

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 coauthors.

### 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.<sup>3</sup> 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.

In the Lewis model, the underdeveloped economy consists of two sectors: a traditional, overpopulated rural subsistence sector characterized by zero marginal labor productivity—a situation that permits Lewis to classify this as **surplus labor** in the sense that it can be withdrawn from the traditional agricultural sector without any loss of output—and a high-productivity modern urban industrial sector into which labor from the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. (The modern sector could include modern agriculture, but we will call the sector "industrial" as a shorthand). Both labor transfer and modern-sector employment growth are brought about by out-

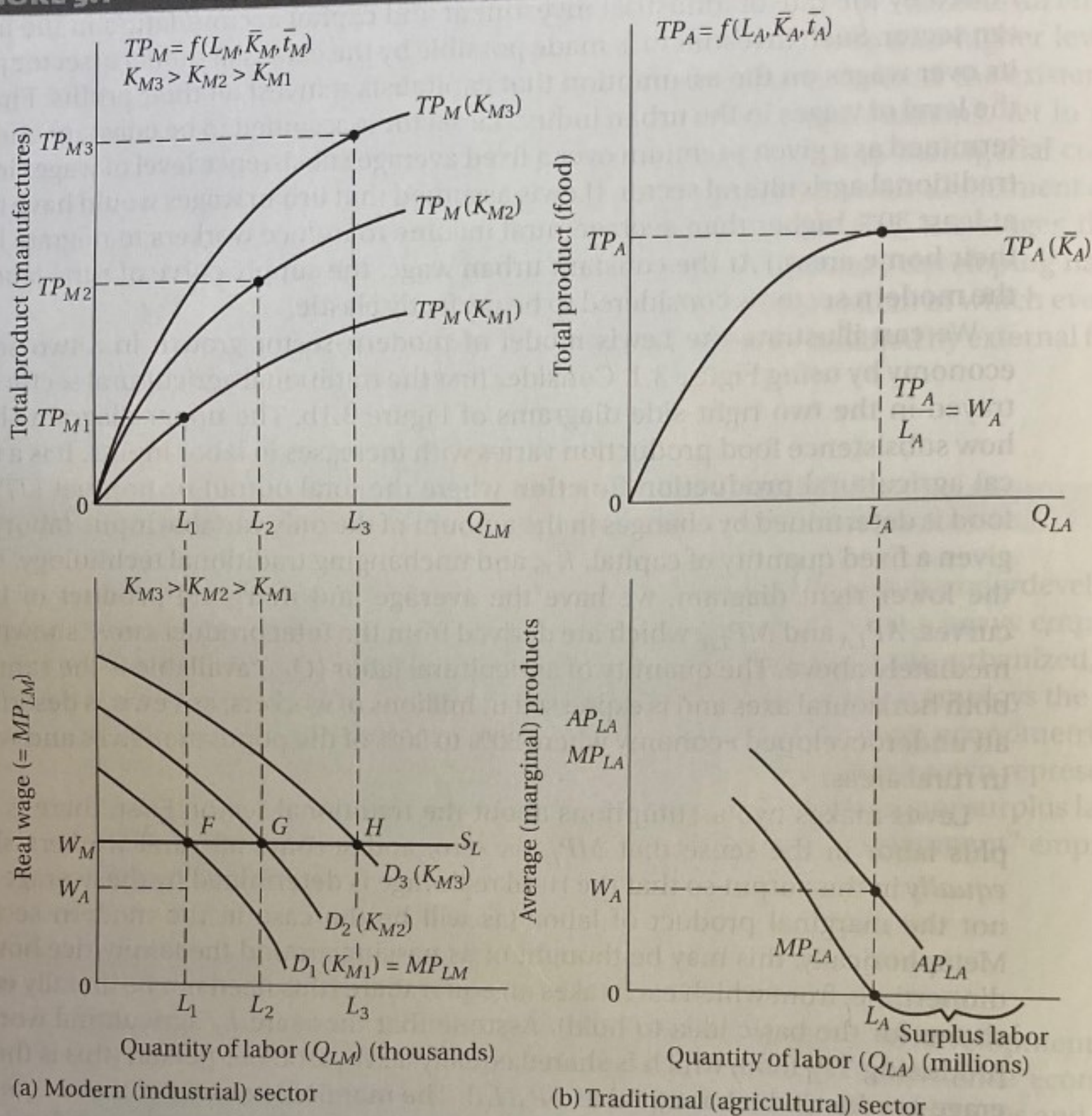
put expansion in that sector. The speed with which this expansion occurs is determined by the rate of industrial investment and capital accumulation in the modern sector. Such investment is made possible by the excess of modern-sector profits over wages on the assumption that capitalists reinvest all 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 3.1. Consider first the traditional agricultural sector portrayed in the two right-side diagrams of Figure 3.1b. 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,  $\bar{K}_A$ , and unchanging traditional technology,  $\bar{t}_A$ . 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 dinnertime, 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 3.1b; 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 3.1a 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  $\bar{K}_M$  and technology,  $\bar{t}_M$ . 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 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 3.1a 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 3.1a. Here we have modern-sector marginal labor

**FIGURE 3.1** The Lewis Model of Modern-Sector Growth in a Two-Sector Surplus-Labor Economy



product curves derived from the  $TP_M$  curves of the upper diagram. Under the assumption of perfectly competitive labor markets in the modern sector, these marginal 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 3.1a and 3.1b represents the average level of real subsistence income in the traditional rural sector.  $W_M$  in Figure 3.1a 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

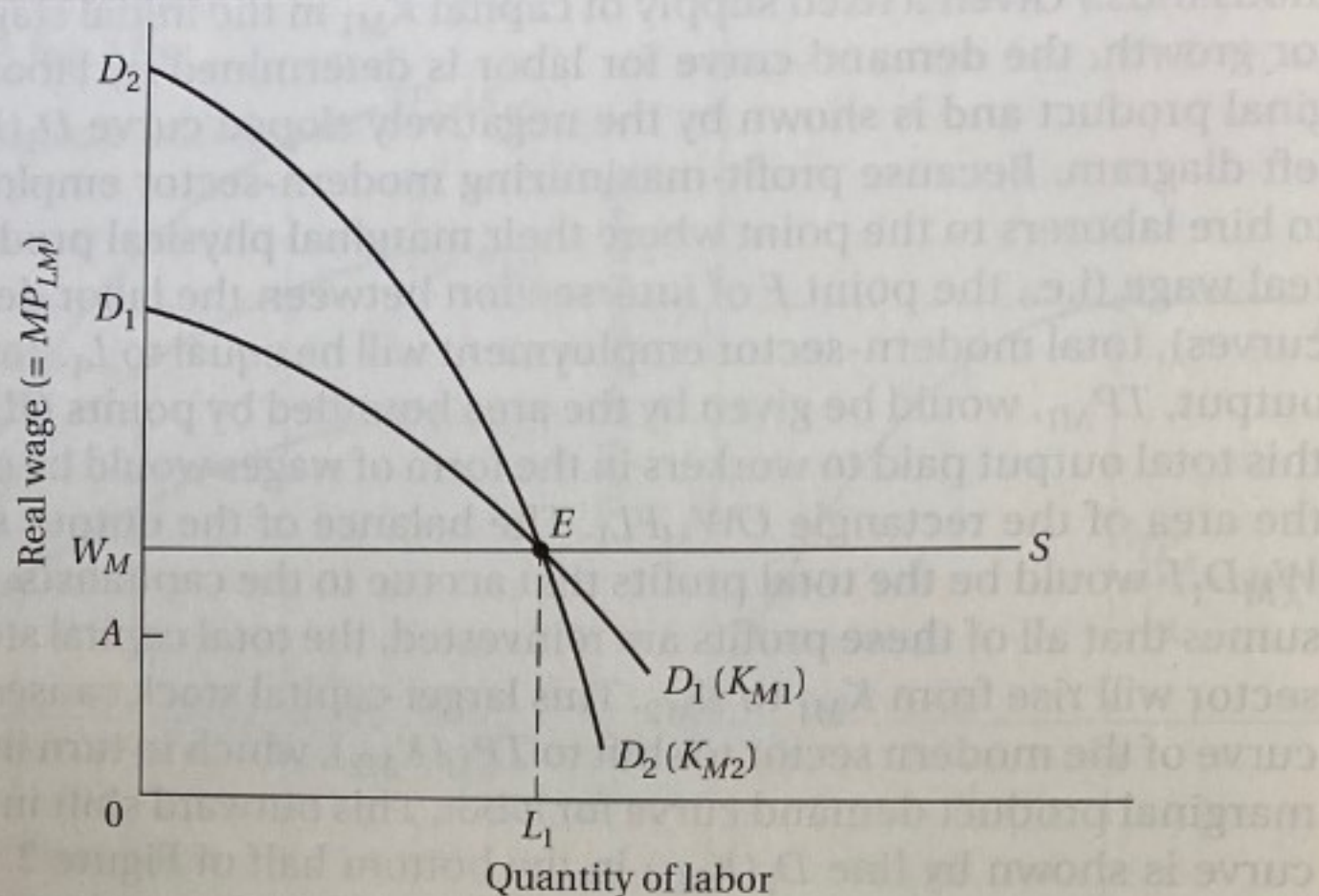
that the quantity of labor in the rural sector, Figure 3.1b, is expressed in millions whereas in the modern urban sector, Figure 3.1a, units of labor are expressed in thousands.) Given a fixed supply of capital  $K_{M1}$  in the initial stage of modern-sector growth, the demand curve for labor is determined 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  $OW_MFL_1$ . The balance of the output shown by the area  $W_MD_1F$  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 3.1a. 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  $OW_MGL_2$  and  $W_MD_2G$ , respectively. Once again, these larger ( $W_MD_2G$ ) 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.

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

**FIGURE 3.2** The Lewis Model Modified by Laborsaving Capital Accumulation: Employment Implications



banks.) Figure 3.2 reproduces the lower, modern-sector diagram of Figure 3.1a, 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  $D_1(K_{M1})$  to reflect the fact that additions to the capital stock embody laborsaving technical progress—that is,  $K_{M2}$  technology requires much less labor per unit of output than  $K_{M1}$  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 3.2 therefore provides an illustration of what some might call “anti-developmental” 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 GDP 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 Caribbean 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. 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.

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 4.

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.

### 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.

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 an 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.<sup>4</sup> 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 6), with population growth first increasing and 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 9, that is precisely the opposite conclusion than should be drawn. Observing the important role of higher education in developed countries, policymakers may be inclined to em-

phasize 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 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.<sup>5</sup> 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.<sup>6</sup> Certain groups in the developing countries (including landlords, entrepreneurs, military rulers, merchants,