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Classic Theories of Development: A Comparative Analysis

It matters little how much information we possess about development if we have not grasped its inner meaning.

—DENIS GOULET, *The Cruel Choice*

Development must be redefined as an attack on the chief evils of the world today: malnutrition, disease, illiteracy, slums, unemployment and inequality. Measured in terms of aggregate growth rates, development has been a great success. But measured in terms of jobs, justice and the elimination of poverty, it has been a failure or only a partial success.

—PAUL P. STREETEN, Former Director, World Development Institute

Our new framework is a holistic and integrated approach to development strategies and programs that highlights the interdependence of all aspects of development strategy— social, structural, human, institutional, environmental, economic and financial.

—JAMES D. WOLFENSOHN, President, World Bank

Every nation strives after development. Economic progress is an essential component, but it is not the only component. As we discovered in Chapter 1, development is not purely an economic phenomenon. In an ultimate sense, it must encompass more than the material and financial side of people's lives. Development should therefore be perceived as a multidimensional process involving the reorganization and reorientation of entire economic and social systems. In addition to improvements in incomes and output, it typically involves radical changes in institutional, social, and administrative structures as well as in popular attitudes and, in many cases, even customs and beliefs. Finally, although development is usually defined in a national context, its widespread realization may necessitate fundamental modification of the international economic and social system as well.

In this chapter we explore the recent historical and intellectual evolution in scholarly thinking about how and why development does or does not take place. We do this by examining four major and often competing development theories. In addition to presenting these differing approaches, we will discover how each offers

valuable insights and a useful perspective on the nature of the development process. Newer models of development and underdevelopment often draw eclectically on the classic theories, and we consider them in the following chapter.

Classic Theories of Economic Development: Four Approaches

The post–World War II literature on economic development has been dominated by four major and sometimes competing strands of thought: (1) the linear-stages-of-growth model, (2) theories and patterns of structural change, (3) the international-dependence revolution, and (4) the neoclassical, free-market counterrevolution. In recent years, an eclectic approach has emerged that draws on all of these classic theories.

Theorists of the 1950s and early 1960s viewed the process of development as a series of successive stages of economic growth through which all countries must pass. It was primarily an economic theory of development in which the right quantity and mixture of saving, investment, and foreign aid were all that was necessary to enable developing nations to proceed along an economic growth path that historically had been followed by the more developed countries. Development thus became synonymous with rapid, aggregate economic growth.

This linear-stages approach was largely replaced in the 1970s by two competing economic (and indeed ideological) schools of thought. The first, which focused on theories and patterns of structural change, used modern economic theory and statistical analysis in an attempt to portray the internal process of structural change that a "typical" developing country must undergo if it is to succeed in generating and sustaining a process of rapid economic growth. The second, the international-dependence revolution, was more radical and political in orientation. It viewed underdevelopment in terms of international and domestic power relationships, institutional and structural economic rigidities, and the resulting proliferation of dual economies and dual societies both within and among the nations of the world. Dependence theories tended to emphasize external and internal institutional and political constraints on economic development. Emphasis was placed on the need for major new policies to eradicate poverty, to provide more diversified employment opportunities, and to reduce income inequalities. These and other egalitarian objectives were to be achieved within the context of a growing economy, but economic growth per se was not given the exalted status accorded to it by the linear stages and the structural-change models.

Throughout much of the 1980s and early 1990s, a fourth approach prevailed. This neoclassical (sometimes called neoliberal) counterrevolution in economic thought emphasized the beneficial role of free markets, open economies, and the privatization of inefficient public enterprises. Failure to develop, according to this theory, is not due to exploitive external and internal forces as expounded by dependence theorists. Rather, it is primarily the result of too much government intervention and regulation of the economy. Today's eclectic approach draws on all of these perspectives, and we will highlight the strengths and weaknesses of each.

Development as Growth, and the Linear-Stages Theories

When interest in the poor nations of the world really began to materialize following the Second World War, economists in the industrialized nations were caught off guard. They had no readily available conceptual apparatus with which to analyze the process of economic growth in largely agrarian societies characterized by the virtual absence of modern economic structures. But they did have the recent experience of the Marshall Plan, under which massive amounts of U.S. financial and technical assistance enabled the war-torn countries of Europe to rebuild and modernize their economies in a matter of a few years. Moreover, was it not true that all modern industrial nations were once undeveloped agrarian societies? Surely their historical experience in transforming their economies from poor agricultural subsistence societies to modern industrial giants had important lessons for the "backward" countries of Asia, Africa, and Latin America. The logic and simplicity of these two strands of thought—the utility of massive injections of capital and the historical pattern of the now developed countries—was too irresistible to be refuted by scholars, politicians, and administrators in rich countries to whom people and ways of life in the developing world were often no more real than U.N. statistics or scattered chapters in anthropology books. Because of its emphasis on the central role of accelerated capital accumulation, this approach is often dubbed "capital fundamentalism."

Rostow's Stages of Growth

Out of this somewhat sterile intellectual environment, fueled by the cold war politics of the 1950s and 1960s and the resulting competition for the allegiance of newly independent nations, came the **stages-of-growth model of development.** Its most influential and outspoken advocate was the American economic historian Walt W. Rostow. According to the Rostow doctrine, the transition from underdevelopment to development can be described in terms of a series of steps or stages through which all countries must proceed. As Rostow wrote in the opening chapter of *The Stages of Economic Growth:*

> This book presents an economic historian's way of generalizing the sweep of modern history. . . . It is possible to identify all societies, in their economic dimensions, as lying within one of five categories: the traditional society, the pre-conditions for take-off into self-sustaining growth, the take-off, the drive to maturity, and the age of high mass consumption. . . .These stages are not merely descriptive. They are not merely a way of generalizing certain factual observations about the sequence of development of modern societies. They have an inner logic and continuity. . . . They constitute, in the end, both a theory about economic growth and a more general, if still highly partial, theory about modern history as a whole.[1]

The advanced countries, it was argued, had all passed the stage of "take-off into self-sustaining growth," and the underdeveloped countries that were still in either the traditional society or the "preconditions" stage had only to follow a certain set of rules of development to take off in their turn into self-sustaining economic growth.

One of the principal strategies of development necessary for any takeoff was the mobilization of domestic and foreign saving in order to generate sufficient investment to accelerate economic growth. The economic mechanism by which more investment leads to more growth can be described in terms of the **Harrod-Domar growth model**, today often referred to as the AK model. In one form or another, it has frequently been applied to policy issues facing developing countries, such as in the two-gap model examined in Chapter 15.

The Harrod-Domar Growth Model

Every economy must save a certain proportion of its national income, if only to replace worn-out or impaired capital goods (buildings, equipment, and materials). However, in order to grow, new investments representing net additions to the **capital stock** are necessary. If we assume that there is some direct economic relationship between the size of the total capital stock, K, and total GNP, Y—for example, if $3 of capital is always necessary to produce a $1 stream of GNP—it follows that any net additions to the capital stock in the form of new investment will bring about corresponding increases in the flow of national output, GNP.

Suppose that this relationship, known in economics as the **capital-output ratio**, is roughly 3 to 1. If we define the capital-output ratio as k and assume further that the national **savings ratio**, s, is a fixed proportion of national output (e.g., 6%) and that total new investment is determined by the level of total savings, we can construct the following simple model of economic growth:

1. Saving (S) is some proportion, s, of national income (Y) such that we have the simple equation

$$S = sY \qquad (4.1)$$

2. Net investment (I) is defined as the change in the capital stock, K, and can be represented by ΔK such that

$$I = \Delta K \qquad (4.2)$$

But because the total capital stock, K, bears a direct relationship to total national income or output, Y, as expressed by the capital-output ratio, k, it follows that

$$\frac{K}{Y} = k$$

or

$$\frac{\Delta K}{\Delta Y} = k$$

or, finally,

$$\Delta K = k\Delta Y \tag{4.3}$$

3. Finally, because net national savings, S, must equal net investment, I, we can write this equality as

$$S = I \tag{4.4}$$

But from Equation 4.1 we know that $S = sY$ and from Equations 4.2 and 4.3 we know that

$$I = \Delta K = k\Delta Y$$

It therefore follows that we can write the "identity" of saving equaling investment shown by Equation 4.4 as

$$S = sY = k\Delta Y = \Delta K = I \tag{4.5}$$

or simply as

$$sY = k\Delta Y \tag{4.6}$$

Dividing both sides of Equation 4.6 first by Y and then by k, we obtain the following expression:

$$\frac{\Delta Y}{Y} = \frac{s}{k} \tag{4.7}$$

Note that the left-hand side of Equation 4.7, $\Delta Y/Y$, represents the rate of change or rate of growth of GNP (i.e., it is the percentage change in GNP).

Equation 4.7, which is a simplified version of the famous equation in the Harrod-Domar theory of economic growth,[2] states simply that the rate of growth of GNP ($\Delta Y/Y$) is determined jointly by the national savings ratio, s, and the national capital-output ratio, k. More specifically, it says that in the absence of government, the growth rate of national income will be directly or positively related to the savings ratio (i.e., the more an economy is able to save—and invest—out of a given GNP, the greater the growth of that GNP will be) and inversely or negatively related to the economy's capital-output ratio (i.e., the higher k is, the lower the rate of GNP growth will be).

The economic logic of Equation 4.7 is very simple. In order to grow, economies must save and invest a certain proportion of their GNP. The more they can save and invest, the faster they can grow. But the actual rate at which they can grow for any

level of saving and investment—how much additional output can be had from an additional unit of investment—can be measured by the inverse of the capital-output ratio, k, because this inverse, $1/k$, is simply the output-capital or output-investment ratio. It follows that multiplying the rate of new investment, $s = I/Y$, by its productivity, $1/k$, will give the rate by which national income or GNP will increase.

Obstacles and Constraints

Returning to the stages-of-growth theories and using Equation 4.7 of our simple Harrod-Domar growth model, we learn that one of the most fundamental strategies of economic growth is simply to increase the proportion of national income saved (i.e., not consumed). If we can raise s in Equation 4.7, we can increase $\Delta Y/Y$, the rate of GNP growth. For example, if we assume that the national capital-output ratio in some less developed country is, say, 3 and the aggregate saving ratio is 6% of GNP, it follows from Equation 4.7 that this country can grow at a rate of 2% per year because

$$\frac{\Delta Y}{Y} = \frac{s}{k} = \frac{6\%}{3} = 2\% \tag{4.8}$$

Now if the national net savings rate can somehow be increased from 6% to, say, 15%—through increased taxes, foreign aid, and/or general consumption sacrifices—GNP growth can be increased from 2% to 5% because now

$$\frac{\Delta Y}{Y} = \frac{s}{k} = \frac{15\%}{3} = 5\% \tag{4.9}$$

In fact, Rostow and others defined the takeoff stage in precisely this way. Countries that were able to save 15% to 20% of GNP could grow ("develop") at a much faster rate than those that saved less. Moreover, this growth would then be self-sustaining. The mechanisms of economic growth and development, therefore, are simply a matter of increasing national savings and investment.

The main obstacle to or constraint on development, according to this theory, was the relatively low level of new capital formation in most poor countries. But if a country wanted to grow at, say, a rate of 7% per year and if it could not generate savings and investment at a rate of 21% of national income (assuming that k, the final aggregate capital-output ratio, is 3) but could only manage to save 15%, it could seek to fill this "savings gap" of 6% through either foreign aid or private foreign investment.

Thus the "capital constraint" stages approach to growth and development became a rationale and (in terms of cold war politics) an opportunistic tool for justifying massive transfers of capital and technical assistance from the developed to the less developed nations. It was to be the Marshall Plan all over again, but this time for the underdeveloped nations of the developing world.

Necessary versus Sufficient Conditions: Some Criticisms of the Stages Model

Unfortunately, the mechanisms of development embodied in the theory of stages of growth did not always work. And the basic reason they didn't work was not because more saving and investment isn't a **necessary condition** for accelerated rates of economic growth—it is—but rather because it is not a **sufficient condition.** The Marshall Plan worked for Europe because the European countries receiving aid possessed the necessary structural, institutional, and attitudinal conditions (e.g., well-integrated commodity and money markets, highly developed transport facilities, a well-trained and educated workforce, the motivation to succeed, an efficient government bureaucracy) to convert new capital effectively into higher levels of output. The Rostow and Harrod-Domar models implicitly assume the existence of these same attitudes and arrangements in underdeveloped nations. Yet in many cases they are lacking, as are complementary factors such as managerial competence, skilled labor, and the ability to plan and administer a wide assortment of development projects. But at an even more fundamental level, the stages theory failed to take into account the crucial fact that contemporary developing nations are part of a highly integrated and complex international system in which even the best and most intelligent development strategies can be nullified by external forces beyond the countries' control.

Structural-Change Models

Structural-change theory focuses on the mechanism by which underdeveloped economies transform their domestic economic structures from a heavy emphasis on traditional subsistence agriculture to a more modern, more urbanized, and more industrially diverse manufacturing and service economy. It employs the tools of neoclassical price and resource allocation theory and modern econometrics to describe how this transformation process takes place. Two well-known representative examples of the structural-change approach are the "two-sector surplus labor" theoretical model of W. Arthur Lewis and the "patterns of development" empirical analysis of Hollis B. Chenery and his co-authors.

The Lewis Theory of Development

Basic Model

One of the best-known early theoretical models of development that focused on the **structural transformation** of a primarily subsistence economy was that formulated by Nobel laureate W. Arthur Lewis in the mid-1950s and later modified, formalized, and extended by John Fei and Gustav Ranis.[3] The **Lewis two-sector model** became the general theory of the development process in surplus-labor Third World nations during most of the 1960s and early 1970s. It still has many adherents today, especially among American development economists.
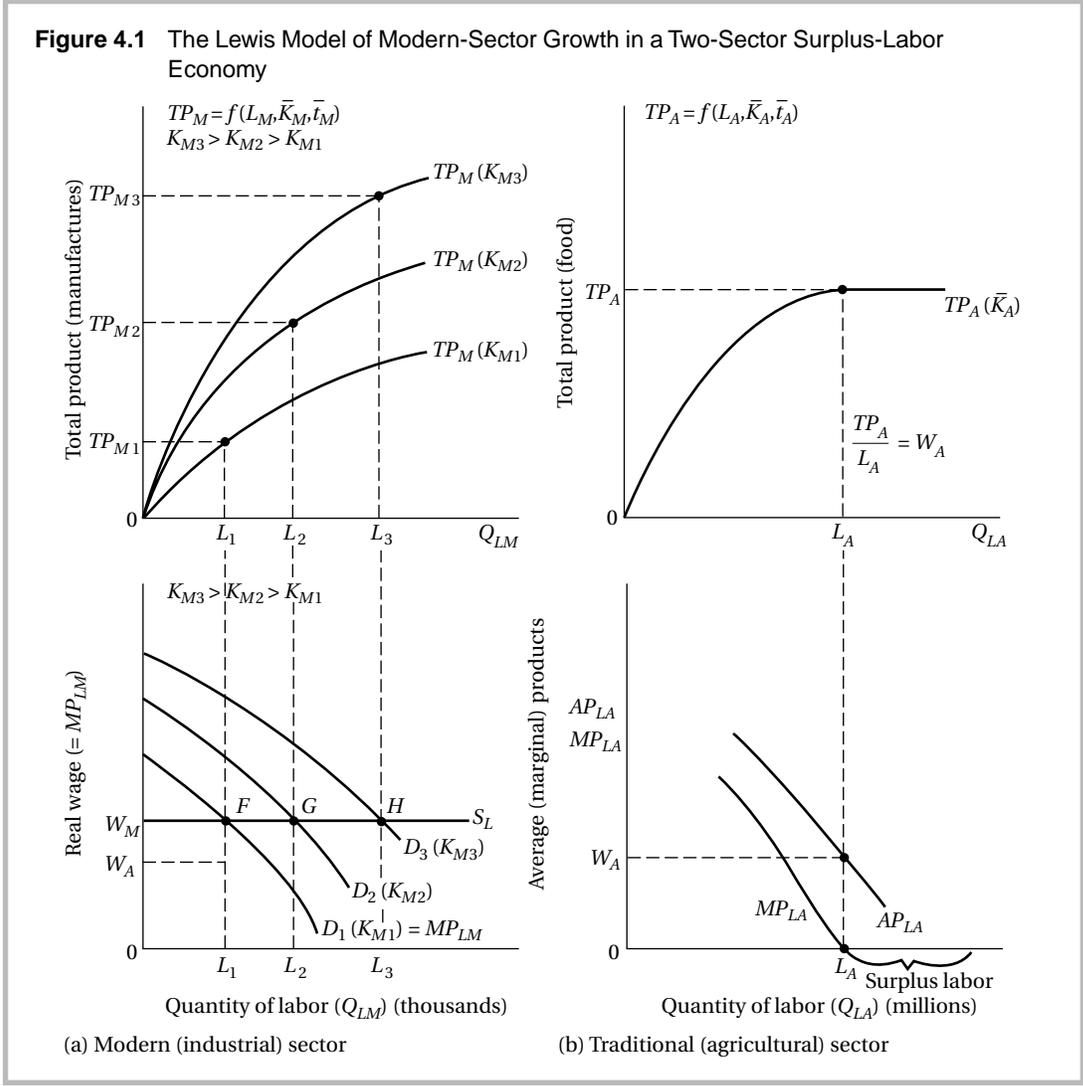
In the Lewis model, the underdeveloped economy consists of two sectors: a traditional, overpopulated rural subsistence sector characterized by zero marginal la-

bor productivity—a situation that permits Lewis to classify this as **surplus labor** in the sense that it can be withdrawn from the agricultural sector without any loss of output—and a high-productivity modern urban industrial sector into which labor from the subsistence sector is gradually transferred. The primary focus of the model is on both the process of labor transfer and the growth of output and employment in the modern sector. Both labor transfer and modern-sector employment growth are brought about by output expansion in that sector. The speed with which this expansion occurs is determined by the rate of industrial investment and capital accumulation in the modern sector. Such investment is made possible by the excess of modern-sector profits over wages on the assumption that capitalists reinvest all their profits. Finally, the level of wages in the urban industrial sector is assumed to be constant and determined as a given premium over a fixed average subsistence level of wages in the traditional agricultural sector. (Lewis assumed that urban wages would have to be at least 30% higher than average rural income to induce workers to migrate from their home areas.) At the constant urban wage, the supply curve of rural labor to the modern sector is considered to be perfectly elastic.

We can illustrate the Lewis model of modern-sector growth in a two-sector economy by using Figure 4.1. Consider first the traditional agricultural sector portrayed in the two right-side diagrams of Figure 4.1b. The upper diagram shows how subsistence food production varies with increases in labor inputs. It is a typical agricultural **production function** where the total output or product (TP_A) of food is determined by changes in the amount of the only variable input, labor (L_A), given a fixed quantity of capital, $\overline{K}_A$, and unchanging traditional technology, $\overline{t}_A$. In the lower right diagram, we have the **average** and **marginal product** of labor curves, AP_{LA} and MP_{LA}, which are derived from the total product curve shown immediately above. The quantity of agricultural labor (Q_{LA}) available is the same on both horizontal axes and is expressed in millions of workers, as Lewis is describing an underdeveloped economy where 80% to 90% of the population lives and works in rural areas.

Lewis makes two assumptions about the traditional sector. First, there is surplus labor in the sense that MP_{LA} is zero, and second, all rural workers share *equally* in the output so that the rural real wage is determined by the average and not the marginal product of labor (as will be the case in the modern sector). Metaphorically, this may be thought of as passing around the family rice bowl at dinner time, from which each takes an equal share (this need not be literally equal shares for the basic idea to hold). Assume that there are L_A agricultural workers producing TP_A food, which is shared equally as W_A food per person (this is the average product, which is equal to TP_A/L_A). The marginal product of these L_A workers is zero, as shown in the bottom diagram of Figure 4.1b; hence the surplus-labor assumption applies to all workers in excess of L_A (note the horizontal TP_A curve beyond L_A workers in the upper right diagram).

The upper-left diagram of Figure 4.1a portrays the total product (production function) curves for the modern, industrial sector. Once again, output of, say, manufactured goods (TP_M) is a function of a variable labor input, L_M, for a given capital stock $\overline{K}_M$ and technology, $\overline{t}_M$. On the horizontal axes, the quantity of labor employed to produce an output of, say, TP_{M1}, with capital stock K_{M1}, is expressed in

Figure 4.1 The Lewis Model of Modern-Sector Growth in a Two-Sector Surplus-Labor
Economy

(a) Modern (industrial) sector   (b) Traditional (agricultural) sector

thousands of urban workers, L_1. In the Lewis model, the modern-sector capital
stock is allowed to increase from K_{M1} to K_{M2} to K_{M3} as a result of the reinvestment of
profits by industrial capitalists. This will cause the total product curves in Figure
4.1a to shift upward from $TP_M(K_{M1})$ to $TP_M(K_{M2})$ to $TP_M(K_{M3})$. The process that will
generate these capitalist profits for reinvestment and growth is illustrated in the
lower-left diagram of Figure 4.1a. Here we have modern-sector marginal labor
product curves derived from the TP_M curves of the upper diagram. Under the as-
sumption of perfectly competitive labor markets in the modern sector, these mar-

ginal product of labor curves are in fact the actual demand curves for labor. Here is how the system works.

W_A in the lower diagrams of Figures 4.1a and 4.1b represents the average level of real subsistence income in the traditional rural sector. W_M in Figure 4.1a is therefore the real wage in the modern capitalist sector. At this wage, the supply of rural labor is assumed to be unlimited or perfectly elastic, as shown by the horizontal labor supply curve $W_M S_L$. In other words, Lewis assumes that at urban wage W_M above rural average income W_A, modern-sector employers can hire as many surplus rural workers as they want without fear of rising wages. (Note again that the quantity of labor in the rural sector, Figure 4.1b, is expressed in millions whereas in the modern urban sector, Figure 4.1a, units of labor are expressed in thousands.) Given a fixed supply of capital K_{M1} in the initial stage of modern-sector growth, the demand curve for labor is determined by labor's declining marginal product and is shown by the negatively sloped curve $D_1(K_{M1})$ in the lower-left diagram. Because profit-maximizing modern-sector employers are assumed to hire laborers to the point where their marginal physical product is equal to the real wage (i.e., the point F of intersection between the labor demand and supply curves), total modern-sector employment will be equal to L_1. Total modern-sector output, TP_{M1}, would be given by the area bounded by points OD_1FL_1. The share of this total output paid to workers in the form of wages would be equal, therefore, to the area of the rectangle $OW_M FL_1$. The balance of the output shown by the area $W_M D_1 F$ would be the total profits that accrue to the capitalists. Because Lewis assumes that all of these profits are reinvested, the total capital stock in the modern sector will rise from K_{M1} to K_{M2}. This larger capital stock causes the total product curve of the modern sector to shift to $TP_M(K_{M2})$, which in turn induces a rise in the marginal product demand curve for labor. This outward shift in the labor demand curve is shown by line $D_2(K_{M2})$ in the bottom half of Figure 4.1a. A new equilibrium modern-sector employment level will be established at point G with L_2 workers now employed. Total output rises to TP_{M2} or OD_2GL_2 while total wages and profits increase to $OW_M GL_2$ and $W_M D_2 G$, respectively. Once again, these larger ($W_M D_2 G$) profits are reinvested, increasing the total capital stock to K_{M3}, shifting the total product and labor demand curves to $TP_M(K_{M3})$ and to $D_3(K_{M3})$, respectively, and raising the level of modern-sector employment to L_3.

This process of modern-sector **self-sustaining growth** and employment expansion is assumed to continue until all surplus rural labor is absorbed in the new industrial sector. Thereafter, additional workers can be withdrawn from the agricultural sector only at a higher cost of lost food production because the declining labor-to-land ratio means that the marginal product of rural labor is no longer zero. Thus the labor supply curve becomes positively sloped as modern-sector wages and employment continue to grow. The structural transformation of the economy will have taken place, with the balance of economic activity shifting from traditional rural agriculture to modern urban industry.

Criticisms of the Lewis Model

Although the Lewis two-sector development model is simple and roughly reflects the historical experience of economic growth in the West, four of its key assumptions do not fit the institutional and economic realities of most contemporary developing countries.

Figure 4.2 The Lewis Model Modified by Laborsaving Capital Accumulation: Employment Implications
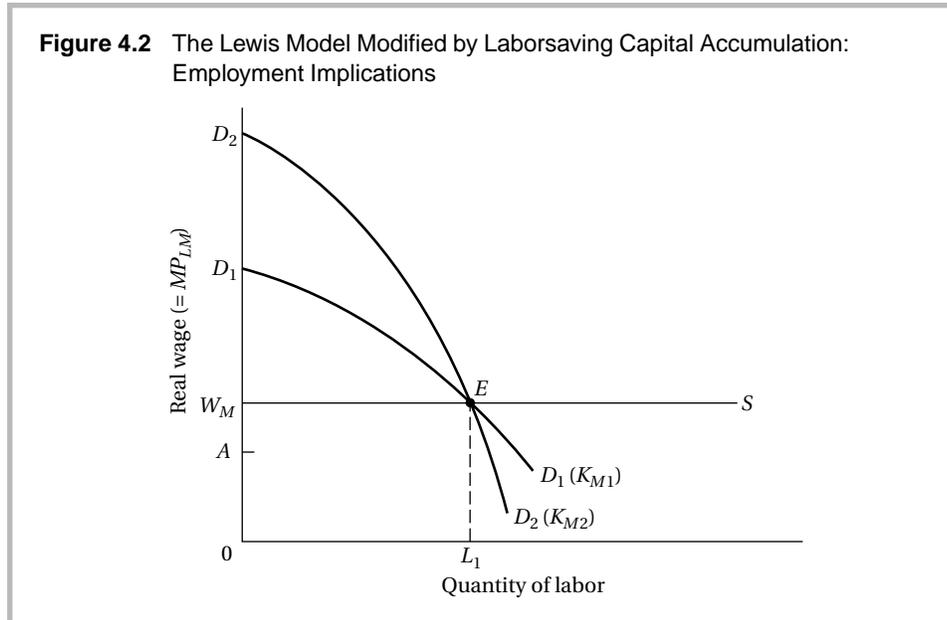
First, the model implicitly assumes that the rate of labor transfer and employment creation in the modern sector is proportional to the rate of modern-sector capital accumulation. The faster the rate of capital accumulation, the higher the growth rate of the modern sector and the faster the rate of new job creation. But what if capitalist profits are reinvested in more sophisticated laborsaving capital equipment rather than just duplicating the existing capital as is implicitly assumed in the Lewis model? (We are, of course, here accepting the debatable assumption that capitalist profits are in fact reinvested in the local economy and not sent abroad as a form of "capital flight" to be added to the deposits of Western banks.) Figure 4.2 reproduces the lower, modern-sector diagram of Figure 4.1a, only this time the labor demand curves do not shift uniformly outward but in fact cross. Demand curve $D_2(K_{M2})$ has a greater negative slope than $D_2(K_{M1})$ to reflect the fact that additions to the capital stock embody laborsaving technical progress—that is, KM_2 technology requires much less labor per unit of output than KM_1 technology does.

We see that even though total output has grown substantially (i.e., OD_2EL_1, is significantly greater than OD_1EL_1), total wages (OW_MEL_1) and employment (L_1) remain unchanged. All of the extra output accrues to capitalists in the form of profits. Figure 4.2 therefore provides an illustration of what some might call "antidevelopmental" economic growth—*all* the extra income and output growth are distributed to the few owners of capital, while income and employment levels for the masses of workers remain largely unchanged. Although total GNP would rise, there would be little or no improvement in aggregate social welfare measured, say, in terms of more widely distributed gains in income and employment.

The second questionable assumption of the Lewis model is the notion that surplus labor exists in rural areas while there is full employment in the urban areas. Most contemporary research indicates that there is little general surplus labor in rural locations. True, there are both seasonal and geographic exceptions to this rule (e.g., parts of China and the Asian subcontinent, some Carribean islands, and isolated regions of Latin America where land ownership is very unequal), but by and large, development economists today agree that Lewis's assumption of rural surplus labor is generally not valid.

The third unreal assumption is the notion of a competitive modern-sector labor market that guarantees the continued existence of constant real urban wages up to the point where the supply of rural surplus labor is exhausted. It will be demonstrated in Chapter 8 that prior to the 1980s, a striking feature of urban labor markets and wage determination in almost all developing countries was the tendency for these wages to rise substantially over time, both in absolute terms and relative to average rural incomes, even in the presence of rising levels of open modern-sector unemployment and low or zero marginal productivity in agriculture. Institutional factors such as union bargaining power, civil service wage scales, and multinational corporations' hiring practices tend to negate competitive forces in LDC modern-sector labor markets.

We conclude, therefore, that when one takes into account the laborsaving bias of most modern technological transfer, the existence of substantial capital flight, the widespread nonexistence of rural surplus labor, the growing prevalence of urban surplus labor, and the tendency for modern-sector wages to rise rapidly even where substantial open unemployment exists, the Lewis two-sector model—though extremely valuable as an early conceptual portrayal of the development process of sectoral interaction and structural change—requires considerable modification in assumptions and analysis to fit the reality of contemporary developing nations.

A final concern with the Lewis model is its assumption of diminishing returns in the modern industrial sector. Yet there is much evidence that increasing returns prevail in that sector, posing special problems for development policymaking, as we examine in Chapter 5.

Structural Change and Patterns of Development

Like the earlier Lewis model, the **patterns-of-development analysis** of structural change focuses on the sequential process through which the economic, industrial, and institutional structure of an underdeveloped economy is transformed over time to permit new industries to replace traditional agriculture as the engine of economic growth. However, in contrast to the Lewis model and the original stages view of development, increased savings and investment are perceived by patterns-of-development analysts as necessary but not sufficient conditions for economic growth. In addition to the accumulation of capital, both physical and human, a set of interrelated changes in the economic structure of a country are required for the transition from a traditional economic system to a modern one. These structural changes involve virtually all economic functions, including the transformation of production and changes in the composition of consumer demand, international

trade, and resource use as well as changes in socioeconomic factors such as urbanization and the growth and distribution of a country's population. The work of Nobel laureate Simon Kuznets, reviewed in part in Chapter 3, is an important precursor of this approach.

Empirical structural-change analysts emphasize both domestic and international constraints on development. The domestic ones include economic constraints such as a country's resource endowment and its physical and population size as well as institutional constraints such as government policies and objectives. International constraints on development include access to external capital, technology, and international trade. Differences in development level among developing countries are largely ascribed to these domestic and international constraints. However, it is the international constraints that make the transition of currently developing countries differ from that of now industrialized countries. To the extent that developing countries have access to the opportunities presented by the industrial countries as sources of capital, technology, and manufactured imports as well as markets for exports, they can make the transition at an even faster rate than that achieved by the industrial countries during the early periods of their economic development. Thus, unlike the earlier stages model, the structural-change model recognizes the fact that developing countries are part of a highly integrated international system that can promote (as well as hinder) their development.

The best-known model of structural change is the one based largely on the empirical work of the late Harvard economist Hollis B. Chenery and his colleagues, who examined patterns of development for numerous developing countries during the postwar period.[4] Their empirical studies, both cross-sectional (among countries at a given point in time) and time-series (over long periods of time), of countries at different levels of per capita income led to the identification of several characteristic features of the development process. These included the shift from agricultural to industrial production, the steady accumulation of physical and human capital, the change in consumer demands from emphasis on food and basic necessities to desires for diverse manufactured goods and services, the growth of cities and urban industries as people migrate from farms and small towns, and the decline in family size and overall population growth as children lose their economic value and parents substitute child quality (education) for quantity (see Chapter 7), with population growth first increasing, then decreasing in the process of development. Proponents of this school often call for development specialists to "let the facts speak for themselves," rather than get bogged down in the arcana of theories such as the stages of growth. This is a valuable counterbalance to empty theorizing, but it also has its own limits.

Conclusions and Implications

The structural changes that we have described are the "average" patterns of development Chenery and colleagues observed among countries in time-series and cross-sectional analyses. The major hypothesis of the structural-change model is that development is an identifiable process of growth and change whose main features are similar in all countries. However, as mentioned earlier, the model does

recognize that differences can arise among countries in the pace and pattern of development, depending on their particular set of circumstances. Factors influencing the development process include a country's resource endowment and size, its government's policies and objectives, the availability of external capital and technology, and the international trade environment.

One limitation to keep in mind is that by emphasizing patterns rather than theory, this approach runs the risk of leading practitioners to draw the wrong conclusions about causality, in effect, to "put the cart before the horse." Observing developed-country patterns such as the decline of the share of the labor force in agriculture over time, many developing-country policymakers have been inclined to neglect that vital sector. But as we will see in Chapter 10, that is precisely the opposite conclusion that should be drawn. Observing the important role of higher education in developed countries, policymakers may be inclined to emphasize the development of an advanced university system even before a majority of the population has gained basic literacy, a policy that has led to gross inequities even in countries at least nominally committed to egalitarian outcomes, such as Tanzania.

Empirical studies on the process of structural change lead to the conclusion that the pace and pattern of development can vary according to both domestic and international factors, many of which lie beyond the control of an individual developing nation. Yet despite this variation, structural-change economists argue that one can identify certain patterns occurring in almost all countries during the development process. And these patterns, they argue, may be affected by the choice of development policies pursued by LDC governments as well as the international trade and foreign-assistance policies of developed nations. Hence structural-change analysts are basically optimistic that the "correct" mix of economic policies will generate beneficial patterns of self-sustaining growth. The international-dependence school to which we now turn, is, in contrast, much less sanguine and is in many cases downright pessimistic.

The International-Dependence Revolution

During the 1970s, international-dependence models gained increasing support, especially among developing-country intellectuals, as a result of growing disenchantment with both the stages and structural-change models. While this theory to a large degree went out of favor during the 1980s and into the 1990s, versions of it have enjoyed a resurgence in the early years of the twenty-first century, as some of its views have been adopted, albeit in modified form, by theorists and leaders of the antiglobalization movement.[5] Essentially, international-dependence models view developing countries as beset by institutional, political, and economic rigidities, both domestic and international, and caught up in a **dependence** and **dominance** relationship with rich countries. Within this general approach are three major streams of thought: the neocolonial dependence model, the false-paradigm model, and the dualistic-development thesis.

The Neocolonial Dependence Model

The first major stream, which we call the **neocolonial dependence model,** is an indirect outgrowth of Marxist thinking. It attributes the existence and continuance of underdevelopment primarily to the historical evolution of a highly unequal international capitalist system of rich country–poor country relationships. Whether because rich nations are intentionally exploitative or unintentionally neglectful, the coexistence of rich and poor nations in an international system dominated by such unequal power relationships between the **center** (the developed countries) and the **periphery** (the LDCs) renders attempts by poor nations to be self-reliant and independent difficult and sometimes even impossible.[6] Certain groups in the developing countries (including landlords, entrepreneurs, military rulers, merchants, salaried public officials, and trade union leaders) who enjoy high incomes, social status, and political power constitute a small elite ruling class whose principal interest, knowingly or not, is in the perpetuation of the international capitalist system of inequality and conformity by which they are rewarded. Directly and indirectly, they serve (are dominated by) and are rewarded by (are dependent on) international special-interest power groups including multinational corporations, national bilateral-aid agencies, and multilateral assistance organizations like the World Bank or the International Monetary Fund (IMF), which are tied by allegiance or funding to the wealthy capitalist countries. The elites' activities and viewpoints often serve to inhibit any genuine reform efforts that might benefit the wider population and in some cases actually lead to even lower levels of living and to the perpetuation of **underdevelopment.** In short, the neo-Marxist, neocolonial view of underdevelopment attributes a large part of the developing world's continuing and worsening poverty to the existence and policies of the industrial capitalist countries of the Northern Hemisphere and their extensions in the form of small but powerful elite or ***comprador* groups** in the less developed countries.[7] Underdevelopment is thus seen as an *externally* induced phenomenon, in contrast to the linear-stages and structural-change theories' stress on *internal* constraints such as insufficient savings and investment or lack of education and skills. Revolutionary struggles or at least major restructuring of the world capitalist system are therefore required to free dependent developing nations from the direct and indirect economic control of their developed-world and domestic oppressors.

One of the most forceful statements of the international-dependence school of thought was made by Theotonio Dos Santos:

> Underdevelopment, far from constituting a state of backwardness prior to capitalism, is rather a consequence and a particular form of capitalist development known as dependent capitalism. . . . Dependence is a conditioning situation in which the economies of one group of countries are conditioned by the development and expansion of others. A relationship of interdependence between two or more economies or between such economies and the world trading system becomes a dependent relationship when some countries can expand through self-impulsion while others, being in a dependent position, can only expand as a reflection of the expansion of the dominant countries, which may have positive or negative effects on their immediate development. In either case, the basic situation of dependence causes these countries to be both backward and exploited.

> Dominant countries are endowed with technological, commercial, capital and socio-political predominance over dependent countries—the form of this predominance varying according to the particular historical moment—and can therefore exploit them, and extract part of the locally produced surplus. Dependence, then, is based upon an international division of labor which allows industrial development to take place in some countries while restricting it in others, whose growth is conditioned by and subjected to the power centers of the world.[8]

Curiously, a very similar but obviously non-Marxist perspective was expounded by Pope John Paul II in his widely quoted 1988 encyclical letter (a formal, elaborate expression of papal teaching) *Sollicitude rei socialis* (The Social Concerns of the Church), in which he declared:

> One must denounce the existence of economic, financial, and social mechanisms which, although they are manipulated by people, often function almost automatically, thus accentuating the situation of wealth for some and poverty for the rest. These mechanisms, which are maneuvered directly or indirectly by the more developed countries, by their very functioning, favor the interests of the people manipulating them. But in the end they suffocate or condition the economies of the less developed countries.

The False-Paradigm Model

A second and a less radical international-dependence approach to development, which we might call the **false-paradigm model,** attributes underdevelopment to faulty and inappropriate advice provided by well-meaning but often uninformed, biased, and ethnocentric international "expert" advisers from developed-country assistance agencies and multinational donor organizations. These experts offer sophisticated concepts, elegant theoretical structures, and complex econometric models of development that often lead to inappropriate or incorrect policies. Because of institutional factors such as the central and remarkably resilient role of traditional social structures (tribe, caste, class, etc.), the highly unequal ownership of land and other property rights, the disproportionate control by local elites over domestic and international financial assets, and the very unequal access to credit, these policies, based as they often are on mainstream, Lewis-type surplus labor or Chenery-type structural-change models, in many cases merely serve the vested interests of existing power groups, both domestic and international.

In addition, according to this argument, leading university intellectuals, trade unionists, high-level government economists, and other civil servants all get their training in developed-country institutions where they are unwittingly served an unhealthy dose of alien concepts and elegant but inapplicable theoretical models. Having little or no really useful knowledge to enable them to come to grips in an effective way with real development problems, they often tend to become unknowing or reluctant apologists for the existing system of elitist policies and institutional structures. In university economics courses, for example, this typically entails the perpetuation of the teaching of many irrelevant Western concepts and models, while in government policy discussions too much emphasis is placed on attempts to measure capital-output ratios, to increase savings and investment ratios, or to

maximize GNP growth rates. As a result, proponents argue that desirable institutional and structural reforms, many of which we have discussed, are neglected or given only cursory attention.

The Dualistic-Development Thesis

Implicit in structural-change theories and explicit in international-dependence theories is the notion of a world of dual societies, of rich nations and poor nations and, in the developing countries, pockets of wealth within broad areas of poverty. **Dualism** is a concept widely discussed in development economics. It represents the existence and persistence of increasing divergences between rich and poor nations and rich and poor peoples on various levels. Specifically, the concept of dualism embraces four key arguments[9]:

1. Different sets of conditions, of which some are "superior" and others "inferior," can coexist in a given space. Examples of this element of dualism include Lewis's notion of the coexistence of modern and traditional methods of production in urban and rural sectors; the coexistence of wealthy, highly educated elites with masses of illiterate poor people; and the dependence notion of the coexistence of powerful and wealthy industrialized nations with weak, impoverished peasant societies in the international economy.

2. This coexistence is chronic and not merely transitional. It is not due to a temporary phenomenon, in which case time could eliminate the discrepancy between superior and inferior elements. In other words, the international coexistence of wealth and poverty is not simply a historical phenomenon that will be rectified in time. Although both the stages-of-growth theory and the structural-change models implicitly make such an assumption, to proponents of the dualistic development thesis, the facts of growing international inequalities seem to refute it.

3. Not only do the degrees of superiority or inferiority fail to show any signs of diminishing, but they even have an inherent tendency to increase. For example, the productivity gap between workers in developed countries and their counterparts in most LDCs seems to widen with each passing year.

4. The interrelations between the superior and inferior elements are such that the existence of the superior elements does little or nothing to pull up the inferior element, let alone "trickle down" to it. In fact, it may actually serve to push it down—to "develop its underdevelopment."

Conclusions and Implications

Whatever their ideological differences, the advocates of the neocolonial-dependence, false-paradigm, and dualism models reject the exclusive emphasis on traditional neoclassical economic theories designed to accelerate the growth of GNP as the principal index of development. They question the validity of Lewis-type two-sector models of modernization and industrialization in light of their questionable assumptions and recent developing-world history. They further reject the claims

made by Chenery and others that there exist well-defined empirical patterns of development that should be pursued by most poor countries on the periphery of the world economy. Instead, dependence, false-paradigm, and dualism theorists place more emphasis on international power imbalances and on needed fundamental economic, political, and institutional reforms, both domestic and worldwide. In extreme cases, they call for the outright expropriation of privately owned assets in the expectation that public asset ownership and control will be a more effective means to help eradicate absolute poverty, provide expanded employment opportunities, lessen income inequalities, and raise the levels of living (including health, education, and cultural enrichment) of the masses. Although a few radical neo-Marxists would even go so far as to say that economic growth and structural change do not matter, the majority of thoughtful observers recognize that the most effective way to deal with these diverse social problems is to accelerate the pace of economic growth through domestic and international reforms accompanied by a judicious mixture of both public and private economic activity.

Dependence theories have two major weaknesses. First, although they offer an appealing explanation of why many poor countries remain underdeveloped, they offer little formal or informal explanation of how countries initiate and sustain development. Second and perhaps more important, the actual economic experience of LDCs that have pursued revolutionary campaigns of industrial nationalization and state-run production has been mostly negative.

If we are to take dependency theory at its face value, we would conclude that the best course for developing countries is to become entangled as little as possible with the developed countries, and instead pursue a policy of **autarky,** or inwardly directed development, or at most trade only with other developing countries. But large countries that embarked on autarkic policies, such as China and, to a significant extent, India, experienced stagnant growth and ultimately decided to substantially open their economies, China beginning this process after 1978 and India after 1990. At the opposite extreme, economies such as Taiwan and South Korea that have most emphasized exporting, at least, to developed countries have grown very strongly. Although close ties to metropolitan countries during the colonial period apparently produced lastingly damaging outcomes—for example, Peru under Spain, Congo under Belgium, India under Great Britain, or West Africa under France—at the very least, this relationship appears to have significantly altered during the postcolonial period. Though we shall later learn that policies pursued by Taiwan and South Korea also do not really fit the free-market model, we next consider the view that the keys to development are found in free markets. For perspective, as we shall discover in later chapters, governments can succeed or fail as well as markets; the key to successful development performance is achieving a careful balance among what government can successfully accomplish, what the private market system can do, and what both can best do together.

While the international-dependence revolution in development theory was capturing the imagination of many Western and LDC scholars, a reaction was emerging in the late 1970s in the form of a neoclassical free-market counterrevolution. This very different approach would ultimately dominate Western (and, to a lesser extent, LDC) development writings during the 1980s and early 1990s.

The Neoclassical Counterrevolution: Market Fundamentalism

Challenging the Statist Model: Free Markets, Public Choice, and Market-Friendly Approaches

In the 1980s, the political ascendancy of conservative governments in the United States, Canada, Britain, and West Germany brought a **neoclassical counterrevolution** in economic theory and policy. In developed nations, this counterrevolution favored supply-side macroeconomic policies, rational expectations theories, and the privatization of public corporations. In developing countries it called for freer markets and the dismantling of public ownership, statist planning, and government regulation of economic activities. Neoclassicists obtained controlling votes on the boards of the world's two most powerful international financial agencies—the World Bank and the International Monetary Fund. In conjunction and with the simultaneous erosion of influence of organizations such as the International Labor Organization (ILO), the United Nations Development Program (UNDP), and the United Nations Conference on Trade and Development (UNCTAD), which more fully represent the views of LDC delegates, it was inevitable that the neoconservative, free-market challenge to the interventionist arguments of dependence theorists would gather momentum.

The central argument of the neoclassical counterrevolution is that underdevelopment results from poor resource allocation due to incorrect pricing policies and too much state intervention by overly active developing-nation governments. Rather, the leading writers of the counterrevolution school, including Lord Peter Bauer, Deepak Lal, Ian Little, Harry Johnson, Bela Balassa, Jagdish Bhagwati, and Anne Krueger, argue that it is this very state intervention in economic activity that slows the pace of economic growth. The neoliberals argue that by permitting competitive **free markets** to flourish, privatizing state-owned enterprises, promoting free trade and export expansion, welcoming investors from developed countries, and eliminating the plethora of government regulations and price distortions in factor, product, and financial markets, both economic efficiency and economic growth will be stimulated. Contrary to the claims of the dependence theorists, the neoclassical counterrevolutionaries argue that the Third World is under-developed not because of the predatory activities of the First World and the international agencies that it controls but rather because of the heavy hand of the state and the corruption, inefficiency, and lack of economic incentives that permeate the economies of developing nations. What is needed, therefore, is not a reform of the international economic system, a restructuring of dualistic developing economies, an increase in foreign aid, attempts to control population growth, or a more effective development planning system. Rather, it is simply a matter of promoting free markets and laissez-faire economics within the context of permissive governments that allow the "magic of the marketplace" and the "invisible hand" of market prices to guide resource allocation and stimulate economic development. They point both to the success of countries like South Korea, Taiwan, and Singapore as "free market" examples (although, as we shall see later, these Asian Tigers are far from

the laissez-faire neoconservative prototype) and to the failures of the public-interventionist economies of Africa and Latin America.[10]

The neoclassical challenge to the prevailing development orthodoxy can be divided into three component approaches: the free-market approach, the public-choice (or "new political economy") approach, and the "market-friendly" approach. **Free-market analysis** argues that markets alone are efficient—product markets provide the best signals for investments in new activities; labor markets respond to these new industries in appropriate ways; producers know best what to produce and how to produce it efficiently; and product and factor prices reflect accurate scarcity values of goods and resources now and in the future. Competition is effective, if not perfect; technology is freely available and nearly costless to absorb; information is also perfect and nearly costless to obtain. Under these circumstances, any government intervention in the economy is by definition distortionary and counterproductive. Free-market development economists have tended to assume that developing-world markets are efficient and that whatever imperfections exist are of little consequence.

Public-choice theory, also known as the **new political economy approach,** goes even further to argue that governments can do nothing right. This is because public-choice theory assumes that politicians, bureaucrats, citizens, and states act solely from a self-interested perspective, using their power and the authority of government for their own selfish ends. Citizens use political influence to obtain special benefits (called "rents") from government policies (e.g., import licenses or rationed foreign exchange) that restrict access to important resources. Politicians use government resources to consolidate and maintain positions of power and authority. Bureaucrats and public officials use their positions to extract bribes from rent-seeking citizens and to operate protected businesses on the side. Finally, states use their power to confiscate private property from individuals. The net result is not only a misallocation of resources but also a general reduction in individual freedoms. The conclusion, therefore, is that minimal government is the best government.[11]

The **market-friendly approach** is the most recent variant on the neoclassical counterrevolution. It is associated principally with the writings of the World Bank and its economists, many of whom were more in the free-market and public-choice camps during the 1980s.[12] This approach recognizes that there are many imperfections in LDC product and factor markets and that governments do have a key role to play in facilitating the operation of markets through "nonselective" (market-friendly) interventions—for example, by investing in physical and social infrastructure, health care facilities, and educational institutions and by providing a suitable climate for private enterprise. The market-friendly approach also differs from the free-market and public-choice schools of thought by accepting the notion that market failures are more widespread in developing countries in areas such as investment coordination and environmental outcomes. Moreover, phenomena such as missing and incomplete information, externalities in skill creation and learning, and economies of scale in production are also endemic to LDC markets. In fact it is the recognition of these last three phenomena that gives rise to the newest schools of development theory, the *new* or *endogenous growth* school of thought, and the coordination failure approach, to which we turn in Chapter 5.

Traditional Neoclassical Growth Theory

Another cornerstone of the neoclassical free-market argument is the assertion that liberalization (opening up) of national markets draws additional domestic and foreign investment and thus increases the rate of capital accumulation. In terms of GNP growth, this is equivalent to raising domestic savings rates, which enhances **capital-labor ratios** and per capita incomes in capital-poor developing countries. Traditional neoclassical models of growth are a direct outgrowth of the Harrod-Domar and Solow models, which both stress the importance of savings.[13]

The **Solow neoclassical growth model** in particular represented the seminal contribution to the neoclassical theory of growth and later earned Solow the Nobel Prize in economics. It expanded on the Harrod-Domar formulation by adding a second factor, labor, and introducing a third independent variable, technology, to the growth equation. Unlike the fixed-coefficient, constant-returns-to-scale assumption of the Harrod-Domar model, Solow's neoclassical growth model exhibited diminishing returns to labor and capital separately and constant returns to both factors jointly. Technological progress became the residual factor explaining long-term growth, and its level was assumed by Solow and other growth theorists to be determined exogenously, that is, independently of all other factors.

More formally, the Solow neoclassical growth model uses a standard aggregate production function in which

$$Y = K^{\alpha}(AL)^{1-\alpha} \tag{4.10}$$

where Y is gross domestic product, K is the stock of capital (which may include human capital as well as physical capital), L is labor, and A represents the productivity of labor, which grows at an exogenous rate. For developed countries, this rate has been estimated at about 2% per year. It may be smaller or larger for developing countries, depending on whether they are stagnating or catching up with the developed countries. Because the rate of technological progress is given exogenously (at 2% per year, say), the Solow neoclassical model is sometimes called an "exogenous" growth model, to be contrasted with the endogenous growth approach (discussed at the beginning of Chapter 5). In Equation 4.10, α represents the elasticity of output with respect to capital (the percentage increase in GDP resulting from a 1% increase in human and physical capital). It is usually measured statistically as the share of capital in a country's national income accounts. Since α is assumed to be less than 1 and private capital is assumed to be paid its marginal product so that there are no external economies, this formulation of neoclassical growth theory yields diminishing returns to capital and labor. The Solow neoclassical growth model is examined in detail in Appendix 4.1.

According to **traditional neoclassical growth theory,** output growth results from one or more of three factors: increases in labor quantity and quality (through population growth and education), increases in capital (through saving and investment), and improvements in technology (see Chapter 3). **Closed economies** (those with no external activities) with lower savings rates (other things being equal) grow more slowly in the short run than those with high savings' rates and tend to con-

verge to lower per capita income levels. **Open economies** (those with trade, foreign investment, etc.), however, experience income convergence at higher levels as capital flows from rich countries to poor countries where capital-labor ratios are lower and thus returns on investments are higher. Consequently, by impeding the inflow of foreign investment, the heavy-handedness of LDC governments, according to neoclassical growth theory, will retard growth in the economies of the developing world.

Conclusions and Implications

Like the dependence revolution of the 1970s, the neoclassical counterrevolution of the 1980s had its origin in an economics-cum-ideological view of the developing world and its problems. Whereas dependence theorists (many, but certainly not all, of whom were LDC economists) saw underdevelopment as an externally induced phenomenon, neoclassical revisionists (most, but certainly not all, of whom were Western economists) saw the problem as an internally induced LDC phenomenon, caused by too much government intervention and bad economic policies. Such finger-pointing on both sides is not uncommon in issues so contentious as those that divide rich and poor nations.

But what of the neoclassical counterrevolution's contention that free markets and less government provide the basic ingredients for development? On strictly efficiency (as opposed to equity) criteria, there can be little doubt that market price allocation usually does a better job than state intervention. The problem is that many LDC economies are so different in structure and organization from their Western counterparts that the behavioral assumptions and policy precepts of traditional neoclassical theory are sometimes questionable and often incorrect. Competitive markets simply do not exist, nor, given the institutional, cultural, and historical context of many LDCs, would they necessarily be desirable from a long-term economic and social perspective (see Chapter 16). Consumers as a whole are rarely sovereign about anything, let alone about what goods and services are to be produced, in what quantities, and for whom. Information is limited, markets are fragmented, and much of the economy is still nonmonetized.[14] There are widespread externalities of both production and consumption as well as discontinuities in production and indivisibilities (i.e., economies of scale) in technology. Producers, private or public, have great power in determining market prices and quantities sold. The ideal of competition is typically just that—an ideal with little substance in reality. Although monopolies of resource purchase and product sale are a pervasive developing-world phenomenon, the traditional neoclassical theory of monopoly also offers little insight into the day-to-day activities of public and private corporations. Decision rules can vary widely with the social setting, so that profit maximization may be a low-priority objective especially in state-owned enterprises, in comparison with, say, the creation of jobs or the replacement of foreign managers with local personnel (see Chapter 17). Finally, the invisible hand often acts not to promote the general welfare but rather to lift up those who are already well-off while pushing down the vast majority.

Much can be learned from neoclassical theory with regard to the importance of elementary supply-and-demand analysis in arriving at "correct" product, factor, and foreign-exchange prices for efficient production and resource allocation. However, do not confuse free markets with price allocation. Enlightened governments can also make effective use of prices as signals and incentives for influencing socially optimal resource allocations. Indeed, we will often demonstrate the usefulness of various tools of neoclassical theory in our later analysis of problems such as population growth, agricultural stagnation, unemployment and underemployment, the environment, educational demands, export promotion versus import substitution, devaluation, project planning, monetary policy, and economic privatization. Nevertheless, the reality of the institutional and political structure of many developing-world economies—not to mention their differing value systems and ideologies—often makes the attainment of appropriate economic policies based either on markets or enlightened public intervention an exceedingly difficult endeavor. In an environment of widespread institutional rigidity and severe socioeconomic inequality, *both* markets and governments will typically fail. It is not simply an either-or question based on ideological leaning; rather it is a matter of assessing each individual country's situation on a case-by-case basis. Development economists must therefore be able to distinguish between textbook neoclassical theory and the institutional and political reality of contemporary LDCs.[15] They can then choose the neoclassical concepts and models that can best illuminate issues and dilemmas of development and discard those that cannot. This will be our task in Parts Two, Three, and Four.

Classic Theories of Development: Reconciling the Differences

In this chapter we have reviewed a range of competing theories and approaches to the study of economic development. Each approach has its strengths and weaknesses. The fact that there exists such controversy—be it ideological, theoretical, or empirical—is what makes the study of economic development both challenging and exciting. Even more than other fields of economics, development economics has no universally accepted doctrine or paradigm. Instead, we have a continually evolving pattern of insights and understandings that together provide the basis for examining the possibilities of contemporary development of the diverse nations of Africa, Asia, and Latin America.

You may wonder how consensus could emerge from so much disagreement. Although it is not implied here that such a consensus exists today or can indeed ever exist when such sharply conflicting values and ideologies prevail, we do suggest that something of significance can be gleaned from each of the four approaches that we have described. For example, the linear-stages model emphasizes the crucial role that saving and investment plays in promoting sustainable long-run growth. The Lewis two-sector model of structural change underlines the importance of attempting to analyze the many linkages between traditional agriculture and modern industry, and the empirical research of Chenery and his associates attempts to document precisely how economies undergo structural change while

identifying the numeric values of key economic parameters involved in that process. The thoughts of international-dependence theorists alert us to the importance of the structure and workings of the world economy and the many ways in which decisions made in the developed world can affect the lives of millions of people in the developing world. Whether or not these activities are deliberately designed to maintain developing nations in a state of dependence is often beside the point. The fact of their very dependence and their vulnerability to key economic decisions made in the capitals of North America, Western Europe, or Japan (not to mention those made by the IMF and the World Bank) forces us to recognize the validity of many of the propositions of the international-dependence school. The same applies to arguments regarding the dualistic structures and the role of ruling elites in the domestic economies of the developing world.

Although a good deal of conventional neoclassical economic theory needs to be modified to fit the unique social, institutional, and structural circumstances of developing nations, there is no doubt that promoting efficient production and distribution through a proper, functioning price system is an integral part of any successful development process. Many of the arguments of the neoclassical counterrevolutionaries, especially those related to the inefficiency of state-owned enterprises and the failures of development planning (see Chapter 16) and the harmful effects of government-induced domestic and international price distortions (see Chapters 8, 13, and 15) are as well taken as those of the dependence and structuralist schools. By contrast, the unquestioning exaltation of free markets and open economies along with the universal disparagement of public-sector leadership in promoting growth with equity in the developing world is open to serious challenge. As we shall discover all too often in Parts Two, Three, and Four, successful development requires a skillful and judicious balancing of market pricing and promotion where markets can indeed exist and operate efficiently, along with intelligent and equity-oriented government intervention in areas where unfettered market forces would lead to undesirable economic and social outcomes.

In summary, each of these approaches to understanding development has something to offer. Their respective contributions will become more clear later in the book when we explore in detail both the origins of and possible solutions to a wide range of problems such as poverty, population growth, unemployment, rural development, international trade, and the environment. They also inform contemporary models of development and underdevelopment, to which we turn in the next chapter.

The Economy of Kenya

Geographic, Social, and Economic Indicators
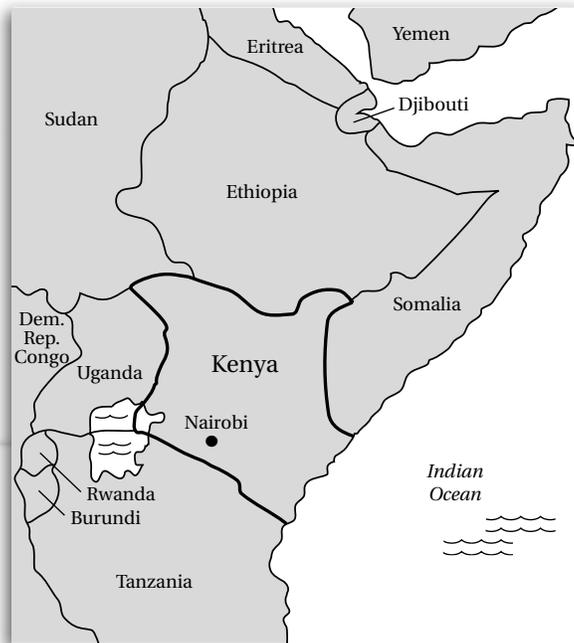
Capital:	Nairobi
Area:	582,646 km^2
Population:	30 million (2000)
Population (annual growth rate):	2.4% (1990–2000)
GNI per capita:	U.S. $360 (2000)
GNI per capita (PPP):	U.S. $1,010 (2000)
GDP per capita (average annual growth rate):	−0.3% (1990–2000)
Agriculture as share of GDP:	23% (2000)
Exports as share of GDP:	16% (2000)
Under age 5 mortality rate (per 1,000 live births):	118 (1999)
Child malnutrition (underweight):	23% (1992–1997)
Females as share of labor force:	46% (1997)
Illiteracy rate (age 15+):	Male 14%, Female 30% (1996)
	Overall: 18.5% (1999)
Human Development Index:	0.514 (medium) (1999)
Life expectancy:	51.3 (1999)

Kenya's economy has been beset by high rates of unemployment and underemployment for many years. But at no time has it been more significant and more politically dangerous than in the late 1990s as an authoritarian regime beset by corruption, cronyism, and economic plunder threatened the economic stability of this once proud young nation. Yet Kenya still has a great potential. Located in East Africa it has a diverse geographic and climatic endowment. Three-fifths of the nation is semiarid desert (mostly

in the north), and the resulting infertility of this land has dictated the location of 85% of the population and almost all economic activity in the southern two-fifths of the country. Kenya's rapidly growing population is composed of many tribes and is extremely heterogeneous (including traditional herders, subsistence and commercial farmers, Arab Muslims, and cosmopolitan residents of Nairobi). The standard of living, at least in the major cities, is relatively high compared to the average of other sub-Saharan African countries.

However, widespread poverty, high unemployment, and growing income inequality make Kenya a country of economic as well as geographic diversity. Agriculture is the most important economic activity. About three-quarters of the population still lives in rural areas, and about 7 million workers are employed in agriculture, accounting for over two-thirds of the total workforce.

Despite many changes in the democratic system, including the switch from a federal to a republican government, the conversion of the prime ministerial system into a presidential one, the transition to a unicameral legislature, and the creation of a one-party state, Kenya has displayed relatively high political stability (by African standards) since gaining independence from Britain in 1963. Since independence, there have been only two presidents. However, this once stable and prosperous capitalist nation has witnessed widespread ethnic violence and political upheavals since 1992 as a deteriorating economy, unpopular one-party rule, and charges of government corruption created a tense situation.

An expansionary economic policy characterized by large public investments, support of small agricultural production units, and incentives for private (domestic and foreign) industrial investment played an important role in the early 7% rate of GDP growth in the first decade after independence. In the following seven years (1973–1980), the oil crisis

helped lower GDP growth to an annual 5% rate. Along with the oil price shock, a lack of adequate domestic saving and investment slowed the growth of the economy. Various economic policies designed to promote industrial growth led to a neglect of agriculture and a consequent decline in farm prices, farm production, and farmer incomes. As peasant farmers became poorer, more of them migrated to Nairobi, swelling an already overcrowded city and pushing up an existing high rate of urban unemployment. Very high birthrates along with a steady decline in death rates (mainly through lower infant mortality) led Kenya's population growth to become the highest in the world (4.1% per year) in 1988. Population growth fell to a still-high rate of 2.4% for the 1990–2000 period.

The slowdown in GDP growth persisted in the following five years (1980–1985), when the annual average was 2.6%. It was a period of stabilization in which the political shakiness of 1982 and the severe drought in 1984 contributed to brake industrial growth. Interest rates rose and wages fell in the public and private sectors. An improvement in the budget deficit and in the current account trade deficit obtained through cuts in development expenditures and recessive policies aimed at reducing imports contributed to lower economic growth. By 1990, Kenya's per capita income was 9% *lower* than it was in 1980: $370 compared to $410. It continued to decline in the 1990s. In fact, GDP per capita *fell* at an annual average rate of 0.3% throughout the decade. At the same time, the urban unemployment rate rose to 30%.

Comprising 23% of 2000 GDP and 77% of merchandise exports, agricultural production is the backbone of the Kenyan economy. Because of its importance, the Kenyan government has implemented several policies to nourish the agricultural sector. Two such policies include setting attractive producer prices and making available increasing amounts of fertilizer. Kenya's chief agricultural exports

are coffee, tea, sisal, cashew nuts, pyrethrum, and horticultural products. Traditionally, coffee has been Kenya's chief earner of foreign exchange.

Although Kenya is chiefly agrarian, it is still the most industrialized country in eastern Africa. Public and private industry accounted for 16% of GDP in 2000. Kenya's chief manufacturing activities are food processing and the production of beverages, tobacco, footwear, textiles, cement, metal products, paper, and chemicals.

Kenya currently faces a multitude of problems. These include a stagnating economy, growing political unrest, a huge budget deficit, high unemployment, a substantial balance of payments problem, and a stubbornly high population growth rate.

With an unemployment rate already at 30% and its population growing, Kenya faces the major task of employing its burgeoning labor force. Yet only 10% to 15% of seekers land jobs in the modern industrial sector. The remainder must find jobs in the self-employed sector; work in the agricultural sector, where wages are low and opportunities are scarce; or join the masses of the unemployed.

In addition to the employment problem, Kenya must always be concerned with how to feed its growing population. An increase in population means an increasing demand for food. Yet only 20% of Kenya's land is arable. This implies that the land must become increasingly productive. Unfortunately, several factors work to constrain Kenya's food output, among them fragmented landholdings, increasing environmental degradation, the high cost of agricultural inputs, and burdensome governmental involvement in the purchase, sale, and pricing of agricultural output.

For the fiscal year 1995 the Kenyan budget deficit was $362 million, well above the government's target rate. Dealing with a high budget deficit is a second problem Kenya currently faces. Following the collapse of the East African Common Market, Kenya's industrial growth rate has declined; as a result, the government's tax base has diminished. To supplement domestic savings, Kenya has had to turn to external sources of finance, including foreign aid grants from Western governments. Its highly protected public enterprises have been turning in a poor performance, thus absorbing a large chunk of the government budget. To pay for its expenses, Kenya has had to borrow from international banks on top of receiving foreign aid. In recent years, government borrowing from the international banking system rose dramatically and contributed to a rapid growth in the money supply. This translated into high inflation and pinched availability of credit.

Kenya has also had a chronic international balance of payments problem. Decreasing prices for its exports, combined with increasing prices for its imports, left Kenya importing almost twice as much as it exported in 2000, at $3,200 million in imports and only $1,650 million in exports. World demand for coffee, Kenya's predominant export, remains below supply. In 2000–2001, a dramatic surge in coffee exports from Vietnam hurt Kenya further. Hence Kenya cannot make full use of its comparative advantage in coffee production, and its stock of coffee has been increasing. Tea, another main export, has also had difficulties. In 1987, Pakistan, the second largest importer of Kenyan tea, slashed its purchases. Combined with a general oversupply on the world market, this fall in demand drove the price of tea downward. Hence Kenya experienced both a lowered dollar value and quantity demanded for one of its principal exports.

Kenya faces major challenges in the years ahead as the economy tries to recover. Current growth is expected to be no more than 1% to 2% annually. Heavy rains have spoiled crops and washed away roads, bridges, and telephone lines. Foreign exchange earnings from tourism, once promising, dropped by 40% in the mid-1990s then suffered again after the

August 7, 1998, terrorist bombing of the U.S. Embassy in Nairobi. Even more frightening, however, is the prospect of growing hunger as Kenya's maize (corn) crop has failed to meet rising internal demand and dwindling foreign-exchange reserves have to be spent to import food. Corruption is perceived to be so widespread that the International Monetary Fund and World Bank suspended $292 million in loans to Kenya in the summer of 1997 while insisting on tough new austerity measures to control public spending and weed out eco-

nomic cronyism. As a result, the economy went into a tailspin, foreign investors fled the country, and inflation accelerated markedly.

Unfortunately, needed structural adjustments resulting from World Bank- and IMF-induced austerity demands usually take a long time. Whether the Kenyan political and economic system can withstand any further deterioration in living conditions is a major question. Public protests for greater democracy and a growing incidence of ethnic violence may be harbingers of things to come.

Concepts for Review

Autarky
Average product
Capital-labor ratio
Capital-output ratio
Capital stock
Center
Closed economy
Comprador groups
Dependence
Dominance
Dualism
False-paradigm model
Free market
Free-market analysis
Harrod-Domar growth
   model

Lewis two-sector model
Marginal product
Market-friendly approach
Necessary condition
Neoclassical counterrevolution
Neocolonial dependence
   model
New institutionalism
New political economy approach
Open economy
Patterns-of-development
   analysis
Periphery
Production function

Public-choice theory
Savings ratio
Self-sustaining growth
Solow neoclassical growth
   model
Stages-of-growth model of
   development
Structural-change theory
Structural transformation
Sufficient condition
Surplus labor
Traditional neoclassical
   growth theory
Underdevelopment

Questions for Discussion

1. Explain the essential distinctions among the stages-of-growth theory of development, the structural-change models of Lewis and Chenery, and the theory of international dependence in both its neo-Marxist and false-paradigm conceptualizations. Which model do you think provides the best explanation of the situation in most developing nations? Explain your answer.

2. Explain the meaning of *dualism* and *dual societies.* Do you think that the concept of dualism adequately portrays the development picture in most developing countries? Explain your answer.

3. Some people claim that international dualism and domestic dualism are merely different manifestations of the same phenomenon. What do you think they mean by this, and is it a valid conceptualization? Explain your answer.

4. What is meant by the term *neoclassical counterrevolution*? What are its principal arguments, and how valid do you think they are? Explain your answer.

5. Given the diversity of developing countries, do you think that there could ever be a single, unified theory of development? Explain your answer.

6. Is the neoclassical, free-market theory necessarily incompatible with dependence theory? How might these two approaches work together?

Notes

1. Walt W. Rostow, *The Stages of Economic Growth: A Non-Communist Manifesto* (London: Cambridge University Press, 1960), pp. 1, 3, 4, and 12. For an extensive and critical review of the Rostow stages doctrine from a Marxist perspective, see Paul Baran and Edward Hobsbawm, "The stages of economic growth," *Kyklos* 14(1961): 234–242.
2. This model is named after two economists, Sir Roy Harrod of England and Professor Evesey Domar of the United States, who separately but concurrently developed a variant of it in the early 1950s.
3. W. Arthur Lewis, "Economic development with unlimited supplies of labour," *Manchester School* 22 (May 1954):139–191; John C. H. Fei and Gustav Ranis, *Development of the Labor Surplus Economy: Theory and Policy* (Homewood, Ill.: Irwin, 1964). In fact, many of the basic ideas of the Lewis and Fei-Ranis model were originally expounded by Ragnar Nurkse in his famous little book *Problems of Capital Formation in Underdeveloped Countries* (New York: Oxford University Press, 1953). We are indebted to Professor Harold Votey for reminding us of this often forgotten fact.
4. See Hollis B. Chenery, *Structural Change and Development Policy* (Baltimore: Johns Hopkins University Press, 1979); Hollis B. Chenery and Moshe Syrquin, *Patterns Of Development, 1950–70* (London: Oxford University Press, 1975); Moshe Syrquin, "Patterns of structural change," in Hollis B. Chenery and T. N. Srinivasan (eds.), *Handbook of Development Economics* (Amsterdam: Eslevier–North Holland, 1989), vol. 1, pp. 205–273, and the landmark magnus opus of this school, *Industrialization and Growth: A Comparative Study,* by Hollis Chenery, Sherman Robinson, and Moshe Syrquin (New York: Oxford University Press, 1986).
5. See, for example, Sarah Anderson, John Cavanagh, Thea Lee, and the Institute for Policy Studies, *Field Guide to the Global Economy* (New York: The New Press, 2000), Robin Broad, ed., *Global Backlash: Citizen Initiatives for a Just World Economy* (Lanham, MD.: Rowman & Littlefield Publishers, Inc. 2002), and John Gray, *False Dawn: The Delusions of Global Capitalism* (New Press, 2000).
6. For a comprehensive introduction to the neo-Marxist view of international development and underdevelopment, see Paul Baran, *The Political Economy of Neo-Colonialism* (London: Heinemann, 1975). An outstanding literature review is contained in Keith Griffin and John Gurley, "Radical analysis of imperialism, the Third World, and the transition to socialism: A survey article," *Journal of Economic Literature* 23 (September 1985): 1089–1143. See also Ted C. Lewellen, *Dependency and Development: An Introduction to the Third World* (Westport, Conn.: Bergin & Garvey, 1995).
7. A provocative and well-documented application of this argument to the case of Kenya can be found in Colin Leys, *Underdevelopment in Kenya: The Political Economy of Neo-Colonialism* (London: Heinemann, 1975).

8. Theotonio Dos Santos, "The crisis of development theory and the problem of dependence in Latin America," *Siglo* 21 (1969). See also Benjamin J. Cohen, *The Question of Imperialism: The Political Economy of Dominance and Dependence* (New York: Basic Books, 1973).

9. Hans W. Singer, "Dualism revisited: A new approach to the problems of dual societies in developing countries," *Journal of Development Studies* 7 (January 1970): 60–61.

10. For examples of the literature of neoclassical counterrevolutionaries, see Peter T. Bauer, *Reality and Rhetoric: Studies in the Economics of Development* (London: Weidenfield & Nicolson, 1984); Deepak Lal, *The Poverty of Development Economics* (Cambridge, Mass.: Harvard University Press, 1985); Harry Johnson, "A word to the Third World: A Western economist's frank advice," *Encounter* 37 (1971); Ian Little, *Economic Development: Theories, Policies, and International Relations* (New York: Basic Books 1982); and any mid-1980s issue of the World Bank's *World Development Report* (New York: Oxford University Press) and the International Monetary Fund's *Annual World Economic Outlook.* An outstanding critique of this literature can be found in John Toye, *Dilemmas of Development: Reflections on the Counter-Revolution in Development Theory and Policy* (Oxford: Blackwell, 1987). See also Ziya Onis, "The limits of neoliberalism: Toward a reformulation of development theory," *Journal of Economic Issues* 29 (March 1995): 97–119; Lance Taylor, "The revival of the liberal creed: The IMF and the World Bank in a globalized economy," *World Development* 25 (February 1997):145–152; and Alexandro Portes, "Neoliberalism and the sociology of development: Emerging trends and unanticipated facts," *Population and Development Review* 23 (June 1997): 229–259.

11. For a good explication of the tenets of the public-choice theory, see Merilee S. Grindle and John W. Thomas, *Public Choices and Public Policy Change: The Political Economy of Reform in Developing Countries* (Baltimore: Johns Hopkins University Press, 1991). The classic article in the field is by Nobel laureate James M. Buchanan, "Social choice, democracy and free markets," *Journal of Political Economy* 62 (April 1954): 114–123. For a critique, see Paul P. Streeten, "Markets and states: Against minimalism," *World Development* 21 (August 1993): 1281–1298, and Amartya Sen, "Rationality and social choice," *American Economic Review* 85 (March 1995): 1–24.

12. See any of the 1990s *World Development Reports* and also World Bank, *The East Asian Miracle* (New York: Oxford University Press, 1993). For a critique of this approach, see Ajit Singh, "State intervention and 'market-friendly' approach to development: A critical analysis of the World Bank theses," in Amitava K. Dutt, Kwan S. Kim, and Ajit Singh (eds.), *The States, Markets and Development* (London: Elgar, 1994).

13. The Solow model is set forth in Robert Solow, "A contribution to the theory of economic growth," *Quarterly Journal of Economics* 70 (February 1956): 65–94.

14. For a discussion of these and related issues, see H. W. Arndt, " 'Market failure' and underdevelopment," *World Development* 16 (February 1988).

15. A possible fourth component of the neoclassical counterrevolution—one that goes to the essence of development issues—has been called the **new institutionalism.** The institutions include property rights, prices and market structures, money and financial institutions, firms and industrial organization, and relationships between government and markets. The basic message of the new institutionalism is that even in a neoclassical world, the success or failure of development efforts will depend on the nature, existence, and proper functioning of a country's fundamental institutions. The origins of the new institutionalism can be found in the theory of institutions pioneered by the work of Nobel laureate Ronald Coase. See Ronald Coase, "The institutional structure of production," *American Economic Review* 82 (December 1992); Howard Stein, "Theories of institutions and economic reform

in Africa," *World Development* 22 (December 1994); Oliver E. Williamson, "The institutions and governance of economic development and reform," in *Proceedings of the World Bank Annual Conference on Development Economics, 1994* (Washington, D.C.: World Bank, 1995); and Jean-Jacques Laffont, "Competition, conformation and development," *Annual World Bank Conference on Development Economics, 1998* (Washington, D.C.: World Bank, 1999).

Further Reading

Thoughtful analyses of the evolution of development thinking can be found in Gerald M. Meier and Joseph E. Stiglitz (eds.) *Frontiers of Development Economics: The Future in Perspective* (New York: Oxford University Press, 2001); Amartya Sen, *Development as Freedom* (New York: Knopf, 1999); Amartya Sen, "Development: Which way now?" *Economic Journal* 93 (December 1983): 745–762; H. W. Arndt, *Economic Development: The History of an Idea* (Chicago: University of Chicago Press, 1987); Diana Hunt, *Economic Theories of Development* (Totawa, N.J.: Rowman & Littlefield, 1987); Nicholas Stern, "The economics of development: A survey," *Economic Journal* 99 (September 1989): 597–685; Robert Dorfman, "Economic development from the beginning to Rostow," *Journal of Economic Literature* 29 (June 1991): 573–591; Hollis B. Chenery and T. N. Srinivasan (eds.), *Handbook of Development Economics* (Amsterdam: Elsevier-North Holland, 1989), vol. 1, pt. 1 articles by Sen, Lewis, Bardhan, and Ranis; and Jean Waelbroeck, "Half a century of development economics: A review based on the *Handbook of Development Economics,"* *World Bank Economic Review* 12 (May 1998): 323–335.

For an excellent summary statement of the concept of dualism and dual societies, see Hans Singer, "Dualism revisited: A new approach to the problems of dual society in developing countries," *Journal of Development Studies* 7 (January 1970): 60–61.

Among surveys of the dependence literature as applied to problems of underdevelopment, the following are perhaps the best: Keith Griffin and John Gurley, "Radical analysis of imperialism, the Third World, and the transition to socialism: A survey article," *Journal of Economic Literature* 23 (September 1985): 1089–1143; Samir Amin, *Imperialism and Unequal Development* (New York: Monthly Review Press, 1977); F. H. Cardoso, "Dependence and development in Latin America," *New Left Review,* July–August 1972, pp. 83–95; Patrick O'Brien, "A critique of Latin American theories of dependency," in Iver Oxaal et al. (eds.), *Beyond the Sociology of Development* (London: Routledge, 1975); Sanjaya Lall, "Is 'dependence' a useful concept in analyzing underdevelopment?" *World Development* 3 (1975): 799–810; G. Kay, *Development and Underdevelopment: A Marxist Analysis* (London: Macmillan, 1975); Gabriel Palma, "Dependency: A formal theory of underdevelopment or a methodology for the analysis of concrete situations of underdevelopment," *World Development* 6 (1978); Celso Furtado, "Underdevelopment: To conform or reform?" in Gerald M. Meier (ed.), *Pioneers in Development: Second Series* (New York: Oxford University Press, 1987), pp. 203–207; and Ted C. Lewellen, *Dependency and Development: An Introduction to the Third World* (Westport, Conn.: Bergin & Garvey, 1995).

Readings on the neoclassical counterrevolution, in addition to those cited in note 10, include Peter T. Bauer, *Dissent on Development* (London: Weidenfeld & Nicolson, 1972); Julian Simon, *The Ultimate Resource* (Princeton, N.J.: Princeton University Press, 1981); Ian Little, "An economic renaissance," in W. Galenson (ed.), *Economic Growth and Structural Change in Taiwan* (Ithaca, N.Y.: Cornell University Press, 1979); and World Bank, *World Development Report, 1982* and *1983* (New York: Oxford University Press, 1982,1983).

Appendix 4.1

The Solow Neoclassical Growth Model

The Solow neoclassical growth model, for which Robert Solow of the Massachusetts Institute of Technology received the Nobel Prize, is probably the best known model of economic growth.[1] Although in some respects Solow's model describes a developed economy better than a developing one, it remains a basic reference point for the literature on growth and development. It implies that economies will conditionally converge to the same level of income, given that they have the same rates of savings, depreciation, labor force growth, and productivity growth. Thus, the Solow model is the basic framework for the study of convergence across countries (see Chapter 3). In this appendix, we consider this model in further detail.

The key modification from the Harrod-Domar (or AK) growth model, considered earlier in Chapter 4, is that the Solow model allows for substitution between capital and labor. In the process, it assumes that there are diminishing returns to the use of these inputs.

The aggregate production function, $Y = F(K,L)$ is assumed characterized by constant returns to scale. For example, in the special case known as the Cobb-Douglas production function, at any time t we have

$$Y(t) = K(t)^\alpha \, (A(t)L(t))^{1-\alpha} \tag{A4.1}$$

where Y is gross domestic product, K is the stock of capital (which may include human capital as well as physical capital), L is labor, and $A(t)$ represents the productivity of labor, which grows over time at an exogenous rate.

Because of constant returns to scale, if all inputs are increased by the same amount, say 10%, then output will increase by the same amount (10% in this case). More generally,

$$\gamma Y = F(\gamma K, \gamma L)$$

where γ is some positive amount (1.1 in the case of a 10% increase).

Because γ can be any positive real number, a mathematical "trick" useful in analyzing the implications of the model is to set $\gamma = 1/L,$ so that

$$Y/L = f(K/L,1), \text{ or, } y = f(k) \tag{A4.2}$$

This simplification allows us to deal with just one argument in the production function. For example, in the Cobb-Douglas case introduced in Equation 4.1,

$$y = Ak^\alpha \tag{A4.3}$$

This represents an alternative way to think about a production function, in which everything is measured in quantities per worker. Equation A4.3 states that output per worker is a function that depends on the amount of capital per worker. The more capital with which each worker has to work, the more output that worker can produce. The labor force grows at rate n per year, say, and labor productivity growth, the rate at which the value of A in the production function increases, occurs at rate λ. The total capital stock grows when savings are

Figure A4.1 Equilibrium in the Solow Growth Model
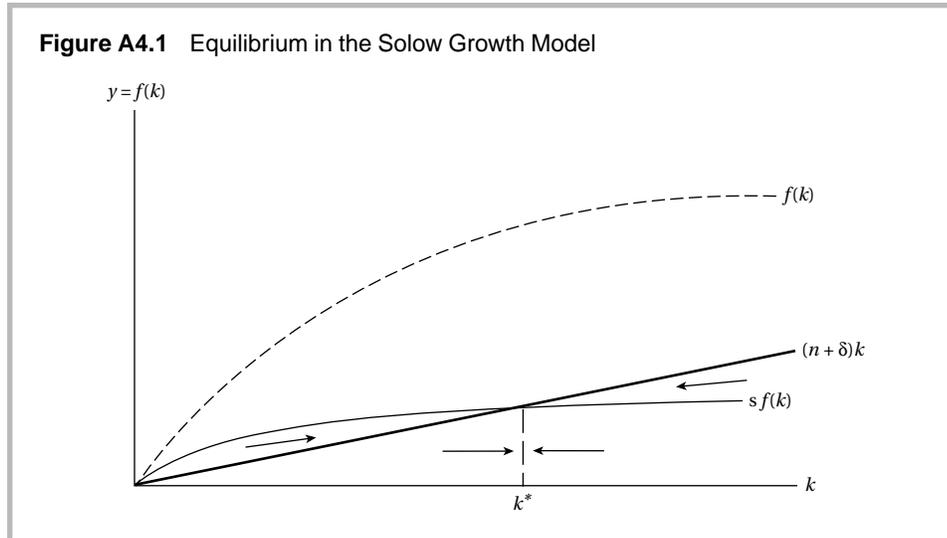
greater than depreciation, but capital per worker grows when savings are also greater than what is needed to equip new workers with the same amount of capital as existing workers have.

The Solow equation (Equation 4.4) gives the growth of the capital-labor ratio, k (known as capital deepening), and shows that the growth of k depends on savings $sf(k)$, after allowing for the amount of capital required to service depreciation, δk, and after capital widening, that is, providing the existing amount of capital per worker to net new workers joining the labor force, nk. That is

$$\Delta k = sf(k) - (\delta + n)k \tag{A4.4}$$

Versions of the Solow equation are also valid for other growth models, such as the Harrod-Domar model.

For simplicity we are assuming for now that A remains constant. In this case, there will be a state in which output and capital per worker are no longer changing, known as the steady state. (If A is increasing, the corresponding state will be one in which capital per effective worker is no longer changing. In that case, the number of effective workers rises as A rises; this is because when workers have higher productivity, it is as if there were extra workers on the job.) To find this steady state, set $\Delta k = 0$:

$$sf(k^*) = (\delta + n)k^* \tag{A4.5}$$

The notation k^* means the level of capital per worker when the economy is in its steady state. That this equilibrium is stable can be seen from Figure A4.1.[2]

The capital per worker k^* represents the steady state. If k is higher or lower than k^*, the economy will return to it; thus k^* is a stable equilibrium. This stability is seen in the diagram by noting that to the left of k^*, $k < k^*$. Looking at the diagram, we see that in this case, $(n +$

Figure A4.2   The Long-Run Effect of Changing the Savings Rate in the Solow Model
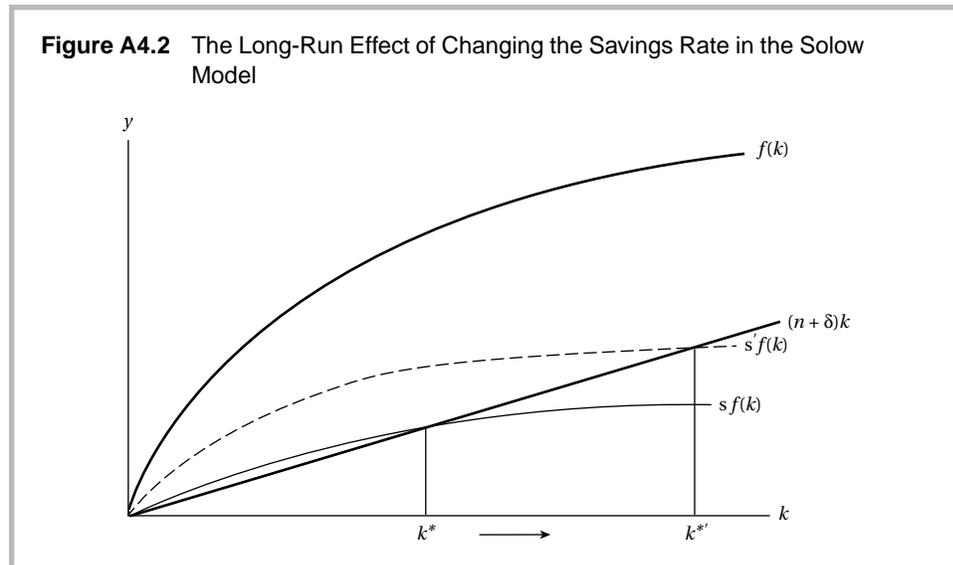
$\delta)k < sf(k)$. But now looking at the Solow equation (Equation A4.4), we see that when $(n + \delta)k < sf(k)$, $\Delta k > 0$. As a result, k in the economy is growing toward the equilibrium point k^*. By similar reasoning, to the right of k^*, $(n + \delta)k > sf(k)$ and as a result $\Delta k < 0$ (again refer to Equation A4.4), and capital per worker is actually shrinking toward the equilibrium k^*.[3]

It is instructive to consider what happens in this model if we increase the rate of savings s. A temporary increase in the rate of output growth is realized as we increase k by raising the rate of savings. We return to the original steady-state growth rate later, though at a higher level of output per worker in each later year. The key implication is that, unlike in the Harrod-Domar (or AK) analysis, in the Solow model an increase in s will not increase growth in the long run, it will only increase the equilibrium k^*. That is, after the economy has time to adjust, the capital-labor ratio increases, and so does the output-labor ratio, but not the rate of growth. The effect is shown in Figure A4.2.

Note carefully that an increase in s does raise equilibrium output per person—which is certainly a valuable contribution to development—just not the equilibrium rate of growth. And the growth rate does increase temporarily as the economy kicks up toward the higher equilibrium capital per worker. Moreover, simulations based on cross-national data suggest that if s is increased, the economy may not return even half-way to its steady state for decades.[4] That is, for practical purposes of policymaking in developing countries, even if the Solow model is an accurate depiction of the economy, an increase in savings may substantially increase the growth rate for many decades to come. (Both theoretically and empirically, the link between the rate of savings and the rate of growth remains controversial).

Finally, it is possible that the rate of savings (and hence investment) is positively related to the rate of technological progress itself, so that the growth of A depends on s. This could be the case if investment uses newer-vintage capital and hence is more productive, if investment represents innovation in that it solves problems faced by the firm, and if other firms see what the investing firm has done and imitate it ("learning by watching"), generating

externalities. This leads to a model somewhere between the standard Solow model and the endogenous growth models examined in Chapter 5.

Notes to Appendix 4.1

1. Robert M. Solow, "A contribution to the theory of economic growth," *Quarterly Journal of Economics* 70 (1956): 65–94.

2. Those with more advanced mathematical training may note that Figure A4.1 is a phase diagram, which applies given that the Inada conditions hold: that the marginal product of k goes to infinity as k goes to zero, and goes to zero as k goes to infinity (this follows from Inada conditions assumed separately for capital and labor inputs). This diminishing returns feature drives results of the Solow model.

3. Note that in the Solow model with technological progress, that is, growth of A, the capital-labor ratio grows to keep pace with the effective labor force, which is labor power that is augmented by its increasing productivity over time.

4. See N. Gregory Mankiw, David Romer, and David N. Weil, "A contribution to the empirics of economic growth," *Quarterly Journal of Economics* 107 (May 1992): 407–437. This article shows that when human capital is accounted for, as well as physical capital, the Solow model does a rather good job of explaining incomes and growth across countries. For a critical view see William Easterly and Ross Levine, "It's not factor accumulation: Stylized facts and growth models," *World Bank Economic Review* 15, 2 (2001):177–219, with the reply by Robert Solow, "Applying growth theory across countries," *World Bank Economic Review* 15, 2 (2001): 283–288. For time-series evidence that the Solow model does a good job of explaining even the dynamic case of South Korean growth, see Edward Feasel, Yongbeom Kim and Stephen C. Smith, "Investment, exports, and output in South Korea: A VAR approach to growth empirics," *Review of Development Economics* 5, 3, 421–432, October 2001.