



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

# The Basic Issue: Population Growth and Quality of Life



- Six major issues:
  - Will developing countries be able to improve levels of living given anticipated population growth?
  - How will developing countries deal with the vast increases in their labor forces?
  - How will higher population growth rates affect poverty?

# The Basic Issue: Population Growth and Quality of Life



- Six major issues (cont'd):
  - Will developing countries be able to extend the coverage and improve the quality of health care and education in the face of rapid population growth?
  - Is there a relationship between poverty and family size?
  - How does affluence in the developed world affect the ability of developing countries to provide for their people?

# Population Growth—Past, Present, and Future



- World population growth through history
- In 2009, the world's population was estimated to be 6.8 billion people. Projections by the United Nations placed the figure at more than 9.2 billion by the year 2050 (another widely cited projection is higher, at 9.5 billion).
- 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.

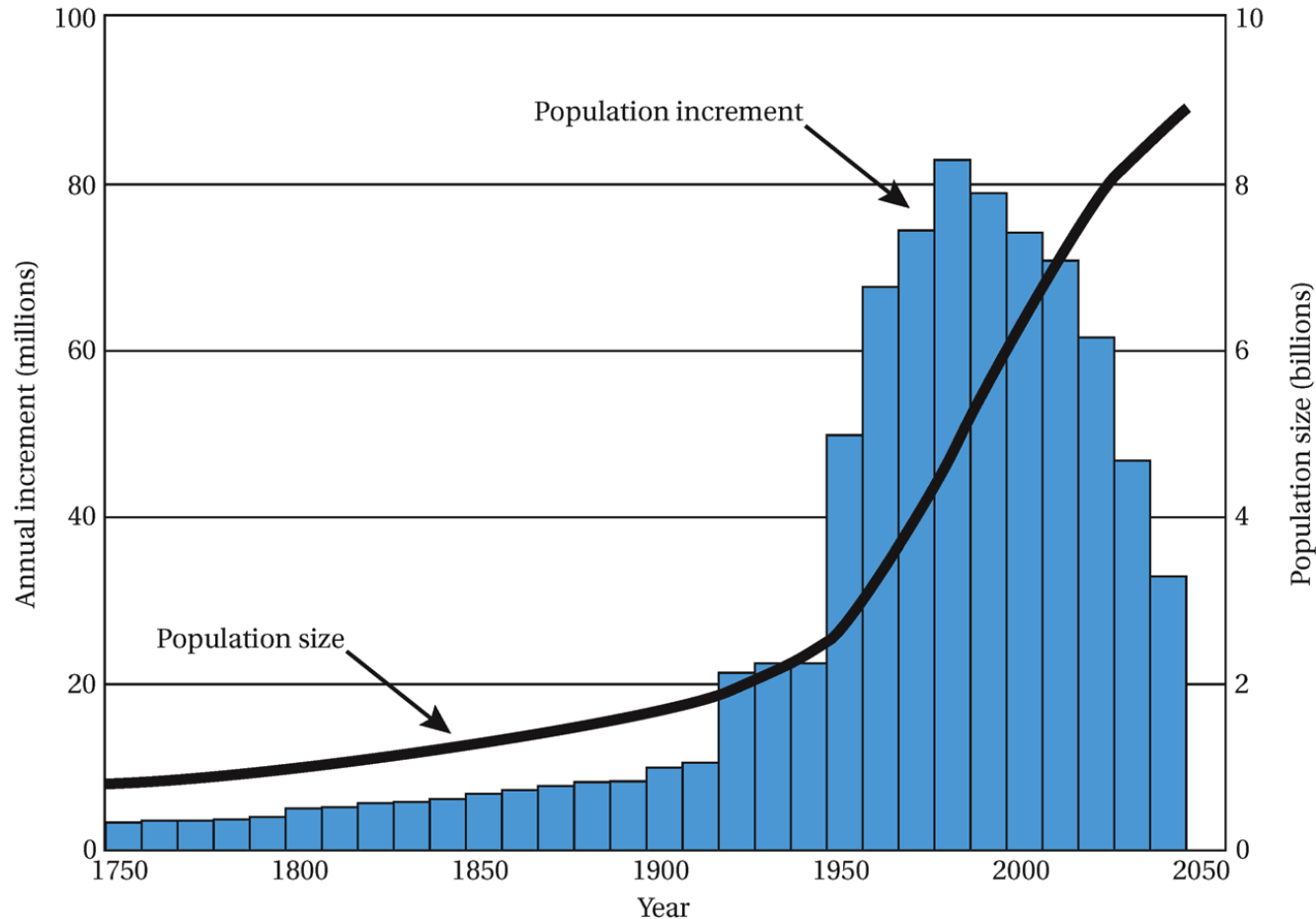
# Table 6.1 Estimated World Population Growth



Year	Estimated Population (millions)	Estimated Annual Increase in the Intervening Period (%)
10,000 B.C.E.	5	
1 C.E.	250	0.04
1650	545	0.04
1750	728	0.29
1800	906	0.45
1850	1,171	0.53
1900	1,608	0.65
1950	2,576	0.91
1970	3,698	2.09
1980	4,448	1.76
1990	5,292	1.73
2000	6,090	1.48
2050 (projected)	9,036	0.45

Sources: 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; Population Reference Bureau, *World Population Data Sheet* (Washington, D.C.: Population Reference Bureau, 1998, 2001).

# Figure 6.1 World Population Growth, 1750-2050



Source: United Nations Population Division, *The World at Six Billion* (New York: United Nations, 2000), p. 7. Used with permission.

# Table 6.2 World Population Growth Rates and Doubling Times



Period	Approximate Growth Rate (%)	Doubling Time (years)
Appearance of humans to early historical times	0.002	36,000
1650–1750	0.3	240
1850–1900	0.6	115
1930–1950	1.0	72
1960–1980	2.3	31
2006	1.2	58

Sources: Warren S. Thompson and David T. Lewis, *Population Problems*, 5th ed. (New York: McGraw-Hill, 1965), p. 384; Population Reference Bureau, *World Population Data Sheet* (Washington, D.C.: Population Reference Bureau, various issues).

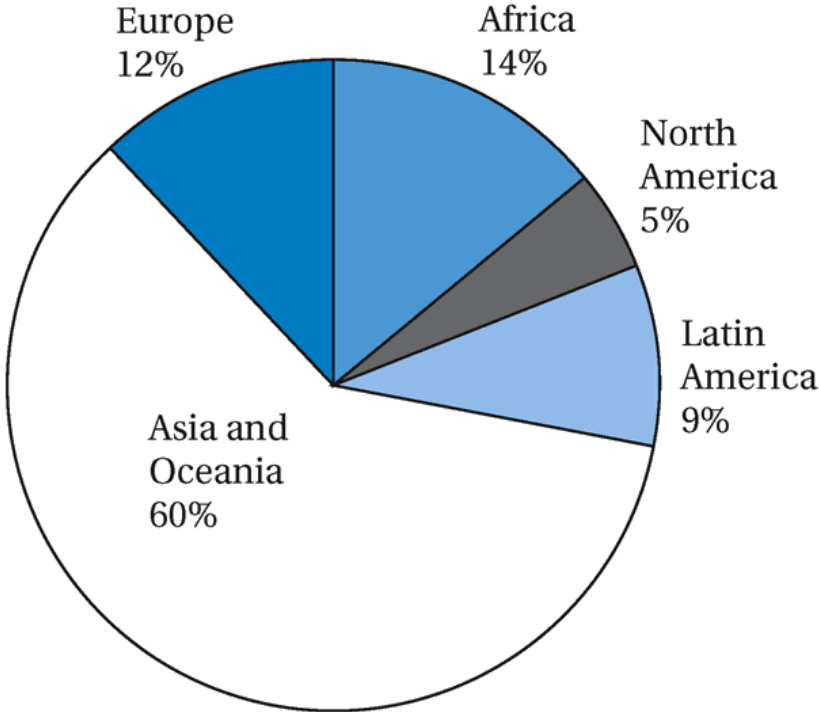
# Population Growth—Past, Present, and Future



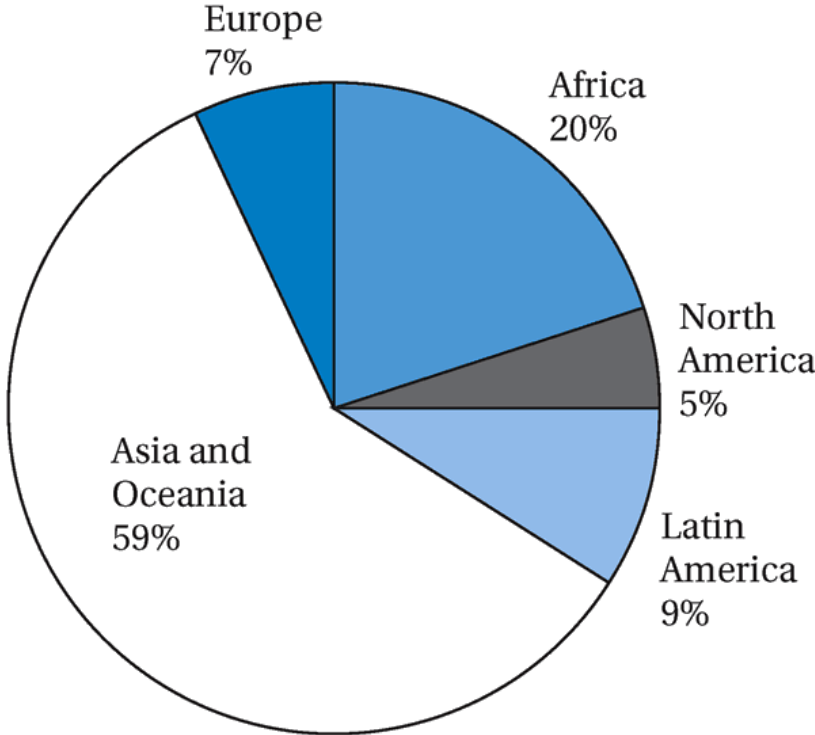
- Structure of the world's population
  - Geographic region
  - Fertility and Mortality Trends
  - Rate of population increase
  - Birth rates, death rates , Total fertility rates
  - Age Structure and dependency burdens



# Figure 6.2 World Population Distribution by Region, 2003 and 2050



(a) Total population 2003: 6.313 billion



(b) Total population 2050: 9.198 billion

Source: Data from Population Reference Bureau.

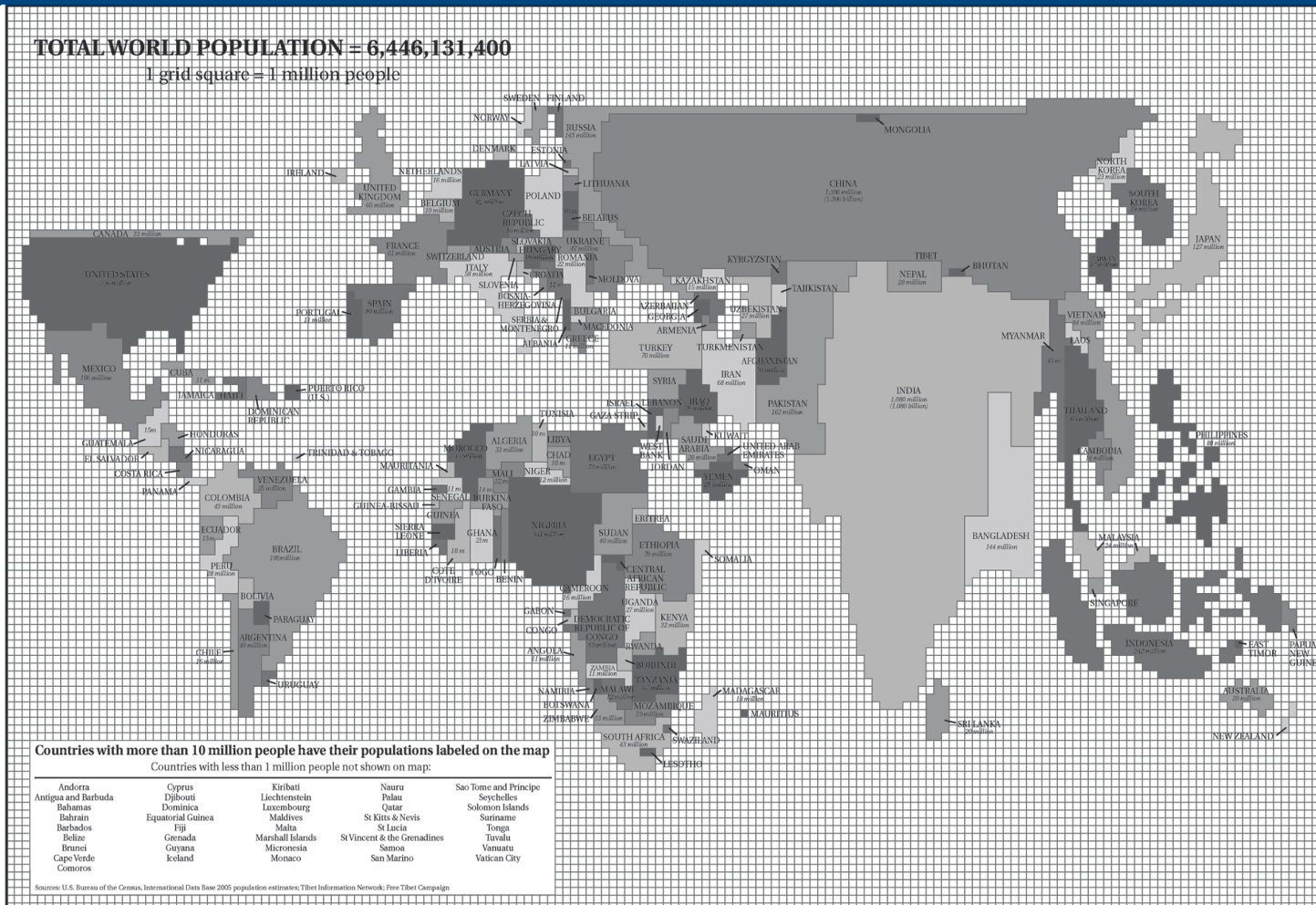


**TABLE 7.3** The Fifteen Largest Countries and Their Annual Population Increases

Rank	Country	2001 Population (millions)	Rate of Increase (%)
1	China	1,273	0.9
2	India	1,033	1.7
3	United States	285	0.6
4	Indonesia	206	1.7
5	Brazil	172	1.5
6	Pakistan	145	2.8
7	Russia	144	-0.7
8	Bangladesh	134	2.0
9	Japan	127	0.2
10	Nigeria	127	2.8
11	Mexico	100	1.9
12	Germany	82	-0.1
13	Vietnam	79	1.4
14	Philippines	77	2.2
15	Egypt	70	2.1

Source: Population Reference Bureau, *2001 World Population Data Sheet* (Washington, D.C.: Population Reference Bureau, 2001).

# Figure 6.3 The Population Map



Source: Copyright © ODT, Inc., 2005, <http://www.odt.org>.

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# Table 6.3 **Fertility Rate** for Selected Countries, 1970 and 2006



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.

Country	Total Fertility Rate <sup>a</sup>	
	1970	2006
Bangladesh	7.0	3.0
Colombia	5.3	2.4
Indonesia	5.5	2.4
Jamaica	5.3	2.3
Mexico	4.9	2.4
Thailand	5.5	1.7
Zimbabwe	7.7	3.6

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, 2006).

<sup>a</sup>Average number of children born to women who live beyond age 49.

# Age Structure and Dependency Burdens



- Population is relatively youthful in the developing world. Children under the age of 15 constitute more than 30% of the total population of developing countries but just 17% of developed nations.
- In fact, at least 10 developing nations have over 44% of their population under the age of 15; as of 2009, 43% of Ethiopia's population, 45% of Nigeria's, and 38% of Pakistan's was under 15; for both India and Mexico, the comparable figure is 32%.



- 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 North America, the workforce age group (15 to 64) amounts to about 68% of the total population. This workforce has to support only about 20% of the population as youthful dependents.



- 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).

# Population Growth—Past, Present, and Future



- The Hidden Momentum of Population Growth
  - High birth rates cannot be altered overnight
  - Age structure of LDC populations



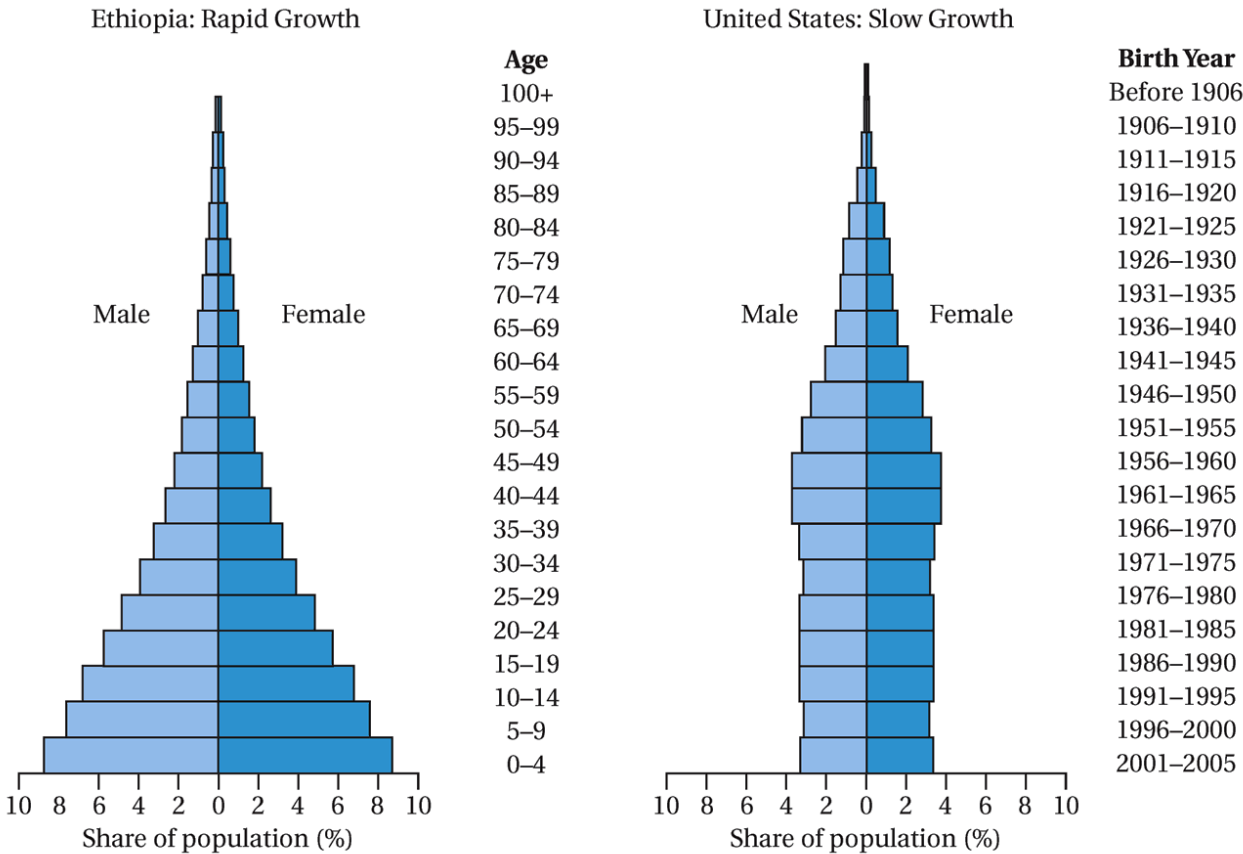




**hidden momentum of population growth** → is the tendency of population growth to continue, even after birthrates have decline substantially. Why?

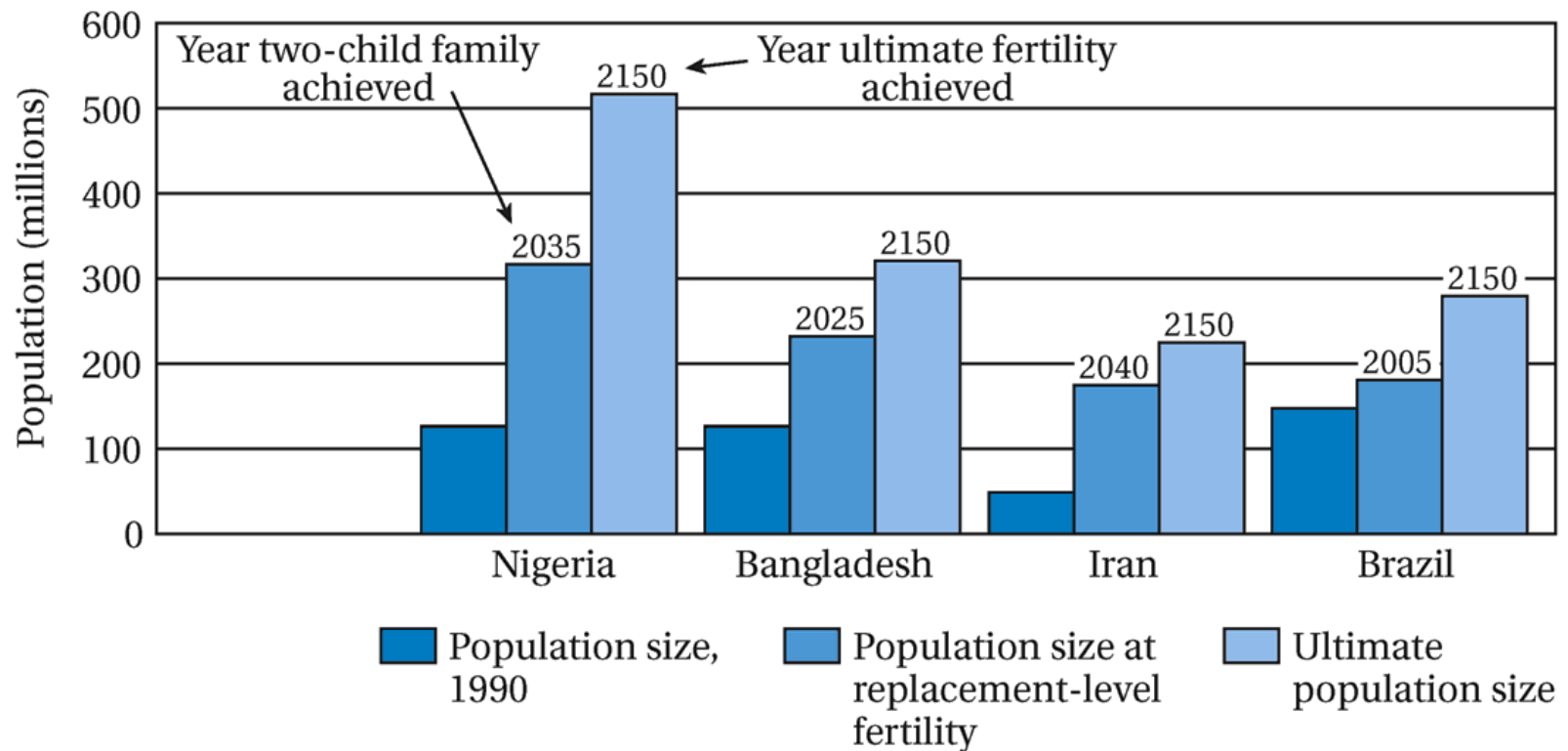
1. because substantial changes in birthrates may take decades;
2. because when the young population is large, in the near future high-fertility population will be high, even if fertility levels are lower.

# Figure 6.4 Population Pyramids: Ethiopia and the United States, 2005



Source: Population Bulletin 62 (2007): fig. 6. Used with permission.

# Figure 6.5 The Hidden Momentum of Population Growth



Source: Population Reference Bureau, *World Population: Fundamentals of Growth* (Washington, D.C.: Population Reference Bureau, 1990), p. 14. Reprinted with permission.

# The Demographic Transition



- Stage I: High birthrates and death rates
- Stage II: Continued high birthrates, declining death rates
- Stage III: Falling birthrates and death rates, eventually stabilizing



Demographic transition → process by which fertility rates eventually decline to *replacement levels* in the history of all modern developed countries

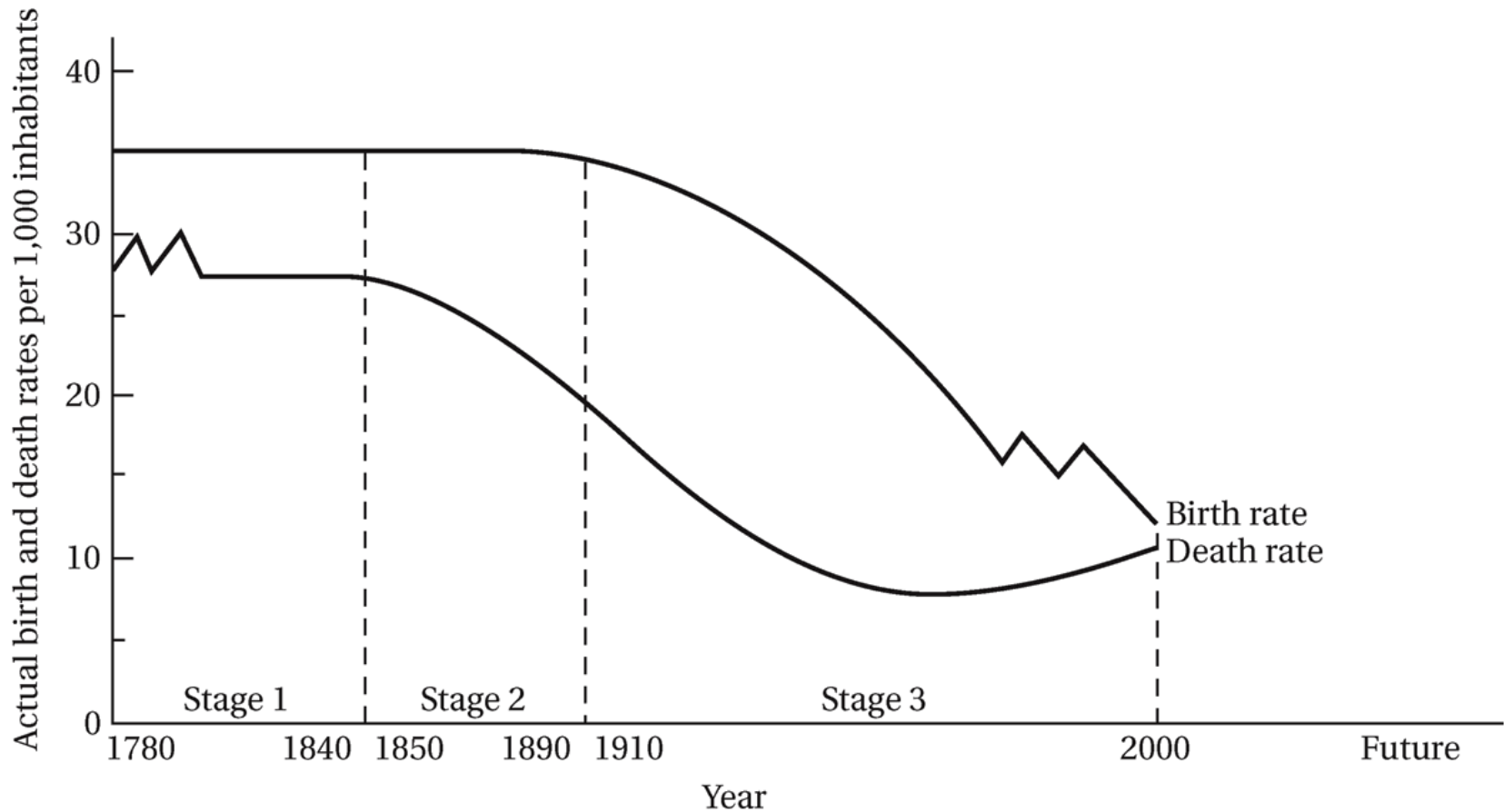
3 stages

**Stage I:** high birthrates and equally high death rates (before modernization).

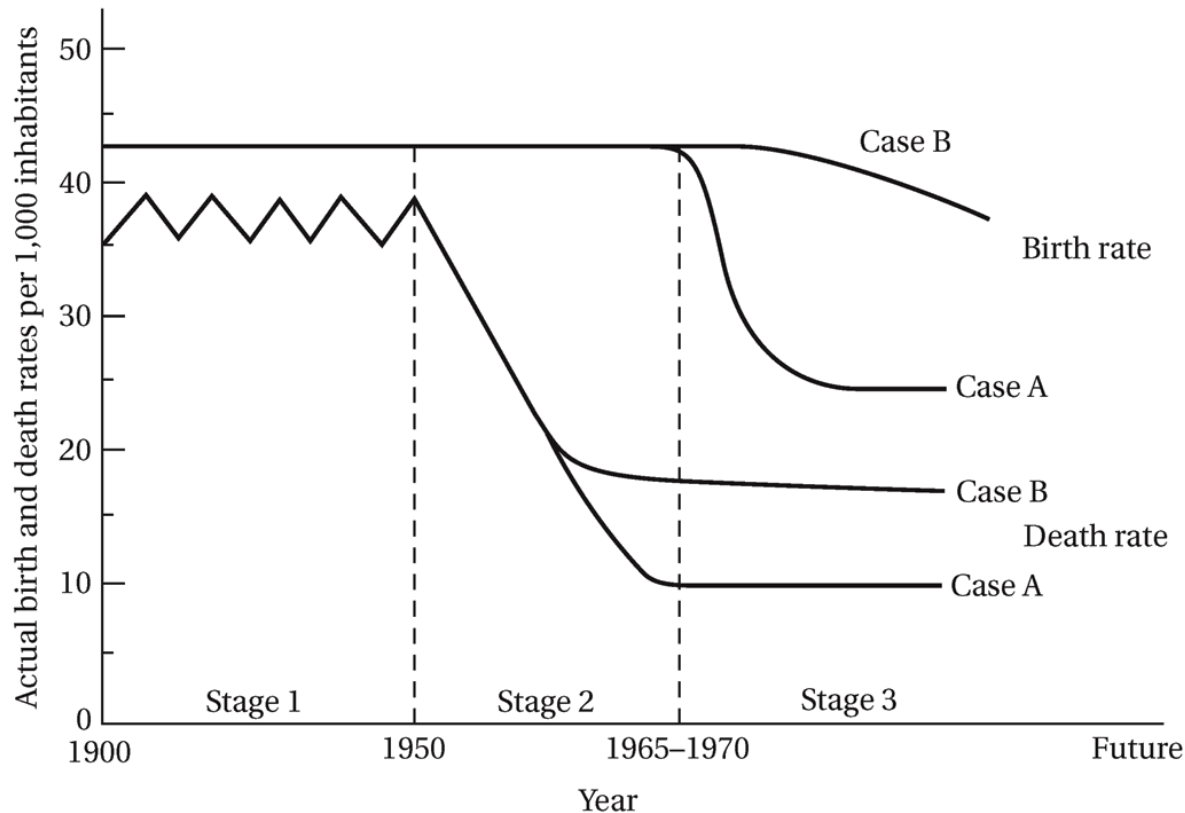
**Stage II:** high birthrates and declining death rates.

**Stage III:** falling birthrates and low death rates.

# Figure 6.6 The Demographic Transition in Western Europe



# Figure 6.7 The Demographic Transition in Developing Countries



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



# How is demographic transition in developing countries?



**Stage II** already occurred in most of the developing world, but with higher birthrates than in the developed world.

## **Stage III:**

- 1. has been similar to developed countries for some developing countries like Taiwan, South Korea, China, Chile, Costa Rica
- 2. has not occurred yet for other countries mainly in Sub-Saharan Africa and the Middle East, death rates have failed to drop due to widespread poverty and

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



- The Malthusian population trap
  - The idea that rising population and diminishing returns to fixed factors result in a low levels of living (population trap)

# Malthusian population model



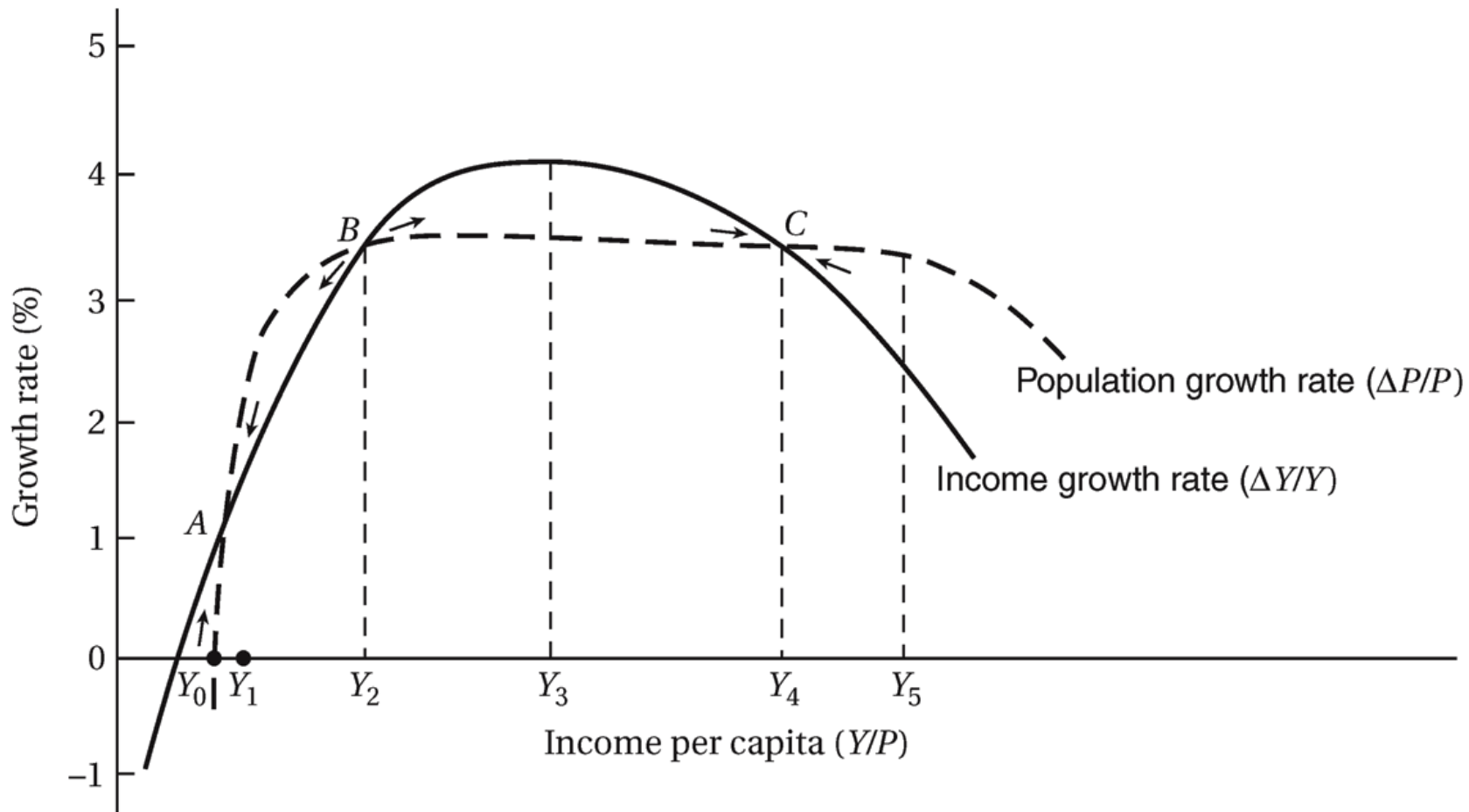
**Main idea:** in 1798 Malthus postulated that:

1. population tends to grow at a geometric rate, doubling every 30 to 40 years
2. food supplies only expand at an arithmetic rate due to diminishing returns to land (fixed factor)

consequence

**Malthusian population trap:** countries would be trapped in low per-capita incomes (per capita food), and population would stabilize at a *subsistence level*.

# Figure 6.8 The Malthusian Population Trap

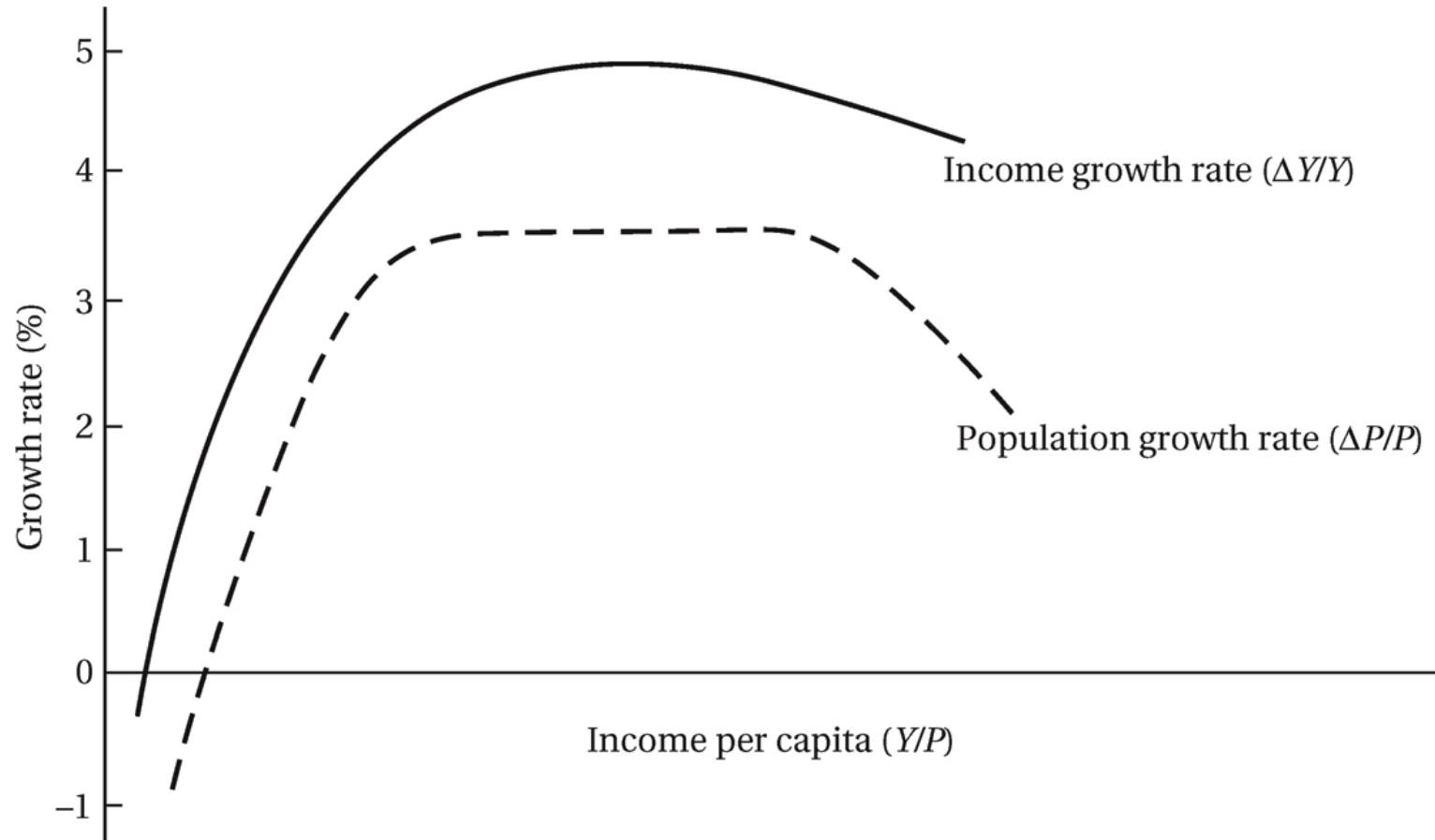


# The Causes of High Fertility in Developing Countries: The Malthusian and Household Models



- Criticisms of the Malthusian model
  - Impact of technological progress
  - No correlation between population growth and levels of per capita income
  - Microeconomics of family size; individual and not aggregate variables

# Figure 6.9 How Technological and Social Progress Allows Nations to Avoid the Population Trap



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



- The microeconomic household theory of fertility
- The demand for children in developing countries
  - First two or three as “consumer goods”
  - Additional children as “investment goods”

# Household theory of fertility




**Main idea:** fertility (family size) is a decision taken at the microeconomic level by households → there is a rational economic decision on “demand for children”

income effect → higher income allows for larger family size

substitution effect → higher price (cost) of children implies smaller family size

2 effects in consumption of children





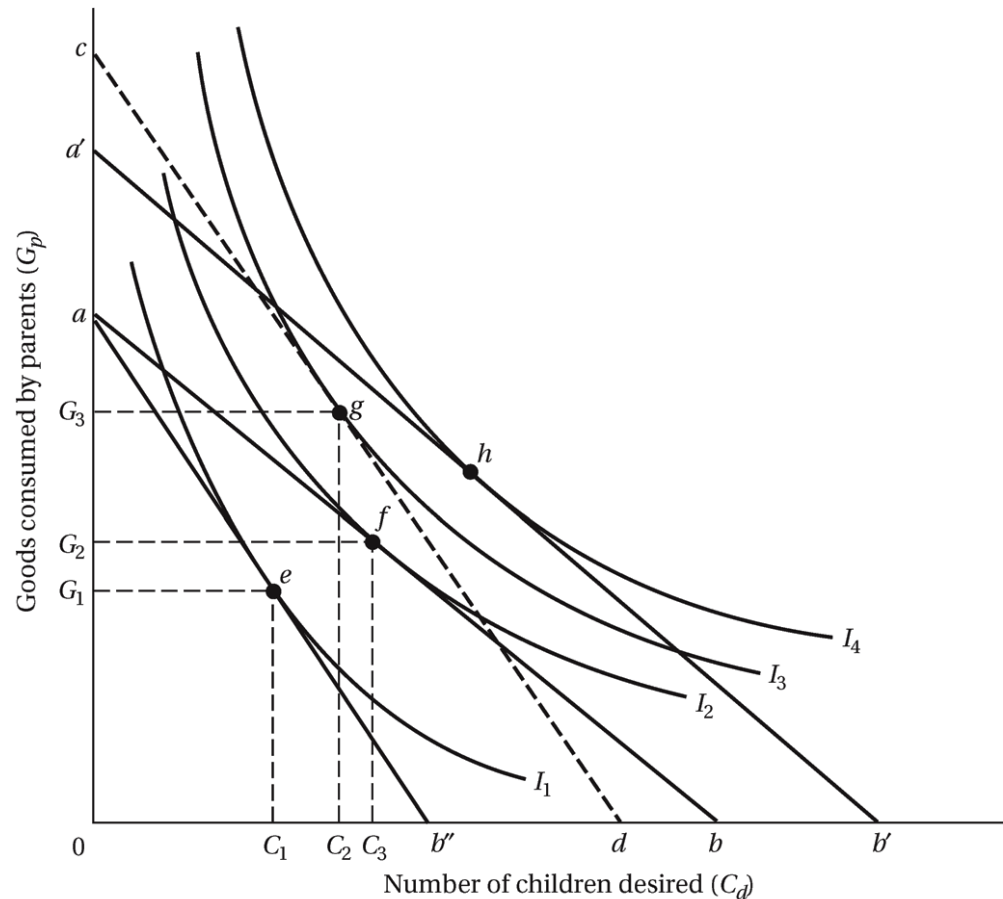
Why are there so many children in poor countries?

because children are an “investment” rather than a “consumption good” → the “expected return of the investment” is given by child labor and financial support for parents in old age



In developing countries, parents are assumed to have children up to the point at which:  
marginal economic benefit = marginal private cost

# Figure 6.10 Microeconomic Theory of Fertility: An Illustration



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



## Demand for Children Equation

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

Where

$C_d$  is the demand for surviving children

$Y$  is the level of household income

$P_c$  is the “net” price of children

$P_x$  is price of all other goods

$t_x$  is the tastes for goods relative to children

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



## Demand for Children Equation

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

Under neoclassical conditions, we would expect:

$$\frac{\partial C_d}{\partial Y} > 0 \quad \frac{\partial C_d}{\partial P_x} > 0$$

$$\frac{\partial C_d}{\partial P_c} < 0 \quad \frac{\partial C_d}{\partial t_x} < 0$$

# The Demand for Children in Developing Countries



- 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.
- 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.



- 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.

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



- Some empirical evidence
- Implications for development and fertility
  - Women's Education, role , and status
  - Female nonagricultural wage employment
  - Rise in family income levels
  - Reduction in infant mortality
  - Development of old-age and social security
  - Expanded schooling opportunities

# The Consequences of High Fertility: Some Conflicting Opinions



- Population growth isn't a real problem
  - The real problem is not population growth but the following,
    - Underdevelopment
    - World resource depletion and environmental destruction
    - Population Distribution
    - Subordination of women
- Overpopulation is a deliberately contrived false issue
- Population growth is a desirable phenomenon



# The Consequences of High Fertility: Some Conflicting Opinions



- Population Growth is a real problem
  - Extremist arguments
  - Theoretical arguments
  - Empirical arguments
    - Lower economic growth
    - Poverty and Inequality
    - Adverse impact on education
    - Adverse impact on health
    - Food issues
    - Impact on the environment
    - International migration

# Goals and Objectives: Toward a Consensus



- Despite the conflicting opinions, there is some common ground on the following
  - Population is not the primary cause of lower living levels
  - It's not numbers but quality of life
  - Population intensifies underdevelopment

# Goals and Objectives: Toward a Consensus



- Some Policy Approaches
  - Attend to underlying socioeconomic conditions that impact development
  - Family planning programs should provide education and technological means to regulate fertility
  - Developed countries have responsibilities too

# Some Policy Approaches



- What developing countries can do
  - Persuasion through education
  - Family planning programs
  - Manipulate incentives and disincentives for having children
  
  - Coercion may not be a good option
  - Raise the socioeconomic status of women

# Table 6.4 Countries Adopting Family-Planning Programs, 1960-1990



Region	Date of Adoption of National Family-Planning Program					
	Before 1960	1960-1964	1965-1969	1970-1974	1975-1979	1980-1990
Asia and Pacific	India	China Fiji South Korea Pakistan	Indonesia Iran Malaysia Nepal Singapore Sri Lanka Taiwan Turkey	Bangladesh Hong Kong Philippines Thailand	Vietnam	Yemen
Caribbean and Latin America			Barbados Dominican Republic Jamaica Trinidad and Tobago	Colombia El Salvador Mexico Puerto Rico	Guatemala	Brazil Haiti Honduras Peru
Africa			Egypt Ghana Kenya Mauritius Morocco Tunisia	Botswana		Algeria Burundi Gambia Lesotho Rwanda Senegal Uganda Zimbabwe
Totals	1	4	18	9	2	13

Source: Population Council, *Data Bank*, 1992 (Washington, D.C.: Population Council, 1992). Reprinted with permission.

# Some Policy Approaches



- What the developed countries can do
  - Address resources use inequities
  - Migration policies
- How Developed countries can assist developing countries with their population programs
  - International economic relations
  - Research into technology of fertility control
  - Financial assistance for family planning programs