Chapter 8

Human Capital: Education and Health in Economic Development
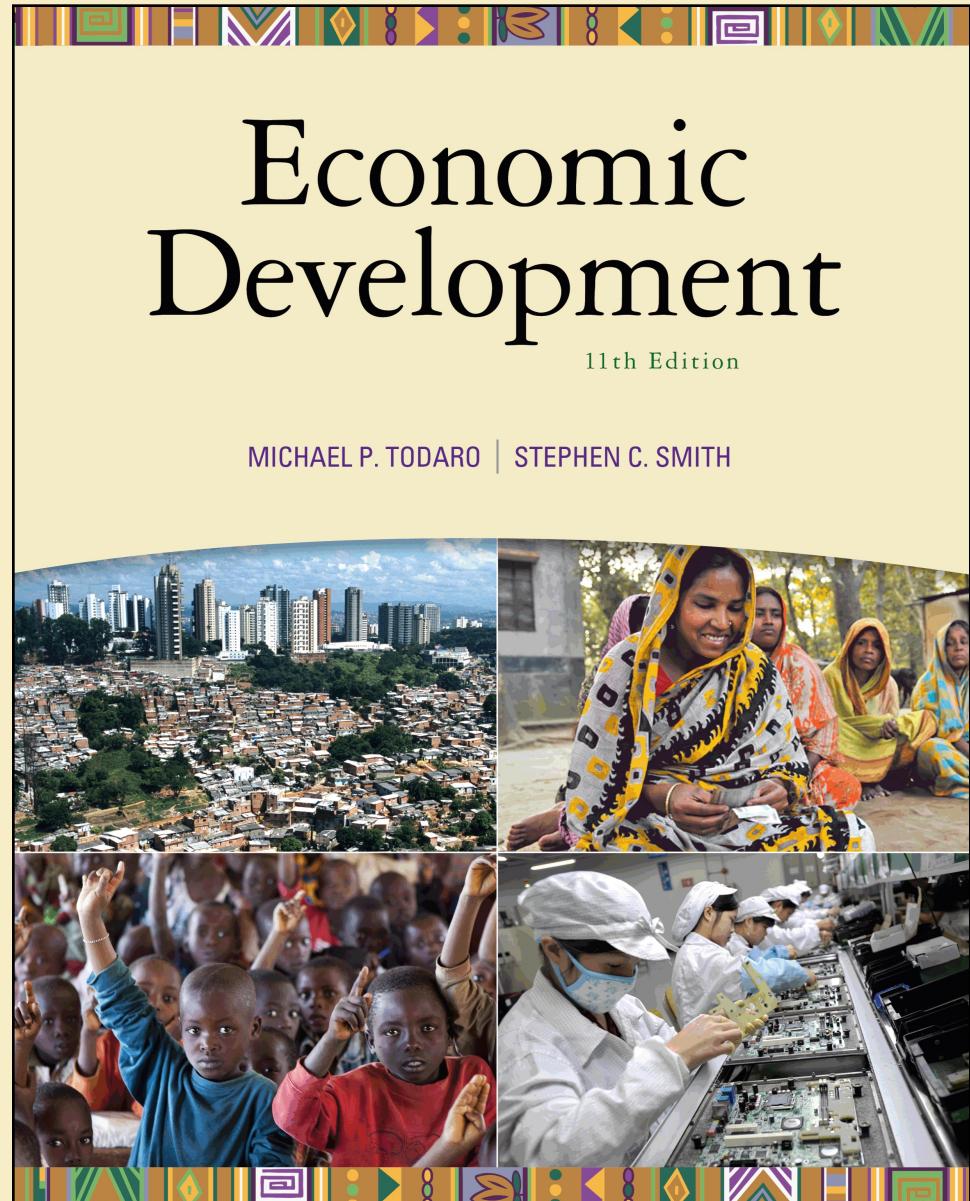
Economic Development

11th Edition

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8.1 The Central Roles of Education and Health

- Health and education are important objectives of development, as reflected in Amartya Sen's capability approach, and in the core values of economic development

- Health and education are also important components of growth and development – inputs in the aggregate production function

Education and Health as Joint Investments for Development

- These are investments in the same individual
- Greater health capital may improve the returns to investments in education
  - Health is a factor in school attendance
  - Healthier students learn more effectively
  - A longer life raises the rate of return to education
  - Healthier people have lower depreciation of education capital
- Greater education capital may improve the returns to investments in health
  - Public health programs need knowledge learned in school
  - Basic hygiene 卫生 and sanitation 卫生设施 may be taught in school
  - Education needed in training of health personnel

Improving Health and Education: Why Increasing Incomes Is Not Sufficient

- Increases in income often do not lead to substantial increases in investment in children's education and health
- But better educated mothers tend to have healthier children at any income level
- Significant market failures in education and health require policy action
  - An educated person provides spillover benefits to people around   溢出优势

# 8.2 Investing in Education and Health: The Human Capital Approach

- *Human capital*: productive investments embodied in human persons, including skills, abilities, ideals, health, and locations, often resulting from expenditures on education, on-the-job training programmes, and medical care.

表现

- Initial investments in health or education lead to a stream of higher future income
- The present discounted value of this stream of future income is compared to the costs of the investment
- The income gains is the summation over expected years of working life

$$\sum \frac{E_t - N_t}{(1 + i)^t}$$

where E is income with extra education, N is income without extra education, t is year, i is the discount rate.

Figure 8.1 Age-Earnings Profiles by Level of Education: Venezuela
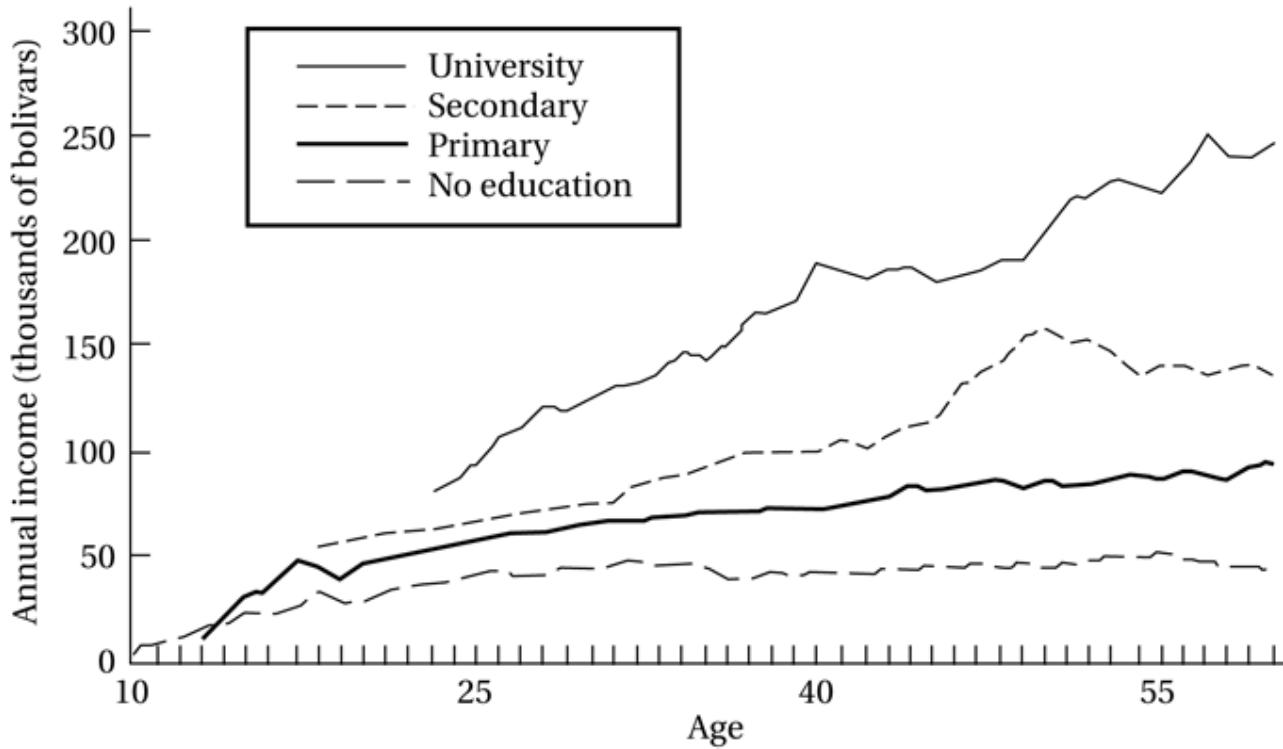
- The impact of human capital investments in developing countries can be quite substantial.

Figure 8.2 Financial Trade-Offs in the Decision to Continue in School
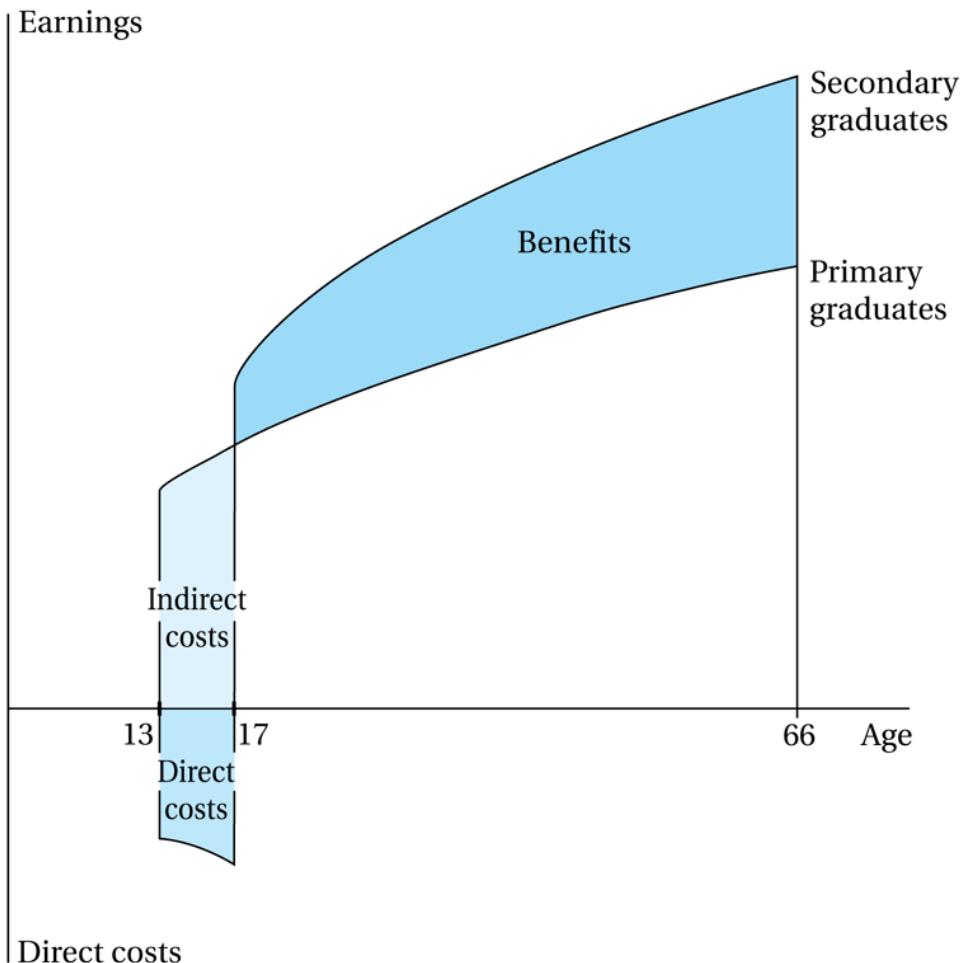
- Indirect costs: four years of income are forgone
- Direct costs: fees, school uniforms, books and other expenditures
- Before comparing costs with benefits, note that a dollar today is worth more to an individual than a dollar in the future

Table 8.1 Sample Rates of Return to Investment in Education by Level of Education, Country, Type, and Region

Region	Social			Private		
	Primary	Secondary	Higher	Primary	Secondary	Higher
Asia[a]	16.2	11.1	11.0	20.0	15.8	18.2
MENA[b]	15.6	9.7	9.9	13.8	13.6	18.8
Latin America/Caribbean	17.4	12.9	12.3	26.6	17.0	19.5
OECD	8.5	9.4	8.5	13.4	11.3	11.6
Sub-Saharan Africa	25.4	18.4	11.3	37.6	24.6	27.8
World	18.9	13.1	10.8	26.6	17.0	19.0

TABLE 8.1 Returns to Investment in Education by Level, Regional Averages (%)

- The social rate of return is found by including the amount of public subsidy for the individual's education as part of the direct costs.
- Despite this extraordinary return, many families do not make this investment b/c they have no ability to borrow even the meager amount of money that a working child can bring into the family.

8.3 Child Labor 童工

- Child labor is a widespread phenomenon
- The problem may be modeled using the "multiple equilibria" approach
- Government intervention may be called for to move to a 'better' equilibrium
- Sometimes this shift can be self-enforcing, so active intervention is only needed at first

Assumptions of the Child Labor Multiple Equilibria Model

- Luxury Axiom: A household with sufficiently high income would not send its children to work

- Substitution Axiom: Adult and child labor are substitutes (perfect substitutes in this model), in which the quantity of output by a child is a given fraction of that of an adult: $Q^C = \gamma Q^A$, $0 < \gamma < 1$.

童工与成年劳动力完全替代

Figure 8.3 Child Labor as a Bad Equilibrium
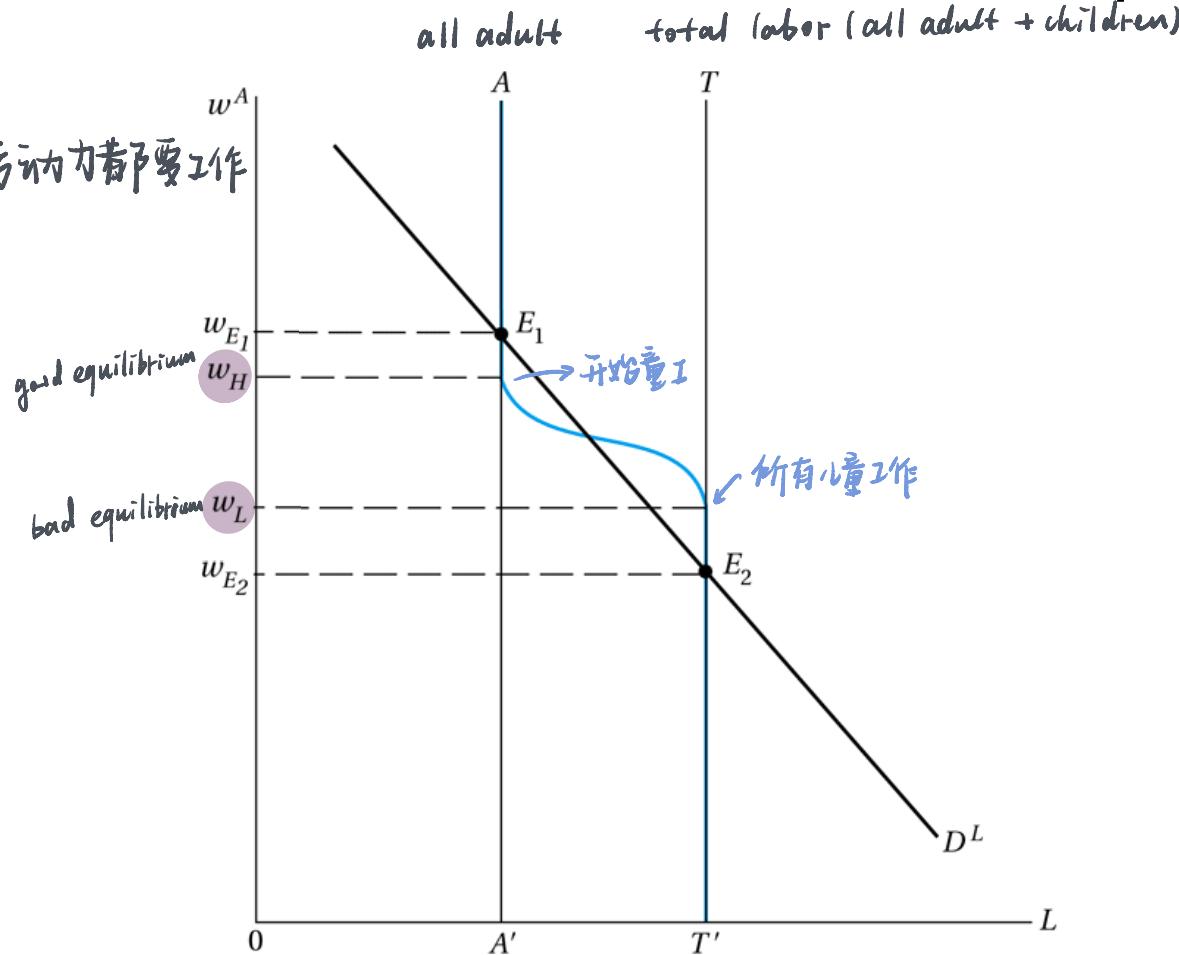
Source: From *Journal of Economic Literature* by Kaushik Basu. Copyright 1999 by the American Economic Association. Reproduced with permission of the American Economic Association via Copyright Clearance Center.

- Inelastic unskilled adult labor supply curve: AA'
  - Every adult is involved in some type of activity to help the family survive
- If wage $< w_H$, some families find they are poor enough to send children to work
  - At first wages are still high enough so that this affects only a few families and children
  - As the wage continued to fall, more families would do the same. Smaller drops lead many more families do so.
- If wage $= w_L$, all children would work.
  - TT' is the aggregate labor supply of all adults and children
- With demand curve D^L, two equilibriums
  - An effective ban on child labor would move the region from bad equ. E_2 to a good one E_1
- New wage is high enough to prevent children labor

Other approaches to child labor policy

Conditional Cash Transfer.

- Get more children into school (as in Millennium Development Goals), e.g. new village schools; and enrollment incentives for parents such as the Progresa/ Oportunidades Programme in Mexico

- Consider child labor an expression of poverty, so emphasize ending poverty generally (a traditional World Bank approach, now modified)

- If child labor is inevitable 不可避免 in the short run, regulate it to prevent abuse and provide support services for working children (UNICEF approach)

Other approaches to child labor policy (con't)

- Ban child labor; or if impossible, ban child labor in its most abusive forms (ILO strategy; "Worst Forms of Child Labor Convention")

- Activist approach: trade sanctions against countries that permit child labor or at least banning the goods on which children work. Concerns: could backfire when children shift to informal sector; and might make modern sector growth slows and difficult to get out of poverty

8.4 The Gender Gap: Discrimination in Education and Health

- Young females receive less education than young males in nearly every low and lower-middle income developing country
- Closing the educational gender gap is important because:
  - The social rate of return on women's education is higher than that of men in developing countries 收益率高
  - Education for women increases productivity, lowers fertility
  - Educated mothers have a multiplier impact on future generations
  - Education can break the vicious 恶毒的 cycle of poverty and inadequate schooling for women
  - Good news: Millennium Development Goals on parity being approached, progress in every developing region

# **Figure 8.4** Youth Literacy Rate, 2016
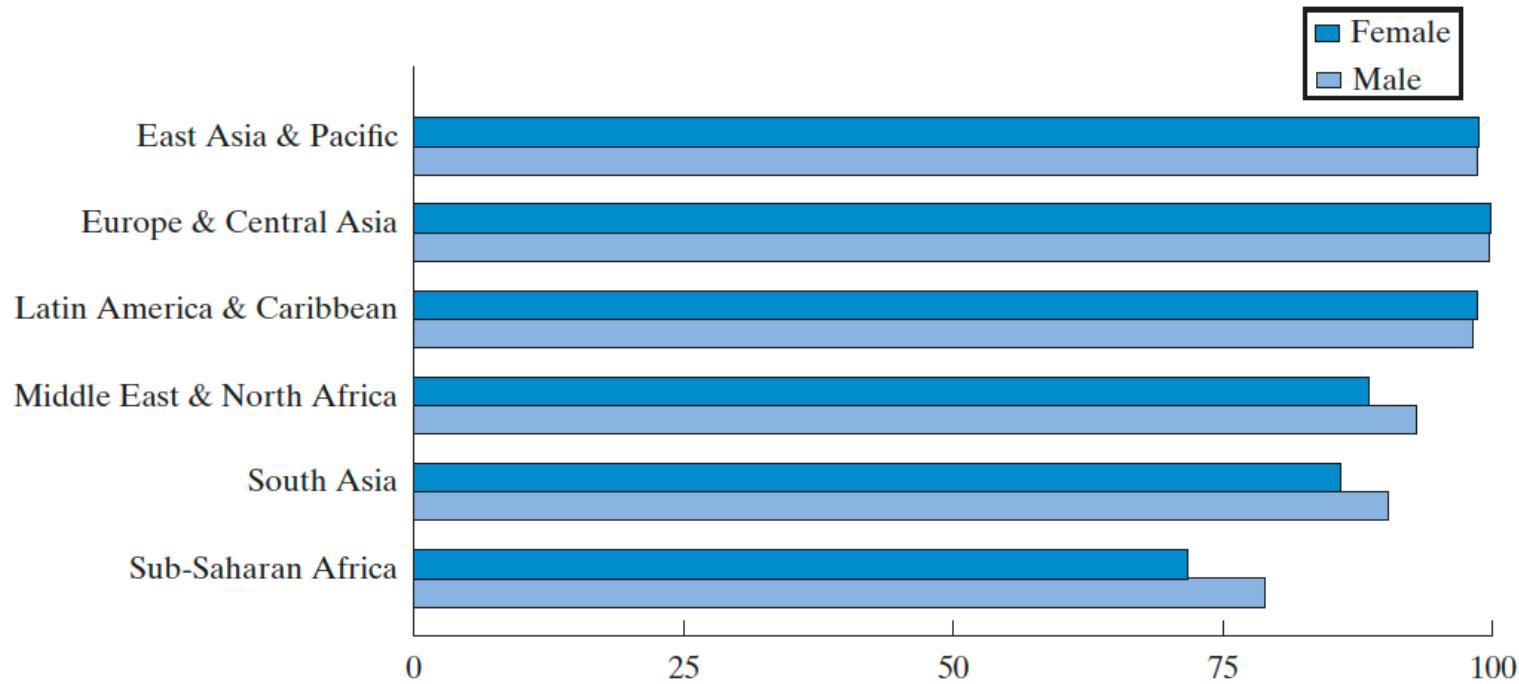
Source: UNESCO Institute for Statistics

# 8.4 The Gender Gap: Discrimination in Education and Health (cont'd)

- Consequences of gender bias in health and education

  - Economic incentives and their cultural setting

  - "Missing Women" mystery in Asia: UN has found that there are far fewer females as a share of the population than would be.

- Increase in family income does not always lead to better health and education

Figure 8.5 Female-Male Ratios in Total Population in Selected Communities
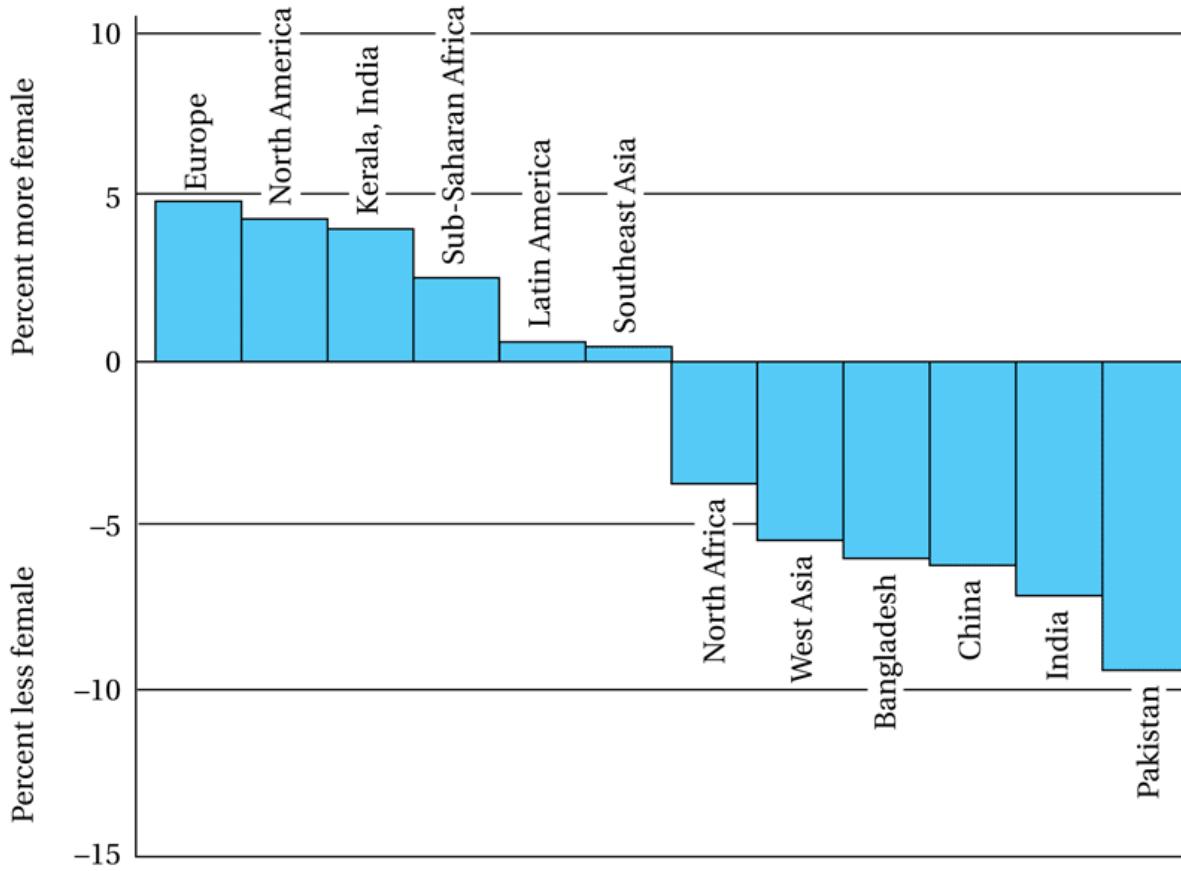
Source: Amartya Sen, *Development as Freedom* (New York: Knopf, 1999), p. 104. Copyright © 1999 by Amartya Sen. Reprinted with the permission of Alfred A. Knopf, a division of Random House, Inc..

FIGURE 8.6 Estimated Percentage of Women "Missing"
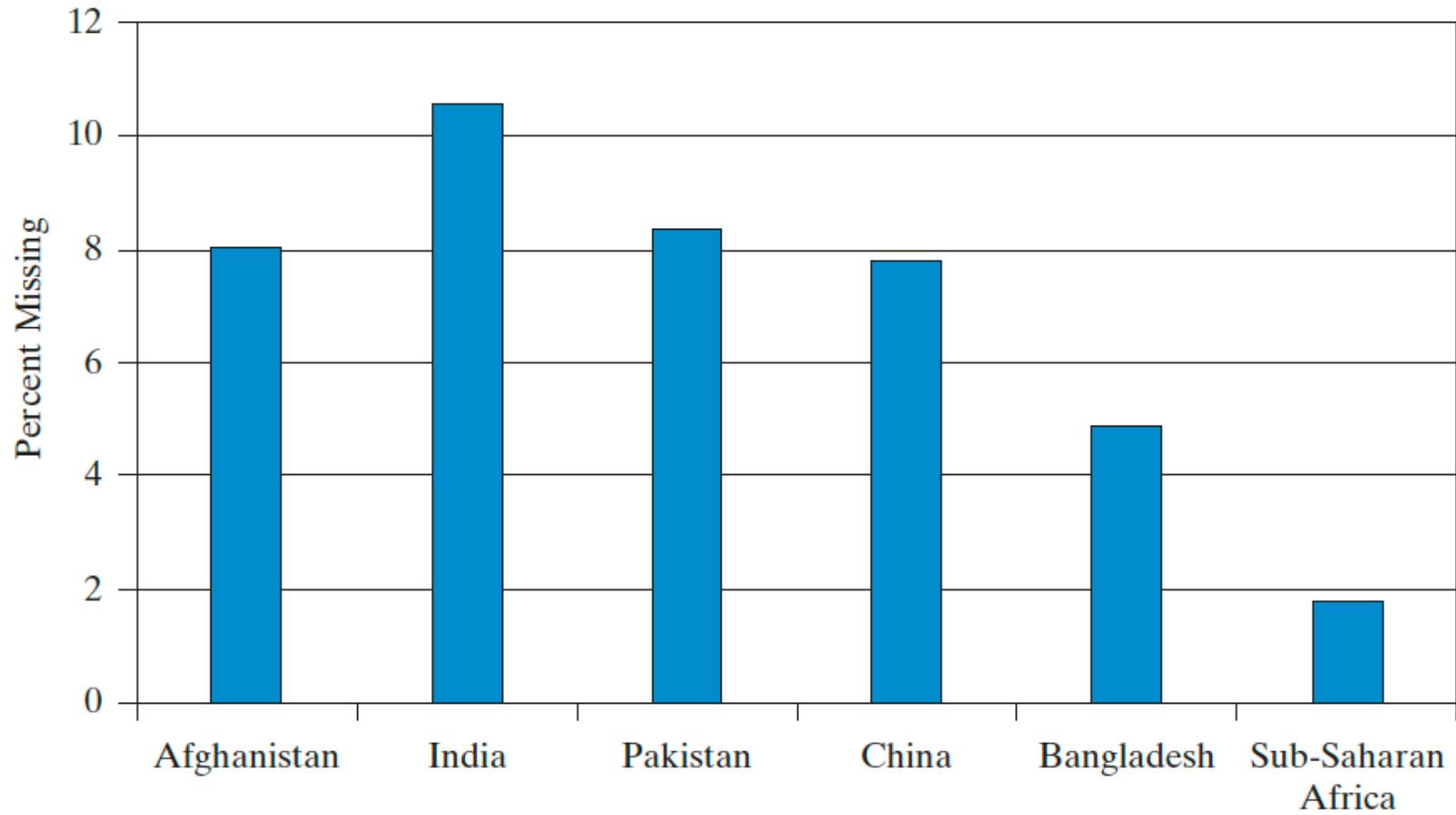
8.5 Educational Systems and Development

- The Political Economy of Educational Supply and Demand: The Relationship between Employment Opportunities and Educational Demands

- Social versus Private Benefits and Costs

Figure 8.6 Private versus Social Benefits and Costs of Education: An Illustration

- There is a divergence between private and social benefits and costs.
- The optimal strategy for a student would be to secure as much schooling as possible.
- The optimal strategy from a social viewpoint is to provide all students with at least B years of schooling.
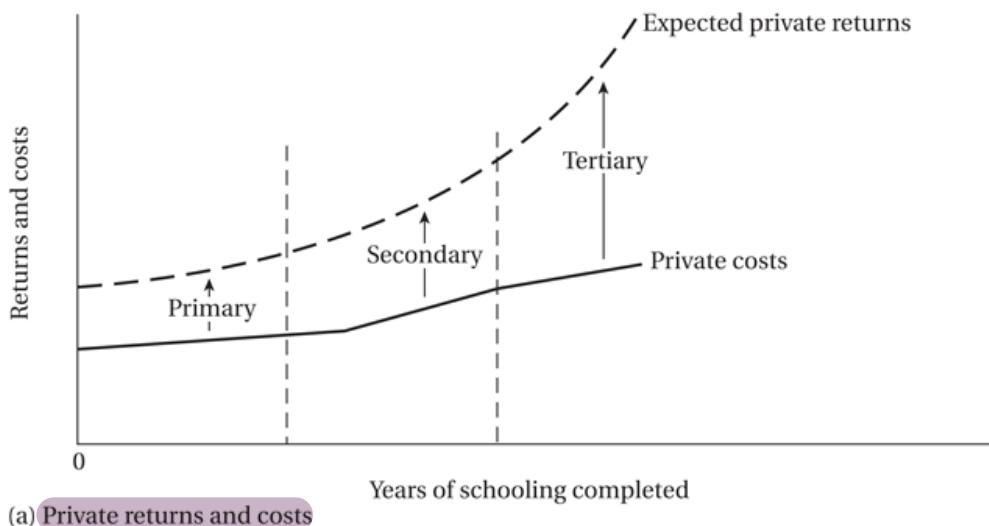

(a) Private returns and costs
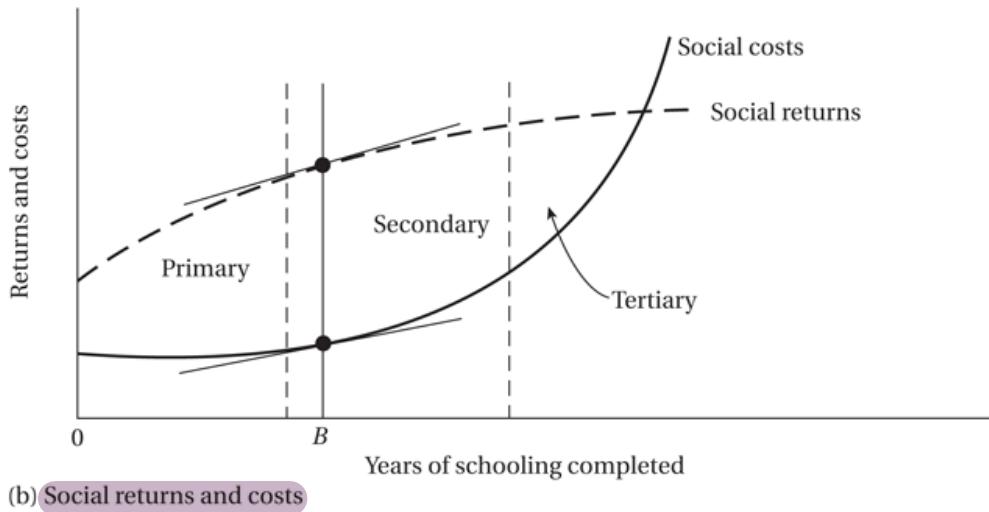
(b) Social returns and costs

8.5 Educational Systems and Development

- ## Distribution of Education
  - Lorenz curves for the distribution of education
- ## Education, Inequality, and Poverty

Figure 8.7 Lorenz Curves for Education in India

Source: https://www.epdc.org/epdc-data-points/epdc-spotlight-india; Data are based on the 2006 DHS India household dataset.
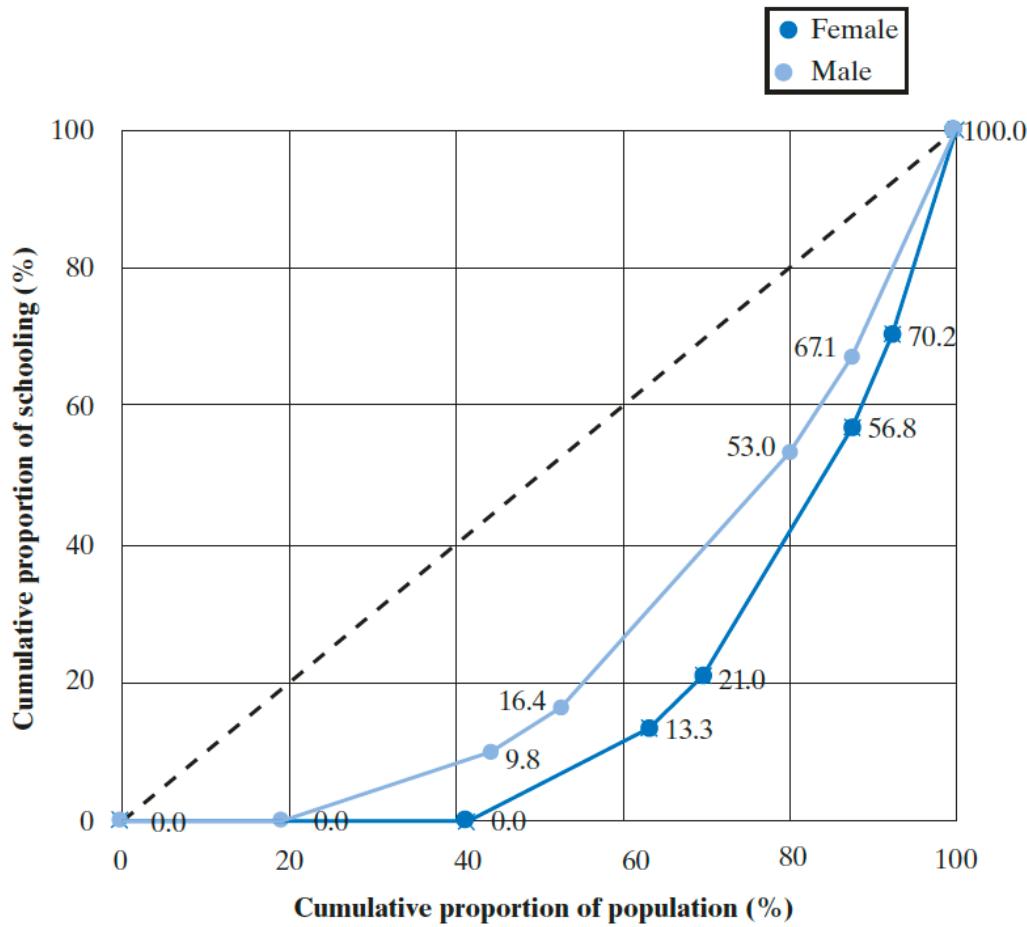
- The closer the Lorenz curve is to the 45-degree line, the more equal the distribution of education.

Figure 8.8 Gini Coefficients for Education in 85 Countries and Regions
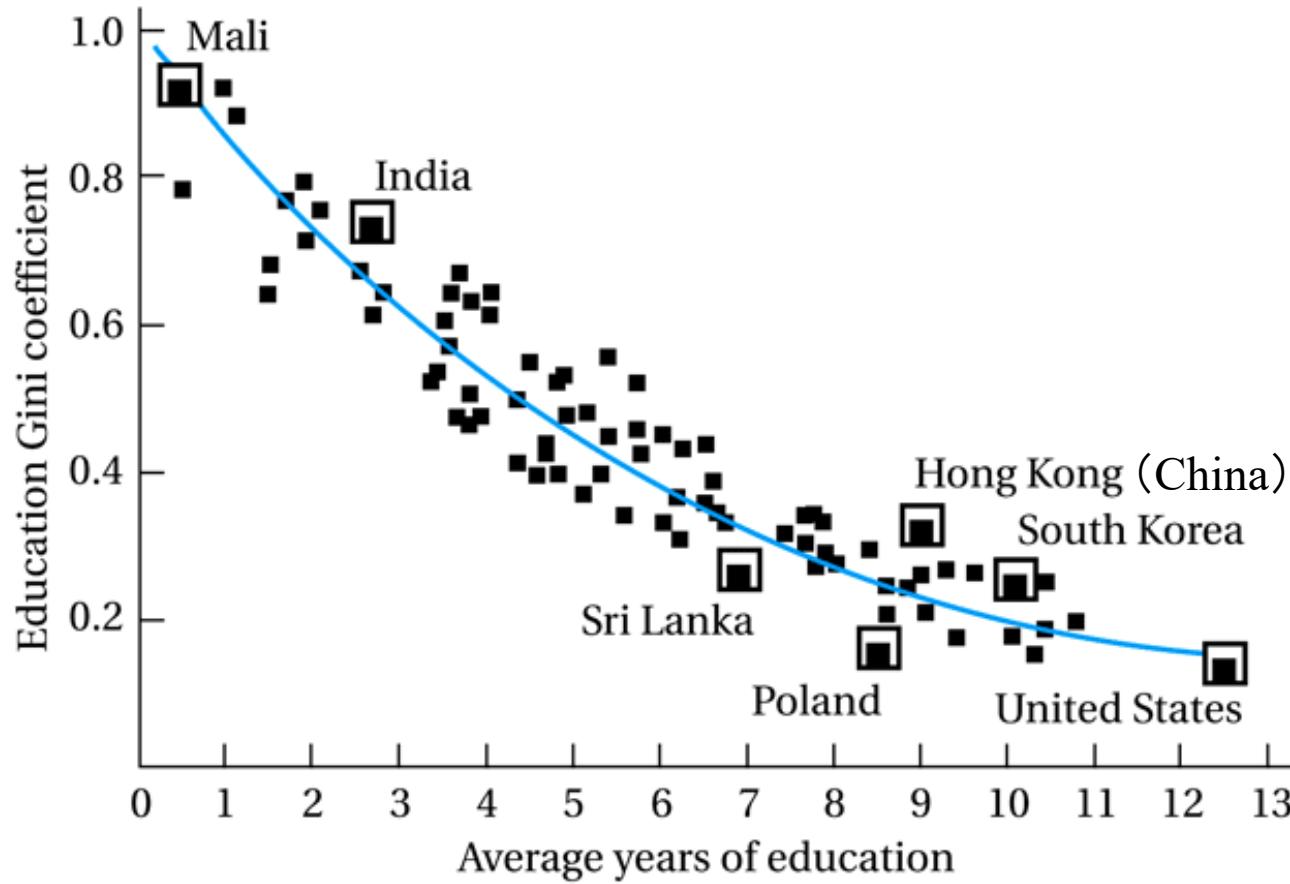
8.6 Health Measurement and Distribution

- World Health Organization (WHO): The key United Nations agency concerned with global health matters.

FIGURE 8.8 Children's Likelihood to Die in Selected Countries

Legend:
- Q1 (Poorest)
- Percent Q5 (Richest)

Countries (top to bottom): Brazil, Philippines, Indonesia, South Africa, Guatemala, India, Honduras, Ghana, Dominican Republic, Rwanda, Pakistan, Burundi, Uganda, Haiti, Bangladesh, Côte d'Ivoire, United Republic of Tanzania, Niger
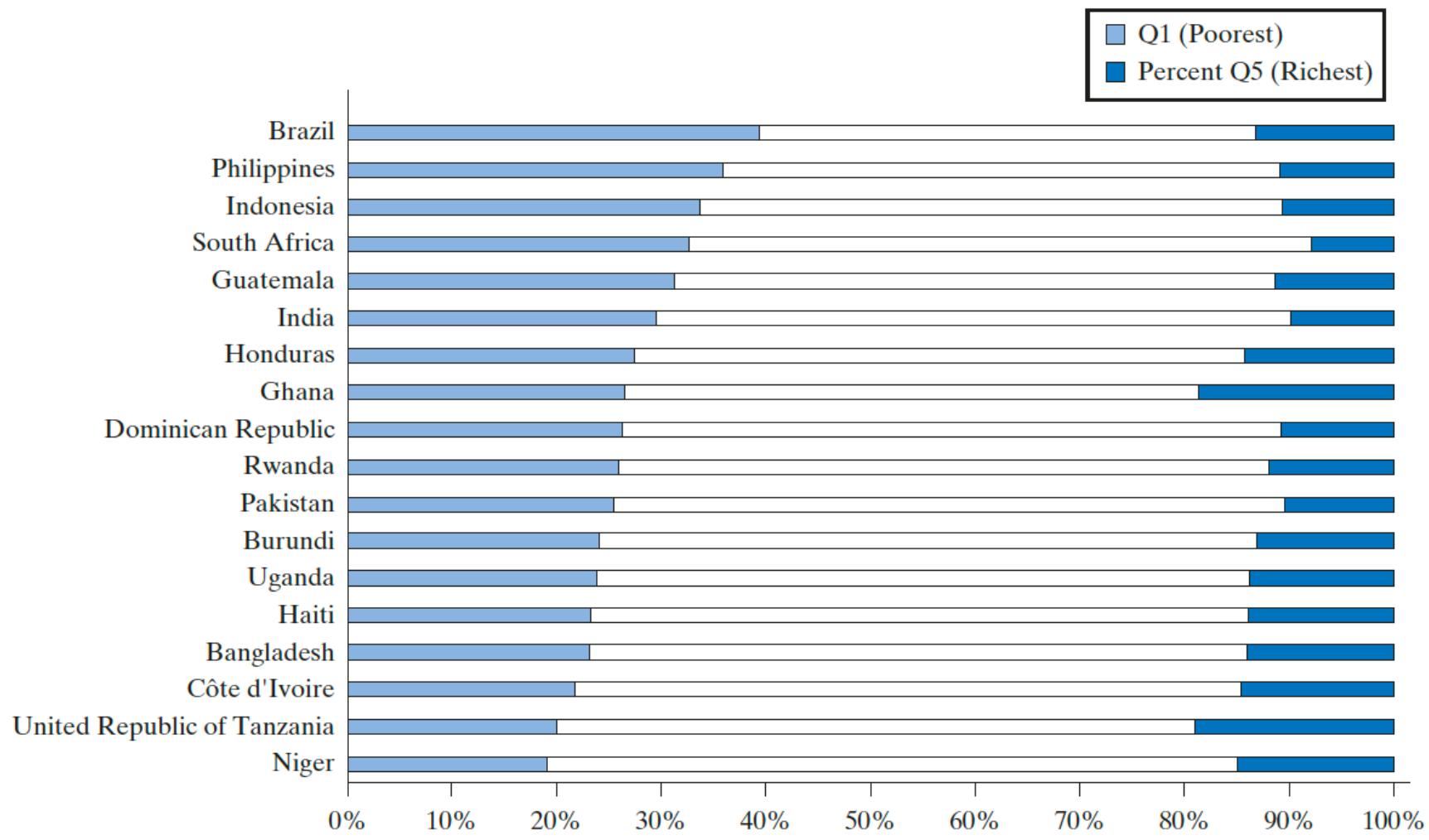
FIGURE 8.9 Proportion of Children Under Five Who Are Underweight, by Household Wealth, Around 2008
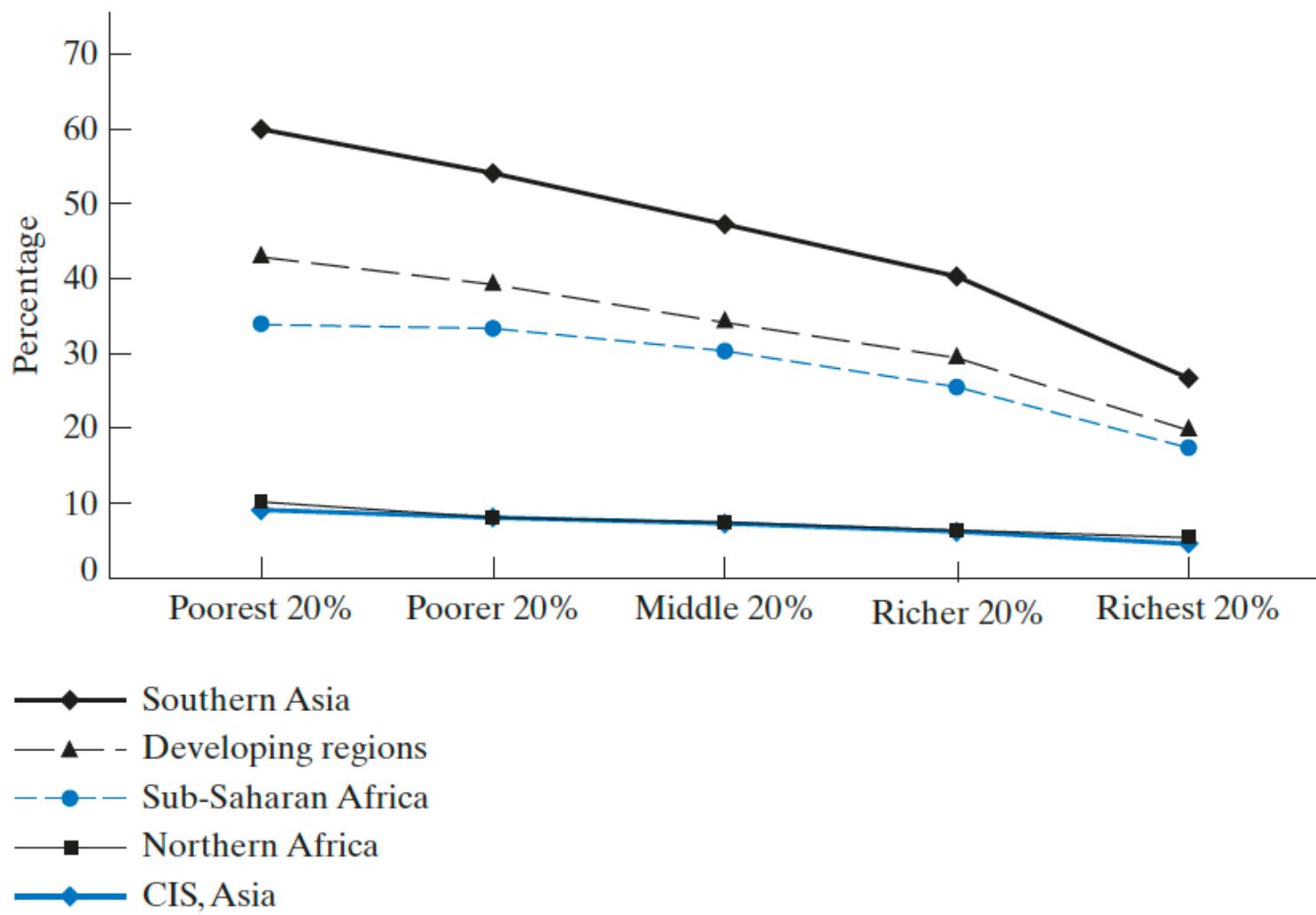
FIGURE 8.10 Proportion of Children Under Five Who are Underweight, 1990 and 2018

Legend:
- 1990
- 2018

Region	1990	2018
Southern Asia	49.8	27.0
Sub-Saharan Africa	26.3	16.6
South-Eastern Asia	31.1	14.2
Northern Africa	10.6	5.3
Latin America and the Caribbean	7.6	2.7
Western Asia	12.9	4.6
Eastern Asia	14.6	1.7
Landlocked developing countries (LLDCs)	29.6	15.3
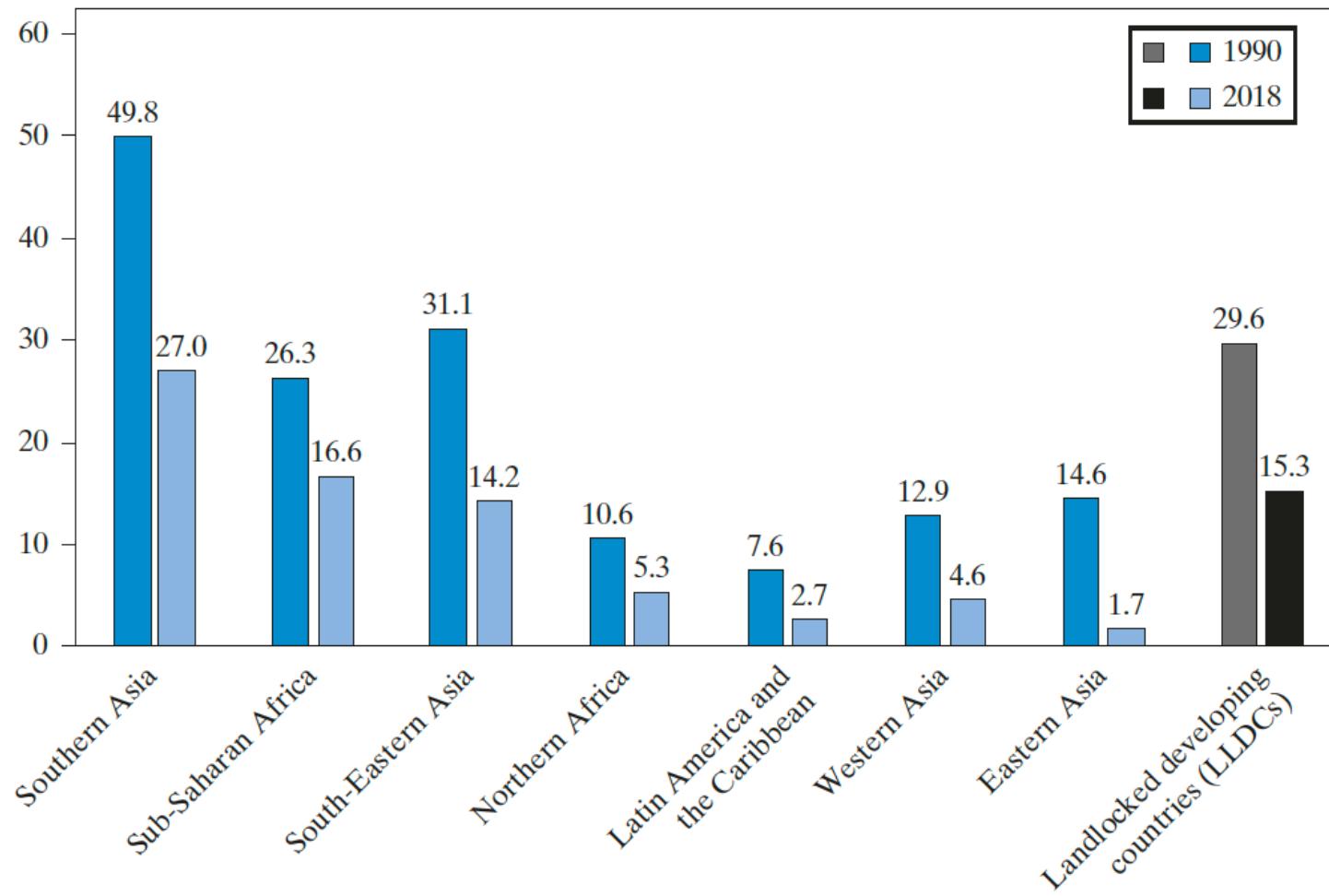
8.7 Disease Burden

- HIV/AIDS
- Malaria 疟疾
- Parasitic Worms 寄生虫 and Other "Neglected Tropical Diseases"

Table 8.2 Regional HIV and AIDS Statistics, 2009

Region	Adults and Children Living with HIV	Adults and Children Newly Infected with HIV	Adult and Child Deaths Due to AIDS
Sub-Saharan Africa	22.4 million	1.9 million	1.4 million
Middle East and North Africa	310,000	35,000	20,000
South and Southeast Asia	3.8 million	280,000	270,000
East Asia	850,000	75,000	50,000
Oceania	59,000	3,900	2,000
Latin America	2 million	170,000	77,000
Caribbean	240,000	20,000	12,000
Eastern Europe and Central Asia	1.5 million	110,000	87,000
Western and Central Europe	850,000	30,000	13,000
North America	1.4 million	55,000	25,000
Total	33.4 million	2.7 million	2 million

Source: Adapted from *2009 AIDS Epidemic Update*, p. 11. © 2009 Joint United Nations Programme on HIV/AIDS (UNAIDS) and World Health Organization (WHO).

Table 8.3 The Major Neglected Tropical Diseases, Ranked by Prevalence

| Disease	Global Prevalence (millions)	Population at Risk	Regions of Highest Prevalence
Ascariasis	807	4.2 billion	East Asia and Pacific Islands, sub-Saharan Africa, India, South Asia, China, Latin America and Caribbean
Trichuriasis	604	3.2 billion	Sub-Saharan Africa, East Asia and Pacific Islands, Latin America and Caribbean, India, South Asia
Hookworm infection	576	3.2 billion	Sub-Saharan Africa, East Asia and Pacific Islands, India, South Asia, Latin America and Caribbean
Schistosomiasis	207	779 million	Sub-Saharan Africa, Latin America and Caribbean
Lymphatic filariasis	120	1.3 billion	India, South Asia, East Asia and Pacific Islands, sub-Saharan Africa
Trachoma	84	590 million	Sub-Saharan Africa, Middle East and North Africa
Onchocerciasis	37	90 million	Sub-Saharan Africa, Latin America and Caribbean
Leishmaniasis	12	350 million	India, South Asia, sub-Saharan Africa, Latin America and Caribbean
Chagas' disease	8–9	25 million	Latin America and Caribbean
Leprosy	0.4	N.D.	India, sub-Saharan Africa, Latin America and Caribbean
Human African trypanosomiasis	0.3	60 million	Sub-Saharan Africa
Dracunculiasis	0.01	N.D.	Sub-Saharan Africa
Buruli ulcer	N.D.	N.D.	Sub-Saharan Africa

Source: "Control of neglected tropical diseases," by Peter Hotez et al., *New England Journal of Medicine,* 357: 1018–1027 (September 6, 2007). Copyright © 2007 Massachusetts Medical Society. All rights reserved.

Note: N.D. = not determined.

8.8 Health, Productivity, and Policy

- ## Health & productivity
  - Is there a connection?
  - Studies show that healthier people earn higher wages.

- ## Health Systems Policy
  - Great variability in the performance of health systems at each income level

# Figure 8.14 Wages, Education, and Height of Males in Brazil and the United States
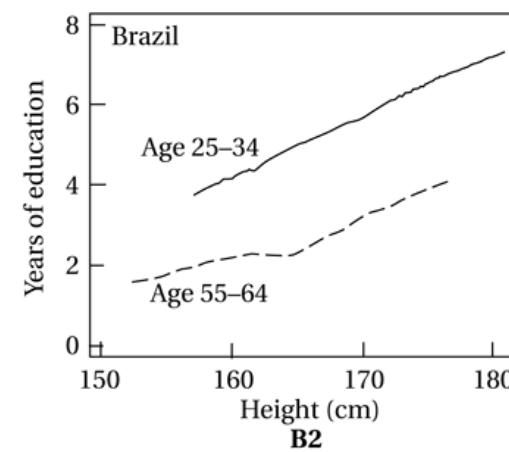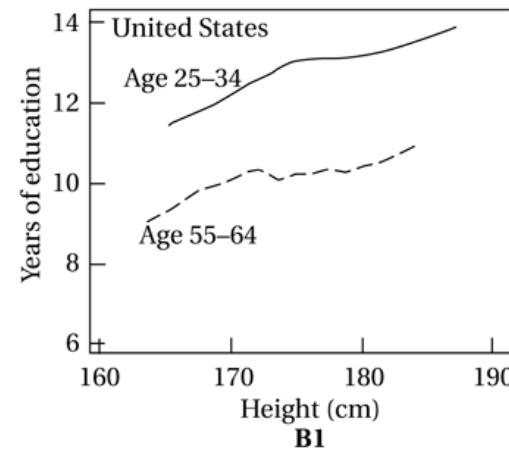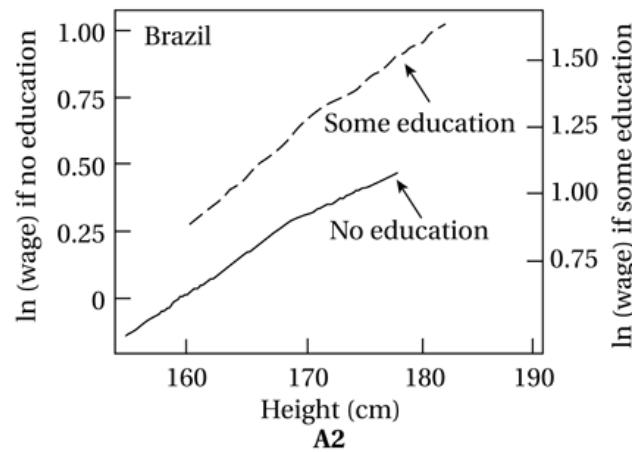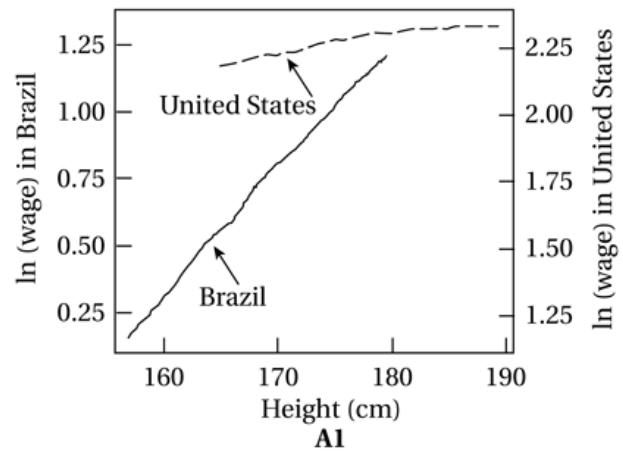
Note: ln (wage) stands for natural log of wage.

Exercise: Draw a supply and demand for labor diagram such as Figure 8.3 in the textbook. Specifically, put the wage on the vertical axis, and the number of adult-equivalent workers on the horizontal. Draw a linear, downward-sloping labor demand curve. Draw a perfectly inelastic (i.e., vertical) labor supply curve such as AA' in Figure 8.3, and another such as TT'. Mark the wage at which AA' intersects the labor demand curve w_{E1}, and the wage at which TT' intersects the labor demand curve w_{E2}.

a. Why does the labor supply curve have an S-shaped segment that begins at a wage slightly below w_{E1} continuing to a wage just above w_{E2}?

b. What does your diagram suggest about the role of government policy in reducing the amount of child labor?

Answer:

a) As the wage falls from w_{E1} to w_H, some families are forced by poverty to send their children to work. At first the S-shaped segment decreases at a decreasing rate, but as the wage continues to fall (because of the increased number of child workers), the wage falls faster and faster.
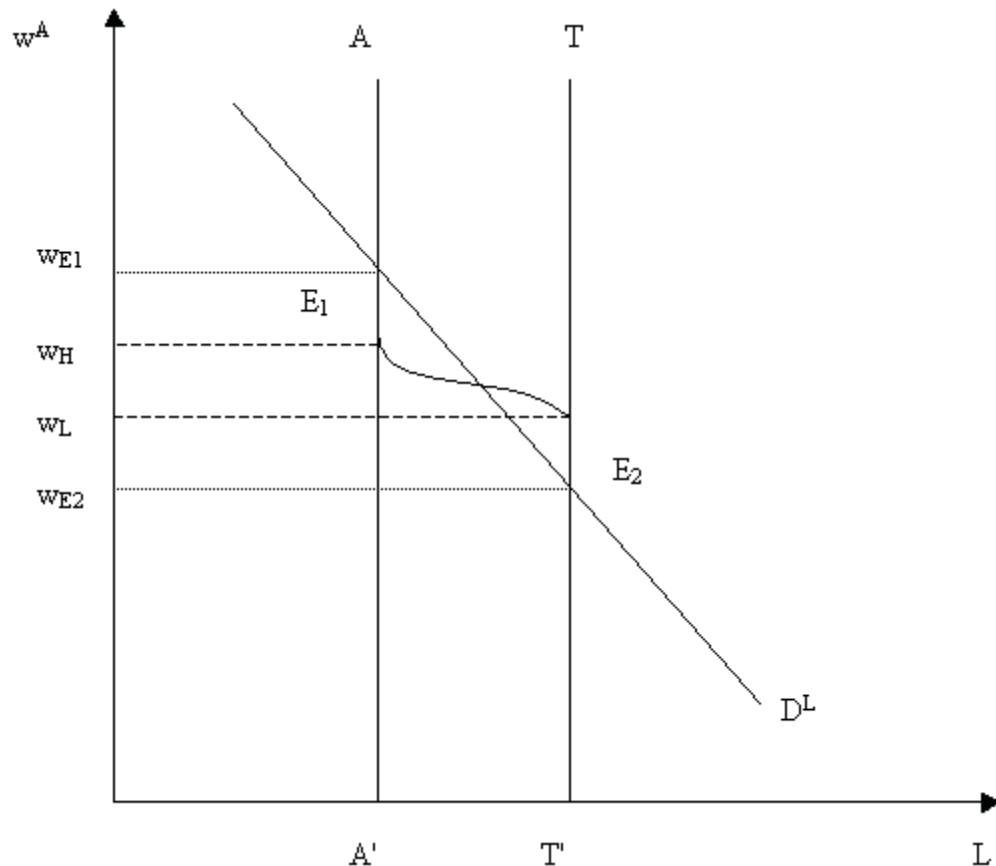
b) The system may settle at the 'bad' equilibrium of E_2. To prevent this, government intervention (such as a ban on child labor) is required to return to the 'good' equilibrium.

1. As the number of years of schooling completed increases, the expected private return and private cost of education
- A: increase at roughly the same rate.
- B: increase at different rates with expected private return increasing at a slower rate than private cost.
- C: increase at different rates with expected private return increasing at a faster rate than private cost.
- D: do not increase.

2. An individual's demand for education is most affected by
- A: direct and indirect costs of schooling.
- B: development priorities of the country.
- C: the desire to escape agricultural work.
- D: all of the above.