

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:

$$C_d = f(Y, P_c, P_x, t_x), x = 1, \dots, n \quad (6.1)$$

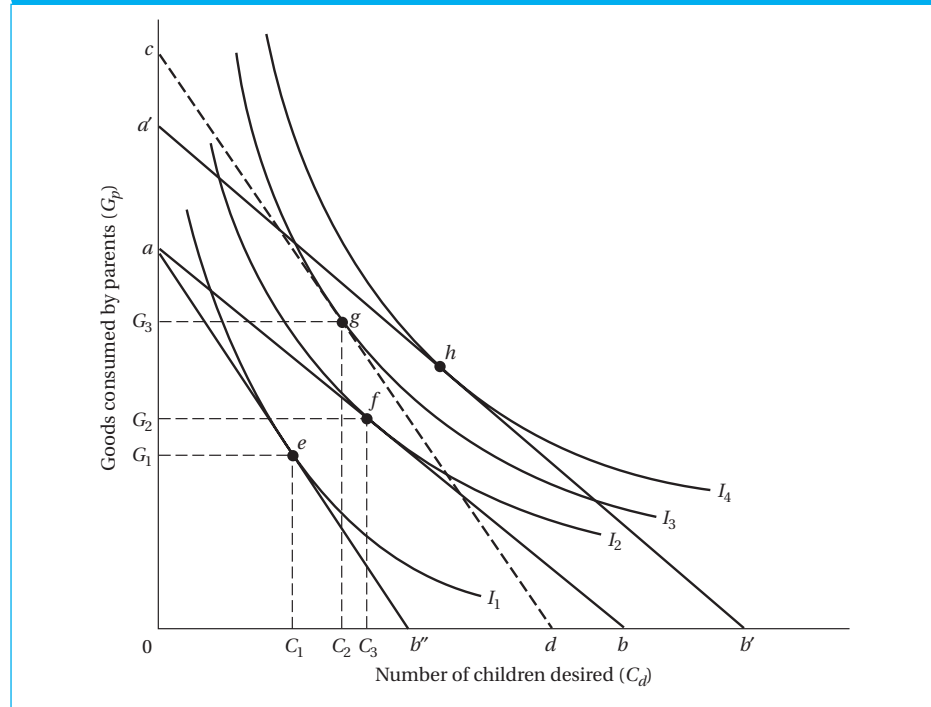
where  $C_d$ , the demand for surviving children (an important consideration in low-income societies where infant mortality rates are high), is a function of the given level of household income ( $Y$ ), the “net” price of children (the difference between anticipated costs, mostly the opportunity cost 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.

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

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

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  $0ab$ ) 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,  $C_2$  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.<sup>12</sup> 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.<sup>13</sup>

**Some Empirical Evidence** Statistical studies in a broad spectrum of developing countries have provided support for the economic theory of fertility.<sup>14</sup> 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.<sup>15</sup> 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

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For many years, development economists and other social scientists have debated the seriousness of the consequences of rapid population growth.<sup>16</sup> 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.<sup>17</sup>

### 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.<sup>18</sup> 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.<sup>19</sup> 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.<sup>20</sup> 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.<sup>21</sup> 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.<sup>22</sup> 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.

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

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

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.<sup>23</sup> 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

$$y - l = \alpha(k - l) + t \quad (6.2)$$

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  $\Delta K/K$ ,  $\alpha$  = 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.”<sup>24</sup> 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.<sup>25</sup>

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.<sup>26</sup>

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

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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.<sup>27</sup>

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.<sup>28</sup> 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.<sup>29</sup>

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:

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.<sup>30</sup>

**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.

### 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<sub>2</sub>) gases into the atmosphere and to the phenomenon of greenhouse global warming (see Chapter 10).<sup>31</sup> 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.<sup>32</sup>

### 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