, as a result of its low capital intensity, only a fraction of the capital needed in the formal sector is required to employ a worker in the informal sector, offering considerable savings to developing countries so often plagued with capital shortages. Third, by providing access to training and apprenticeships at substantially lower costs than provided by formal institutions and the formal sector, the informal sector can play an important role in the formation of human capital. Fourth, the informal sector generates demand for semiskilled and unskilled labor, whose supply is increasing in both

FIGURE 7.10 Youth Unemployment Rates, 1995 and 2005



Source: Adapted from United Nations, *Millennium Development Goals Report, 2006* (New York: United Nations, 2006), p. 24. Reproduced by permission of United Nations Publications.

relative and absolute terms and is unlikely to be absorbed by the formal sector with its increasing demands for a skilled labor force. Fifth, the informal sector is more likely to adopt appropriate technologies and make use of local resources, allowing for a more efficient allocation of resources. Sixth, the informal sector plays an important role in recycling waste materials, engaging in the collection of goods ranging from scrap metals to cigarette butts, many of which find their way to the industrial sector or provide basic commodities for the poor. Finally, promotion of the informal sector would ensure an increased distribution of the benefits of development to the poor, many of whom are concentrated in the informal sector.

Promotion of the informal sector is not, however, without its disadvantages. One of the major disadvantages in promoting the informal sector lies in the strong relationship between rural-urban migration and labor absorption in the informal sector. Migrants from the rural sector have both a lower unemployment rate and a shorter waiting period before obtaining a job in the informal sector. Promoting income and employment opportunities in the informal sector could therefore aggravate the urban unemployment problem by attracting more labor than either the desirable parts of the informal or the formal sector could absorb. Furthermore, there is concern over the environmental consequences of a highly concentrated informal sector in the urban areas. Many informal-sector activities cause pollution and congestion (e.g., pedicabs) or inconvenience to pedestrians (e.g., hawkers and vendors). Moreover, increased densities in slums and low-income neighborhoods, coupled with poor urban services, could cause enormous problems for urban areas. Any policy measures designed to promote the informal sector must be able to cope with these various problems. Finally, it is an almost universal observation that when regular formal-sector employment becomes available, many informal-sector microentrepreneurs switch sectors to take these jobs—clear evidence of "revealed preference."

The International Labor Organization has made some general suggestions as to what sorts of measures might be adopted to promote the informal sector. To begin with, governments will have to abandon their hostility toward the informal sector and adopt a more positive and sympathetic posture. For example, in Latin America, although improving in many cases, bureaucratic red tape and an inordinate number of administrative procedures needed to register a new business result in delays of up to 240 days in Ecuador, 310 days in Venezuela, and 525 days in Guatemala. Until recently, Brazil, Mexico, and Chile all required more than 20 applications before a company could be approved to do business. Such procedures not only cause excessive delays but can also inflate the costs of doing business by up to 70% annually. So informal-sector businesses simply skirt the law. Fortunately, there has been progress in improving these policies; the 2013 *Doing Business* annual report explains that, "in the past 8 years the start-up process received more attention from policy makers than any other area of business regulation tracked by *Doing Business*—through 368 reforms in 149 economies. These worldwide efforts reduced the average time to start a business from 50 days to 30 and the average cost from 89% of income per capita to 31%. But other metrics indicate less progress."[23]

Because access to skills plays an important role in determining the structure of the informal sector, governments should facilitate training in the areas

that are most beneficial to the urban economy. In this way, the government can play a role in shaping the informal sector so that it contains production and service activities that provide the most value to society. Specifically, such measures might promote legal activities and discourage illegal ones by providing proper skills and other incentives. They could also generate taxes that now go unpaid.

The lack of capital is a major constraint on activities in the informal sector. The provision of credit would therefore permit these enterprises to expand, produce more profit, and hence generate more income and employment. Microfinance institutions have been leading the way in providing enhanced credit access (see Chapter 15). Access to improved technology would have similar effects. Providing infrastructure and suitable locations for work (e.g., designating specific areas for stalls) could help alleviate some of the environmental and congestion consequences of an expanded informal sector. Finally, better living conditions must be provided, if not directly, then by promoting growth of the sector on the fringes of urban areas or in smaller towns where the population will settle close to its new area of work, away from the urban density. Promotion of the informal sector outside the urban areas may also help redirect the flow of rural-urban migration, especially if carried out in conjunction with the policies discussed later in this chapter.

Women in the Informal Sector

In some regions of the world, women predominate among rural-urban migrants and may even comprise the majority of the urban population. Though historically many of these women are simply accompanying their spouses, a growing number of women in Latin America, Asia, and Africa migrate to seek economic opportunity. With the exception of the export enclaves of East Asia and a few other cities, where everything from computers to clothing and running shoes are manufactured, only a small minority of these migrants is able to find employment in the formal sector, which is generally dominated by men. As a consequence, women often represent the bulk of the informal-sector labor supply, working for low wages at unstable jobs with no employee or social security benefits. The increase in the number of single female migrants has also contributed to the rising proportion of urban households headed by women, which tend to be poorer, experience tighter resource constraints, and retain relatively high fertility rates. The changing composition of migration flows has important economic and demographic implications for many urban areas of the developing world.

As UN-Habitat noted for its *State of Women in Cities 2012/2013*:

> Urban women supposedly enjoy greater social, economic, political opportunities and freedoms than their rural counterparts. However, the notable gender gaps in labor and employment, decent work, pay, tenure rights, access to and accumulation of assets, personal security and safety and representation in formal structures of urban governance, show that women are often the last to benefit from the prosperity of cities.[24]

Because members of female-headed households are generally restricted to low-productivity, informal-sector employment and experience higher

dependency burdens, they are more likely to be poor and malnourished and less likely to obtain formal education, health care, or clean water and sanitation, often remaining effectively excluded from government services. Dropout rates among children from households headed by women are much higher because the children are more likely to be working to contribute to household income.

Many women run small business ventures or microenterprises that require little or no start-up capital and often involve the marketing of homemade foodstuffs and handicrafts. Though women's restricted access to capital leads to high rates of return on their tiny investments, the extremely low capital-labor ratios confine women to low-productivity undertakings. Studies in Latin America and Asia have found that where credit is available to women with informal-sector microenterprises, repayment rates have equaled or exceeded those for men (see Chapter 15) . And because women are able to make more productive use of capital and start from a much lower investment base, their rates of return on investments often surpass those for men.

Despite the impressive record of these credit programs, they remain limited. The majority of institutional credit is still channeled through formal-sector agencies, and as a result, women generally find themselves ineligible for even small loans. Government programs to enhance income in poor households will inevitably neglect the neediest households so long as governments continue to focus on formal-sector employment of men and allocation of resources through formal-sector institutions. To solve the plight of poor urban women and their children, it is imperative that efforts be made to integrate women into the economic mainstream. Ensuring that women benefit from development programs will require that women's special circumstances be considered in policy design.

The legalization and economic promotion of informal-sector activities, where the majority of the urban female labor force is employed, could greatly improve women's financial flexibility and the productivity of their ventures. However, to enable women to reap these benefits, governments must repeal laws that restrict women's rights to own property and conduct financial transactions. Likewise, barriers to women's direct involvement in technical training programs and extension services must be eradicated. Finally, the provision of affordable child care and family-planning services would lighten the burden of women's reproductive roles and permit them a greater degree of economic participation.

7.5 Migration and Development

As noted earlier in the chapter, rural-urban migration has been dramatic, and urban development plays an important role in economic development. Rates of rural-urban migration in developing countries have exceeded rates of urban job creation and thus have surpassed greatly the absorption capacity of both industry and urban social services.

Migration worsens rural-urban structural imbalances in two direct ways. First, on the supply side, internal migration disproportionately increases the growth rate of urban job seekers relative to urban population growth, which

itself is at historically unprecedented levels because of the high proportion of well-educated young people in the migrant system. Their presence tends to swell the urban labor supply while depleting the rural countryside of valuable human capital. Second, on the demand side, urban job creation is generally more difficult and costly to accomplish than rural job creation because of the need for substantial complementary resource inputs for most jobs in the industrial sector. Moreover, the pressures of rising urban wages and compulsory employee fringe benefits in combination with the unavailability of appropriate, more labor-intensive production technologies means that a rising share of modern-sector output growth is accounted for by increases in labor productivity. Together this rapid supply increase and lagging demand growth tend to convert a short-run problem of resource imbalances into a long-run situation of chronic urban surplus labor.

But the impact of migration on the development process is much more pervasive than its exacerbation of urban unemployment and underemployment. In fact, the significance of the migration phenomenon in most developing countries is not necessarily in the process itself or even in its impact on the sectoral allocation of human resources. Rather, its significance lies in its implications for economic growth in general and for the character of that growth, particularly its distributional manifestations.

We must therefore recognize that migration in excess of job opportunities is both a symptom of and a contributor to underdevelopment. Understanding the causes, determinants, and consequences of internal rural-urban labor migration is thus central to understanding the nature and character of the development process and to formulating policies to influence this process in socially desirable ways. A simple yet crucial step in underlining the centrality of the migration phenomenon is to recognize that any economic and social policy that affects rural and urban real incomes will directly or indirectly influence the migration process. This process will in turn tend to alter the pattern of sectoral and geographic economic activity, income distribution, and even population growth. Because all economic policies have direct and indirect effects on the level and growth of urban or rural incomes, or both, they all will have a tendency to influence the nature and magnitude of the migration stream. Some policies may have a more direct and immediate impact, such as wages and income policies and employment promotion programs. There are other policies that, though less obvious, may in the long run be no less important. Included among these policies, for example, would be land tenure arrangements; commodity pricing policies; credit allocation; taxation; export promotion; import substitution; commercial policies; the geographic distribution of social services; the nature of public investment programs; attitudes toward private foreign investors; the organization of population and family-planning programs; the structure, content, and orientation of the educational system; the functioning of labor markets; and the nature of public policies toward international technology transfer and the location of new industries. There is thus a clear need to recognize the central importance of internal and, for many countries, even international migration and to integrate the two-way relationship between migration and population distribution on the one hand and economic variables on the other into a more comprehensive framework designed to improve development policy formulation.

In addition, we need to understand better not only why people move and what factors are most important in their decision-making process but also what the consequences of migration are for rural and urban economic and social development. If all development policies affect migration and are affected by it, which are the most significant, and why? What are the policy options and trade-offs among different and sometimes competing objectives (e.g., curtailing internal migration and expanding educational opportunities in rural areas)? Part of our task in the following sections will be to seek answers to these and other questions relating to migration, unemployment, and development.

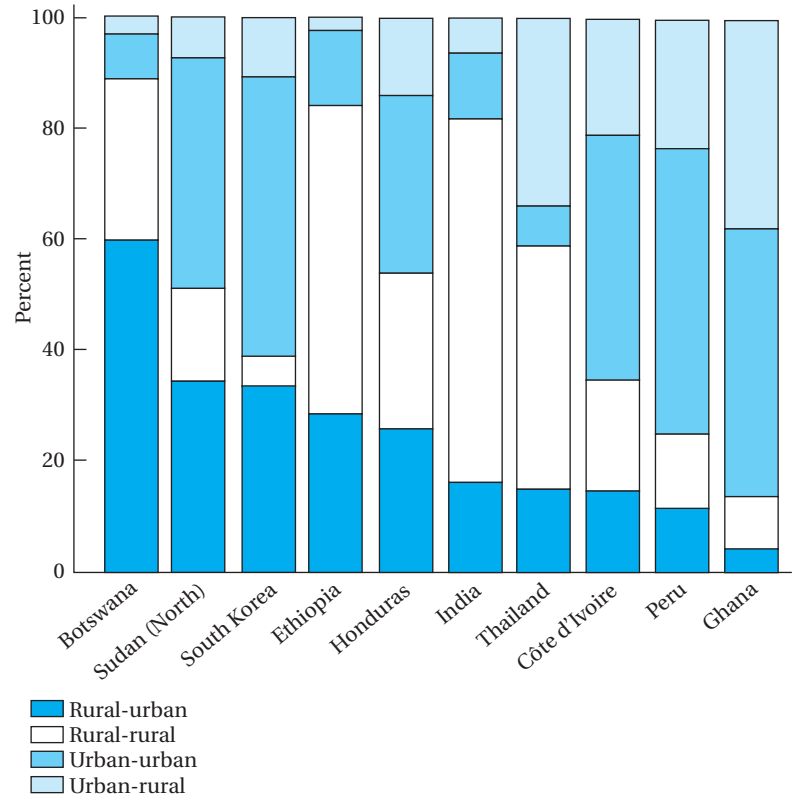
Migration patterns are complex. The most important type of migration from the standpoint of long-run development is rural-urban migration, but a great deal of rural-rural, urban-urban, and even urban-rural migration also takes place. Rural-urban migration is most important because the population share of cities is growing, despite the fact that fertility is much lower in urban areas, and the difference is accounted for by rural-urban migration. It is also important because of the potential development benefits of economic activity of cities, due to agglomeration economies and other factors. However, urban-rural migration is important to understand because it usually occurs when hard times in cities coincide with increases in output prices from the country's cash crops, as occurred in Ghana not long ago. Thus, the overall picture is one of a remarkable amount of "churning," or continuous movements of people within developing countries, especially over short distances. These movements contradict the popular image of stasis in traditional societies. The composition of internal migration for several countries is shown in Figure 7.11.

In addition to wage differentials, age, and education, migration is also explained partly by relocation upon remarrying; prior emigration of family members; distance and costs of relocation; occurrence of famine, disease, violence, and other disasters; and relative standing in the origin community, with those lower on the social order more likely to migrate. Migration can also be a form of portfolio diversification for families who seek to settle some members in areas where they may not be affected by economic shocks in the same way as if they had stayed at home.[25]

7.6 Toward an Economic Theory of Rural-Urban Migration

The economic development of western Europe and the United States was closely associated with the movement of labor from rural to urban areas. For the most part, with a rural sector dominated by agricultural activities and an urban sector focusing on industrialization, overall economic development in these countries was characterized by the gradual reallocation of labor out of agriculture and into industry through rural-urban migration, both internal and international. Urbanization and industrialization were in essence synonymous. This historical model served as a blueprint for structural change in developing countries, as evidenced, for example, by the original Lewis theory of labor transfer (see Chapter 3).

FIGURE 7.11 Components of Migration in Selected Countries



Source: World Development Report, 1999–2000, "Internal migration and urbanization: Recent contributions and new evidence," by Robert E. B. Lucas. Copyright 1999 by the World Bank.

Todaro migration model
A theory that explains rural-urban migration as an economically rational process despite high urban unemployment. Migrants calculate (present value of) urban expected income (or its equivalent) and move if this exceeds average rural income.

Harris-Todaro model
An equilibrium version of the Todaro migration model that predicts that expected incomes will be equated across rural and urban sectors when taking into account informal-sector activities and outright unemployment.

But the overwhelming evidence of the past several decades, when developing nations witnessed a massive migration of their rural populations into urban areas despite rising levels of urban unemployment and underemployment, lessens the validity of the Lewis two-sector model of development.[26] An explanation of the phenomenon, as well as policies to address the resulting problems, must be sought elsewhere. One theory to explain the apparently paradoxical relationship of accelerated rural-urban migration in the context of rising urban unemployment has come to be known as the **Todaro migration model** and in its equilibrium form as the **Harris-Todaro model**.[27]

A Verbal Description of the Todaro Model

Starting from the assumption that migration is primarily an economic phenomenon, which for the individual migrant can be a quite rational decision despite the existence of urban unemployment, the Todaro model postulates that migration proceeds in response to urban-rural differences in expected

income rather than actual earnings. The fundamental premise is that migrants consider the various labor market opportunities available to them in the rural and urban sectors and choose the one that maximizes their expected gains from migration.

In essence, the theory assumes that members of the labor force, both actual and potential, compare their expected incomes for a given time horizon in the urban sector (the difference between returns and costs of migration) with prevailing average rural incomes and migrate if the former exceeds the latter. (See Appendix 7.1 for a mathematical formulation.)

Consider the following illustration. Suppose that the average unskilled or semiskilled rural worker has a choice between being a farm laborer (or working his own land) for an annual average real income of, say, 50 units or migrating to the city, where a worker with his skill or educational background can obtain wage employment yielding an annual real income of 100 units. The more commonly used economic models of migration, which place exclusive emphasis on the income differential factor as the determinant of the decision to migrate, would indicate a clear choice in this situation. The worker should seek the higher-paying urban job. It is important to recognize, however, that these migration models were developed largely in the context of advanced industrial economies and hence implicitly assume the existence of full or near-full employment. In a full-employment environment, the decision to migrate can be based solely on the desire to secure the highest-paid job wherever it becomes available. Simple economic theory would then indicate that such migration should lead to a reduction in wage differentials through the interaction of the forces of supply and demand, in areas of both emigration and immigration.

Unfortunately, such an analysis is not realistic in the context of the institutional and economic framework of most developing nations. First, these countries are beset by a chronic unemployment problem, which means that a typical migrant cannot expect to secure a high-paying urban job immediately. In fact, it is much more likely that on entering the urban labor market, many uneducated, unskilled migrants will either become totally unemployed or will seek casual and part-time employment as vendors, hawkers, repairmen, and itinerant day laborers in the urban traditional or informal sector, where ease of entry, small scale of operation, and relatively competitive price and wage determination prevail. In the case of migrants with considerable human capital in the form of a secondary or university certificate, opportunities are much better, and many will find formal-sector jobs relatively quickly. But they constitute only a small proportion of the total migration stream. Consequently, in deciding to migrate, the individual must balance the probabilities and risks of being unemployed or underemployed for a considerable period of time against the positive urban-rural real income differential. The fact that a typical migrant who gains a modern-sector job can expect to earn twice the annual real income in an urban area than in a rural environment may be of little consequence if the actual probability of his securing the higher-paying job within, say, a one-year period is one chance in five. Thus, the actual probability of his being successful in securing the higher-paying urban job is 20%, and therefore his expected urban income for the one-year period is in fact 20 units and not the 100 units that an urban worker in a full-employment environment

would expect to receive. So with a one-period time horizon and a probability of success of 20%, it would be irrational for this migrant to seek an urban job, even though the differential between urban and rural earnings capacity is 100%. However, if the probability of success were 60% and the expected urban income therefore 60 units, it would be entirely rational for our migrant with his one-period time horizon to try his luck in the urban area, even though urban unemployment may be extremely high.

If we now approach the situation by assuming a considerably longer time horizon—a more realistic assumption, especially in view of the fact that the vast majority of migrants are between the ages of 15 and 24—the decision to migrate should be represented on the basis of a longer-term, more permanent income calculation. If the migrant anticipates a relatively low probability of finding regular wage employment in the initial period but expects this probability to increase over time as he is able to broaden his urban contacts, it would still be rational for him to migrate, even though expected urban income during the initial period or periods might be lower than expected rural income. As long as the **present value** of the net stream of expected urban income over the migrant's planning horizon exceeds that of the expected rural income, the decision to migrate is justifiable.

Present value The discounted value at the present time of a sum of money to be received in the future.

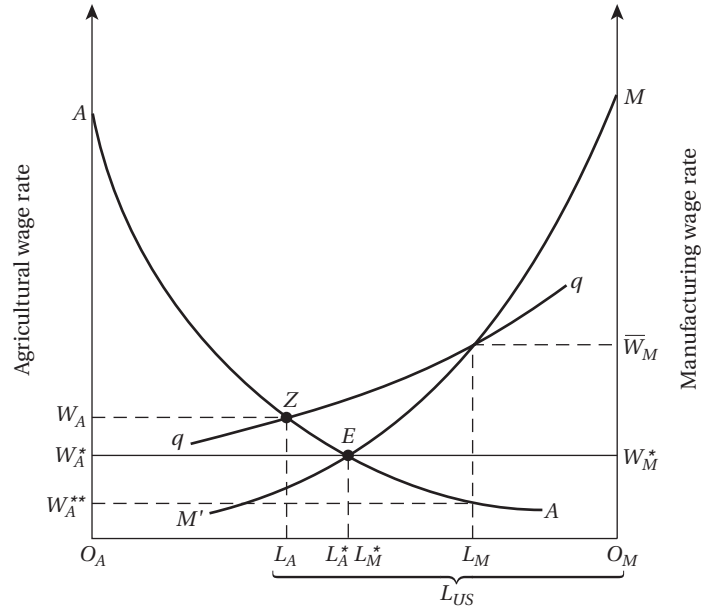
Rather than equalizing urban and rural wage rates, as would be the case in a competitive model, we see that rural-urban migration in our model equates rural and urban expected incomes. For example, if average rural income were 60 and urban income were 120, a 50% urban unemployment rate would be necessary before further migration would no longer be profitable. Because expected incomes are defined in terms of both wages and employment probabilities, it is possible to have continued migration despite the existence of sizable rates of urban unemployment. In our example, migration would continue even if the urban unemployment rate were 30% to 40%.

A Diagrammatic Presentation

This process of achieving an unemployment equilibrium between urban expected wages and average rural income rather than an equalized rural-urban wage, as in the traditional neoclassical free-market model, can also be explained by a diagrammatic portrayal of the basic Harris-Todaro model. This is done in Figure 7.12.[28] Assume only two sectors, rural agriculture and urban manufacturing. The demand for labor (the marginal product of labor curve) in agriculture is given by the negatively sloped line AA. Labor demand in manufacturing is given by MM' (reading from right to left). The total labor force is given by line O_AO_M. In a neoclassical, flexible-wage, full-employment market economy, the equilibrium wage would be established at $W_A^*W_M^*$, with $O_AL_A^*$ workers in agriculture and $O_ML_M^*$ workers employed in urban manufacturing. All available workers are therefore employed.

But what if urban wages are institutionally determined (inflexible downward) as assumed by Todaro at a level $\overline{W}_M$, which is at a considerable distance above W_A^*? If for the moment we continue to assume that there is no unemployment, O_ML_M workers would get urban jobs, and the rest, O_AL_M, would have to settle for rural employment at $O_AW_A^{**}$ wages (below the free-market level of $O_AW_A^*$). So now we have an urban-rural real wage gap of $\overline{W}_M - W_A^{**}$, with $\overline{W}_M$ institutionally fixed. If rural workers were free to migrate (as they

FIGURE 7.12 The Harris-Todaro Migration Model



are almost everywhere except China), then despite the availability of only O_ML_M jobs, they are willing to take their chances in the urban job lottery. If their chance (probability) of securing one of these favored jobs is expressed by the ratio of employment in manufacturing, L_M, to the total urban labor pool, L_{US}, then the expression

$$W_A = \frac{L_M}{L_{US}}(\overline{W}_M) \tag{7.1}$$

shows the probability of urban job success necessary to equate agricultural income W_A with urban expected income (L_M/L_{US}) $(\overline{W}_M)$, thus causing a potential migrant to be indifferent between job locations. The locus of such points of indifference is given by the qq' curve in Figure 7.12.[29] The new unemployment equilibrium now occurs at point Z, where the urban-rural actual wage gap is $\overline{W}_M - W_A$, O_AL_A workers are still in the agricultural sector, and O_ML_M of these workers have modern (formal)-sector jobs paying $\overline{W}_M$ wages. The rest, $O_ML_A - O_ML_M$, are either unemployed or engaged in low-income informal-sector activities. This explains the existence of urban unemployment and the private economic rationality of continued rural-to-urban migration, despite this high unemployment. However, although it may be privately rational from a cost-benefit perspective for an individual to migrate to the city despite high unemployment, it can, as will soon become clear, be socially very costly.

There are many ways to extend the model; here we mention four. First, Equation 7.1 simplifies by assuming that those who migrate and do not get a modern job receive no income; but if they instead receive urban informal-sector

income, we modify expected income accordingly.[30] Second, note that if instead of assuming that all urban migrants are the same, we incorporate the reality of different levels of human capital (education), we can understand why a higher proportion of the rural educated migrate than the uneducated—because they have a better chance (a higher probability) of earning even higher urban wages than unskilled migrants.

Third, we often observe that migrants from the same rural region tend to settle in common cities, even the same neighborhoods of cities, that are relatively distant from the migrants' place of origin. In a model proposed by William Carrington, Enrica Detragiache, and Tara Vishwanath, earlier migrants create a positive externality for later potential migrants from their home region by lowering their costs of moving by helping with resettlement and lowering their probability of unemployment by providing them with jobs or information about available jobs. Thus, the search for employment, selection into the migration decision, and forward-looking behavior may all be incorporated into an equilibrium migration model.[31]

Fourth, the Todaro and Harris-Todaro models are relevant to developing countries even if the wage is not fixed by institutional forces, such as a minimum wage. Recent theoretical research on rural-urban migration has confirmed that the emergence of a high modern-sector wage alongside unemployment or an urban traditional sector as seen in these models can also result from market responses to imperfect information, cost of **labor turnover**, **efficiency wage** payments, and other common features of labor markets.[32]

Labor turnover Worker separations from employers, a concept used in theory that the urban-rural wage gap is partly explained by the fact that urban modern-sector employers pay higher wages to reduce labor turnover rates and retain trained and skilled workers.

Efficiency wage The notion that modern-sector urban employers pay a higher wage than the equilibrium wage rate in order to attract and retain a higher-quality workforce or to obtain higher productivity on the job.

To sum up, the Todaro migration model has four basic characteristics:

1. Migration is stimulated primarily by rational economic considerations of relative benefits and costs—mostly financial but also psychological.
2. The decision to migrate depends on expected rather than actual urban-rural real-wage differentials, where the expected differential is determined by the interaction of two variables, the actual urban-rural wage differential and the probability of successfully obtaining employment in the urban sector.
3. The probability of obtaining an urban job is directly related to the urban employment rate and thus inversely related to the urban unemployment rate.
4. Migration rates in excess of urban job opportunity growth rates are not only possible but also rational and even likely in the face of wide urban-rural expected income differentials. High rates of urban unemployment are therefore inevitable outcomes of the serious imbalance of economic opportunities between urban and rural areas in most underdeveloped countries.

Five Policy Implications

Although the Todaro theory might at first seem to devalue the critical importance of rural-urban migration by portraying it as an adjustment mechanism by which workers allocate themselves between rural and urban labor markets, it does have important policy implications for development strategy with regard to wages and incomes, rural development, and industrialization.

First, imbalances in urban-rural employment opportunities caused by the urban bias, particularly first-city bias, of development strategies must be

reduced. Because migrants are assumed to respond to differentials in expected incomes, it is vitally important that imbalances between economic opportunities in rural and urban sectors be minimized. When urban wage rates rise faster than average rural incomes, they stimulate further rural-urban migration in spite of rising levels of urban unemployment. This heavy influx of people into urban areas not only gives rise to socioeconomic problems in the cities but may also eventually create problems of labor shortages and lack of entrepreneurship in rural areas. Thus, policy distortions that induce more rapid rural-to-urban migration than would otherwise occur generally reduce overall social welfare.

Second, urban job creation is an insufficient solution for the urban unemployment problem. The traditional (Keynesian) economic solution to urban unemployment (the creation of more urban modern-sector jobs without simultaneous attempts to improve rural incomes and employment opportunities) can result in the paradoxical situation in which more urban employment leads to higher levels of urban unemployment! Once again, the imbalance in expected income-earning opportunities is the crucial concept. Because migration rates are assumed to respond positively to *both* higher urban wages *and* higher urban employment opportunities (or probabilities), it follows that for any given positive urban-rural wage differential (in most developing countries, urban wages are typically three to four times as large as rural wages), higher urban employment rates will widen the expected differential and induce even higher rates of rural-urban migration. For every new job created, two or three migrants who were productively occupied in rural areas may come to the city. Thus, if 100 new jobs are created, there may be as many as 300 new migrants and therefore 200 more urban unemployed. Hence, a policy designed to reduce urban unemployment may lead not only to higher levels of urban unemployment but also to lower levels of agricultural output due to **induced migration**.

Induced migration Process in which the creation of urban jobs raises expected incomes and induces more people to migrate from rural areas.

Third, indiscriminate educational expansion will lead to further migration and unemployment. The Todaro model also has important policy implications for curtailing public investment in higher education. The heavy influx of rural migrants into urban areas at rates much in excess of new employment opportunities necessitates rationing in the selection of new employees. Although within each educational group such selection may be largely random, many observers have noted that employers tend to use educational attainment or number of years of completed schooling as the typical rationing device. For the same wage, they will hire people with more education in preference to those with less, even though extra education may not contribute to better job performance. Jobs that could formerly be filled by those with a primary education (sweepers, messengers, filing clerks, etc.) now require secondary training; those formerly requiring a secondary certificate (clerks, typists, bookkeepers, etc.) must now have a university degree. It follows that for any given urban wage, if the probability of success in securing a modern-sector job is higher for people with more education, their expected income differential will also be higher, and they will be more likely to migrate to the cities. The basic Todaro model therefore provides an economic explanation for the observed fact in most developing countries that rural inhabitants with more education are more likely to migrate than those with less.

Fourth, wage subsidies and traditional scarcity factor pricing can be counterproductive. As noted in Chapter 5 and Appendix 5.1, a standard economic policy prescription for generating urban employment opportunities is to eliminate factor price distortions by using "correct" prices, perhaps implemented by wage subsidies (fixed government subsidies to employers for each worker employed) or direct government hiring. Because actual urban wages generally exceed the market or "correct" wage as a result of a variety of institutional factors, it is often argued that the elimination of wage distortions through price adjustments or a subsidy system will encourage more labor-intensive modes of production. Although such policies can generate more labor-intensive modes of production, they can also lead to higher levels of unemployment in accordance with our argument about induced migration. The overall welfare impact of a **wage subsidy** policy when both the rural and urban sectors are taken into account is not immediately clear. Much will depend on the level of urban unemployment, the size of the urban-rural expected-income differential, and the magnitude of induced migration as more urban jobs are created.

Wage subsidy A government financial incentive to private employers to hire more workers, as through tax deductions for new job creation.

Finally, programs of integrated rural development should be encouraged. Policies that operate only on the demand side of the urban employment picture, such as wage subsidies, direct government hiring, elimination of factor price distortions, and employer tax incentives, are probably far less effective in the long run in alleviating the unemployment problem than policies designed directly to regulate the supply of labor to urban areas. Clearly, however, some combination of both kinds of policies is most desirable.

Conceptually, it may be useful to think of cities and their surrounding rural areas as integrated systems. There are significant complementarities between town and country (see Chapter 9). Agricultural and raw materials grown and extracted in rural areas are inputs for urban industry. Although there is some urban agriculture, most food consumed in urban areas is grown in agricultural regions. Towns are needed to allow sufficient agglomeration economies, as well as economies of scale, to produce and exchange many goods and services that are needed in rural areas. In turn, when rural incomes grow, markets for urban manufacturers expand. People come from their rural residences to work in the city by the day or the week. City residents temporarily migrate to nearby agricultural regions during peak planting and harvesting seasons. Thus, rural-urban linkages are extensive. And while investment in urban areas can accelerate migration to cities, investment in agriculture can raise productivity and incomes, making labor redundant, and also accelerate migration. As a result, for policy purposes, it may make a great deal of sense to take account of rural impacts when devising urban policies and vice versa.

At the same time, as globalization proceeds (see Chapter 12), cities tend to trade more with other cities, often in distant parts of the world, and less with nearby rural areas. Moreover, cities generally get the upper hand when urban and rural areas are treated as a bloc, reinforcing urban bias. And rural hinterlands, far from significant cities and from the attention of distant governments, whether national or regional, often suffer from benign neglect at best and systematic exploitation at worst, such as forced sale of food at low prices. Thus, rural areas need to retain their own autonomy, and poverty programs need to be tailored to the needs of rural citizens.

Every effort must be made to broaden the economic base of the rural economy. The present unnecessary economic incentives for rural-urban migration can be minimized through creative and well-designed programs of integrated rural development. These should focus on both farm and nonfarm income generation, employment growth, health care delivery, educational improvement, infrastructure development (electricity, water, roads, etc.), and the provision of other rural amenities. Successful rural development programs adapted to the socioeconomic and environmental needs of particular countries and regions seem to offer the only viable long-run solution to the problem of excessive rural-urban migration.

To assert, however, that there is an urgent need for policies designed to curb the excessive influx of rural migrants is not to imply an attempt to reverse what some observers have called inevitable historical trends. Rather, the implication of the Todaro migration model is that there is a growing need for a policy package that does not exacerbate these historical trends toward urbanization by artificially creating serious imbalances in economic opportunities between urban and rural areas.

7.7 Conclusion: A Comprehensive Urbanization, Migration, and Employment Strategy

Developing-country cities are projected to grow by more than 2 billion people over the next three decades. This presents enormous challenges for the developing world, but at the same time important economic development opportunities. The pattern of urban settlements tends to be very persistent, so the quality of planning now for this enormous transformation will have ramifications for decades to come.

Based on long-term trends, comparisons with developed countries, and still-strong individual incentives, continued urbanization and rural-urban migration are probably inevitable. Urban bias spurs migration, but focused investment in agriculture raises rural productivity sufficiently to require less labor; a majority of alternative types of employment expansion tend to be concentrated in urban areas because of agglomeration effects. Moreover, as education increases in rural areas, workers gain the skills they need, and perhaps the rising aspirations, to seek employment in the city. But the pace of rural-urban migration is still often excessive from the social viewpoint. At various points throughout this chapter, we have looked at possible policy approaches designed to improve the very serious migration and employment situation in developing countries. We conclude with a summary of what appears to be the growing consensus of most economists on the shape of a comprehensive migration and employment strategy.[33] These elements reflect the complex and nuanced nature of the topic, with potentially excessive migration relative to urban opportunities partly due to low productivity, poor rural institutions, and harsh social conditions; and the great and still not fully tapped opportunities for urban dynamism as an engine of economic development. We consider 10 key elements:

1. *Creating an appropriate rural-urban economic balance*. A more appropriate balance between rural and urban economic opportunities appears to be

indispensable to ameliorating both urban and rural unemployment problems and to slowing the pace of excessive rural-urban migration. The main thrust of this activity should be in the integrated development of the rural sector, the spread of rural nonfarm employment opportunities, improved credit access, better agricultural training, the reorientation of social investments toward rural areas, improving rural infrastructure, and addressing shortcomings of rural institutions (including corruption, discrimination, and stratification), the presence of which has the effect of raising the cost of delaying out-migration.

2. *Expansion of small-scale, labor-intensive industries.* The composition or "product mix" of output has obvious effects on the magnitude (and in many cases the location) of employment opportunities, because some products (often basic consumer goods) require more labor per unit of output and per unit of capital than others. Expansion of these mostly small-scale and labor-intensive industries in both urban and rural areas can be accomplished in two ways: directly, through government investment and incentives and improved access to credit, particularly for activities in the urban informal sector, and indirectly, through income redistribution (either directly or from future growth) to the rural poor, whose structure of consumer demand is both less import-intensive and more labor-intensive than that of the rich. Under the right conditions, such enterprises can agglomerate as industrial districts in ways that can generate exports, as pointed to by the findings on China in Box 7.1. Policies that effectively discourage clustering of specialized activities are likely to be harmful.

3. *Eliminating factor price distortions*. There is ample evidence to demonstrate that correcting factor price distortions—primarily by eliminating various capital subsidies and curtailing the growth of urban wages through market-based pricing—would increase employment opportunities and make better use of scarce capital resources. But by how much or how quickly these policies would work is not clear. Moreover, their migration implications would have to be ascertained. Correct pricing policies by themselves are insufficient to fundamentally alter the present employment situation.[34]

4. *Choosing appropriate labor-intensive technologies of production.* One of the principal factors inhibiting the success of any long-run program of employment creation in both urban industry and rural agriculture is the almost complete technological dependence on (typically laborsaving) machinery and equipment from the developed countries. Domestic and international efforts can help reduce this dependence by developing technological research and adaptation capacities in developing countries. Such efforts might first be linked to the development of small-scale, labor-intensive rural and urban enterprises. They could focus on developing low-cost, labor-intensive methods of meeting rural infrastructure needs, including roads, irrigation and drainage systems, and essential health and educational services. This is an area where scientific and technological assistance from the developed countries could prove extremely helpful.

5. *Modifying the linkage between education and employment.* The emergence of the phenomenon of the educated unemployed is calling into question the

appropriateness of the massive quantitative expansion of educational systems, especially at the higher levels. Formal education has become the rationing tunnel through which all prospective jobholders must pass. Although a full discussion of educational problems and policies must await the next chapter, one way to moderate the excessive demand for additional years of schooling (which in reality is a demand for modern-sector jobs) would be for governments, often the largest employers, to base their hiring practices and their wage structures on other criteria. Moreover, the creation of attractive economic opportunities in rural areas would make it easier to redirect educational systems toward the needs of rural development. At present, many of the skills needed for development remain largely neglected.

6. *Reducing population growth*. This is most efficiently accomplished through reductions in absolute poverty and inequality, particularly for women, along with the expanded provision of family-planning and rural health services. The labor force size for the next two decades is already determined by today's birth rates, and hidden momentum of population growth applies as well to labor force growth. Together with the demand policies identified in points 1 through 5, the population and labor supply reduction policies described in this chapter provide an essential ingredient in any strategy to combat the severe employment problems that developing countries face now and in future years.

7. *Decentralizing authority to cities and neighborhoods*. Experience shows that decentralization of authority to municipalities is an essential step in the improvement of urban policies and the quality of public services. Local conditions vary greatly among small and large cities, as well as across different national regions, and policies need to be designed to reflect these differences. Local officials have greater information about evolving local conditions; and when officials are held accountable for local fiscal performance and know they must answer to recipients of the services they provide, they also have greater incentives to carry out their responsibilities effectively. Decentralization, with increased authority of cities and regions, has been a major international trend in the organization of government (see Chapter 11) .

8. *Leveraging untapped opportunities for urban dynamism.* With strong, pro-poor rural development policies in place, many developing countries in Africa, Asia, and Latin America can still make gains in harnessing the growth potential of developing-country cities, with ongoing attention to preparing for its possible migration implications.

9. *Addressing the desperate poverty needs of the poor now living in urban slum conditions.* As poor rural residents continue to migrate to urban areas, there is a growing phenomenon of the "urbanization of global poverty," even if more than half of the poor will be found in rural areas for the next decades. As Martin Ravallion, Shaohua Chen, and Prem Sangraula concluded, "By fostering economic growth, urbanization helped reduce absolute poverty in the aggregate but did little for urban poverty."[35] For poor residents in slum communities, basic protection is needed. These residents face disease and death from unsanitary conditions and increasing vulnerability to severe weather events and other disasters. These citizens urgently need a

basic safety net, let alone an improvement in the actively hostile policies that have prevailed in many developing nations and regions by denying property rights (which has allowed the seizing of land and the demolishing of housing) and other forms of discrimination. A change in basic policies can lead to large improvements in living conditions in slums.

10. *Anticipating and assisting the new "climate migrants."* In a related point, one major response to climate change is rural-to-urban migration (see Chapter 10), section 10.3). This needs to be anticipated and planned for. A critical part of the solution is more effective rural development, from better access to sustainable irrigation to improved rural institutions. But "climate migrants" are already arriving in developing-country cities, and many of them end up on land that is highly vulnerable to disasters brought about by extreme weather, such as mudslides following heavy rains. As the World Bank has proposed:

> In facilitating migration as a response to climate impacts, it is better to formulate integrated migration and development policies that address the needs of voluntary migrants and support their entrepreneurial abilities and technical skills. To the extent possible, policies should discourage settlement of migrants in areas with high exposure to persistent climate hazards . . . forward-looking plans should identify alternative sites, apply compensation formulas that allow migrants to relocate and develop new sources of livelihoods, and build public and social infrastructure for community life.[36]

We return to the topic of rural development in Chapter 9 and environment and development in Chapter 10.

We conclude by noting that while a much higher urban share of population is inevitable, the tempo and pattern of urbanization will be key determinants of whether the deeper objectives of economic development are achieved. China and India, which together account for over one-third of the world's population, are in the midst of their most rapid migration and urbanization period. Several African and other Asian countries are entering this stage. Because of fixed costs, including infrastructure and land use patterns, the quality of policies toward urbanization and migration that are implemented now are thus of momentous importance for the character of economic development for many decades to come.

Case Study 7

Rural-Urban Migration and Urbanization in Developing Countries: India and Botswana

About half of the world's population lives in cities; by 2025, nearly two-thirds will live in urban areas. Most of the urban growth is taking place in the developing world. The patterns of this growth and its implications are complex. Urban population growth in the developing world is far more rapid than population growth generally; about half the urban growth is accounted for by migrants from rural areas. Unchecked urbanization of the developing world is placing a strain on infrastructure and public health and threatens social stability. Shantytowns and similar makeshift settlements represent over one-third of developing-country urban residences. About half of the urban labor force works in the informal sector of low-skilled, low-productivity, often self-employed jobs in petty sales and services. Still, this sector may generate up to a third of urban income and features a low capital intensity, low-cost training, waste recycling, and employment creation. What drives migration? The cases of India and Botswana are instructive in showing the value of the probabilistic theory of migration and suggesting ways of extending it.

The scale of urbanization in these countries is dramatic. The UN Population Division projected in 2013 that India will surpass China as the world's largest nation in 2028, when India reaches a population of 1.45 billion; due largely to migration, the growth of the urban population will be much faster than that of the rural population. Botswana is a small country but represents one of Africa's relatively few long-term success stories (see the case study for Chapter 14); and as of 2012, its urbanization rate had already reached well over 60%, compared with an average of under one-third in sub-Saharan Africa as a whole.

Any economic or social policy that affects rural and urban incomes will influence migration; this, in turn, will affect sectoral and geographic economic activity, income distribution, and even population growth. Before the Todaro and Harris-Todaro migration models were introduced, migration was widely viewed as irrational or driven by noneconomic motivations, sometimes attributed to the lure of the "bright city lights." Noneconomic factors do influence migration decisions, but economic factors are now understood to be primary. In the economic version of the bright-city-lights theory, people rationally migrated on the basis of costs and benefits. In this approach, it was assumed that if migrants appeared to be worse off, this was because other benefits were being overlooked, with the effect of making the migrants feel better off (or raising their overall utility).

The Todaro migration models postulate that observed migration is individually rational but that migrants respond to urban-rural differences in expected rather than actual earnings. Urban modern-sector earnings are much higher than rural earnings, which may in turn be even higher than urban traditional-sector earnings. Migration occurs until average or expected rather than actual incomes are equal across regions, generating equilibrium unemployment or underemployment in the urban traditional sector. The extension of the model to consider equilibrium and effects of actions such as increases in wages and probability of employment in the urban areas, undertaken by Harris and Todaro, shows that under some conditions, notably elastic supply of labor, creation of employment opportunities in cities can actually lead to an *increase* in unemployment by attracting more migrants than there are new jobs. Despite being individually rational, extensive rural-urban migration generates social costs for crowded cities, while excessive migration also

imposes external costs on the rural areas emptied of better-educated, more venturesome young people, as well as external costs on urban infrastructure and lost output.

One set of relevant migration and employment policies emphasizes rural development, rural basic-needs strategies, elimination of factor price distortions, appropriate technology choice, and appropriate education. Each is intended to increase the incentives for rural residents to remain in rural areas rather than migrate to cities. But even if rural development is successful, fewer rural laborers will ultimately be needed, and demand for products of the cities will grow, which will fuel migration anyway. So other policies seek to influence the pace and pattern of urban development to gain the most benefits for the fewest costs from migration that is probably inevitable.

India provides an interesting setting for a case study because future urban migration is potentially so vast and because a number of interesting studies have been undertaken there. Botswana offers a good counterpoint because it has been the subject of some of the most interesting empirical research and represents one of the most rapidly urbanizing African countries as well as one of its most important success stories.

India

The growth of Delhi has been extraordinary: In 1950, Delhi was not even among the world's 30 largest cities, but by 2013 its population had soared to become second in size only to Tokyo.

One of the most detailed studies of rural-urban migration, providing some tests of the Todaro migration models and depicting the characteristics of migrants and the migration process, is Biswajit Banerjee's *Rural to Urban Migration and the Urban Labor Market: A Case Study of Delhi*.

Everyone who has been to a major city in a developing country has noticed the sharp inequality between residents with modern-sector jobs and those working in the informal sector. But can the informal sector be seen as a temporary way station on the road to the formal sector, or can the barriers between these sectors be explained by education and skill requirements that informal-sector workers cannot hope to meet? Banerjee found that the idea of segmented formal-informal rural labor markets could be substantiated statistically. After carefully controlling for human capital variables, Banerjee was still left with earnings in the formal sector 9% higher than in the informal sector that were not explained by any standard economic factor. Even so, the earnings differences found in India were not nearly so dramatic as implied in some of the migration literature.

In much of the literature on urbanization, the typical laborer is characterized as self-employed or working on some type of piecework basis. But Banerjee found that only 14% of his informal-sector sample worked in nonwage employment. Interestingly, average monthly incomes of nonwage workers were 47% higher than those of formal-sector workers.

Banerjee argued that entry into nonwage employment was not easy in Delhi. Some activities required significant skills or capital. Those that did not were often controlled by cohesive "networks" of operators that controlled activities in various enterprises. Entry barriers to self-employment in petty services were probably lower in other developing-country cities.

Consistent with these findings, Banerjee found that mobility from the informal to the formal sector was low: There was little evidence that more than a very small minority of informal-sector workers were actively seeking jobs in the formal sectors, and only 5% to 15% of rural migrants in the informal sector had moved over to the formal sector in a year's time.

Moreover, the rate of entrance into the formal sector from the informal sector was just one-sixth to one-third that of the rate of direct entry into the urban formal sector from outside the area.

Informal-sector workers tended to work in the same job almost as long as those in the formal sector; the average informal-sector worker had worked 1.67 jobs over a period of 61 months in the city, while formal-sector workers averaged 1.24 jobs over an urban career of 67 months.

Banerjee's survey data suggested that a large number of informal-sector workers who had migrated to the city were attracted to the informal rather than the formal sector, coming to work as domestic servants, informal construction laborers, and salespeople. Of those who began nonwage employment upon their arrival, 71% had expected to do so. The fact that only a minority of informal-sector workers continued to search for formal-sector work was taken as further evidence that migrants had come to Delhi expressly to take up informal-sector work.

Workers who appear underemployed may not consider themselves as such, may perceive no possibility of moving into the modern sector, may be unable to effectively search for modern-sector work while employed in the informal sector, and hence do not create as much downward pressure on modern-sector wages as it may at first appear. This may be one factor keeping modern-sector wages well above informal-sector wages for indefinite periods of time despite high measured urban underemployment.

One reason for this focus on the informal sector was concluded to be the lack of contacts of informal-sector workers with the formal sector. About two-thirds of direct entrants into the formal sector and nearly as many of those switching from the informal to the formal sector found their jobs through personal contacts. This overwhelming importance of contacts explained why some 43% of Banerjee's sample migrated after receiving a suggestion from a contact, which suggests that job market information can become available to potential migrants without their being physically present in the city. An additional 10% of the sample had a prearranged job in the city prior to migration.

Finally, the duration of unemployment following migration is usually very short. Within one week, 64% of new arrivals had found employment, and although a few were unemployed for a long period, the average waiting time to obtain a first job was just 17 days.

Banerjee also found that migrants kept close ties to their rural roots. Some three-quarters of the migrants visited their villages of origin and about two-thirds were remitting part of their urban incomes, a substantial 23% of income on average. This indicates that concern for the whole family appeared to be a guiding force in migration. It also suggests a source of the rapid flow of job market information from urban to rural areas.

In a separate study, A. S. Oberai, Pradhan Prasad, and M. G. Sardana examined the determinants of migration in three states in India—Bihar, Kerala, and Uttar Pradesh. Their findings were consistent with the ideas that migrants often have a history of chronic underemployment before they migrate, migrate only as a measure of desperation, and have the expectation of participating in the informal urban sector even in the long run. Remittances were found to be substantial, and considerable levels of return migration were also documented, among other evidence of continued close ties of migrants to their home villages.

But Banerjee's fascinating findings do not necessarily represent a challenge to the applicability of Harris-Todaro or other "probabilistic migration models." Instead, they suggest that they need to be extended to accommodate the apparently common pattern of migrating with the ultimate aim of urban informal-sector employment. As Ira Gang and Shubhashis Gangopadhyay have noted, one can modify the model to include in the urban area not only a formal sector but also a highly paid informal sector, as well as a low-paid (or unemployed) sector. In this case, people will migrate looking for either a formal-sector job or a high-paying informal-sector job. This seems to be consistent with Banerjee's evidence. The assumption that keeps the essence of the probabilistic models intact is that the wage of the formal urban sector exceeds the high-paying informal wage, which in turn exceeds the agricultural wage, which in turn exceeds the low-paying informal (or unemployed) wage. In fact, if rural wages remain below all urban opportunities, this suggests that we are well out of equilibrium, and much additional migration must occur before expected incomes can be equalized across sectors. The particular formulations of the Todaro models are really no more than examples of a general principle: that migrants go where they expect in advance to do better, not where they do better after the fact. The basic ideas of the Todaro models do not depend on a particular notion of an informal or a formal sector.

Oded Stark's ideas on a family's use of migration can be a useful supplement to the Todaro models and may apply to some of Banerjee's findings. In his view, a family will send members to different areas as a "portfolio diversification" strategy, to reduce the risk that the family will have no income. This approach is useful to explain any observed migration from higher- to lower-wage areas and into higher-wage areas but not necessarily the area with the highest expected wage. The basic idea of the Todaro models still applies, but this approach looks at families rather than individuals and stresses risk aversion.

Other studies have shown that the Todaro migration models have held up well without modification in other parts of the world. A survey by Deepak Mazumdar confirmed that the evidence is overwhelming that migration decisions are made according to rational economic motivations.

Botswana

A study of migration behavior conducted by Robert E. B. Lucas in Botswana addressed such problems in one of the most careful empirical studies of migration in a developing country. His econometric model consisted of four groups of equations—for employment, earnings, internal migration, and migration to South Africa. Each group was estimated from microeconomic data on individual migrants and nonmigrants. Very detailed demographic information was used in the survey.

Rural migrants in Botswana moved to five urban centers (they would be called towns rather than cities in many parts of the world) as well as to neighboring South Africa. Lucas found that unadjusted urban earnings were much higher than rural earnings—68% higher for males—but these differences became much smaller when schooling and experience were controlled for.

Lucas's results confirm that the higher a person's expected earnings and the higher the estimated probability of employment after a move to an urban center, the greater the chances that the person will migrate. And the higher the estimated wage and probability of employment for a person in his or her home village, the lower the chances that the person will migrate. This result was very "robust"—not sensitive to which subgroups were examined or the way various factors were controlled for—and statistically significant. It represents clear evidence in support of Todaro's original hypothesis.

Moreover, Lucas estimated that at current pay differentials, the creation of one job in an urban center would draw more than one new migrant from the rural areas, thus confirming the Harris-Todaro effect. Earnings were also found to rise significantly the longer a migrant had been in an urban center, holding education and age constant. But the reason was because of increases in the rate of pay rather than in the probability of modern-sector employment.

Taken together, the best-conducted studies of urbanization confirm the value of probabilistic migration models as the appropriate place to start seeking explanations of rural-to-urban migration in developing countries. But these studies underscore the need to expand these explanations of migration, considering that many people today migrate to participate in the informal rather than the formal urban sector and that workers may face a variety of risks in different settings. ■

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Concepts for Review

Agglomeration economies
Congestion
Efficiency wage
Harris-Todaro model
Induced migration
Informal sector
Labor turnover
Localization economies
Present value
Rural-urban migration
Social capital
Todaro migration model
Urban bias
Urbanization economies
Wage subsidy

Questions for Discussion

1. Why might the problem of rapid urbanization be a more significant population policy issue than curtailing population growth rates over the next two decades for most developing countries? Explain your answer.
2. Describe briefly the essential assumptions and major features of the Todaro model of rural-urban migration. One of the most significant implications of this model is the paradoxical conclusion that government policies designed to create more urban employment may in fact lead to more urban unemployment. Explain the reasons for such a paradoxical result.
3. "The key to solving the serious problem of excessive rural-urban migration and rising urban unemployment and underemployment in developing countries is to restore a proper balance between urban and rural economic and social opportunities." Discuss the reasoning behind this statement, and give a few specific examples of government policies that would promote a better balance between urban and rural economic and social opportunities.
4. For many years, the conventional wisdom of development economics assumed an inherent conflict between the objectives of maximizing output growth and promoting rapid industrial employment growth. Might these two objectives be mutually supportive rather than conflicting? Explain your answer.
5. What is meant by the expression "getting prices right"? Under what conditions will eliminating factor price distortions generate substantial new employment opportunities? (Be sure to define *factor price distortions*.)
6. The informal sector has become a very large part of the urban economy. Distinguish between the urban formal and informal sectors, and discuss both the positive and the negative aspects of the informal urban labor market.

7. Why are primary cities—generally the capital—often disproportionately large in many developing countries? Which factors can be addressed with better policies?
8. What is an industrial district? How might governments of developing countries help them succeed?
9. Suppose that potential migrants make decisions only based on comparisons of their expected incomes. Now suppose the rural wage is $1 per day. Urban modern sector employment can be obtained with 0.25 probability and pays $3 per day. The urban traditional sector pays $0.40 per day. Using this information, and making assumptions as needed, can you make a prediction about whether there will be any rural-to-urban or urban-to-rural migration? Explain your reasoning, stating explicitly any simplifying assumptions, and show all work. Consider an approach that calculates an expected income in the urban sector of 0.25(3) + (0.75)(0.40) = 1.05; and note that this exceeds the rural wage of 1—would you predict that there will be rural-to-urban migration? What simplifying assumptions are needed to make this a valid conclusion? Now, what would the urban traditional sector daily income have to be to induce no net rural-urban migration? If wages in all sectors are inflexible, what else adjusts in this model to lead to equilibrium (how much does it adjust and what is the intuition)?
10. Explain the concept of urban bias. What policies are associated with it, and what are their likely effects on urban and rural areas?
11. Now explain the economic benefits of concentration of economic activity in cities. How are various costs of doing business likely to be affected? Why are some of the potential benefits of urbanization lost when congestion becomes substantial? What policies are likely to strengthen or weaken the opportunities to take advantage of the economic benefits of cities?

Appendix 7.1

A Mathematical Formulation of the Todaro Migration Model

Consider the following mathematical formulation of the basic Todaro model discussed in this chapter. Individuals are assumed to base their decision to migrate on considerations of income maximization and what they perceive to be their expected income streams in urban and rural areas. It is further assumed that the individual who chooses to migrate is attempting to achieve the prevailing average income for his or her level of education or skill attainment in the urban center of his or her choice. Nevertheless, the migrant is assumed to be aware of the limited chances of immediately securing wage employment and the likelihood that he or she will be unemployed or underemployed for a certain period of time. It follows that the migrant's expected income stream is determined by both the prevailing income in the modern sector and the probability of being employed there, rather than being underemployed in the urban informal sector or totally unemployed.

If we let $V(0)$ be the discounted present value of the expected "net" urban-rural income stream over the migrant's time horizon; $Y_u(t)$ and $Y_r(t)$ the average real incomes of individuals employed in the urban and the rural economy, respectively; n the number of time periods in the migrant's planning horizon; and r the discount rate reflecting the migrant's degree of time preference, then the decision to migrate or not will depend on whether

$$V(0) = \int_{t=0}^{n} [p(t)Y_u(t) - Y_r(t)]e^{-rt}dt - C(0) \qquad \text{(A7.1.1)}$$

is positive or negative, where $C(0)$ represents the cost of migration and $p(t)$ is the probability that a migrant will have secured an urban job at the average income level in period t.

In any one time period, the probability of being employed in the modern sector, $p(t)$, will be directly related to the probability π of having been selected in that or any previous period from a given stock of unemployed or underemployed job seekers. If we assume that for most migrants the selection procedure is random, then the probability of having a job in the modern sector within x periods after migration, $p(x)$, is $p(1) = \pi(1)$ and $p(2) = \pi(1) + [1 - \pi(1)]\pi(2)$ so that

$$p(x) = p(x-1) + [1 - p(x-1)]\pi(x) \qquad \text{(A7.1.2)}$$

or

$$p(x) = \pi(1) + \sum_{t=2}^{x} \pi(t) \prod_{s=1}^{t-1} [1 - \pi(s)] \qquad \text{(A7.1.3)}$$

where $\pi(t)$ equals the ratio of new job openings relative to the number of accumulated job aspirants in period t.

It follows from this probability formulation that for any given level of $Y_u(t)$ and $Y_i(t)$, the longer the migrant has been in the city, the higher his or her probability p of having a job and the higher, therefore, his or her expected income in that period.

Formulating the probability variable in this way has two advantages:

1. It avoids the "all or nothing" problem of having to assume that the migrant either earns the average income or earns nothing in the periods immediately following migration. Consequently, it reflects the fact that many underemployed migrants will be able to generate some income in the urban informal or traditional sector while searching for a regular job.
2. It modifies somewhat the assumption of random selection, since the probability of a migrant's having been selected varies directly with the time the migrant has been in the city. This permits adjustments for the fact that longer-term migrants usually have more contacts and better information systems so that their expected incomes should be higher than those of newly arrived migrants with similar skills.

Suppose that we now incorporate this behavioristic theory of migration into a simple aggregate dynamic equilibrium model of urban labor demand and supply in the following manner. We once again define the probability π of obtaining a job in the urban sector in any one time period as being directly related to the rate of new employment creation and inversely related to the ratio of unemployed job seekers to the number of existing job opportunities, that is:

$$\pi = \frac{\lambda N}{S - N} \tag{A7.1.4}$$

where λ is the net rate of urban new job creation, N is the level of urban employment, and S is the total urban labor force. If w is the urban real wage rate and r represents average rural real income, then the expected urban-rural real-income differential d is

$$d = w\pi - r \tag{A7.1.5}$$

or, substituting Equation A7.1.4 into Equation A7.1.5,

$$d = w\frac{\lambda N}{S - N} - r \tag{A7.1.6}$$

The basic assumption of our model once again is that the supply of labor to the urban sector is a function of the urban-rural *expected* real-income differential, that is,

$$S = f_s(d) \tag{A7.1.7}$$

If the rate of urban job creation is a function of the urban wage w and a policy parameter a, such as a concentrated governmental effort to increase employment through a program of import substitution, both of which operate on labor demand, we have

$$\lambda = f_d(w; a) \tag{A7.1.8}$$

where it is assumed that $\partial\lambda/\partial a > 0$. If the growth in the urban labor demand is increased as a result of the governmental policy shift, the increase in the urban labor supply is

$$\frac{\partial S}{\partial a} = \frac{\partial S}{\partial d}\frac{\partial d}{\partial \lambda}\frac{\partial \lambda}{\partial a} \tag{A7.1.9}$$

Differentiating Equation A7.1.6 and substituting into Equation A7.1.9, we obtain

$$\frac{\partial S}{\partial a} = \frac{\partial S}{\partial d} w \frac{N}{S - N} \cdot \frac{\partial \lambda}{\partial a} \tag{A7.1.10}$$

The absolute number of urban employed will increase if the increase in labor supply exceeds the increase in the number of new jobs created, that is, if

$$\frac{\partial S}{\partial a} > \frac{\partial(\lambda N)}{\partial a} = \frac{N \partial \lambda}{\partial a} \tag{A7.1.11}$$

Combining Equations A7.1.10 and A7.1.11, we get

$$\frac{\partial S}{\partial d} w \frac{N}{S - N} \cdot \frac{\partial \lambda}{\partial a} > \frac{N \partial \lambda}{\partial a} \tag{A7.1.12}$$

or

$$\frac{\partial S/S}{\partial d/d} > \frac{d}{w} \cdot \frac{S - N}{S} \tag{A7.1.13}$$

or, finally, substituting for d:

$$\frac{\partial S/S}{\partial d/d} > \frac{w\pi - r}{w} \cdot \frac{S - N}{S} \tag{A7.1.14}$$

Equation A7.1.14 reveals that the absolute level of unemployment will rise if the elasticity of urban labor supply with respect to the expected urban-rural income differential $(\partial S/S)/(\partial d/d)$—what has been called elsewhere the "migration response function"—exceeds the urban-rural differential as a proportion of the urban wage times the unemployment rate, $(S - N)/S$. Alternatively, Equation A7.1.14 shows that the higher the unemployment rate, the higher must be the elasticity to increase the level of unemployment for any expected real-income differential. But note that in most developing nations, the inequality in Equation A7.1.14 will be satisfied by a very low elasticity of supply when realistic figures are used. For example, if the urban real wage is 60, average rural real income is 20, the probability of getting a job is 0.50, and the unemployment rate is 20%, then the level of unemployment will increase if the elasticity of urban labor supply is greater than 0.033; that is, substituting into Equation A7.1.14, we get

$$\frac{\partial S/S}{\partial d/d} = \frac{(0.5 \times 60) - 20}{60}(0.20) = \frac{2}{60} = 0.033 \tag{A7.1.15}$$

Note that before one can realistically predict what the impact of a policy to generate more urban *employment* will be on the overall level of urban *unemployment*, one needs solid estimates of the empirical value of this elasticity coefficient prevailing in particular developing nations.

Notes

1. The estimate of 9.6 billion people was announced in June 2013; see *United Nations World Population Prospects: The 2012 Revision* (New York: United Nations, Department of Economic and Social Affairs, June 13, 2013). The mid-2009 estimate for the point when the urban population became the majority globally is found in *United Nations World Urbanization Prospects: The 2011 Revision*, 2012; the quote is from the UN Population Division 2009 chart at: http://www.un.org/en/development/desa/population/publications/urbanization/urban-rural.shtml.
2. See *United Nations World Urbanization Prospects: The 2011 Revision*, released April 5, 2012.
3. A well-known comment along these lines was made in 1984 by former World Bank president Robert McNamara, who expressed his skepticism that huge urban agglomerations could be made to work at all: "These sizes are such that any economies of location are dwarfed by costs of congestion. The rapid population growth that has produced them will have far outpaced the growth of human and physical infrastructure needed for even moderately efficient economic life and orderly political and social relationships, let alone amenity for their residents." See Robert S. McNamara, "The population problem: Time bomb or myth?" *Foreign Affairs* 62 (1984): 1107–1131. For additional arguments on problems caused by rapid urban population growth, see Bertrand Renaud, *National Urbanization Policy in Developing Countries* (New York: Oxford University Press, 1981). A less concerned viewpoint is expressed in Jeffrey G. Williamson, "Migration and urbanization," in *Handbook of Development Economics*, vol. 1, eds. Hollis B. Chenery and T. N. Srinivasan (Amsterdam: Elsevier, 1988), pp. 426–465.
4. United Nations Population Fund, *Population, Resources, and the Environment* (New York: United Nations, 1991), p. 61.
5. United Nations Population Division, *World Population Monitoring, 1987* (New York: United Nations, 1988). Those results were reiterated in the Program of Action of the 1994 International Conference on Population and Development, para. 9.1. More recently, the United Nations reported in 2006 that nearly three-quarters of developing-country officials indicated a strong desire to implement policies that would reduce rural-to-urban migration or to take actions to reverse rural-urban migration trends. See United Nations Population Division, *World Urbanization Prospects: The 2005 Revision*.
6. See Michael Porter, *The Competitive Advantage of Nations* (New York: Free Press, 1990); his theory is reviewed further in Chapter 12. Marshall introduced the industrial districts concept in his 1890 *Principles of Economics*.
7. See Michael Piore and Charles Sabel, *The Second Industrial Divide* (New York: Basic Books, 1984).
8. See Khalid Nadvi, "Collective efficiency and collective failure: The response of the Sialkot Surgical Instrument Cluster to global quality pressures," *World Development* 27 (1999): 1605–1626.
9. Gezahegn Ayele, Lisa Moorman, Kassu Wamisho, and Xiaobo Zhang, "Infrastructure and cluster development," International Food Policy Research Institute Discussion Paper No. 980, 2009.
10. The significance of industrial districts in developing countries is difficult to pin down, in part because such clusters overlap traditional political jurisdictions for which data are collected. An excellent source on this topic is Hubert Schmitz and Khalid Nadvi, eds., "Introduction: Clustering and industrialization," *World Development* 27 (1999): 1503–1514. See also Khalid Nadvi, "Collective efficiency and collective failure: The response of the Sialkot Surgical Instrument Cluster to global quality pressures," *World Development* 27 (1999): 1605–1626. Hermine Weijland, "Microenterprise clusters in rural Indonesia: Industrial seedbed and policy target," in ibid., p. 1519.
11. Dorothy McCormick, "African enterprise and industrialization: Theory and reality," in ibid., pp. 1531–1551.
12. Schmitz and Nadvi, "Introduction" ibid., pp. 1505–1506,
13. World Bank, *World Development Report, 1999–2000* (New York: Oxford University Press, 2000), ch. 6.
14. Ibid.

15. For an introductory overview of urban economics, see, for example, Arthur M. O'Sullivan, *Urban Economics*, 5th ed. (New York: McGraw-Hill/Irwin, 2002). Formal models of some of these ideas can be found in Masahisa Fujita, Paul Krugman, and Anthony J. Venables, *The Spatial Economy: Cities, Regions, and International Trade* (Cambridge, Mass.: MIT Press, 1999). We would like to thank Anthony Yezer for his very helpful suggestions on these sections.

15a. For a discussion, see World Bank, *World Development Report 2009: Reshaping Economic Geography*.

16. In this comparison, it is no accident that a relatively modest scale of the largest city tends to be found in countries in which the political capital is not found in the largest city, as will be explained shortly. This has been true in Canada and the United States nearly since their founding; it is more recently true in Brazil, where urban growth has been diverted to the new capital, Brasilia, which was inaugurated in 1960 and has reached a population approaching 4 million. Comparative advantage and geography are other important factors; continent-sized countries are more plausible settings for multiple major hubs, as are also found in China and India. The picture also changes somewhat if one considers what the United Nations termed *megaregions* in a 2010 report, which include Hong Kong–Shenzhen–Guangzhou in China and Rio de Janeiro–São Paulo in Brazil.

17. With the exception of France and Britain, most ratios in Europe are small. Examples—Italy: Rome, 3.4 million; Milan, 2.9 million. Germany: Berlin, 3.4 million; Hamburg, 1.7 million. Netherlands: Rotterdam and Amsterdam, 1.0 million each. Portugal: Lisbon, 2.7 million; Porto, 1.3 million. Spain: Madrid, 5.4 million; Barcelona, 4.8 million. Other sizable developing countries where ratios of largest to second-largest city are relatively higher include Indonesia (about 4), Ethiopia (over 8), Afghanistan (over 6), and Côte d'Ivoire (over 6). Egypt, Iran, Iraq, Kenya, Nigeria, and Bangladesh all have ratios of about 3. Some ratios are higher with alternative metropolitan area estimates.

18. For example, while Mexico City continues to expand, it has a smaller share of industry than in decades past. A major reason is the growing concentration of export industries in northern Mexico along the U.S. border, especially following implementation of NAFTA and, even more recently, the move of some low-skill industries to southern Mexico.

19. Alberto F. Ades and Edward L. Glaeser, "Trade and circuses: Explaining urban giants," *Quarterly Journal of Economics* 110 (1995): 195–227. Urban concentration is defined as the average share of urbanized population living in the main city from 1970 to 1985. Stable countries are defined as those whose average number of revolutions and coups is below the worldwide median. Dictatorships are countries whose average Gastil democracy and freedoms index for the period is higher than 3. See also Rasha Gustavsson, "Explaining the phenomenon of Third World urban giants: The effects of trade costs," *Journal of Economic Integration* 14 (1999): 625–650.

20. UN-Habitat's annual "State of the World's Cities" reports are available at http://www.unhabitat.org.

21. See World Bank, *World Development Report, 2008–2009* (New York: Oxford University Press, 2008), on the often unrealized role of agriculture in development (discussed in Chapter 9); UN-Habitat on new developing-country perspectives on urbanization at http://www.unhabitat.org; and the World Bank on realizing more of the potential benefits of cities at http://www.worldbank.org/urban. See also World Bank, *World Development Report 2009: Reshaping Economic Geography* (New York: Oxford University Press, 2009).

22. For the 2012 CIV study, see Isabel Günther and Andrey Launov, "Informal employment in developing countries: Opportunity or last resort?" *Journal of Development Economics* 97, No. 1 (2012): 88–98; the authors use a parametric identification strategy. For a concise review of the overall debate, see Cathy A. Rakowski, "Convergence and divergence in the informal sector debate: A focus on Latin America, 1984–92," *World Development* 22 (1994): 501–516. See also Donald C. Mead and Christian Morrisson, "The informal sector elephant," *World Development* 24 (1996): 1611–1619, and Edward Funkhauser, "The urban informal sector in Central America: Household survey evidence," *World Development* 24 (1996): 1737–1751.

23. For updates on these and related indices, see International Finance Corporation, *Doing Business 2013, Smarter Regulations for Small and Medium-Size Enterprises*, http://www.doingbusiness.org/~/media/GIAWB/Doing%20Business/Documents/Annual-Reports/English/DB13-full-report.pdf.
24. UN-Habitat noted this for its *State of Women in Cities 2012/2013,* http://www.unhabitat.org/pmss/listItemDetails.aspx?publicationID=3457.
25. See Robert E. B. Lucas, "Internal migration and urbanization: Recent contributions and new evidence," background paper for World Bank, *World Development Report, 1999–2000*.
26. Although the *rate* of rural-urban migration slowed during the 1980s, especially in Latin America and sub-Saharan Africa, as a result of declining urban real wages and fewer formal-sector employment opportunities, the actual number of migrants continued to increase.
27. See Appendix 7.1 and Michael P. Todaro, "A model of labor migration and urban unemployment in less developed countries," *American Economic Review* 59 (1969): 138–148, and John R. Harris and Michael P. Todaro, "Migration, unemployment, and development: A two-sector analysis," *American Economic Review* 60 (1970): 126–142.
28. This graph was first introduced in W. Max Corden and Ronald Findlay, "Urban unemployment, intersectoral capital mobility, and development policy," *Economica* 42 (1975): 59–78. It reflects Harris and Todaro," Migration, unemployment, and development."
29. Note that qq' is a rectangular hyperbola, a unitary-elasticity curve showing a constant urban wage bill; that is, L_M ¥ W_M is fixed.
30. That is, if informal-sector income is greater than zero, we add to expected urban income (on the right side of Equation 7.1) the informal-sector wage W_{UI} times the probability of receiving it: $W_{UI}(1 - L_M/L_{US})$, where $(1 - L_M/L_{US})$ is the probability of not receiving the preferred urban formal wage. We can further distinguish wages and probabilities of receiving them in this period, or in a more general model in future periods; for a fully developed model, see Appendix 7.1.
31. William J. Carrington, Enrica Detragiache, and Tara Vishwanath, "Migration with endogenous moving costs," *American Economic Review* 86 (1996): 909–930.
32. Whereas the Todaro model focuses on the institutional determinants of urban wage rates above the equilibrium wage, several later analysts have sought to explain this phenomenon by focusing on the high costs of labor turnover (the so-called labor turnover model) in urban areas and the notion of an efficiency wage; an above-equilibrium urban wage enables employers to secure a higher-quality workforce and greater productivity on the job. For a review of these various models, see Joseph E. Stiglitz, "Alternative theories of wage determination and unemployment in LDCs: The labor turnover model," *Quarterly Journal of Economics* 88 (1974): 194–227, and Janet L. Yellen, "Efficiency wage models of unemployment," *American Economic Review* 74 (1984): 200–205. For evidence of the existence and importance of an institutionally determined urban-rural wage gap, see Francis Teal, "The size and sources of economic rents in a developing country manufacturing labour market," *Economic Journal* 106 (1996): 963–976. In an influential study, Valerie Bencivenga and Bruce Smith make the alternative assumption that urban modern firms do not know the productivity of migrants but that some potential migrants from rural areas are highly productive and others are unproductive within formal-sector (say, industrial) firms. In this scenario, firms will be motivated through competitive forces to (in effect) offer migrants a package of a wage and a probability of employment. Modern-sector firms hire labor until their marginal products are equal to the resulting high wage rate, and unemployment ensues. Moreover, if modern-sector labor demand increases, both modern- and traditional-sector workforces expand proportionately, inducing additional migration. See Valerie R. Bencivenga and Bruce D. Smith, "Unemployment, migration, and growth," *Journal of Political Economy* 105 (1997): 582–608. An alternative perspective in the economics-of-information framework, based on moral hazard problems, is offered by Hadi S. Esfahani and Djavad Salehi-Ifsahani, "Effort observability and worker productivity: Toward an explanation of economic dualism," *Economic Journal* 99 (1989): 818–836.

33. On problems of job creation, see World Bank, *World Development Report 2012*. For other perspectives on migration and urbanization policy, see, for example, Gary S. Fields, "Public policy and the labor market in less developed countries," in *The Theory of Taxation for Developing Countries*, eds. David P. Newbery and Nicholas Stern (New York: Oxford University Press, 1987); Charles M. Becker, Andrew M. Hammer, and Andrew R. Morrison, *Beyond Urban Bias in Africa: Urbanization in an Era of Structural Adjustment* (Portsmouth, N.H.: Heinemann, 1994), chs. 4–7; David Turnham, *Employment and Development: A New Review of Evidence* (Paris: Organization for Economic Coordination and Development, 1993), pp. 245–253; Paul P. Streeten, *Strategies for Human Development: Global Poverty and Unemployment* (Copenhagen: Handelshøjskolens Forlag, 1994), pp. 50–64; and Cedric Pugh, "Poverty and progress: Reflections on housing and urban policies in developing countries, 1976–96," *Urban Studies* 34 (1997): 1547–1595.
34. The literature has also examined strategies to eliminate excessive migration through wage subsidies; these would prove expensive and difficult to administer, but their analysis has yielded interesting insights into the nature of the Harris-Todaro migration model. See, for example, Ira Gang and Shubhashis Gangopadhyay, "Optimal policies in a dual economy with open unemployment and surplus labour," *Oxford Economic Papers* 39 (1987): 378–387, which also contains references to important earlier work.
35. Martin Ravallion, Shaohua Chen, and Prem Sangraula, "New evidence on the urbanization of global poverty," World Bank Research Working Paper 4199, 2008.
36. *World Bank World Development Report,* 2010, p. 110.