

Measuring economic growth and development

After reading this chapter, you should understand:

- the difference between economic growth and development;
- the difference between GNP and GDP, and how to calculate each;
- why some economists measure the development progress of nations using GNP or GDP per person;
- how income distribution is measured using Lorenz curves, the Gini coefficient, and the ratio of income quintiles;
- how to determine real GNP or real GDP from nominal GNP or nominal GDP;
- how the purchasing power parity (PPP) definition of income for a nation differs from the GNP or GDP measure;
- how to measure the progress of nations using the Human Development Index (HDI);
- the importance of sustainable development as a goal;
- the significance of the Kuznets inverted-U hypothesis for the equity versus growth controversy.

Introduction

What is meant by development? Though this may seem to be a deceptively simple question, the answer to this query shapes how one proceeds to evaluate the positions of different countries as to their relative levels of development, to judge the forces

MEASURING

that are considered contributory to fostering future progress, and how one might begin to formulate appropriate public policies that can facilitate the pursuit of a society's development goals. Knowing what is meant and what is not meant by development is thus a necessary first step if, as the British economist Joan Robinson insisted, one is to be able to ask the right questions.

We begin by considering how economists measure the level of development of a particular nation. There are two broad methodologies. One, the income per person, or *economic growth*, criterion suggests that income levels are reasonably good approximate measures for comparing the level of development of nations and that the level of income per person can serve as a logical surrogate for gauging overall social progress. The competing view argues that development is such a complex, multi-faceted notion and goal that it should be conceived from the outset as considerably broader than economic growth alone, and hence development can only be measured by entirely different standards. Let us turn to a discussion of these two perspectives.

The economic growth criterion of development

It is often proposed that it is reasonable to use a nation's income as a *proxy* or substitute measure for the overall level of development. Those who take this view are quite aware that the development of a nation actually encompasses much more than simply its level of income. Development incorporates the diverse and broad aspirations of the 'good life', in all its economic, social and political dimensions, that each society sets, if only implicitly, for itself. Societies value, differently of course, goals as diverse as: equality of opportunity; a rising income and standard of living, including a wider array of consumable goods and services; equity in the distributions of income and wealth; political democracy and participation; an expanded role for women, minorities and all social classes in economic, political, and social life; increased opportunities for education and self-improvement irrespective of class, race, ethnicity or gender; the expanded availability of, and improvements in, health care; public and private safety nets to protect the most vulnerable, particularly the young, the old, the infirm, and the poorer, from extreme hardship; a reasonably clean and healthy environment; an efficient, competent, and fairly administered public sector; a reasonable degree of competition in the private sector; and so on. Each of us, as does each society, could add to or subtract from this list of goals that nations might wish to attain. But there is no doubting that development encompasses a wide range of social and human goals (see Box 2.1 High-Quality Growth).

Development, being broader than income growth alone, typically requires fundamental structural change in an economy and society, as discussed in Chapter 1; a higher level of development does not mean more of the same of the past in larger quantities. Rather, development necessitates a substantially transformed future in which new values, institutions, markets, and products emerge, as the old society slips from view and becomes the new. Development is a process of sometimes wrenching social change. What is certain is that the legitimate and full range of development goals of any nation go far beyond any simple concern with the level

BOX 2.1 HIGH-QUALITY GROWTH

The International Monetary Fund (IMF) often has been taken to task for the onerous 'conditionality' it puts on borrowing countries, which often has contributed to increases in poverty and lower average incomes. In the mid-1990s, the IMF seemed to be learning from the criticisms of its policies and from its own evaluations of its past lending policies.

Now, the IMF sees itself as promoting *high-quality growth*,

defined as growth that is sustainable, brings lasting gains in employment and living standards, and reduces poverty. High-quality growth should promote greater equity and equality of opportunity. It should respect human freedom and protect the environment. Obviously, growth cannot be high quality . . . if it does not benefit fully, tangibly, and equitably a group that constitutes more than one half the population of the world and still bears the primary responsibility for the care, nutrition, and education of the world's children. Achieving high-quality growth depends, therefore, not only on pursuing sound economic policies, but also on implementing a broad range of social policies.

Economic development is not just about economic growth, but about a particular kind of growth: high-quality growth, in the IMF's terminology.

Source: 'Gender Issues in Economic Adjustment Discussed at UN Conference on Women', *IMF Survey* (September 25, 1995): 286-8.

of income alone. All economists recognize this, including those who use a nation's income as an index for the broader development ambitions listed above.

What is suggested is that it is convenient and not particularly damaging to reality to use income as a substitute gauge for the broader goals of development that characterize the ultimate objectives of all nations. And there is empirical evidence, some of which we shall examine below, to at least partially support the claim that income per person is highly correlated with key measures that attempt to capture the broader aspirations of economic, social, and political progress. Thus many economists, acknowledging that it would be imprudent and wrong-headed to imply that economic growth is the same as development, firmly believe that it is nonetheless reasonable to focus primarily, even exclusively, on the factors that contribute to enhancing a nation's economic growth and wealth, since the greatest number of the other dimensions of development that countries might wish to realize are more easily attained at, and tend to accompany, higher income levels. It is precisely the expansion in income over time that provides the means which make the broader end goals of development easier to achieve, according to this

MEASURING ECONOMIC GROWTH

perspective.¹ Nations may thus be ranked from highest to lowest by per capita income level, as a measure of their relative development achievement.

Part of the attractiveness of using the per capita economic growth criterion is its very simplicity. All countries collect data on their level of economic activity, though with varying degrees of accuracy despite efforts by international institutions to unify the methods of data collection and to strive, to the degree feasible, for statistical comparability of the information collected.² The data for comparing income among countries, or for any particular country over time, are thus readily available and roughly comparable. We make use here of the annual data published by the World Bank in its *World Development Report*, a source which provides a consistent and reliable series of data available to researchers around the world. Thus in terms of ease of comparison, the income criterion has an undeniable attraction.

Measuring economic growth

Economic growth can be measured either by the growth of total *output* or that of total *income*. In fact, the values of total final output and of income paid to all factors of production are equal to one another, by definition, as demonstrated in the simple circular flow diagram presented at the beginning of virtually every introductory economics text. The two most common measures used for international income and output comparisons, and hence for measuring economic growth, are gross national product (GNP) and gross domestic product (GDP). GNP is the total value of all income (= value of final output) *accruing to residents of a country*, regardless of the source of that income, that is, irrespective of whether such income is derived from sources inside or outside the country. GDP is the total value of all income *created in a country*, regardless of whether the ultimate recipient of that income resides within or outside the country.

How do the GNP and GDP measures differ? Not at all, if a country is completely 'closed' to the rest of the world. Then, the only income that would be received by residents of the country would be derived from income created as a result of new productive activity taking place within that country alone. However, in a world with multinational corporate investment across national borders and with financial capital and labour flows between nations, it is easy to see how a country's GNP can diverge from its GDP. For example, United States-based corporations had foreign direct investments outside the US equal to \$468 billion in 1991. As a result of these investments in other countries, of US bank loans to other countries and other financial flows, a flow of profits, dividends and interest income (called factor service payments) equal to \$155.7 billion was returned to the US and was received as income by residents there. This income inflow added to the level of GNP in the United States, but it was not part of the US GDP, since it was not income created in the US. In fact, the value of this flow of profits, dividends, and interest to the US was included as part of the GDP of other nations. So, US GNP was made greater than US GDP, *ceteris paribus*, by this inflow of income from outside the US.

But everything else was not the same. In the same year, total foreign direct investment in the US of \$419 billion, bank loans extended to the United States, and other prior financial flows created income (and output) that was included as

part of US GDP, since it represented income and output produced in the US. However, not all that income remained in the US; some of it, such as profit, interest, and dividend income equal to \$139.7 billion in 1991 was income accruing to countries like the United Kingdom, Germany, and Japan that had made investments in the United States in the past. Thus, this foreign income tended to reduce US GNP below the level of US GDP. In 1991, for the US, the net effect of the inflow of profits, interest, and dividends to the US from other nations *less* the outflow of profits and dividends from the US was equal to \$16 billion. Thus US GNP > US GDP by that amount, since more factor service payments flowed into the United States to pay for US investments and loans abroad than was paid to foreigners who had invested in, or loaned to, the United States (US Department of Commerce 1994: 25; US Department of Commerce 1995: 58, 94).

Remittances returned home by immigrant workers to their families also have the same effect of tending to make GNP < GDP in the sending country and GNP > GDP in the receiver nation, all else being the same. For the US in 1991, such remittances amounted to -\$7,600 million, indicating a net outflow of income earned in the US being sent to other countries. Mexico, on the other hand, had a net inflow of income in the form of workers' remittances equal to +\$1,853 million, helping to raise Mexico's GNP above its GDP, all else being the same.

In general, then, whether a country's GNP < GDP or its GNP > GDP depends on the sum of the income inflows into the country from the rest of the world (ROW) *less* the sum of the income leakages leaving the country flowing to the ROW. When the income inflows from the ROW exceed the income leakages to the ROW, then GNP > GDP. When the income inflows from the ROW are smaller than the income leakages to the ROW, then GNP < GDP.

The second and third columns of Table 2.1 provide information on total GDP and GNP for a number of nations. The fourth column calculates the value of the GDP/GNP gap, that is, the difference of GDP - GNP. When the GDP/GNP gap is positive, the country had outflows of income to the ROW that exceeded inflows into the country from the ROW, and thus its GNP < GDP. When the GDP/GNP gap is negative, the country had inflows of income from the ROW that exceeded outflows to the ROW, and thus its GNP > GDP. While there are no readily apparent patterns to the GDP/GNP gap for all less-developed nations, there would seem to be a tendency for the Latin American countries in the last part of the table to have GNP < GDP, perhaps because of the importance that foreign investment, to be discussed later, has had in these economies.

Adjustments to the economic growth measures

The values for both GDP and GNP shown in the second and third columns of Table 2.1 are aggregate *nominal*, or current dollar, figures. There are a number of adjustments that need be made to these numbers if they are to be used in a reliable manner as a basis for evaluating the level and pace of economic growth over time and between nations so as to create a surrogate measure potentially suitable for ranking nations by their level of development and for gaining insight into the level of development of any particular country.

Table 2.1 GDP and GNP comparisons, selected nations, 1993

Country	Population (millions) (1)	GDP ^a (2)	GNP ^a (3)	GDP/GNP gap ^b (4)	GNP per capita [(2) ÷ (1)] (5)
Botswana	1.4	3,813	3,906	-93	2,790
Congo	2.4	2,385	2,280	105	950
Côte d'Ivoire	13.3	8,087	8,379	-292	630
Ethiopia	51.9	5,750	5,190	560	100
Ghana	16.4	6,084	7,052	-968	430
Kenya	25.3	4,691	6,831	-2,140	270
Mozambique	15.1	1,367	1,359	8	90
Rwanda	7.6	1,359	1,596	-237	210
Algeria	26.7	39,836	47,526	-7,690	1,780
Egypt	56.4	35,784	37,224	-1,440	660
Morocco	25.9	26,635	26,936	-301	1,040
Turkey	59.6	156,413	177,012	-20,599	2,970
Bangladesh	115.2	23,977	25,344	-1,367	220
China	1,188.4	425,611	577,416	-151,805	490
India	898.2	225,431	269,460	-44,029	300
Indonesia	187.2	144,707	138,528	6,179	740
Malaysia	19.0	64,450	59,660	4,790	3,140
Pakistan	122.8	46,360	52,804	-6,444	430
Philippines	64.8	54,068	55,080	-1,012	850
South Korea	44.1	330,831	337,806	-6,975	7,660
Thailand	58.1	124,862	122,591	2,271	2,110
Argentina	33.8	255,595	244,036	11,559	7,220
Brazil	156.5	444,205	458,545	-14,340	2,930
Guatemala	10.0	11,309	11,000	309	1,100
Jamaica	2.4	3,825	3,456	369	1,440
Mexico	90.0	343,472	324,400	18,572	3,610
Venezuela	20.9	59,995	59,356	639	2,840

Source: World Bank (1995: Table 1, pp. 162-3; Table 3, pp. 166-7).

Notes:

^a Millions of US dollars; GNP estimated as column (1) × column (5).
^b GDP/GNP gap = column (2) - column (3), in millions of US dollars. A positive value indicates that GNP < GDP; a negative value indicates that GNP > GDP.

1 Adjusting for population size A first necessary correction to the aggregate GNP and GDP figures in Table 2.1 is to adjust them for the size of a country's population. Dividing GNP (or GDP) by the total population figures in column (1) of the table provides a measure of per capita (per person) income and output; it is one measure of a country's *average income*. Per capita GNP figures are shown in column (5) of Table 2.1. (If you wish, you can calculate per capita GDP from the data provided in the table.) This population adjustment is essential to determine if, over time, changes in the level of aggregate income (a) are just sufficient to keep up with population growth, so that per capita GNP (or GDP) remains constant over time; (b) are more than sufficient to keep up with population growth, so that per capita GNP is rising over time; or (c) are insufficient to keep pace with population growth, such that per capita GNP is falling over time.

Since GNP per capita is simply $\text{GNP} \div \text{population}$, the percentage change in GNP per capita can be determined as in equation 2.1.

$$\% \text{ change GNP per capita} = \% \Delta \left(\frac{\text{GNP}}{\text{population}} \right) = \% \Delta \text{ GNP} - \% \Delta \text{ population} \quad (2.1)$$

The rate of growth of GNP per capita thus can easily be approximated as the difference between the rate of growth of aggregate GNP and the rate of population expansion (GDP can be substituted for GNP in equation 2.1 to determine the rate of change of GDP per capita).

Equation 2.1 makes it clear why countries with high rates of population growth need to generate higher rates of growth in total income and output just to keep the level of per capita income constant, compared to countries with lower population growth rates. If one country's population is growing at 2 per cent per year, total GNP must increase by 2 per cent per annum just to maintain a constant level of income per capita (a zero per cent change in per capita income in equation 2.1). Another country with 1 per cent growth in population and 2 per cent growth in total GNP would experience an increase in per capita GNP of 1 per cent.

It would not be correct, however, to infer from equation 2.1 that slow population growth causes a faster rate of growth of income per person, or that rapid population growth causes slower growth in income per person. Equation 2.1 is true by definition; it is a mathematical identity. It does not uncover the underlying reasons for rapid or slow income or population growth that result in rapid or slow per capita income growth. Equation 2.1 only indicates the consequences of specific rates of change of the two variables. This important issue of population growth and its precise relation to economic growth is examined in more detail in Chapter 12.

2 Accounting for income distribution Calculating income per capita is an improvement over simply looking at aggregate, or total, income and output figures for a nation. However, this estimate is at best an imprecise measure of the actual income received by any particular person, since it is only a simple average derived by dividing total GNP or GDP by total population. The per capita income measure does not provide any information about the dispersion of actual incomes around this mean. It is thus helpful to also know something about the distribution of income in a country, if one is to make reasonable sense of the per capita income figures. Table 2.2 provides some income distribution information on most of the countries in Table 2.1.³

The income distribution figures in Table 2.2 are reported in two ways: the shares of total income received by the poorest 20 per cent (the lowest fifth or quintile of income earners) and for the richest 20 per cent (the highest quintile) of the population. The number of persons or families in each quintile is the same within any nation, representing exactly one-fifth of all income recipients. Also shown in the table, in column (3), is the ratio of the share of total income received by the richest 20 per cent of the population (column (2)) to the share of total income received by the poorest 20 per cent (column (1)) for each country. The closer this number is to 1, the greater the degree of equality between the lowest and highest income receivers, and the further away is the ratio from 1, the greater the degree of relative inequality. In no country is the ratio very close to 1; the richest 20 per

cent of income recipients receive more total income than the poorest 20 per cent in all nations, since no economy, not even communist China, has anything approaching complete equality of income.

Of the countries shown in Table 2.2, Brazil's richest 20 per cent of the population receives more than thirty-two times the share of total income received by the poorest 20 per cent, which means that the actual average of income of the richest 20 per cent of the population is more than thirty-two times the average income of the poorest quintile. Applying this distribution to 1993, this means that, given a total GNP of \$458,545 million (from Table 2.1), the richest 20 per cent of Brazil's population (equal to 0.2×156.5 million = 31.3 million persons) received \$309,518 million (= $0.675 \times \$458,545$), for a per capita income for the richest 20 per cent of \$9,889. The poorest 20 per cent of the population (also 31.3 million persons) received \$9,629 million of the total income, for a per capita income for the poorest 20 per cent of \$308.⁴ Compare these two average income values for these quintiles with the mean per capita GNP value of \$2,930 for Brazil as a whole. The richest 20 per cent of income earners receive an average income more than three times the level of GNP per capita reported in Table 2.1, while the poorest 20 per cent of the Brazilia population has an actual per capita income that is but 10.5 per cent of the GNP per capita figure for the country as a whole. This clearly illustrates the importance of at least having some rough idea of income distribution in a country if the per capita income figures are to have meaning.

Other countries have substantial deviations between the richest income recipients and the poorest, though none are so wide as found in Brazil. Still, for any country, the ratio shown in column (3) of Table 2.2 tells us by how many times the average income of the richest 20 per cent exceeds the average income received by the poorest quintile of income earners in that economy. The larger the ratio in column (3), then, the less meaningful is the average GNP per capita figure shown in Table 2.1 as a measure of the actual average income received and as a measure of the degree of development of an economy.

Also shown in Table 2.2 are estimates of Gini coefficients for some of the countries. The Gini coefficient is another method for attempting to capture in a simple form – as does the ratio of the richest 20 per cent of income earners to the poorest 20 per cent – the degree of income inequality, though the Gini coefficient is often a richer measure of the overall distribution of income. The value of the Gini coefficient can vary between 0 and 1. The closer to 1 is the Gini coefficient, the greater the degree of income inequality in that country; the closer it is to 0, the lesser the degree of inequality. With some caveats, higher Gini coefficients tend to indicate greater inequality amongst income groups, while lower Gini coefficients imply lesser inequality. Similarly, over time, a rising Gini coefficient within an economy would indicate a worsening of income distribution, while a falling Gini coefficient suggests an improvement in the overall distribution of income.⁵

3 Adjusting nominal income and output for price changes The aggregate and per capita income measures in Table 2.1 are shown for one year only. To obtain a measure of the pace of real economic growth, that is to know what is happening to output levels over time, it is necessary to examine how the level of GNP or GDP, in the aggregate or on a per capita basis, is changing. To compare income and output levels for the same country for different years, it is necessary

Table 2.2 Income distribution, selected nations

	Poorest 20% ^a (1)	Richest 20% ^a (2)	<u>Richest 20%</u> Poorest 20% (3)	Gini coefficient (4)
Botswana (1985–86)	3.6	58.9	16.4	
Côte d'Ivoire (1988)	6.8	44.1	6.5	0.54
Ethiopia (1981–82)	8.6	41.3	4.8	
Ghana (1988–89)	7.0	44.1	6.3	
Kenya (1992)	3.4	61.8	18.2	0.49
Rwanda (1983–85)	9.7	38.9	4.0	
Algeria (1988)	6.9	46.5	6.7	
Morocco (1990–91)	6.6	46.3	7.0	
Bangladesh (1988–89)	9.5	38.6	4.1	
China (1990)	6.4	41.8	6.5	
India (1989–90)	8.8	41.3	4.7	
Indonesia (1990)	8.7	42.3	4.9	
Malaysia (1989)	4.6	53.7	11.7	
Pakistan (1991)	8.4	39.7	4.7	
Philippines (1988)	6.5	47.8	7.4	
South Korea (1988)	7.4	42.2	5.7	
Thailand (1988)	6.1	50.7	8.3	
Argentina (1989)				0.48
Brazil (1989)	2.1	67.5	32.1	0.63
Guatemala (1989)	2.1	63.0	30.0	0.59
Jamaica (1990)	6.0	48.4	8.1	
Mexico (1984)	4.1	55.9	13.6	0.52
Venezuela (1989)	4.8	49.5	10.3	0.44

Sources: World Bank (1995: Table 30, pp. 220–1) for shares of total income. Gini coefficients from Morley (1995: Table 2.1, pp. 30–1); Stewart (1995: Table 6.6, p. 150).

Notes: Dates in parentheses indicate the period to which income share data refers; Gini coefficients are for dates closest to the date in parenthesis.

^a Per cent of total income received; if income were perfectly equally distributed each of these quintiles would receive 20 per cent of total income.

to convert *nominal* or *current price GNP* (or *GDP*) to *real* or *constant price GNP* (or *GDP*).

The GNP and GDP figures shown in Table 2.1 have been calculated at their nominal values, that is, they have been estimated by multiplying the current, or nominal, market price of each good and service by the number of units of new production of each of these goods and services, and then summing across all goods and services. Prices act as a *numeraire*, or a common unit of measure, that allow us to add together physical quantities of different goods and services that otherwise would not be able to be compared or totalled.

The economic wealth of society that economists wish to measure is comprised of what it produces in actual *physical*, rather than value, terms, for it is that material production which is available for use in consumption and investment and which can contribute to individual and social welfare. The nominal GNP or GDP measure of output permits us to reckon the value of dissimilar physical outputs and services by measuring them with a comparable yardstick: a nation's own currency. When it comes to comparing total output and income between years, however, it is obvious

that unless prices have remained constant, the nominal, or current, price measure of GNP (or GDP) will be a combination not only of changes in physical production, but also of the variations in the prices of the goods and services produced that have occurred between years.

Equation 2.2 shows how nominal GNP is determined as the sum of all newly produced final goods and services created within a year, with n being the number of such goods and services, P_i , the price of good or service i , and Q_i , the physical quantity of good or service i produced.

$$\text{GNP} = \sum_{i=1}^n P_i Q_i \quad (2.2)$$

From this simple statement, it is clear that in different years, the prices of goods and services – the P_i s – can differ and that different prices will affect the *nominal* value of GNP, even if output – the Q_i s – have not changed at all.

In comparing GNP (or GDP) in different years, what we want to measure is by how much real, physical output (the Q_i s) has changed, independent of any price changes that may have taken place. To calculate real, or constant price, GNP (or real GDP), it only is necessary to use the same prices, P_i , for all years compared. Once the comparison or *base year* vector of prices is chosen, these same P_i s can be used in equation 2.2 to multiply the current Q_i s measuring the output of all goods and services for all years to be compared. Thus we can write, for example,

$$1997 \text{ GNP}_{1987} = \sum_{i=1}^n P_{i,1987} Q_{i,1997} \quad (2.3)$$

Equation 2.3 shows how GNP for 1997, calculated at 1987 prices (1987 has been selected as the base year in this case), would be determined. Using the prices prevailing for each good and service in 1987 ($P_{i,1987}$), this price vector is multiplied by the physical quantities of all newly produced final goods and services actually produced in 1997 ($Q_{i,1997}$). The resulting sum is the real value of 1997 GNP reckoned at 1987 prices.

In practice, an equivalent approach for calculating 1997 GNP in 1987 prices is to deflate nominal 1997 GNP by an appropriate price index. For example, if the nominal GNP of the fictional country of Luanda in 1997 was US\$3,337 million, and the price index for 1997 was 331.7 (with 1987 = 100), then real 1997 GNP for Luanda, calculated in constant 1987 US dollars, would be equal to US\$1,006 million, as shown in equation 2.4.

$$\begin{aligned} \frac{1997 \text{ GNP}}{1997 \text{ Price Index Value}} \times 100 &= \frac{\text{US\$3,337 million}}{331.7} \times 100 \\ &= \text{US\$1,006 million} \end{aligned} \quad (2.4)$$

This calculation adjusts Luanda's 1997 GNP for the average price changes that occurred between 1987, the base year, and 1997. This operation is equivalent to the calculation in equation 2.3 where 1987 prices are multiplied by 1997

quantities.⁶ After making this correction, which is absolutely necessary when comparing income between years, then *real GNP* or *real GDP* per capita can be calculated by making the population adjustment discussed above, if it was not done prior to the price adjustment.

BOX 2.2 VALUING WOMEN'S WORK

A part of the work which women do is not counted as contributing to an economy's GNP or GDP. That is because the great bulk of work done in the home – caring for and instructing children, preparing meals, drawing drinking and cooking water from wells, washing dishes, cleaning, and so on – is not paid employment. The system of national accounts methodology used to calculate the value of an economy's total output ignores such unpaid, and non-market, production. Much of women's work is thus 'invisible'.

What is especially interesting is that women and girls everywhere labour more hours per week at paid and unpaid work than do men or boys. Of the total number of hours performed in all categories of work, women in less-developed countries account for 53 per cent to men's 47 per cent share. Rural women tend to carry an even larger burden of all work performed. For example, in rural Kenya, women were found to work an average of 1.35 times more hours than men; in Bangladesh, the ratio was 1.1 times more.

However, though women work more in total than men in less-developed economies, more of women's work is carried out in non-paid activities (66 per cent) than in paid work, which accounted for 34 per cent of women's total contribution. For men, on the other hand, 76 per cent of their labour contribution was in paid pursuits, while only 24 per cent of men's total effort was performed in non-paid, non-market activities. For example, more than 15 hours per week are expended by women in Mozambique just to fetch water. Women in rural Kenya work an average of 14 hours per week more than men, and do ten times as much housework, none of which has a 'value' in terms of total GNP or total GDP, though obviously such labour is essential to the living standard of their families and may often spell the difference between survival and perishing.

One estimate of the total contribution of women's unpaid, 'invisible' activities was put at \$11 trillion in 1993. Given that total global output was estimated at \$23 trillion in that year, an adjusted measure of all production might be as much as 50 per cent higher than thought on the basis of the standard measure of output.

Source: UNDP 1995: Chapter 4.

4 Other considerations when using the GNP or GDP measure Both the GNP and GDP measures exclude some new production that clearly adds to the level of well-being of a nation, while at the same time they count some output that does not contribute to human welfare. One of the most significant omissions from the GNP and GDP measures is an estimate for the value of home-production. In particular, the value of the labour services of women and children, and to a lesser degree, men, who cook and clean and tend children, who make and mend clothing, and who perform a variety of other unpaid tasks in the production of non-traded goods and services for their families' own consumption are not included in the traditional GNP or GDP estimates. Certainly these productive activities contribute to social well-being and to social reproduction (see Box 2.2).

On the other hand, the production of all military goods, logging operations that cause environmental destruction of forests, and production processes that spew toxic wastes into the air and water and then force society to pay for their clean-up, or which create health problems requiring remediation, contribute to the measured level of GNP and GDP. Such activities do not add to the level of development or to society's welfare to the degree that their market-valued contributions would suggest, since social costs and private costs diverge, often dramatically, for such production as a result of the *negative externalities* created by such processes. Economists have devised methods, such as the measure of economic welfare (MEW) and more recently the Genuine Progress Indicator (GPI), which attempt to adjust the GNP and GDP measures both for the omissions from measured production that contribute to human welfare not included in the traditional methodology for determining GNP or GDP, as well as for those included values that subtract from human welfare. While the specifics of making such adjustments are not examined here,⁷ it is important to keep in mind that some of the goods and services included in the GNP and GDP measures may contribute negatively to a nation's development goals, while others, such as so-called 'women's work' and much of home production in general are not included, although they represent activities that do contribute positively to a nation's total production and to its potential for full human development (see Box 2.3).

GNP or GDP: which is the appropriate measure to use?

Which income measure of economic growth should one use: real GNP per capita or real GDP per capita? Does it make a difference? The GNP measure provides some notion of what the residents of a nation have available to them for consumption and investment, including government spending; GNP thus furnishes a measure of the sum total of new final goods and services available to those residents in a country. In economic terms, the level of output and income measured by GNP is a proximate gauge of the material welfare or well-being of the residents of a nation. If one is going to use the economic growth criterion as the proxy measure for the broader goals of development, it probably makes sense to use real GNP per capita as the standard, since it measures what is available for contributing to the standard of living of the population, both now for current consumption and, in the future, as investment.

BOX 2.3 SUSTAINABLE DEVELOPMENT: BALANCING GROWTH AND THE ENVIRONMENT

Since the 1970s, at least, there has been a growing concern about the impact of economic growth on the natural environment. In 1971 in Switzerland, a United Nations conference on the Environment and Development was held, followed in 1972 by the UN Conference on the Human Environment in Sweden. These and other gatherings of academics, politicians, activists and NGOs (non-governmental organizations), culminated in the UN Conference on Environment and Development – the so-called ‘Earth Summit’ – held in Rio de Janeiro, Brazil in 1992. The outcome of these various forums and of research has been a growing awareness of, and interest in, the issue of *sustainability*.

Sustainable development has been defined by the Brundtland Commission as ‘development that meets the needs of the present without compromising the ability of future generations to meet their own needs’. While there is still debate over precisely what this definition means, efforts to operationalize it to account for the impact of current economic activities on natural resource use and the carrying capacity of the environment to absorb adverse changes are evident in the creation of the Gross Progress Indicator (GPI) and in other measures, such as the Environmentally-adjusted net Domestic Product (EDP), and other efforts to ‘green’ the national accounts countries traditionally use to measure their economic progress. The motivating conviction of sustainable development is that economic growth need not be in conflict with the natural environment if attention is paid in economic and public policy decisions to the goal of conserving and enhancing the natural resource base and in using technology in ways that value not only increased output, but also consider their impact on the environment.

Part of the new way of looking at sustainability rests on the critical observation that there is *pollution of poverty*, as well as the perhaps more familiar *pollution of affluence*. ‘Pollution of poverty’ recognizes that in many less-developed nations, environmental problems such as degradation of marginal lands leading to erosion of top-soil and desertification, clear-cutting of forests, poor water quality, a lack of sanitation, toxic fumes from cooking, and so on are the consequence of a lack of overall economic growth and of national systems of income and wealth distribution which lead desperate poor people to abuse their environment and their nation’s stock of natural resources, simply to survive. Pollution of poverty extends to the cities of less-developed countries, in the slums and shanty towns where unclean water

and a lack of sanitation create environmental hazards for urban dwellers as well. 'Poverty of affluence' is the environmental damage resulting from increased industrial production and from higher-income consumption patterns, such as motor vehicles and non-recycled waste and refuse.

Both pollution of poverty and pollution of affluence can have local and global, or at least supranational, effects. Global warming, depletion of the ozone layer, desertification, species extinction (estimated in excess of 5,000 annually) set in motion potentially irreversible processes, the effects of which, if unchecked, could have devastating consequences for future generations. Thus there is a compelling need to find the means, and the will, to balance the pressing need for continued economic growth and its better distribution (to reduce the pollution of poverty) in the poorest nations. Equally important is the necessity to value the world's natural and environmental resources more rationally, from a social point of view, so that increased mass consumption is not automatically counted as having value, while environmental costs are ignored, with the environment essentially valued at a price of zero. This neglect of environmental costs has resulted in pollution of affluence in the richer nations and even in the urban areas of many less developed countries.

In discussions over sustainability, however, views often become polarized. The so-called 'deep ecology' perspective tends to be anti-growth, valuing all of nature and all species and natural habitat equally. Humans, in this perspective, have no special rights *vis-à-vis* other species or the environment. The deep ecology perspective exalts relatively simple living, with limited material wants as a desirable objective. Opposed to this viewpoint is that of those who promote economic growth as the means to best improve human development. In this traditional perspective, nature is there for the use of human beings. Not all species have equal value, and the expansion of consumption is one of the chief ends of economic life. Relatively little attention has been afforded to environmental concerns until quite recently for those holding to this perspective.

The effort to define 'sustainability' has been devoted to finding a middle-ground between the view that all of nature is equally valuable and should be preserved as much as possible, and the alternative view that nature is to be conquered for the benefit of human beings. Just as we shall find that developmental economists are taking a closer look at *human capital inputs* as being critical to progress, concern over sustainability can be seen as part of an effort to view *environmental and resource capital* as key inputs to potential national and global prosperity. Environmental and resource capital, however, is only now beginning to be valued, measured, and

thought about as a non-zero price input to production. Increasingly, though, development economists are cognizant of the 'eco-nomics' involved in the connection between ecology and development. This requires more than attention to the potential 'negative externalities' of particular behaviour, the traditional way economics has incorporated environmental and resource concerns into its purview. New ways of measuring and valuing environmental and resource capital are called for, as are new institutions that can operationalize and internalize such calculations, including the nature of property rights to resources, land, and water.

The concept of sustainability need not be limited to considerations about the environment. It is also possible to conceive of the sustainability of social structures. The pace, level, and distribution of economic growth can be extended to quality of life issues, such as the impact of economic change on urban crime and violence, on illegal drug addiction, on racial and ethnic tensions, and so on.

Sources: Bartelmus (1994: Chapter 2); Elliott (1994); Redclift (1987); WCED (1987: 43).

GDP, on the other hand, measures all the output or income produced within the borders of a country, even though not all of that income will necessarily be received by residents of the country, when, because of income inflows and outflows to the rest of the world, GNP is less than GDP. GDP is more purely an index of the value of all new *production* occurring within the frontiers of a nation, rather than of the income available for use, and hence real GDP per capita is a less desirable measure to use if one is interested in a surrogate welfare measure for the broad range of development goals of nations. Real GDP per capita does give information on the pace of aggregate production in a country, irrespective of who ultimately receives the income earned from such production. But the GDP per capita measure is not as closely connected to what remains in the hands of the residents of the nation for current and future consumption as is the GNP per capita measure, and thus GDP per person is a more imperfect measure of a nation's broader welfare targets.

As Table 2.1, column (4) shows, some countries have $GNP < GDP$, while other have the reverse relation. GDP is accordingly a better indicator of the growth of production; GNP is a better indicator of what is available to the residents of a country that can contribute to their potential welfare and human potential. Which measure is employed will be determined by the use to which such a measure is to be put. If one is solely interested in the pace of economic growth, then the real GDP per capita measure will serve quite nicely. If, however, one wishes to use an income proxy as a measure of the level and pace of development, in the broadest sense, it is more reasonable to use the real GNP per capita measure as the surrogate yardstick.

International comparisons of income: purchasing power parity

There is a further complicating issue to consider when using the income levels of different countries as a basis of comparison and as proxy measures of development. What exactly does a comparison of The Gambia's 1993 GNP per capita of \$350 with Germany's 1993 GNP per capita of \$23,560 mean? Of Malaysia's 1993 GNP per capita of \$3,140 with Mexico's \$3,610? Is it legitimate to infer from comparing these figures that one dollar of income in each country purchases an equivalent quantity of goods, so that one could say that \$1,500 of income provides the same standard of living in Germany, Malaysia, Mexico and The Gambia?

The simple answer to this query is, no, it would not be correct to make such an inference. This is due to the fact that the GNP per capita comparisons made above, as well as the GNP and GDP measures shown in Table 2.1, are made comparable by converting each country's GNP and GDP, measured initially in each country's own currency units, to a common US dollar measure using the official exchange rate as the means to arrive at that transformation. The official exchange rate, however, only makes comparable traded goods, such as computers, motor cars, oranges, and wine. The presumption is that, in international trade, the prices of such traded goods, when converted at the official exchange rate, will be quite similar due to the forces of international competition and the potential for arbitrage that large differences in prices between countries would offer.⁸

However, for *non-traded goods* and, especially, non-traded services, which, by definition, do not enter into international trade between nations, prices between countries can vary quite substantially, depending upon conditions internal to each country, particularly the average level of income, but also local customs, regulations, the degree of competition, and so on. For non-traded goods and services, there are no international forces of competition or the possibility of arbitrage to bring prices into line with one another between economies. Thus, significant differences in the *mix* of traded versus non-traded goods and services amongst countries, as well as significant price differentials for these goods and services between economies, can make international GNP and GDP comparisons based on converting domestic currency measures to a common US dollar or pound sterling measure potentially deceiving.

Table 2.3 provides a comparison between GNP per capita calculated at the official exchange rate and GNP per capita calculated at purchasing power parity, both reckoned in US dollars. Basically, the PPP measure makes an adjustment to GNP between countries similar to the adjustment made to determine real GNP or GDP discussed above. The prices of one country, in this case the United States, become the numeraire, or base, prices for determining the purchasing power parity value of GNP per capita in other countries. Thus, Mozambique's PPP GNP ('purchasing power parity GNP') per capita is determined as,

$$\text{PPP GNP per capita} = \frac{\sum_{i=1}^n P_{i,US} Q_{i,M}}{\text{population}} \quad (2.5)$$

Table 2.3 The purchasing power parity (PPP) measure of GNP per capita^a

Country	GNP per capita, 1993 at official exchange rate \$	GNP per capita, 1993 PPP \$
Chad	210	720
Côte d'Ivoire	630	1,400
The Gambia	350	1,170
Kenya	270	1,200
Mozambique	90	550
India	300	1,220
Pakistan	430	2,170
Sri Lanka	600	2,990
Philippines	850	2,670
Turkey	2,970	3,920
South Korea	7,660	9,630
Singapore	19,850	19,510
Peru	1,490	3,220
Colombia	1,400	5,490
Jamaica	1,440	3,000
Chile	3,170	8,400
Brazil	2,930	5,370
Lithuania	1,320	3,110
Spain	13,590	13,510
United Kingdom	18,060	17,210
Italy	19,840	17,830
Japan	31,490	20,850

Source: World Bank (1995: Table 1, pp. 162-3; Table 30, pp. 220-1).

Note: *a* calculated in 'international' dollars; these are roughly, in the aggregate, equal to US dollars.

where $Q_{i,M}$ is the output vector of all newly produced final goods and services, i , in Mozambique, and $P_{i,US}$ is the price vector for goods and services, i , in US prices. Effectively, then, what the PPP measure provides is the estimated value of Mozambique's output and income measured by using the prices for such goods and services prevailing in the United States, unmediated by the exchange rate between the two nations. Obviously, large differences in the prices of non-traded goods and services between the two countries, and of the mix of traded to non-traded goods in total national output, will affect the PPP measure of GNP per capita compared to the measure obtained from the official exchange rate conversion. From Table 2.3, one can say that the per capita PPP value of the goods and services in Mozambique is about \$550, which is an improvement over the exchange rate-converted GNP per capita of \$90, though hardly generous by any standard. Still, the PPP per capita income figure is more than six times larger and is more meaningful when comparing per capita income and the purchasing power of that income in the United States and Mozambique.

Typically, the purchasing power of income in lower-income countries tends to be *understated* by measures of aggregate or per capita income converted at official exchange rates due to the relatively low prices of non-traded goods and services, such as housing, haircuts and local transportation, in less-developed nations, as a result of a lower standard of living that makes the prices of such

goods lower than they are in more developed nations. The more developed economies tend to have their PPP GNP per capita closer to that calculated at the official exchange rate because of the greater openness to world trade, a mix of production with more traded goods relative to non-traded goods, and due to their more modern structures of production which result in greater efficiency in production in both traded and non-traded goods and service sectors.

Much like the adjustment for price changes needed to convert nominal GNP and GDP figures to real values undistorted by the effects of price changes, the PPP calculations of GNP and GDP keep us from thinking too quickly that average income in Mozambique in 1993 was the equivalent of \$90 in the United States. One problem when using the PPP measure is deciding which country's price vector, the P_i s in equation 2.5, should be used. There are an enormous number of possibilities that would give different PPP estimates relative to the prevailing prices in the country used as the numeraire. For example, if the United Kingdom were used as the reference country for determining the PPP values of GNP per capita, Mozambique's income would be stated in terms of how much could be purchased for an equivalent quantity of pounds sterling, and thus Mozambique's PPP income could be compared directly with that of Great Britain.

But despite this complication, there is an increasing tendency for development analysts to use the PPP measure of income in making comparisons amongst countries, rather than using the exchange rate-converted GNP or GDP values. This is a move we applaud. In future, income comparisons used as a basis of determining relative levels of development will more and more use the PPP income measure, and that will improve the quality of such comparisons and the meaning we attach to them.

The indicators criterion of development: the human development index

In the 1960s, there emerged from the International Labour Organization, from the World Bank, and from independent researchers, a growing backlash against the use of the economic growth criterion as the exclusive measure of development. Whether what was proposed as an alternative to the GNP or GDP per capita measure was the *basic needs* approach or the *physical quality of life index* (PQLI), or some other composite measure, the objection to the use of the economic growth standard was the same: it was far too aggregate and did not capture the distributional inequalities all too common in many nations of the world. The income per capita criterion gave a biased view, it was argued, of the level of progress achieved by many countries and was, in and of itself, an insufficient target for ultimately achieving society's broader development goals listed earlier. The link between the level of income per capita and the full range of development objectives was considered to be much too tenuous and unreliable, particularly in the poorest nations that most needed to make progress and in those countries where democratic political processes were all but absent.

Neither the basic needs nor PQLI methodologies took hold, however; the former perhaps because of some undeniable theoretical and empirical ambiguity, and the latter possibly for lack of a powerful institutional champion.⁹ Beginning in 1990, a new measure of development, the Human Development Index (HDI), has

been calculated and published each year by the United Nations Development Programme in its annual *Human Development Report*. The HDI is a composite index measuring 'average deprivation' using 'longevity, knowledge, and income' as the representative indicators for development. The actual index uses estimates of life expectancy, the literacy rate and school enrolment ratio, and an adjusted income measure to calculate an HDI value for each nation.¹⁰ The HDI measure of development is thus broader than the simple income per person yardstick, though income does enter into the calculation of the HDI, something not done in earlier efforts to create an alternative measure of development, such as the PQLI. At the same time, the HDI also gives direct value to those factors, particularly education, which help create opportunities for individuals to reach a higher and more fulfilling standard of living that may not be captured by the income measure alone.¹¹ As the UN Development Programme describes the HDI, it

shows how far a country has to travel to provide these essential choices to all its people. It is not a measure of well-being. Nor is it a measure of happiness. Instead, it is a measure of empowerment.

(UNDP 1995: 12)

The value of the HDI index can vary between 0 and 1, with an HDI score closer to 0 indicating greater distance from the maximum to be achieved on the aggregate of the factors entering the HDI, fewer choices for that nation's citizens, and hence a lower level of human development. An HDI value closer to 1 indicates greater achievement relative to the highest attainable on the constituent elements of the index, and thus a higher level of human development. Thus the HDI is measuring 'relative deprivation', that is, it is measuring how far away a country is from the maximum achievable value of the components that make up the HDI. Roughly, since this is a deprivation index, one can interpret an HDI = 0.600 to indicate that the country has fallen 40 per cent short of the maximum level of human development that could potentially be attained.

The HDI measure was created with the purpose of attempting to take into account the fact that countries, meaning both governments and individuals, make choices on their spending and use of resources and their distribution amongst alternatives which affect the range of choices open to, and the level of well-being of, their citizens and themselves with effects that may not always be captured in the income per person ranking of nations as to their relative level of development. For example, amongst the less-developed nations, the UNDP found that though one-quarter of national income was spent via government, less than 10 per cent of this share, on average, was dedicated to identifiable human development expenditures, such as education, health care, and social security. Rather, the largest area of government spending was on the military (UN Development Programme 1993: 10). Of course, different nations will allocate their public expenditures in distinctive ways, both to achieve particular development goals, as well as to accomplish other priorities, such as defence, that are deemed significant. The impact of these choices, at least partly, will be captured by the HDI.

Table 2.4 shows the value of the HDI and the GDP per capita ranking for an even broader range of countries than was listed in Table 2.1.

Table 2.4 Human development index, selected countries, 1992

	<i>HDI value</i>	<i>HDI rank^a</i>	<i>PPP GDP per capita rank - HDI rank^b</i>
<i>High Human Development^c</i>			
Canada	0.950	1	7
United States	0.937	2	-1
Spain	0.930	9	20
United Kingdom	0.916	18	5
Costa Rica	0.883	28	32
Argentina	0.882	30	9
South Korea	0.882	31	7
Chile	0.880	33	8
Singapore	0.878	35	-19
United Arab Emirates	0.861	45	-41
Venezuela	0.859	47	-7
Poland	0.855	51	20
Mexico	0.842	53	-6
Thailand	0.827	58	-3
Malaysia	0.822	59	-14
Brazil	0.804	63	1
<i>Medium Human Development^c</i>			
Turkey	0.792	66	-1
Botswana	0.763	74	-7
Saudi Arabia	0.762	76	-43
Jamaica	0.721	88	8
South Africa	0.705	95	-15
Sri Lanka	0.704	97	5
Philippines	0.677	100	8
Indonesia	0.637	104	-5
China	0.594	111	12
Morocco	0.554	117	-26
Vietnam	0.539	120	31
Zimbabwe	0.539	121	0
Congo	0.538	122	-21
<i>Low Human Development^c</i>			
Pakistan	0.483	128	-28
Kenya	0.481	130	7
India	0.439	134	7
Côte d'Ivoire	0.369	145	-15
Bangladesh	0.364	146	-5
Rwanda	0.332	156	9
Mozambique	0.246	167	6
Ethiopia	0.228	171	3

Source: UNDP (1995: Table 1, pp. 155-7).

Notes:

- a* The highest, or best, ranking is 1; the lowest, or worst, ranking, is 174 in 1992.
b If positive, this indicates that the HDI ranking for the country is higher than the per capita PPP GDP ranking; if negative, the HDI ranking for the country is lower than the per capita real PPP GDP ranking.
c High human development: HDI \geq 0.800 (63 countries in 1992); Medium human development: $0.500 \leq$ HDI $<$ 0.799 (64 countries); Low human development: HDI $<$ 0.500 (47 countries).

The last column of this table shows the difference between the PPP GDP per capita ranking of each country and its HDI ranking in 1992. The values in this column do not vary systematically in any immediately obvious way, once again underscoring the point of those who have argued that the GNP (or GDP) per person measure is an incomplete index of development and that there is no automatic link between the level of income per capita and the level of development (at least as measured by the HDI).¹²

A positive value in the last column of Table 2.4 indicates by how much a country's HDI ranking exceeded its PPP GDP per capita ranking; such countries scored higher on the broader index of development than they did on an income basis, suggesting that the PPP GDP per capita measure understated that country's level of development, as more broadly defined by the HDI. For example, Costa Rica's HDI ranking exceeded its per capita PPP GDP ranking by thirty-two places. (What, then, was Costa Rica's per capita PPP GDP ranking?) In other words, Costa Rica did substantially better on the HDI measure than would have been expected from its per capita income ranking alone. On the other hand, a negative value in the last column of Table 2.4 indicates by how much a country's HDI ranking fell short of its PPP GDP per capita ranking amongst all countries. For those nations with a negative gap, their PPP GDP per person ranking tends to *overstate* the broader level of development, as measured by the HDI. For example, Pakistan's relative HDI ranking was 28 places below its per capita GDP ranking, suggesting that looking at income alone results in Pakistan having a higher ranking among the 174 countries than is true on a broader measure of development.¹³

Adjustments to the HDI

Just as it is useful to adjust the per capita income figures so that they provide a more reliable standard of the level of development if one is to use that measure, so too are there modifications to the HDI that can be made that refine the information it provides.

The Gender-related Development Index (GDI)

The UN Development Programme, for example, calculates a gender-adjusted HDI, called the gender-related development index or GDI, which takes into account differences in the level of attainment of women and men, as separate groups, on the component values of the HDI. In making such a correction, every country suffers a deterioration in the value of its HDI (gender-adjusted), meaning in no country do women, on average, score higher than men on the HDI components, so that $GDI < HDI$. However, some countries do better than others on gender-equality, so that the GDI ranking of countries is different than the HDI ranking, rising for those nations for which the average achievement of women is closer to that of men and falling for those nations where the achievement of women is more distant from that of men as a group. For example, South Korea's gender-adjusted HDI, or GDI, drops to 0.780, compared to its crude HDI value of 0.882, and in

the gender-adjusted GDI ranking, South Korea falls eleven positions below its HDI ranking. On the other hand, in Thailand, though the GDI was 0.798, compared to an unadjusted HDI = 0.827, Thailand's ranking on the GDI was fifteen places higher than on the HDI alone, indicating a relatively better level of equality between men and women than in many other nations.¹⁴

A separate adjustment to the HDI for income distribution can also be made. Brazil's 1990 HDI value fell from 0.730 to 0.627, and its HDI ranking by four places, when income distribution was taken into account. On the other hand, South Korea's income-distribution-adjusted 1990 HDI rose to 0.885 from an unadjusted 0.872 value, reflecting somewhat greater equality of income in South Korea relative to other nations. Regional adjustments (urban-rural; different parts of a country) are also imaginable and have been calculated for some nations where such information is available (see UNDP 1993; these adjustments are not reported by the UNDP each year, as is the HDI). What such adjustments importantly remind us is that it is necessary to look beyond any *average* index of development – be it an HDI, the PQLI, or a per capita income measure – one uses to determine how specific groups, classes, and regions are performing relative to the average measure utilized as a proxy for the nation as a whole. HDI averages can obscure widely disparate levels of achievement on the vector of human development, just as average income figures can mask immense differences by gender, region, ethnicity and income class.

The HDI is thus an imperfect measure of the well-being of a nation, as well. Further, it does not include any measure that might capture the impact on the environment and sustainability issues related to the environmental quality of a country's economic policies. Such environmental matters are left out of the HDI, except to the extent which they might indirectly affect life expectancy. With the growing awareness of the pressing need to understand the interrelation of biological and economic systems and the concern that an environmental threshold perhaps is being reached with continued global economic expansion, this is a glaring deficiency of the HDI, as it is in the usual GNP and GDP measures. So, too, is the absence of any weight in the gross HDI given to the degree of political democracy and participation. The UN Development Programme is aware of these inadequacies, and in future, changes in the way in which the HDI is calculated are quite likely, with an effort to include environmental and political variables the most pressing concerns.

Comparing the income per capita and HDI measures

Is the effort to construct an HDI for each country worth the effort? Does the HDI provide information about the level of development of a country that is different from that which can be obtained from GDP or GNP per capita figures? Is it reasonable to use real GNP or GDP per capita as a proxy for the level of development, rather than the admittedly more-difficult-to-estimate HDI?

In a statistical study comparing GNP per capita and the HDI as means for ranking nations as to level of development, it was found that there is a distinct and high correlation between the GNP per person and HDI rankings when the entire sample of countries was considered (Dietz and Gibson 1994; in that study there

were 143 nations).¹⁵ This tends to support the view that per capita income is a reasonable proxy for ranking nations as to their relative and absolute level of development. However, when the sample was examined in more detail, this conclusion could be supported only weakly.

The study determined that using GNP per capita as a surrogate for development is most reliable for the highest-income group of nations and for the lowest-income, least-developed nations, with some notable exceptions, like Sri Lanka, China, Guyana and Indonesia in the latter category. For the seventy-two lower-middle and upper-middle income countries in the study, however, the level of GNP per capita turns out to be a poor indicator for the level of human development and an unreliable ranking methodology for relative human development among those nations.

The results of the statistical study strongly suggest that considering *both* the level and relative position of a country for both GNP per capita or GDP per capita and for the HDI score is, perhaps, the more prudent way to discuss the level of development. Since the link between economic growth and development is neither direct nor constant, tracking progress along both indicators provides more information than either per capita income or the HDI value alone. If, however, one were forced to choose one index over another as a measure of the level of development, the HDI would seem to provide fuller information than the GNP or GDP per capita measure.

The HDI thus provides an alternative index to the income per person, economic growth criterion for evaluating the progress of a country in terms of achieving broadly accepted development goals. The HDI reminds us that though increased income is vital for the expanded choices it provides individuals and families, it is not the whole of what development is about. The unadjusted HDI partly captures to what extent the spread effect of growing incomes is filtered through education, health, social security and other areas of the economy and how incomes are distributed to expenditures that are both means to, and ends of, higher levels of development.

One failing of the HDI is that it does not indicate in an obvious way what is happening to the poorest members of society, except to the extent that this is reflected in the HDI. One of the most important aspects of the World Bank's basic needs approach was that it focused attention directly on the prevailing and changing conditions of the poorest 40 per cent of population of the less-developed countries, that is, the 'extremely poor' and 'poor' as defined in Chapter 1. To the extent that it is accepted that development is chiefly concerned with the alleviation of poverty, there would seem to be a compelling justification for always asking what the likely impact of any policy or action will be on the poorest in society. Such a concern does not necessarily mean that every policy or action that might be expected to adversely affect the poorest 40 per cent of the population for the short-term must be rejected; it does mean, however, that, on balance, development policies over the longer-run should be geared to improving a country's performance on the HDI, on income per person, *and* on reducing the share of the poorest 40 per cent of the population who are classified as 'poor' and, especially, those who are 'extremely poor'. Every development decision should include, at a minimum, a reflection on how the fate of the poorest of society will be impacted in the short- and the medium-run.

Throughout this book we will use the HDI concept, the share of the population classified as being in poverty, as well as per capita income, as complementary means to evaluate the merits of alternative strategies and programmes for promoting development; raising income is part of the goal of development, but it is not the entire story. One is less likely to overstate the importance of income growth alone if per capita income figures are related to a country's HDI, ranking, and progress on the path to eliminating absolute poverty as a means of evaluation as to how development is progressing.

The search for any single indicator that will provide all the information that is important and relevant to development is elusive. Any indicator will be at best an imperfect measure of development. Awareness of the weaknesses of whatever indicator is used and an effort by the observer of the development process of any nation to 'fill in the gaps' of coverage inevitable to any single index remains, nonetheless, an essential and somewhat subjective ingredient to evaluation and recommendation.

Economic growth and human development: goals at odds?

Does an emphasis on development and the targeting of objectives such as increased education and better health care, which contribute to improvements on the HDI measure, or to a reduction in the numbers of the poor, come into conflict with achieving more rapid economic growth? Is an emphasis by a country on accelerating economic growth inimical to more rapid development, as measured by the HDI or GDI or by poverty reduction? Does a concern with equity, gender and ethnic inequality, and the plight of the poor result in development policy decisions that slow economic growth to the detriment of meeting the broader goals of society? Underlying the insistence that some economists place on measuring development by real income per capita and of targeting this as a proximate goal for development is a concern that too much emphasis on development will slow economic growth, thus actually making development more difficult to attain, by reducing the material resources available to society that might be dedicated to improving human welfare.

Economists who take this more 'hard-headed' view that rapid economic growth is essential to ultimately achieving broader development goals and who suggest that any diminution of economic growth, even if unequally distributed, should not be the goal of nations, take their cue from important and suggestive empirical work. An influential study in 1955 by Nobel Prize-winning economist Simon Kuznets suggested that at low income levels, economic growth tended to create more inequality, as measured by the Gini coefficient. Once a critical threshold level of income was reached, however, further economic growth tended to reduce inequality, and one assumes would tend to result in an improvement in the broader aims of development, as measured by the HDI. This relation has come to be known as the *Kuznets inverted-U hypothesis*, from the shape of the curve shown in Figure 2.1.

The Kuznets hypothesis has been taken to mean that there is a minimum, critical level of aggregate economic achievement, as measured by real GNP or GDP per capita, that must be realized before greater equity and higher levels of development can be attained. Once that threshold level of income is reached, further economic growth then contributes to greater equity and development. Prior

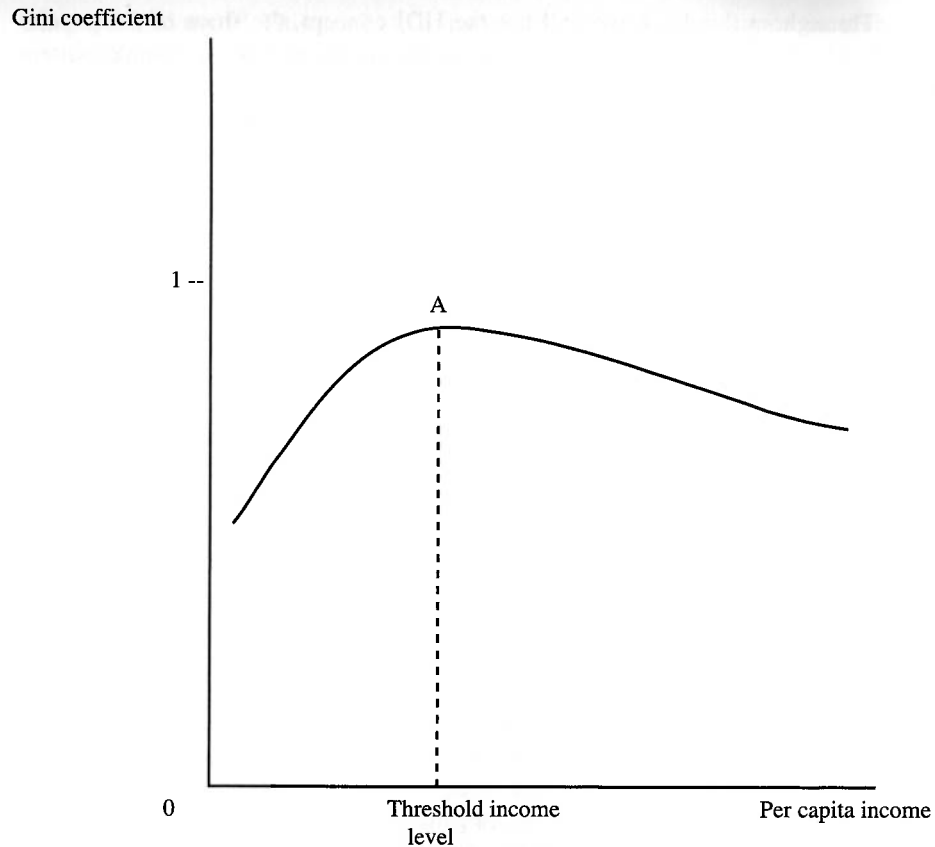


Figure 2.1 The Kuznets inverted-U curve: income versus inequality

to reaching the threshold level of income indicated by point A in Figure 2.1, economic growth does indeed seem to increase inequality, but such economic growth, and hence the accompanying inequality, is necessary if the threshold level of income at A is ever to be reached so that inequality can be reduced and development enhanced through additional economic growth.

The Kuznets inverted-U hypothesis sometimes has been interpreted as something of a law of economic growth and development; nations wishing to promote equity and human development in the wider sense can best do so by pursuing economic growth, since the Kuznets curve 'shows' that equity and development follow, and then are complementary to, economic growth once the threshold level of income per capita, A, is exceeded. There is no apparent necessity to target development goals or poverty reduction *per se* if one accepts this view. The short-term losses in equity and the rising Gini coefficient that accompany economic growth before income level A is reached are the necessary trade-off costs of progress over the longer

haul. From this interpretation of the Kuznets curve, growth and development are not rival goals. Economic growth promotes development and equity in income over the longer term, even if there would seem to be a short-term conflict (see Box 2.4).¹⁶

BOX 2.4 INEQUALITY AS A CONSTRAINT ON GROWTH

The conventional wisdom has been that there is a trade-off between augmenting growth and reducing inequality, so that an unequal distribution of income is sometimes believed necessary for, or the likely consequence of, rapid economic growth. If this is so, however, why do we find in Latin America relatively low rates of economic growth and high inequality, and in East Asia low inequality and rapid growth?

Differences in the political economy of the two regions may be part of the explanation. In the postwar period, governing elites in East Asia, their legitimacy threatened by domestic communist insurgents, sought to widen the base of their political support via policies such as land reform, public housing, investment in rural infrastructure, and, most commonly, widespread high-quality education. In Latin America, governing elites appear to have believed they could thrive irrespective of what happened to those with the lowest income since tax, expenditure, and trade policies have benefited the poor relatively little.

The association of slow growth and high inequality in Latin America could in part be due to the fact that high inequality may itself be a constraint on growth. Conversely, East Asia's low level of inequality may have been a significant stimulus to economic growth. If this is the case, investment in education is a key input to sustained growth not only because it contributes directly to the economy through its productivity effects, but also because it reduces income inequality.

How significant a constraint on growth is high inequality? It appears to be quite substantial. The results of recent research suggest that, *ceteris paribus*, after twenty-five years, GDP per capita would be 8.2 per cent higher in a country with low inequality than in a country with inequality one standard deviation higher.

The ratio of the income shares of the top 20 per cent to the bottom 20 per cent of income earners is 32 in Brazil and 6 in Korea. Simulation results suggest that if, in 1960, Brazil had had Korea's lower level of income inequality, Brazil's growth rate over the following twenty-five years would have been 0.66 percentage points higher each year. This implies that after twenty-five years GDP per capita in Brazil would have been 17.2 per cent higher than it was with the higher degree of inequality.

Source: Birdsall and Sabot (1994).

AN OVERVIEW OF ECONOMIC DEVELOPMENT

The debate over the Kuznets inverted-U hypothesis has generated a vast and often complicated literature. However, the relation Kuznets discovered between income and equity or development is not, in fact, a law of economics, but rather a statistical relation.¹⁷ What seems to happen is that once nations pass the threshold level of income (about US\$1,900 per person in 1990), government expenditures in the areas of health, education, social security, and other social and human capital areas tend to rise relative to total expenditures in the economy. Thus, improvement in equity and on the HDI measure would be expected, as governments are able to focus on broader development goals, which leads to more economic growth in the future.¹⁸ More importantly, the Kuznets hypothesis cannot be sustained once the experience of individual nations is singled out. Some countries have experienced worsening equity along with economic growth, even after the threshold level of income has been reached (Brazil is a recent example), while other nations have been able to improve equity and score higher on the HDI measure at income levels well below Kuznets's threshold level of income (Sri Lanka, for example). The reason? Specific government policies on, for example, education and wealth distribution, can be aimed at redistribution and targeting the broader development goals early on (Sri Lanka) or away from such goals (Brazil), somewhat independent of the level of current income.

What the Kuznets inverted-U demonstrates, then, is historically what, on average, did happen for a group of nations. It does not imply that all countries, especially late developers, must necessarily tolerate or even promote increasing inequality so as to achieve economic growth. The particular path which any nation follows in terms of the relation between its economic growth rate and its success in reaching the broader goals of development is at least partly a consequence of conscious public policy. That policy can be geared toward high economic growth and rapid development, or high growth and slow development; even slow economic growth paths can generate increasing or decreasing inequality, at least for a time. The particular mix of growth and development is a public policy choice that a nation's leaders determine, with or without popular consent. This is not to say economic growth does not matter; it does. Over time, more economic growth will contribute to greater development; but the reverse is also true, since increased human development contributes to higher levels of labour productivity, particularly via increased education and better health care. Countries cannot ignore one side of the development equation – economic growth or development – for very long without suffering the adverse consequences of lop-sided policy. But as we shall see in later chapters, some East Asian countries recently have been able to achieve quite substantial progress on both the economic development and equity and development ledgers simultaneously (see Box 2.4).

The differences in the GDP and HDI rankings in Table 2.4 confirm the importance of policy decisions by government and society, especially for the middle-income less-developed nations, in achieving development goals at different levels of income. The divergence in the rankings also confirm that the Kuznets curve is not strictly a law governing the relation between equity and development and the level of per capita income, or there would be no, or fewer, differences between the PPP, GDP and the HDI rankings. Depending on a nation's policies, greater equity and progress on development goals can be achieved with increases in income

BOX 2.5 AN ENVIRONMENTAL KUZNETS CURVE?

Some researchers have suggested there may be an environmental Kuznets curve, similar to Figure 2.1, but with pollution measured on the vertical axis. At relatively low income levels, increases in economic growth result in increased pollution and environmental destruction. However, after a threshold level of income per person is reached, pollution and adverse environmental effects will be reduced. Why would this be so?

Beginning from low income levels, as industrialization is initiated, and given the relatively low value placed on a clean environment compared to the value of a higher standard of living, little attention may be paid to environmental conditions. Increases in agricultural output also might be expected to expand the volume of toxic wastes created. Further, clean and safe technologies may not be available at a reasonable cost to poor countries, which absorb the costs of pollution and other environmental degradation as one of the 'costs' of improvements in their living conditions.

A clean environment is often assumed to be a 'luxury good', in the sense that its income elasticity is greater than one. It is thus presumed that it is only at higher income levels that a clean environment has a value worth preserving. If these assumptions are correct, then one would expect to see an environmental Kuznets curve, at least for some kinds of pollution and environmental damage (e.g., sulphur dioxide, particulate matter). On the other hand, some types of environmental damage can increase with higher income levels (e.g., carbon dioxide emissions from vehicles, ground-water contamination and municipal waste).

However, much like the traditional Kuznets curve for income growth, the observation of an environmental Kuznets curve has been based on what has occurred in the past. Now, there is better information, better environmental accounting methods, and greater awareness of the global significance of promoting development which takes into consideration environmental effects, in poor and rich countries alike. Progress over time needs to be economically, politically and environmentally sustainable. Thus, there is growing awareness of the desirability and the necessity of taking steps to flatten or even induce a downturn of the environmental Kuznets curve. The real issue is whether it also is politically feasible. As the World Bank noted,

The principles of sound environmental policy . . . are well understood. But they are difficult for national governments to introduce and are even more difficult to translate into international agreements. National

governments may be reluctant to challenge those who cause environmental damage; they are likely to be rich and influential, while those who suffer most are often the poor and powerless.

In other words, it is not possible to leave the environment to chance and to purely market decisions. In many poor countries, it is not possible to simply wait until incomes rise and hope that the environment will be valued more. Environmental degradation is now a global problem, and though its causes are often local, the international community needs to work to see that the age of an environmental Kuznets curve is in the past.

Sources: Dasgupta and Mäler (1995: 2384–8); World Bank (1992: 10–13, 18, 38–41, 43).

per capita, even at relatively low levels of income. It is not necessary for countries to await the threshold level of per capita income shown in Figure 2.1 before progress toward greater equity can be accomplished. It is a matter of policy decisions, and even after attaining the threshold level of income, there still is no guarantee of progress toward greater equity; it still depends on the nature of state and social policy aimed at attaining such goals as greater equity and a higher level of human development.

Questions for review

- 1 In the general discussion of why GNP and GDP may diverge for a specific nation, the focus of the example was on inflows and outflows of profits and dividends due to foreign investments and on workers' remittances that might cause US GNP to differ from US GDP. (a) What other inflows to, and outflows from, a country can cause the GNP measure of income to differ from the GDP measure of income? (b) Choose three countries in Table 2.1 and speculate on why GNP differs from GDP, discussing the possible inflows and outflows of income that might account for the differences in those specific cases. (c) Choose a country you are interested in, but which is not listed in Table 2.1's comparison of GNP and GDP measures, and add that country to the listing there. How might you account for the difference in GNP and GDP for the country you have added?
- 2 Considering only the twenty-seven countries listed in Table 2.1, rank them from the 'most developed' to the 'least-developed' in terms of both GNP per capita and GDP per capita. Do these rankings differ substantially?
- 3 (a) Over the period 1970–80, Tanzania's total GDP grew at 3.0 per cent per annum and by 3.6 per cent from 1980–93, while population expanded at

- 3.1 per cent over the earlier period and by 3.2 per cent during 1980–93. What was the rate of growth of GDP per capita over both periods? (b) Botswana's population grew by 3.5 per cent per year during 1970–80 and by 3.4 per cent during 1980–93, while total GDP grew by 14.5 per cent per year during 1970–80 and by 9.6 per cent per annum during 1980–93. What was happening to Botswana's GDP per person over each period? (c) Does population growth 'cause' slow or fast growth in GDP? What is the connection between population growth and the increase in income (in this case, GDP) per person suggested by these two examples? (d) Can you derive a formula, similar to equation 2.1 in the text, for calculating the approximate rate of change of income per capita when you know the rate of change of total output and the rate of growth of population?
- 4 Determine the estimated *average* income of the poorest 20 per cent and of the richest 20 per cent of income earners in (a) Rwanda, (b) Malaysia, (c) South Korea, (d) Botswana and (e) Kenya by applying the income distribution shares in Table 2.2 to total GNP in Table 2.1. Compare these estimated average incomes per capita for the richest and poorest 20 per cent with the mean GNP values for the country as a whole shown in Table 2.1. For which, if any, of the countries does the overall average per capita GNP figure provide a reasonable measure of the actual income earned by the 'average' income recipient?
 - 5 Using one scatter diagram, with GNP per capita (column (5) of Table 2.1) on the horizontal axis and the ratio of income received by the richest 20 per cent to the share received by the poorest 20 per cent (column (3) of Table 2.2) on the vertical axis, (a) plot a point for each country. (b) Is there any systematic relation between GNP per capita and the degree of income inequality? Do countries with low levels of GNP per capita have more or less inequality than economies with higher levels of GNP per capita? (c) Now try plotting the income share of the poorest 20 per cent and/or the richest 20 per cent against GNP per capita. Do you find any systematic relationship, looking at the data in this way? (If you have access to Excel or Lotus 1–2–3 or some other spreadsheet program or a simple statistical analysis package, you could run a simple regression between the two variables to look for one.)
 - 6 In 1988, Pakistan's current (nominal) GDP was \$34,050 million. Assume that in 1998 total GDP measured in current (nominal) US dollars had increased to \$51,920 million. (a) What was the total per cent increase in nominal GDP over the period and what was the per cent change, on average, per year? (b) Now determine real (constant price) GDP in 1998 calculated at 1988 prices, given that the price index in 1988 = 100 and is assumed to be in 1998 = 215.9. (c) What was the per cent change in real GDP between 1988 and 1998, both in total and the per year average?
 - 7 What might explain the fact that Japan's purchasing power parity (PPP) level of GNP per capita is so much lower than its GNP per capita calculated at the official exchange rate? What might that indicate about the prices of non-traded goods in Japan relative to world prices and also about the relative level of competition in the Japanese economy?
 - 8 Explain why using the purchasing power parity measure of GNP per capita

- might be considered a better measure for comparing development levels between nations than is the exchange rate-converted GNP level.
- 9 Using data on income distribution by quintiles from the *World Development Report* or some other source, draw a Lorenz curve on graph paper (or if available, using a computer graphics package) for one of the countries with sufficient data (see App. 2A).
 - 10 Using the methodology for determining the value of the HDI shown in the UN Development Programme, *Human Development Report* and summarized in Appendix 2B to this chapter, calculate the value of the HDI for a country that interests you and that is not listed in Table 2.4. Does that country's level of GNP provide a reasonable proxy for the country's level of development as measured by the HDI? Are there other countries with a similar level of income to that of the country you have selected that have substantially different HDI values? How might you account for those differences? How does the Kuznets inverted U-shaped curve hypothesis fit the example of the country you have selected?
 - 11 Box 2.5 discusses the possibility of an environmental Kuznets curve and suggests that avoiding such an outcome is more of a political problem than one of know-how. In the quote in that box, what does the World Bank mean that it tends to be the 'rich and powerful' who cause much of the pollution, and the poor who suffer from the effects? In what specific ways do the 'rich and powerful' cause environmental damage? Why is it the poor who tend to bear many of the costs of such damage? In what ways do the poor bear such costs? Can you identify instances where it is the poor who contribute to environmental damage? (Hint: think of clear-cutting of forests for wood for charcoal or for grazing of animals, as one instance.)

Notes

- 1 Further, it is a strongly held belief of economists with this perspective that economic growth in capitalist societies occurs via a *trickle-down* process. With economic growth and an expansion of society's aggregate income, there is assumed to be a wide and fairly automatic dispersion of benefits to all income classes of society. While it is admitted that the incomes of the wealthiest in society perhaps grow most rapidly as economic growth occurs, those at lower income levels are presumed to benefit also from economic expansion as income 'trickles down' the income pyramid. This may occur via the provision of new and better jobs which result from the increased investment undertaken by higher-income recipients who finance such ventures, given their higher disposable incomes. Thus, one view is that income inequality has a *functional* purpose in capitalist economies, in that it is higher income individuals who are likely to save a larger portion of their incomes, relative to lower-income recipients. And it is from this pool of savings that the loanable funds for investment arise. Much like a boat, all of whose passengers are lifted together on a rising tide, it is suggested that greater economic growth benefits all, or certainly the great majority, of the members of society via the automatic mechanism of trickle-down growth. This, of course, is only a theory; the important question is whether this process works as described in particular situations.

- 2 Poorer nations tend to have less dependable estimates of their national income for one obvious reason: collecting data is expensive and for economies already facing the constraint of limited financial and human resources, the collection and evaluation of economic data is likely to be done in a manner that is less than desirable, and certainly less than would be optimal. To develop strategies that contribute to development, however, there is a compelling need for reliable statistical data concerning the objective reality in less-developed nations. In fact, one is tempted to state that the effort put into collecting dependable and timely statistics, making such information available to the public, and in analysing such data is some measure of a country's commitment to doing something about its future development.
- 3 Complete data on income distribution for all countries are not readily available, nor are such data reported very frequently, sometimes due to the cost of collecting such data but, for some countries, because of the unwillingness of governments to compile statistics that might be damaging to their country's stability by providing what might prove to be unflattering information to political opponents.
- 4 An equivalent and even easier method for calculating the average income of the lowest and highest quintiles is to remember that the \$2,930 GNP per capita figure for Brazil would be the average income of all individuals in Brazil if income were perfectly equal. However, the richest 20 per cent in Brazil actually receive 3.375 times their equality share of income ($67.5\% \div 20\%$). Thus the per capita income of the richest 20 per cent in Brazil is $3.375 \times \$2,930 = \$9,889$. For the poorest 20 per cent, their per capita income is but 0.105 their equality share ($2.1\% \div 20\%$), for a per capita income of $0.105 \times \$2,930 = \308 .
- 5 A Gini coefficient of 0 would indicate perfect equality of income, with the Lorenz curve, discussed in Appendix 2A, lying exactly along the line of equality. Hence $A = 0$, so that the Gini coefficient $= A/[A + B] = 0/[0 + B] = 0$. A Gini coefficient = 1 would indicate perfect inequality in the distribution of income; the Lorenz curve would be congruent with the bottom horizontal and right-hand vertical of Figure 2.1A, so that $A = \text{area of the entire triangle below the 'line of equality'}$ and $B = 0$; the Gini coefficient $= A/A = 1$. See Appendix 2A for details on the relation between the Lorenz curve and the derivation of the Gini coefficient.
- 6 There are some caveats worth mentioning when calculating real GNP or real GDP by adjusting for price changes between years. The further apart in time the comparison, the less meaningful it is likely to be. Some goods and services may no longer be produced in later years, while new goods and services can enter the production stream. Thus, price indices and the deflating technique become less reliable for comparing real output over long periods of time. Further, the issue of the *quality* of the Q_s is not captured by the price index adjustment. Prices may rise with quality improvements over time (some couture clothing) or they may fall (as with computers), so some price changes reflect not inflation or deflation, but rather differences in product quality. These differences will be lost in these income adjustments, and such improvements in quality, when they occur, must be reintroduced via other methods. Still, while always being cognizant of the weaknesses of prices adjustments in calculating real GDP or GNP figures, if the years being compared are not too far apart in time, calculations as in equations 2.3 and 2.4 can be taken as reasonable approximations of the changes in real output over time.
- 7 Any good macroeconomics book will have the details on this problem. On the GPI, for which calculations have been made for the United States, see Cobb and Halstead (1994).
- 8 Arbitrage is the process in which goods are purchased in one market to be resold in another market at a higher price. Clearly, if the price of a bar of Cadbury's chocolate in India is the equivalent of £1.50, while it sells for £2.50 in the Philippines, it would be to the advantage of profit-maximizing traders to purchase Cadbury bars in India and

resell them in the Philippines, as long as the costs of doing so – transportation, tariffs, etc. – are less than £1 per bar of chocolate, since there would be profit to be made on such a transaction. The process of arbitrage itself, for traded goods like Cadbury's chocolate, would tend to bring the prices of the two goods in line between the two countries, abstracting from transportation and other transactions costs. The price of Cadbury's bars in India would tend to rise with the increased demand resulting from the opportunities for arbitrage, while the price of chocolate bars would tend to fall in the Philippines due to the increased supply from arbitrage. Ultimately, an equilibrium price would exist in both countries at which all the opportunities for arbitrage and the making of a sure profit from trade would have been exhausted. For this reason, the prices of traded goods are expected to be very similar, except for transportation and other transaction costs between nations.

- 9 See Streeten (1979) and Streeten *et al.* (1981) on the basic needs approach and Morris (1979) for the original contribution to the creation of the PQLI measure.
- 10 The actual calculation of the HDI for any country is based on the country's deviation from the defined targets for each component of the index: an average life expectancy of 85 years at birth; 100 per cent literacy and 100 per cent combined school enrolment at all levels; and income. It is thus a measure of the *relative* position of a country compared with the target levels of achievement. In other words, the HDI is a measure of how far away a country is from the current maximum achievable values on the selected variables that enter the HDI (these variables have changed over time, as the HDI index has been fine-tuned; they may be changed in future).
Income enters the index in an interesting, but economically justifiable, manner. It is assumed that beyond the income level of PPP \$5,120 for 1992 (determined as the world average income per capita), there are rapidly diminishing returns to higher income. Thus higher levels of income beyond the world average do not artificially inflate the value of the HDI, and income growth alone does not overwhelm the other components of the index. On the other hand, income *is* a component of the index, unlike earlier composite development indexes, which gives recognition to the value of expanded choice that greater income provides to individuals. For an example of a recent calculation of the HDI for Gabon, see Appendix 2B to this chapter.
- 11 Incorporating social indicators, and not relying solely on income, may facilitate comparisons of levels of development amongst nations, since the exchange rate and purchasing-power parity issues discussed earlier are avoided. However, as long as the HDI measure includes an income component, there cannot be full independence of the HDI from the valuation-price issue discussed in the sections above.
- 12 Until 1994, the HDI was calculated with, and compared with, GNP per capita, evaluated at official exchange rates. Beginning in 1995, however, the HDI has been calculated using a PPP measure of GDP per capita within the index, and thus now the HDI is compared by the UN Development Programme with the PPP GDP per capita measure of income as a comparison ranking. It is thus not strictly correct to compare the HDI values calculated for years after 1992 (the HDI values in the 1995 *Human Development Report*), with the HDI values calculated for 1987–91. Further changes in the methodology for calculating the HDI are possible in future.
- 13 The highest ranking on both indices is first, or 1, and in 1992, the lowest ranking was 174. Thus, hypothetically, a country that ranked first on PPP GDP per capita and tenth on the HDI amongst the 174 economies would have a PPP GDP per capita rank minus HDI rank equal to $1 - 10 = -9$, indicating that its relative HDI level fell nine countries below its GDP per capita ranking. A country that was ranked forty-third in terms of PPP GDP per capita and thirty-eighth in terms of the HDI (i.e., that scored higher on the HDI than on income alone), would have a PPP GDP per capita rank minus HDI

rank equal to $43 - 38 = 5$, that is, the country performed on the HDI ranking five countries above its GDP per capita position.

The country with the worst PPP GDP per capita rank minus HDI rank gap in 1992 was Oman, which was ranked thirty-first among the 174 nations in terms of GDP per capita, but ninety-first on the HDI, a gap of -60 . The developing nation with the largest positive gap on the PPP GDP per capita rank minus HDI rank gap was São Tomé and Príncipe, in Sub-Saharan Africa, which ranked 169th on PPP GDP per capita and 133rd on the HDI, thirty-six places above its relative GDP ordering among the 174 nations.

- 14 The entire 1995 issue of the UNDP *Human Development Report* is dedicated to analysing the issue of gender inequality, noting that nowhere has development been gender-neutral (UNDP 1995: 1). Besides the GDI discussed here, the UNDP has also calculated a 'gender empowerment measure' (GEM) which attempts to 'reflect women's participation in political decision-making, their access to professional opportunities and their earning power' (UNDP 1995: 72) that should be useful in future for quantifying gender-associated political and economic disparities.
- 15 This study was carried out prior to the new methodology of using real per capita PPP GDP as the income variable for ranking nations.
- 16 It is perhaps worth remembering an important axiom of economic theory which states that there are an infinite number of efficient, i.e., Pareto optimal, outcomes for both the production and distribution of goods and services among the members of any society. As can easily be demonstrated with an Edgeworth-Bowley box analysis, any initial distribution of wealth will, under conditions of perfect competition and free exchange, generate a locally efficient level of production and distribution of society's goods and services, with trade resulting in the contract curve being attained. Thus the distribution of wealth and income amongst society's members is a *choice* variable open to economies, since these distributions are independent of the issue of efficiency. Any initial distribution can be efficient. For an excellent exposition of this issue, see Bator's (1957) classic article.
- 17 See Anand and Kanbur (1993) for a recent review of the literature. These authors argue that the best empirical relation between income growth and equity or development is actually the opposite of the Kuznets hypothesis! This contradictory result illustrates one of the problems in studying economics. There often are competing models that purport to explain some particular phenomenon, frequently based on extremely complicated mathematical and statistical analyses, done by equally competent and respected investigators, that nonetheless come to diametrically opposed, and often irreconcilable, conclusions. How does one choose between such competing theories when compelling empirical evidence can be mustered supporting alternative theories? This is an excellent question for class discussion!
- 18 It is not just governments that today can affect the level of inequality and reduce poverty, even at lower income levels than in the past. There are also a growing number of non-governmental organizations, or NGOs, which operate in the less-developed nations and which often have as their primary objective the alleviation of poverty. These range from large and relatively well-financed groups like Oxfam, the International Red Cross and Crescent, CARE, Caritas, World and Vision to small, regionally and often country-specific groups, such as the Voluntary Action Network India.
- 19 The 1995 *Human Development Report*, pp. 125-33, also provides a technical guide to the determination of the 'gender-related development index' (GDI) and the 'gender empowerment measure' (GEM) mentioned in the text above.

References

- Anand, S. and Kanbur, S. M. 1993. 'Inequality and Development: A Critique', *Journal of Development Economics* 41: 19–43.
- Bartelmus, Peter. 1994. *Environment, Growth and Development*. London: Routledge.
- Bator, Francis. 1957. 'The Simple Analytics of Welfare Maximization', *American Economic Review* (March): 22–59.
- Birdsall, Nancy and Richard Sabot. 1994. 'Inequality as a Constraint on Growth in Latin America', *Development Policy*, Newsletter on Policy Research by the Inter-American Development Bank (September): 1–5.
- Cobb, Clifford and Ted Halstead. 1994. *The Genuine Progress Indicator*. San Francisco, CA: Redefining Progress (September).
- Dasgupta, Partha and Karl-Göran Mäler. 1995. 'Poverty, Institutions, and the Environmental Resource-Base', Chapter 39 in Jere Behrman and T.N. Srinivasan (eds), *Handbook of Development Economics*, volume IIIA. Amsterdam: Elsevier Science.
- Dietz, James L. and Louise Gibson. 1994. 'What is Development?: The Human Development Index, A New Measure of Progress?' mimeo, California State University, Fullerton.
- Elliott, Jennifer A. 1994. *An Introduction to Sustainable Development*. London: Routledge.
- Morley, Samuel A. 1995. *Poverty and Inequality in Latin America*. Baltimore, MD: The Johns Hopkins University Press.
- Morris, Morris D. 1979. *Measuring the Condition of the World's Poor: The Physical Quality of Life Index*. New York: Pergamon Press.
- Redclift, Michael. 1987. *Sustainable Development: Exploring the Contradictions*. London: Routledge.
- Stewart, Frances. 1995. *Adjustment and Poverty*. London: Routledge.
- Streeten, Paul. 1979. 'From Growth to Basic Needs', *Finance and Development* 16 (September).
- et al. (eds). 1981. *First Things First*. Oxford: Oxford University Press.
- UNDP (United Nations Development Programme). 1993. *Human Development Report 1993*. Oxford: Oxford University Press.
- 1995. *Human Development Report 1995*. Oxford: Oxford University Press.
- US Department of Commerce. 1994. *Survey of Current Business* 74 (July).
- 1995. *Survey of Current Business* 75 (August).
- WCED (World Commission on Environment and Development). 1987. *Our Common Future*. Oxford: Oxford University Press.
- World Bank. 1992. *World Development Report 1992*. Oxford: Oxford University Press.
- 1995. *World Development Report 1995*. Oxford: Oxford University Press.

Appendix 2A: Calculating the Gini coefficient

To understand how the Gini coefficient is calculated, it is helpful to look at a Lorenz curve which provides a graphical representation of a nation's income distribution. Figure 2.1A shows a simple Lorenz curve drawn from the following hypothetical income distribution figures.

Income distribution, by quintiles, Country A

	Share of GNP	Cumulative per cent, total income
Poorest 20% of families	4% of total GNP	4%
Second 20% of families	8% of total GNP	12%
Third 20% of families	11% of total GNP	23%
Fourth 20% of families	18% of total GNP	41%
Richest 20% of families	59% of total GNP	100%

Figure 2.1A plots the percentage of families on the horizontal axis against the percentage of income received on the vertical axis. The diagonal in Figure 2.1A is

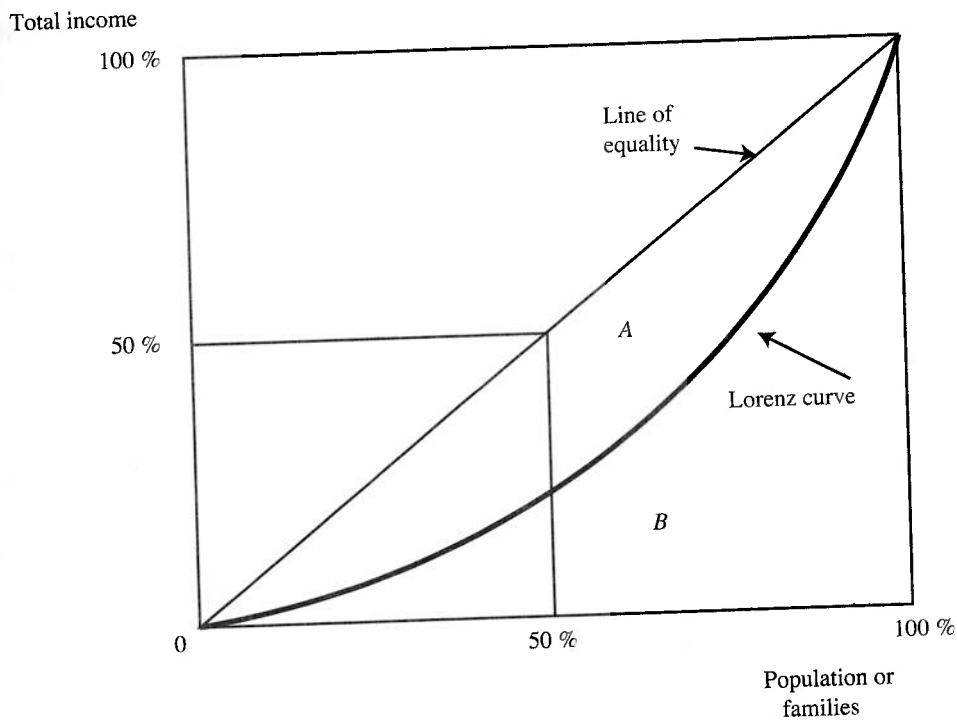


Figure 2.1A A Lorenz curve of income distribution

a reference 'line of equality'. Any point along it would mean that X per cent of families received exactly X per cent of total income (where X could be any value between 1 and 100). Along the line of equality, for example, 10 per cent of the families would be receiving 10 per cent of society's total income; 40 per cent of the families would be receiving 40 per cent of total income; and so on. The diagonal provides a referent for visually comparing and precisely measuring the dispersion of the *actual* income distribution of a nation with what would be a perfectly equal distribution of income among all members of society.

By plotting the hypothetical aggregate values of income received against the quintiles of population for our hypothetical example above, the bowed Lorenz curve in Figure 2.1A can be drawn. Very roughly, the further away the Lorenz curve is from the line of equality, the greater the degree of income inequality. From the Lorenz curve diagram, the Gini coefficient can be calculated. It is equal to the area A (the area between the Lorenz curve and the diagonal line of equality) divided by the total area ($A + B$) of the triangle below the line of equality. Thus the Gini coefficient is equal to $A/(A + B)$.

Appendix 2B: Calculating the HDI index

With the 1995 issue of the *Human Development Report*, the HDI is calculated as a weighted average of educational attainment, life expectancy at birth and income. All components of the index measure the relative distance between a country's achievement and what is possible. Thus,

$$\text{index value} = \frac{\text{actual value of } x_i - \text{minimum value of } x_i}{\text{maximum value of } x_i - \text{minimum value of } x_i}$$

Educational attainment (E) is measured as combination of two indices, one for adult literacy (minimum value = 0 per cent; maximum value = 100 per cent) and of the combined primary, secondary and tertiary enrolment ratios (minimum = 0 per cent; maximum = 100 per cent) with the following weight:

$$E = \frac{2}{3} \text{ adult literacy rate} + \frac{1}{3} \text{ combined enrolment ratio}$$

Life expectancy (L), for purposes of calculating the index, has a minimum value of twenty-five years and a maximum value of eighty-five years.

Income enters the HDI via the following utility of income formulation, where $W(y)$ is the utility of income.

$$W(y) = y^*, 0 < y < y^*$$

$$W(y) = y^* + 2(y - y^*)^{1/2}, y^* \leq y \leq 2y^*$$

$$W(y) = y^* + 2(y^{*1/2}) + 3([y - 2y^*]^{1/2}), 2y^* \leq y \leq 3y^*$$

where y is actual per capita PPP GDP and $y^* = \text{PPP } \$5,120$ for 1992. The minimum value of per capita GDP = PPP \$100, implying a minimum $W(y) = \$100$ by the above calculation (since PPP \$100 < $y^* = \text{PPP } \$5,120$), and the maximum value = PPP \$40,000, implying a maximum $W(y) = \$5,448$.

The value of the HDI is calculated as a weighted average (each = 1/3) of L , E , and Y . Since each of these is a 'deprivation' measure, what is being calculated is the gap between a particular country's achievement level and what might be attained. The following HDI calculation for Gabon is adapted from UNDP, *Human Development Report 1995*, pp. 134-5.¹⁹

Gabon's life expectancy was 53.5 years; the literacy rate was 58.9 per cent; the combined enrolment rate was 47 per cent; and GDP per capita was PPP \$3,913.

Using the first equation in the appendix above, and the minimum and maximum values for life expectancy, the life expectancy index, L , is equal to

$$L = \frac{53.5 - 25}{85 - 25} = \frac{28.5}{60} = 0.475 \quad (1)$$

Development in historical perspective

After reading this chapter, you should understand:

- why and how colonialism left a lasting legacy in developing nations;
- the difference between semi-feudal/semi-capitalist social structures and capitalist social structures;
- the new role credit played in the construction of neocolonial structures in the nineteenth century;
- the nature and importance of the terms of trade;
- economic dualism and its impact on colonial and post-colonial society;
- how to apply the concept of path dependency to post-colonial situations;
- the differential impact of early and mature colonialism; and
- the concept of colonial drain and the extent and significance of de-industrialization in colonial society.

Introduction

Economic development demands and entails profound cultural change, including, often, transformation of the political system, of individual behaviour norms, of the culture of work and production, and most fundamentally, modifications in the manner in which society confronts, moulds, propels, and adapts itself to the requirements of technological progress that are the fount of economic growth and human