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Microeconomic Issues of Labor Markets in Developing Countries

*Analysis and Policy
Implications*

Dipak Mazumdar

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AN EDI SEMINAR PAPER • No. 40

Microeconomic Issues
of Labor Markets
in Developing Countries
Analysis and Policy Implications

Dipak Mazumdar

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Washington, D.C.

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Introduction

✓ This seminar paper deals with labor market structures in developing countries and the impact of government policies on rural and urban labor markets. It will be useful to explain at the outset how the problems examined here fit into a general concern with employment issues and to indicate the limits of the study.

∫ The central concern in analyses of employment is absorption of labor. Governments try to influence the demand for labor so that more members of the labor force are absorbed into productive employment. Employment outcomes are often the by-products of government policies that affect economic growth as a whole. We can expect the rate of growth of employment to be positively related to the rate of growth of output, but the quantitative value of the relationship, termed employment elasticity, depends on the government's development strategy. In general, the objective of development strategy is to maximize the value of employment elasticity without depressing the growth rate of output. In practice, there may be a tradeoff between the two objectives. The economist's role is to identify key elements in the strategy that will minimize the necessary tradeoffs.

The observed pattern of labor absorption is the joint outcome of demand and supply factors in the labor market. Aggregate demand for labor will equal aggregate supply minus the number openly unemployed. But the way the market clears—at what pattern of wage rates and at what level of unemployment—depends on the structure and functioning of labor markets. This is where specific government labor market policies are relevant.

Since the objectives of government policy tend to be multidimensional, labor market policies often are geared to conflicting objectives that are not easy to reconcile. For example, maximizing the volume of new employment may conflict with the objective of raising wages above the level that might be freely established in the market. Governments may wish to alter distribution of income in favor of wage earners—at least in the sectors of the economy that are growing—through labor laws such as minimum wages and through public sector wage policies. Almost all governments try to regulate the conditions of work in the sectors that they can directly control. Such policies may be in conflict not only with the objective of maximizing employment growth but also with equitable distribution with respect to the traditional sectors of employment not controlled by the government. But the political objective of attempting to improve distribution of income in more visible or more volatile sectors may be the overriding one.

∫ This paper concentrates on factors that influence the structure and functioning of labor markets. Discussion of the factors affecting aggregate demand for and supply of labor is left for another study. Another limit on the scope of this paper should be mentioned here. In recent years short-term economic problems connected with major international disturbances have come to the forefront. Examples are inflation in wage costs in the industrial or export sectors owing to the boom in oil prices in oil surplus economies (commonly referred to as the "Dutch disease") and the impact on the labor market of stabilization policies necessitated by the debt crisis of the early 1980s. To understand the sharp short-run changes in wages and employment associated with these disturbances, it would be necessary to analyze the interrelationship between labor market behavior and macroeconomic policies, particularly fiscal, monetary, and exchange rate policies. That important topic

requires extended treatment and is not dealt with in this paper, which emphasizes microeconomics. The relationship between labor markets and macroeconomic policies—in both the short and long run—will be the subject of a second volume.

Chapter 1 presents a schematic picture of labor markets in a typical developing country. The main segments of the market in rural and urban areas are identified, and the specific types of interconnectedness between them are discussed.

Chapters 2 and 3 analyze the salient features of the workings of rural and urban labor markets and discuss some important government policies that affect the functioning of these markets. Some basic differences between rural and urban labor markets should be noted. First, the rural sector uses self-employed labor to a much larger extent than does the urban market. Second, the greater importance of agriculture in the rural sector implies that land is a more important factor there and that the operation of the leasing market in land profoundly affects the way the rural labor market works. The importance of interlinked factor markets is therefore much more pronounced in the rural sector. Also, much of the income generated in this sector is mixed income—a joint return to a number of factors of production. For this reason, and because of the dispersed nature of rural economic units, specific labor market policies are of less importance in the rural sector than in the urban sector, but price policies affecting outputs and inputs have a profound impact on rural labor markets.

Here, we must repeat the point already mentioned about the somewhat artificial distinction between the microeconomic and macroeconomic factors affecting labor markets. The internal terms of trade for agricultural producers—the ratio of the prices they obtain for their outputs to the prices they pay for their inputs—are affected directly by price policies that impinge on farm outputs and inputs, but they are also affected indirectly by the macroeconomic policies of the government (for example, with respect to the exchange rate). We deliberately exclude discussion of the latter, although in some economies these effects might be the more important ones.

1. The Labor Market Structure in Developing Countries

Labor markets may be classified as urban and rural. This distinction originates with census authorities and their practice of classifying administrative districts according to population size. The difference between urban and rural labor markets may be small at the borderline of the classifications, but taking urban and rural communities as a whole there are important differences in the modes of employment and the behavior of economic agents in the two sectors.

Differences between Rural and Urban Labor Markets

Although agriculture is the predominant occupation of rural workers, a sizable proportion of the urban labor force in most developing countries (roughly 10 percent) is also engaged in agricultural occupations—but the figure is always considerably smaller than the proportion of rural workers in agriculture (about 70 percent). Similarly, although wage labor is generally more important in urban areas, not all countries have a significantly larger proportion of all wage labor in urban regions. This is because the predominance of agriculture in rural areas does not mean that most farmers are self-employed. Agricultural wage labor is common in many developing countries, particularly in Asia. Modes of employment in the nonagricultural rural sector also vary greatly from one country to another. The number of wage laborers in this sector depends on how many small-scale enterprises have developed beyond the stage of specialized crafts (such as wood carving and blacksmithing).

Table 1 outlines the labor market structure in a typical developing country.

Table 1. Characteristics of Urban and Rural Labor Markets

<i>Urban</i>	<i>Rural</i>
The formal sector Public and large-scale farms Private (large enterprises)	Wage labor on plantations
The informal sector Informal sector wage labor Self-employed workers Casual wage labor	Workers in the small-scale farm sector Owners-operators Tenants (including sharecroppers) Hired labor
The unemployed	Nonagricultural workers Self-employed full-time Self-employed part-time Wage labor (part-time) Landless full-time wage labor

The most striking difference between rural and urban labor markets in developing countries is the extent of open unemployment. Visible and measurable unemployment is primarily an urban phenomenon, although a great number of factors—notably worksharing and the seasonal nature of much agricultural

work—cause surplus labor (if there is any) to take the form of disguised unemployment. As a result, unemployment in rural areas is difficult to measure.

Another notable difference is participation rates by age and sex. Females and nonprime-age males both participate in rural labor markets more than they do in urban labor markets. This is particularly true for females in most Asian and African countries, although their rates of participation in urban labor markets may not be as low in Latin America.

The Rural Labor Market

The Agricultural Sector

The agricultural sector of the rural labor market can be divided into large-scale and small-scale subsectors. The large-scale subsector includes plantations and large family farms, both of which rely heavily on hired labor, much as factories do. Labor in the small-scale subsector is provided by self-employed and hired workers in varying proportions. Whereas plantations and large farms generally employ labor on long “permanent” contracts for the year or for a season, small farms hire on a casual, day-to-day basis. Although many of these casual workers are landless, many others come from families that own small farms.

Some of the hired workers in the large-scale agricultural sector are organized, and at times it is possible to enforce minimum wage laws in this subsector. In contrast, institutional influence seldom extends to wage labor in small-scale agriculture, where the labor market operates solely on the basis of supply and demand, as influenced by social custom.

The self-employed in the small farm sector consist of owner-operators and tenants. The latter may pay a fixed rent or may have a tenancy arrangement (namely, sharecropping) under which they share agricultural output with their landlords while the landlords share input costs. Fixed rent arrangements are not common in the small-scale sector, however, since the low income of small farmers makes it risky for them to pay a fixed rent unrelated to the value of what they produce during the year.

The net income of the self-employed in the agricultural sector consists of returns to labor, land, capital, and management. The same is true for tenants, especially if the share of farm output claimed by the landlord is less than the economic rent. Convention often determines the owner’s share (in South Asia, for example, the split is usually 50/50). Although the landowner’s share, particularly with respect to input costs, sometimes changes in response to new economic conditions, the process of adjustment is sluggish. Several studies have shown that sharecroppers enjoy a higher economic status than landless wage laborers. This suggests that part of the economic rent accrues to sharecroppers. Quite apart from the rent, however, sharecroppers are likely to earn more than agricultural wage laborers because their income includes a return to management. Even if the sharecropper shares some of the burden of decision making with the owner, he is the one responsible for practical day-to-day implementation of the decisions, and accordingly commands a level of income over and above the payment for his labor.

The fact that the income of a substantial part of the agricultural work force depends on several factors of production has important implications, particularly

for the effect of policy measures on equity. In industrial economies the effect is generally judged by changes in the distribution of income between wages and profit. In the agricultural sector, however, attention shifts to the change in total farm income. If a policy measure increases the income of the farm sector as a whole, the earnings of self-employed farm workers in all income classes can be expected to increase. The central question here is whether a particular policy measure will increase the income of high-income farmers more than that of low-income farmers.

The Nonagricultural Sector

Nonfarm activities account for substantial employment in rural areas, which in some countries (for example, Egypt) runs as high as 30 percent. Although some of these are large-scale activities, particularly in countries with well-developed food-processing firms, the nonagricultural rural sector in most developing countries is the preserve of small-scale enterprises in manufacturing, trade, and services. The workers in this sector consist of both employees and self-employed persons, but some of them divide their time between agricultural and nonagricultural activities. In fact, one important characteristic of rural labor markets is that the workers may have more than one occupation. Since farm and off-farm work offer job alternatives to rural job seekers, nonagricultural earnings set the floor for wages in farmwork, and agricultural earnings set a floor for wages in nonagricultural pursuits.

Income changes have a significant multiplier effect in the nonagricultural sector. A substantial portion of the income of farmers is spent on rural nonagricultural goods and services. Thus, an increase in farm sector income will lead to an increase in the return to factors of production in the nonagricultural sector. This in turn leads to further increases in spending on goods in the rural economy. Total rural income therefore increases until it reaches an equilibrium level that is a multiple of the original rise in income. The value of the multiplier increases as the "leakage" in spending from rural to urban sector decreases.

A rural economy that is more self-sufficient with respect to its ability to satisfy the demand for goods and services will therefore experience less leakage. Thus, strong linkages between farm and nonfarm sectors in a rural economy are a powerful tool for creating employment. Any quantitative assessment of the effect of a stimulus on the agricultural sector must take such linkages into account. The linkage is strongest in Asian economies with a highly developed off-farm sector. In Africa there is a much lower propensity to spend on rural nonfood products and a correspondingly higher propensity to spend on urban goods and on imports. If agricultural development is concentrated in a large-scale subsector (as in many parts of Latin America) with a consequent concentration of new income going to high-income families, the marginal propensity to spend on imports will be large and linkages within the rural economy will be much weaker.

The Urban Labor Market

Urban labor markets can be divided into formal and informal subsectors. Wages in the formal sector are relatively high and are in a sense protected from being bid down by lower-income labor in the urban informal sector. Since the

informal sector is easy to enter and earnings within it are determined by supply and demand, these earnings approximate the level of alternative earnings (the supply price). The supply price, in turn, is determined by earnings in the rural sector, since urban labor markets are fed by rural migrants.

The apparent wage differential between the formal and informal sectors of urban labor markets gives rise to some conceptual and empirical questions. Although the protection enjoyed in the formal sector is sometimes ascribed entirely to such institutional factors as the existence of trade unions and labor laws, it may also be related to economic factors. This issue is discussed in chapter 3 and here we merely note that the combination of institutional and economic factors that may be responsible for higher wages in the formal sector makes it difficult to evaluate empirically the extent to which government policy is responsible for these higher wages.

This situation also makes it hard to define the boundaries of the formal sector, although one of its subsectors—the public sector—is easily discerned by its large size, particularly in the more advanced developing countries. Wages in this subsector are determined by regulations established by governmental institutions (such as pay commissions). Thus, wage determination in the public sector can be clearly distinguished from wage determination in the private sector, where the interplay of supply and demand is the primary influence. Some parts of the private sector, however, have administered wages (and prices). Often, the pay scales set by private sector managers seem to be well above prevailing wages in large parts of the market. The difficulty in identifying high-wage private firms varies from one country to another, but the most widely observed characteristic is probably the size of the firm (defined by workers employed or value of the capital utilized). The point at which a significant increase in wages occurs can be determined empirically. It may or may not coincide with the size group in which institutional influence on wages becomes strong.

Economic and institutional factors that help to maintain wages at a relatively high level tend to diminish rapidly in the informal urban sector. At the bottom of this sector is casual labor, hired by the day and with no particular attachment to any individual employer. Such workers are a prominent part of the labor market in the larger urban areas of developing countries in such fields as portage, transportation, and construction. The wages of these workers, competitively determined by supply and demand, are particularly flexible. Next come wage workers in small enterprises. Some of these workers have a long-term attachment to their employers, but generally the rate of turnover is much higher than in large-scale enterprises. This high turnover weakens any economic forces that would tend to keep wages at a higher level. At the same time, institutional influence on the wages paid by small-scale enterprises is likely to be weak. A third segment of the informal sector is composed of the self-employed, some of whom (for example, doctors and lawyers) are highly paid and institutionally protected. These categories are generally listed separately in labor force surveys and are easily excluded from statistical estimates of the informal sector. Even if we leave out the professionals, however, the self-employed are a very heterogeneous group, many of whom possess only their labor power, which they sell for low remuneration as shoeshine boys, peddlers, and the like. Some may also own small enterprises, including the means of production (capital and land), and make use of family as well as wage labor to produce low-cost goods and service. In addition, the self-employed include the owner-workers of small establishments such as shoeshine boys and street vendors. The range in earnings is accordingly great. The incomes

of the self-employed often include a combination of return to labor, capital, and management. Self-employed workers in the lowest quartile of earnings distribution are likely to have lower incomes than wage earners in the formal sector, but those in the highest quartile will probably earn more. The relatively high earnings of the latter are due to scarcity of capital and enterprise rather than institutional restrictions on the entry of labor into the market.

The openly unemployed make up another part of the urban sector. In many developing countries the rate of unemployment in the urban sector is quite high, on the order of 15 percent or more. Government policies have a substantial influence on the unemployment level.

Open Unemployment

In table 1 the openly unemployed are entered only in the urban sector because most labor force surveys have shown the rate of unemployment to be significantly higher in urban areas, often as much as double the rural rate (see, for example, Squire 1981, table 19, p. 68). The reasons for this difference are not difficult to find. As already mentioned, rural areas usually have more self-employed workers and an excess supply of labor in this group (whether in family farms or nonagricultural enterprises) would lead to work sharing among the available labor force rather than unemployment of some family member. This phenomenon, known as disguised unemployment, is discussed in detail in chapter 2.

Open unemployment can arise in the wage sector in two ways. In the casual labor market unemployment is sometimes the result of the fluctuating demand for labor from a multiplicity of employers. Such fluctuations could be seasonal, as they are in agriculture, or they could be due to specific factors that affect certain employers. Unemployment due to fluctuations tends to increase as the wage structure becomes more rigid and labor mobility between employers declines (for example, owing to geographical separation). Unemployment due to demand fluctuations is probably more important in the rural rather than the urban labor markets because of the seasonal nature of agricultural production.

Unemployment can also arise when workers search for the best combination of wages and employment prospects (including wage progression) before they accept a job offer. Alternatively, they may be simply queuing up to wait their turn for a job in the high wage sector of the market. Unemployment of this type is more important in urban labor markets. The unemployed in this case would generally be out of work for a period of time ranging from several days to several months, whereas the unemployed of the former type are likely to be unemployed for odd days in the week or in the month, depending on job availability, rather than continuously over a period of time. They are therefore less likely to be picked up as unemployed in a labor force survey on the work status of respondents in a specific period (typically the past week).

2. The Rural Labor Market and Policy Intervention

This chapter deals with the operations of rural labor markets, particularly those areas that require policy intervention. Emphasis is placed on two issues: disguised unemployment, which is associated with alleged underutilization of labor; and dualism, which apparently leads to underutilization of land in the rural economy. Both problems are related to market failure—that is, the inability of factor markets to function in a way that allows freely fluctuating prices to equate supply with demand. The types of market failure discussed here do not arise from institutional intervention. Rather, they are the outcome of basic aspects of the rural economies of developing countries. Accordingly, there is a *prima facie* case for policy intervention to correct the resulting inefficiencies.

Note, however, that direct intervention in the rural labor market can have only limited success. The market for hired labor in rural areas is highly dispersed and, except for the large-scale sector, is casual in nature. A rural worker is therefore likely to work for many different employers during the years. It is impossible to enforce wage regulations in such a market. Even if it were theoretically possible for the state to influence wage contracts in the large-scale sector (where a limited number of employers hire a large number of workers), the legal and administrative organization needed to enforce wage legislation is generally much weaker in rural areas. Moreover, hired labor is of limited significance in many rural economies; a majority of the agricultural workers are self-employed. Nonetheless, the state is able to intervene directly in rural employment to some extent, as illustrated in the following discussion of some public works projects carried out in the rural regions of several countries.

In contrast, intervention in the markets for other agricultural inputs—seeds, fertilizer, credit, and agricultural machinery—is quite common. Policies that influence the prices of these inputs, either directly or through taxes and subsidies, have a substantial impact on rural labor markets, especially in developing countries, where interlinked factor markets play an important role in the rural sector.

Note, too, that governments directly influence the price of agricultural outputs by such means as marketing boards, taxes, and subsidies. Macroeconomic policy, particularly with respect to the exchange rate and budgetary balances, also affects the relative prices of rural products. The subsequent effects on the rural terms of trade cause changes in total income as well as in its distribution in the rural sector.¹

Disguised Unemployment

The Theory

As pointed out in chapter 1, a substantial amount of labor in peasant agriculture is provided by the self-employed, who are not paid a market wage. On family farms

1. As noted in the Introduction, this topic is not covered in this paper.

that rely entirely on self-employed workers, some of those workers may be redundant if the ratio of workers to land is high. The social mores of rural families ensure that all family members get a share of what the family produces and that they enjoy an income (or consumption level) approximating the average production of the farm. The workers on the farm also share the work, so that nobody is openly unemployed. But each family member does only a small share of the work. Thus, if one or two members of the family are absent, it is easy for the remaining members to compensate for the shortage by increasing their own share of the total work load. In short, some family workers are disguisedly unemployed. Although they contribute little or nothing to production, they account for additional consumption. Therefore it is possible to use the surplus workers in productive activities outside the farm. Farm output will not be decreased by the absence of these surplus workers. If it is possible to siphon off (either through fiscal measures or market mechanisms) the food they were consuming on the family farm, that food will be available to meet the consumption needs of those workers as they perform useful activities outside the agricultural sector. Total output in the economy is thus increased, consumption does not fall, and no inflationary pressure arises because of a shortage of food outside the farms.

Serious questions have been raised, however, about the applicability of this model in rural developing countries. In many parts of the world family farms also make use of hired labor, particularly during planting and harvesting, on a casual day-to-day basis.² In short, the use of wage labor is not confined to large farms. Furthermore, a large proportion of the family workers also offer themselves for work in the hired labor market. If family farms are both users and suppliers of wage labor, it would seem that the going wage rate in the casual labor market would provide a floor to the marginal product of a day's work as far as farm family workers are concerned. No small farmer will be willing to pay a hired worker unless the worker's contribution to output is worth at least as much as the wage.

The question thus arises, what determines the wage rate in the rural sector? Two answers are possible:

- If the wage rate is determined by supply and demand, the major propositions of the disguised unemployment hypothesis cannot be sustained. Even if the amount of labor per worker appears to be low, the wage rate will be established at the level at which workers are willing to supply just as many work hours as they do in fact supply. The underutilization of labor arises from voluntary unemployment, and withdrawal of some workers from the sector will therefore cause the wage rate to rise. Other things being equal, there will be a fall in agricultural output, and possibly an increase in consumption (or in the wage bill) in the rural sector.
- Alternatively, the wage rate in areas with a plentiful supply of labor may be determined by subtle social and economic forces that keep it at a level at which workers are willing to supply more work hours than are in fact demanded. Available work is rationed among the job seekers (on a random or purposive basis), and thus there is some involuntary unemployment at the going wage. Up to a certain point, then, the withdrawal of some workers from the rural sector will have no effect on the wage rate. Output will not fall, and

2. Two types of wage labor are used in peasant agriculture. "Permanent" farm servants are generally hired for the year or the season, mostly by large farms; but a larger proportion of hired labor days is generally contracted out daily, as and when needed.

each remaining worker will get a larger number of hours of work at the unchanged wage rate. Thus, at least part of the disguised unemployment hypothesis is sustained, even though the wage bill remains constant and there is no automatic transfer of wage goods (food) to the sector outside traditional agriculture.

Empirical Studies of Wage Determination

Some detailed work on the determination of rural wage rates in India, particularly in West Bengal, was done by Bardhan, who found wide variations in wage rates among villages even within a small geographical area. A large-scale survey of 500 villages in four regions of West Bengal showed that in about 30 percent of the villages in each region the mean average wage for male casual workers was 25 percent above or below the overall mean wage for the region (Bardhan 1984, table 4.1, p. 48). Both among villages and among individuals, the factors influencing the strength of demand for labor were found to have a significant effect on the wage rate. Thus, the wage rate was "positively associated with productivity-increasing factors, such as normal rainfall, lower deficit in actual rainfall, use of nitrogenous fertilizers, and the relatively busy season of October-December, and negatively with the village unemployment rate" (Bardhan 1984, p. 53). The proportion of nonagricultural male workers in a village, used as a proxy to show the relative importance of nonagricultural activities in a village, also had a significant positive effect on the wage rate. In villages where nonfarm work opportunities were relatively plentiful, farm wages were higher. In the regression models fitted to the wage data for individual workers, age and education had significant positive effects. At the same time, demand variables related to village characteristics were significant in individual wage functions.³ The dependent variable in these regressions was the money wage rate. Bardhan tried to capture the effect of variations in demand on the real wage rate by including an additional variable, the cost-of-living index for food. This variable had a significant negative effect on money wages. That is, in areas where increases in food costs were low, money wages were relatively higher after allowing for the influence of other variables. This suggests that intervillage differences in real wages tended to be larger than differences in nominal wages.⁴

The fact that demand and supply are important in explaining wage variations supports the view that the competitive model of wages is relevant to Indian agriculture, but competitive forces are only a part of the story. Although the regression model provides a satisfactory explanation of intervillage variations, it assumes that the village labor market is largely insulated. Migration from tight village labor markets to slack ones is not sufficient to iron out the large differentials (Bardhan 1984, p. 55). The explanatory power of the regressions, even when the supply and demand variables are significant with the expected sign, is generally quite low. The proportion of the variance explained (as given by the value of the R^2) is generally about 12 percent. Many factors other than those

3. Examples are normal rainfall per year in the village deficit in actual rainfall in the year in question, amount of fertilizer used per unit of cultivated land, and so on.

4. Bardhan ascribes this effect to a demand-based factor, since the food cost index is generally higher in areas of low productivity, and the latter in turn is associated with low wage rates.

included in the regression models must therefore enter into the determination of wages.

Female workers in the villages of India are generally paid at a substantially lower rate than males. In Bardhan's (1984, table 4.3, p. 51) regression equation of wage rates per worker, the effect of the sex dummy was strongly negative. More detailed field studies have documented the importance of this phenomenon. In a typical village in West Bengal, for example, separate wage rates are assigned to specific tasks and seasons (Rudra 1982, p. 333). These wage rates are generally known and are accepted by most employers and workers. Each task-specific wage rate generally pertains to a particular sex. There will be a specific wage rate for a male ploughman in the busy season, a female weeder in the slack season, and so on. The wage rate attached to female tasks is significantly lower.

However, daily wage rates within villages are strikingly uniform for laborers of the same sex and wage group, in a specific season. This phenomenon has been noted in numerous village studies.⁵ It suggests that wages are determined by administrative rather than competitive factors within the village labor market. In particular, although the productivity of workers varied widely among individuals, the wage rate offered did not. Rudra conducted detailed interviews with employers and employees on this point. The employers assured him that supervision did not even out productivity differentials between laborers. Both employers and laborers reported that less productive workers were "screened out" during the slack periods in the market.

Although wages do vary by season—or, more accurately, by **tasks** in different seasons—pricing appears to be administered. In Rudra's study seasonality took the form of one discrete jump to a new wage standard when agricultural activity changed from peak to slack, or vice versa. However, the wage scale itself (specifying the levels of money wages in different seasons) was found to be quite rigid and moved by discrete steps separated by several years.

The forces supporting the apparent rigidity of the wage structure have not yet been specified in detail. There is some suggestion of an element of monopsony in the market. Although many small farmers make some use of hired labor, the Bardhan-Rudra survey of 1977 in West Bengal showed that seven or fewer employers in about 45 percent of the villages accounted for most of the employment of casual workers (Bardhan 1984, p. 60). Collusion, or wage leadership on the part of a few big landlords, may be an element in the nonvariability of wage rates. However, this view conflicts with the evidence from the village studies indicating that resistance to wage cuts, particularly in the slack seasons, originates in the camp of the employees (see Dreze and Mukherjee 1987, pp. 31-33).

Evidence on unemployment. It has been maintained that involuntary unemployment, if properly measured will turn out to be significant in many rural labor markets. The existence of workers willing to work more hours than they actually get paid for discredits the notion that the established wage is a purely competitive one.

There is generally a discrepancy in the evidence on unemployment obtained from large-scale surveys (like the National Sample Surveys of India) and that from micro-level village studies. Labor force surveys in developed countries are

5. See, for example, the nearly dozen references cited by Dreze and Mukherjee (1987, p. 24, para 2).

designed to obtain information on the hours of work performed during the reference period, usually the previous week. A comparison of the hours worked by employees with the standard (or normal) number of hours worked per week shows the numbers of overemployed, underemployed, and unemployed workers. This procedure is feasible in developed countries because most work is wage employment. In peasant agriculture, however, much gainful activity is in the nature of self-employment, even among those who take part in the market for hired labor. Workers typically report long hours of work in a variety of self-employed activities, but the intensity of work in these activities cannot be measured.⁶

To measure unemployment, more intensive village surveys ask for information on the number of days spent by each respondent in seeking employment at the going wage, and on the number of days the respondent was successful. The ratio of the latter to the former gives the probability of employment in the market (PME) over a specified period, and involuntary unemployment is then given by (1-PME). Employing this method, Ryan and Ghodake (1981) found that the unemployment rate in six villages in Central India in 1975-76 was 0.19 for males and 0.23 for females.⁷

The competitive model of wages can be reconciled with this evidence of a large unemployment rate if we hypothesize that the unemployment is voluntary, but this goes against the declared position of respondents. When they were asked how many additional hours (or days) they were willing to work, it was assumed that the desire for more work was based on the prevailing wage rate. Furthermore, a majority of the households in Bardhan's sample with a more than average incidence of unemployment had incomes below the poverty line, were landless (or had very small farms), were illiterate, and belonged to the lowest caste. They had none of the aversion to wage work generally associated with families from high castes. "We can hardly expect that this unemployment will be voluntary or that the prevailing wage rate will be below the minimum reservation wage of these households" (Bardhan 1984, p. 60). Curiously, a substantial proportion of the sample villages with a relatively high (more than 5 percent) rate of unemployment also have a higher average wage rate than the mean for the entire sample. Thus the market clearing model does not explain the facts in rural India.

Policy Implications: Public Works Programs

Persistent evidence of the existence of underemployed labor in many developing countries points to the importance of rural public works, both as a means of mobilizing unused resources for the creation of productive assets and as a way of ameliorating poverty. Many countries have experimented with programs of public works. It is useful to review the difficulties encountered and to ask why such programs are not as widespread as the theory of surplus labor would lead us to expect.

As noted in early discussions of surplus labor, the opportunity for public works in developing countries is fundamentally different from the conditions that inspire public works in industrial countries at the bottom of a depression,

6. Hansen (1969) found "full employment" in terms of hours worked in Egyptian agriculture, with a large proportion of the time reportedly spent in animal husbandry.

7. The average of (1-PME) for males was 0.12 and 0.39 during peak and slack seasons, respectively; for females, the corresponding figures were 0.11 and 0.50. The differential impact of seasonality on female unemployment should be noted.

particularly stressed by Keynes. Keynesian ideas about public works are concerned with stimulating aggregate demand. Low levels of the latter lead to underutilization of both capital and labor. When output is constrained by a lack of aggregate demand rather than by supply bottlenecks, public works programs—even if financed by deficit spending—could be expected to lead to an increase in output without creating inflationary pressures.

The rural economy of developing countries presents a different situation. Underutilization of labor is accompanied by shortages of fixed capital and wage funds. The latter has been discussed specifically in the context of low elasticity of food supply in the short run. If surplus labor is put to public works, the increase in the wage bill leads to an immediate increase in the demand for food. Since it takes time for the agricultural sector to respond with an augmented supply of food, there is a danger of inflation in food prices unless provision is made for a stock of food that can be used by the public works program. Proponents of public works policies have therefore often tied their proposals to a need for food aid in the regions where the schemes are being implemented. Such food aid may come from regions in the country with surpluses or may be an integral part of foreign aid programs making use of, for example, agricultural surpluses in the United States. In some instances, wages in public works programs have been paid partly in kind with food from public distributive agencies.

All public works programs have two central objectives: to generate employment, and to create potentially productive economic assets. Burki and others studied 24 programs in several countries and found that they fell into four principal types: relief programs for specific emergency situations, such as severe drought; long-term employment programs designed to absorb structural unemployment in areas where only one crop a year can be grown; income-augmenting programs that supplement the normal earning capacities of those they employ and hence are closely geared to seasonal employment patterns; and low-cost infrastructure programs that emphasize the assets created rather than the welfare of employees. It is well to remember, however, that the classification was based on the major emphasis of particular projects and that in practice all projects are motivated to varying degrees by differing goals.

A particularly ambitious and much-discussed scheme of public works is the Employment Guarantee Scheme (EGS) initiated in India in 1978 in the state of Maharashtra. The distinctive feature of the scheme is reflected in the word "guarantee." Under the EGS the government of Maharashtra is responsible for ensuring that every adult in the rural areas of the state who is desirous of employment and is willing to do manual unskilled work will be given a job, at a minimum wage (assuming average effort). The procedure is relatively simple. Adults wanting employment are allowed to register themselves with the local village authority (the pachayat samiti officer or talathi, that is, record keeper). The government, through its local official, is then required to find work for the individual, preferably within the jurisdiction of the village, but at the very least within the district concerned. If no work is found within 15 days, an unemployment allowance of 1 rupee is to be paid for each day of no work. In practice, there has been little payment of the unemployment allowance. The principle of open-ended commitment has been instrumental in the continuous growth of the scheme. As perhaps the largest public works program operated by a government within a limited area, the EGS illustrates well the types of problems encountered by public works projects. The principal ones appear to be connected

with the selection of projects—their timing and content; the wages to be paid on the projects; the distribution of benefits from the projects; and financing.

The selection of projects. The EGS, like other public works programs geared to generating employment, has a strong criterion for labor intensity: The ratio of the cost of unskilled labor to other costs (including equipment, materials, and skilled labor) must be 60:40 or higher. In addition, the projects should create productive assets and, as far as possible, should be within 5 kilometers of the workers' villages. Over the years it has become increasingly difficult to identify projects that meet all three criteria. Total expenditures on roads, originally a low-priority item, increased from 5 to 20 percent between 1975 and 1980, but many of the roads built under the scheme have been dirt roads that are washed away each monsoon. Consequently, such projects are often compared to "digging holes and filling them up again," which might conceivably be useful in a Keynesian world of inadequate aggregate demand but is hardly appropriate to conditions in underdeveloped rural economies.

Why is it so difficult to identify a continuous stream of productive projects when the level of fixed investment in agricultural regions is so low? The answer is probably that productive agricultural investment requires the active participation of farmers, particularly large farmers, or at least a sizable farmer cooperative.

The determination of wage rates. Workers in the EGS program are unskilled and thus have no say in deciding what projects or tasks they will be assigned to. However, even unskilled tasks require different levels of effort. Digging in soft soil is quite different from digging in rocky ground. Accordingly, the EGS wage rates vary with the amount and kinds of work done. Unfortunately, these complicated schedules are poorly understood by workers and allow supervisors to manipulate and usurp the system.

A second problem arises in paying workers a piece rate, which is generally recommended for the efficient completion of tasks. Since the projects do not normally involve an expenditure cutoff, however, both workers and supervisors have an interest in lengthening the period of work. In effect, laborers are paid at a lower daily rate and the supervisors siphon off the difference between the actual wage and what is sanctioned in the official schedule of rates. Although the workers lose some pay each day, they make a net gain from the longer period of employment.

Another concern is how to use labor on public projects without driving up the labor costs of private farmers, particularly in busy seasons. According to the rules of the EGS, daily wage rates are "so fixed that a person working diligently for seven hours a day would normally get a total wage equal to the minimum wage for agricultural laborers for the lowest zone fixed by the State Government" (Herring and Edwards 1983, p. 581). Such a rule is not too sensitive to variations in local supply and demand situations, but the wage rate had to be pegged to the rock bottom level to allay the fears of farmers regarding the competitive bidding up of wage rates. "Both large farmers and sugar factories have pressed for suspension of EGS work when labor markets are tight, and the authorities are required by law to accommodate their requests" (Herring and Edwards 1983, p. 583). This problem crops up in most public works schemes, since it is practically impossible for a public authority to set wages in tune with local supply and demand conditions and seasonal variations. Under a low administered wage, labor is available in

varying and sometimes unpredictable degrees in different areas covered by the program.

The problem of distribution benefits. The EGS program creates productive assets that increase the value of land and thus the welfare of landholders, whereas benefits to workers on the projects are considerably less permanent. Beyond the wage paid while the project lasts, which is the major benefit, the laboring class depends on an uncertain and unpredictable "trickle down" process. Empirical evaluation of the impact of EGS projects bears this out. An official study of the beneficiaries of the assets created or improved by the EGS showed that 91 percent of the users of these assets were cultivators and only 6 percent were agricultural laborers. Moreover, the benefits were seen to be disproportionately concentrated in the hands of the larger farmer. A 30-day wage paid by an EGS project to both parents in a four-person family would not bring the family up to the poverty line. Dandekar and Sathe (1980, p. 12) found that 90 percent of EGS workers remained below the poverty line. In fact, EGS workers are usually uncertain about the period of employment because the state is required to provide a minimum of only 30 days of employment at a stretch.

This is not to suggest that the overall EGS program has not helped to improve conditions for poverty groups. But the unequal distribution of benefits from such public works programs is a persistent and probably unavoidable problem. Even when land is owned entirely by those who cultivate it—as it is in socialist societies, where landless workers and tenants do not exist—matching effort and reward in public works projects is a problem. A typical project may require the effort of all workers in a village, or even a number of villages, whereas the benefits may accrue to only a section of one village. The Chinese solution to this problem was the commune. The entire village owned its land in common. When a rural public works project was undertaken, the workers were allocated "points" proportional to the effort expended. Each point represented a certain amount of claim on the total output produced. Thus, even if the increased productivity due to the project was localized, its benefits were not restricted to the section of the village inhabiting the area. Every member of the commune was able to share in the increased output in proportion to his or her effort.

But the theoretical and practical problems of devising a points system that preserves both equity and efficiency are immense. An additional problem is diseconomies of scale in management. As rural works programs became larger, it became necessary to mobilize labor from a large number of villages, even though the benefits would accrue to only some of the villages. The solution was to combine the land of all villages contributing labor to the project into a single commune and pay each worker according to his effort. With the increase in the size of the commune, however, incentive and managerial problems developed. Thus, even though the Chinese were successful in mobilizing rural labor for asset-creating activities, agricultural output fell. Ultimately, the Chinese replaced the large communes with small production teams.

The problem of financing. The distributional impact of public works programs also depends on how resources are mobilized for financing such programs. In the ideal theoretical scheme of Nurske, the projects would be self-financing. Resources would flow to the state from taxation of the additional income or wealth produced by the assets created by the public works. In other words, the benefits accruing to landholders would be taxed to support the projects. In practice, however, it has

proved to be very difficult for most governments in developing countries to collect taxes on land and on agricultural income. The burden of paying for public works schemes there has been borne instead by taxpayers who do not benefit from the projects in any direct way. Under the EGS, taxes on salaried employees alone have contributed about 60 percent of the total financing. Bombay City's contribution between 1975 and 1980 was about 60 to 70 percent of the total cost of the EGS. In effect, urban salaried workers and consumers have been subsidizing landed farmers.

Economic Dualism in Agriculture

Disguised unemployment, as mentioned earlier, leads to underutilization of labor. Another type of market failure leads to the underutilization of land.

The Analytical Basis of Dualism

In most developing countries, a small proportion of the population owns a large proportion of the cultivable farmland. This is true of the densely populated rural regions of Asia, where the average holding is quite small (2 to 5 acres), as much as it is of the lightly populated regions of Latin America, where the average holding may be several hundred hectares. Although an unequal distribution of land creates equity problems, it does not necessarily affect the efficiency of the agricultural sector. If economies of scale through the use of agricultural technology are possible, large holdings may actually help to improve production. There is little empirical evidence to prove, however, the existence of economies of scale in the farm sector. Even without economies of scale, a skewed distribution of land will not affect efficiency adversely if large farms hire enough labor to achieve approximately the same ratio of labor to land as that found on small farms, or if the rental market allows landless workers or small landowners to lease land from large landlords and thus to establish an optimum land/labor ratio. The problem is that neither the labor market nor the land market work well enough in the agricultural sector of developing countries to achieve the optimum factor ratio, as discussed next. Small farms with relatively high labor input (and a correspondingly high yield) per unit of land often coexist with large farms in which intensity of cultivation and land productivity are low. This state of affairs is commonly referred to as "economic dualism" in the agricultural sector.

Returns of scale. Economies of scale are seldom possible in peasant agriculture. In nonmechanical production there are no indivisible factors. Labor input, together with inputs of water, fertilizer, and pesticides can be increased in small amounts to increase yields, but the land is generally divided into small plots farmed using the same techniques. Although farm machinery increases the possibility of economies of scale, such mechanization is largely labor-saving in character: It increases the productivity of labor but not the productivity of land (Hyamai and Ruttan 1971, p. 71). In this respect it differs from the use of large-scale machines in many industrial sectors (Brewster 1950). When used in industry, modern mechanical techniques often increase both labor and capital productivity, and thus become profitable at all wage levels. In contrast, the labor-saving mechanical techniques generally found in agriculture are only profitable at relatively high wages. Mechanized production is therefore of limited interest in peasant agriculture.

Although machinery is widely used in some of the agricultural regions of developing countries, that is an outcome of economic dualism, not an explanation of it.

Empirical studies of returns to scale in agriculture suggest that returns are constant regardless of scale. In an early survey of agricultural production functions in many developing countries, Heady and Dillon (1961, p. 630) consistently found that returns to scale were constant. Cline's 1970 estimates of production functions for 18 sectors in Brazil showed that returns to scale were not significantly different from constant returns. Several studies of more recent vintage in India have also shown constant, and sometimes decreasing, returns to scale (Sidhu 1974; Bardhan 1973; Lau and Yotopoulos 1971).

Agricultural processing plants in developing countries sometimes have indivisible capital equipment and thus show increasing returns to scale up to a point. But economies of scale in processing do not necessarily imply that economies of scale are possible through large-scale production of the crop to be processed. The perishability of the crop is an important determinant of the optimum scale of production, since large capital-intensive processing plants must be operated continuously to achieve cost effectiveness. Most grains, for example, are relatively long-lasting following harvest. Thus, "a large mill can easily buy the grain at harvest in the open market and store it for milling throughout the year. . . . Plantations or contract farming in wheat and other food grains have therefore never been able to survive. For perishable commodities, however, the processing period is equal to the harvesting period; that is, it is confined to a particular season. To stretch out this season, crop planting must be staggered over a long period of time or some plots must be harvested at nonoptimal times. Both methods will reduce the yield or the value of the crop, but these losses are offset by savings from better capacity utilization of the processing plant. Therefore, it is profitable for a large-scale factory to coordinate planting, harvesting, and processing (Binswager and Rosenzweig 1982, p. 48).

We conclude that, except for a few crops requiring mechanized processing in order to serve a large market, economies of scale are unimportant in agriculture in developing countries. If returns to scale are constant, the crucial determinant of efficiency among farms of different sizes is relative effectiveness in the use of all factors of production—land, labor, management, and capital.

Labor market dualism. In the absence of economies of scale, labor on farms of all sizes will show similar marginal productivity. Thus, for the sake of economic efficiency, labor as an input should be applied at the point at which its marginal productivity is equal among farms of different sizes. Since land is the most important factor of production other than labor, the ratio of labor to land will be equal across farms. The empirical evidence surveyed below, however, shows that labor input on large farms is typically restricted. This means that the labor-to-land ratio and the yield per acre of land are higher on small farms. Various factors are responsible for this misallocation of labor.

To begin with, peasant agriculture involves a mixture of family and hired labor, which makes it difficult to ensure efficiency. Family labor, on one hand, has a strong incentive to work because of the family's interest in net farm income. Hired labor, on the other, is typically used on a daily basis and needs substantial

supervision.⁸ Thus, as the size of a farm's labor force increases, the proportion of hired labor increases, and supervision costs rise. This is sufficient to increase labor costs as farm size increases, even if a perfectly elastic supply of hired labor is available at the same wage to all farms.

In some developing countries, particularly those in Latin America, very large farms are common. The labor supply to the farm will therefore not be perfectly elastic. When landowners in a given region possess monopsony power over the local labor market, any increase in employment demand will push wages up. Large landowners will therefore hire fewer workers than will smaller landowners operating in the same area.

The fact that small farms supply labor to the hired labor market might be expected to ensure equality between the marginal product of labor on family farms and the going wage. Frictions in the labor market may prevent this, however, for at least three reasons. First, insofar as individual family workers share equally in total family income, the supply price of each one's labor outside the farm is determined by his average rather than his marginal product (that is, as long as he is interested in maximizing his personal welfare rather than that of the family). Second, a family worker cannot be certain of getting wage work outside his farm when he offers his labor to the market. Thus, in equilibrium the marginal product of small farm labor will be equal to the going wage multiplied by the probability of getting a day's work (the probability is always less than one, and increases with the rate of unemployment in the area). Third, if the daily wage rate in the labor market is held above the market-clearing level by social custom or economic forces, the gap between the marginal product of labor on small farms and the wage rate will increase.

To conclude, agricultural labor markets work in a way that does not ensure equality in the marginal product of labor among farms of different sizes. In particular, the marginal product of family labor on small farms will be low, whereas the marginal product on large farms will be equated to the much higher wage rate (or, in the case of monopsony, to the marginal cost of labor). Further, the cost of labor will probably increase with the size of the labor force on the farm. Therefore, as farm size increases there will be a continuously declining ratio of labor to land.

Imperfect operation of the rental market. Imperfect operation of the labor market is not a sufficient explanation for the divergence in the labor/land ratio among farms of different sizes and the consequent underutilization of land on large farms. Adjustments may take place by way of the land market if the labor market fails. Even if we assume that land sales will not be a significant part of the rural scene because of the capital constraints smallholders face, there is always the possibility that the large landowner may lease part of his underutilized land to smallholders burdened with high labor/land ratios. For widely different factor ratios to persist there must be imperfections in both the labor and the land markets.

It is clearly profitable for the large landowner to lease his land under a fixed rent contract if he is able to charge the economic rent while retaining the right to repossess his land. However, institutional and legal arrangements designed to protect tenant security discourage fixed rent contracts. Small farmers may also

8. Incentive problems are experienced with piece work. But piece work is a viable system of payment only when productivity can be directly related to the individual worker's effort and output can be measured unambiguously.

find it difficult to lease lands because the rent is generally paid at the beginning of the crop year, when the small farmer may have little cash in hand. Moreover, the risks of production (which are very high in peasant agriculture) are borne entirely by the small farmer. Sharecropping evolved as a way of apportioning the risks of farming between landlord and tenant, but sharecropping reduces the renter's incentive because he retains only a portion (typically one-half) of incremented production. Even though the sharecropper has more incentive to increase his productivity than a wage laborer employed by the landlord on a fixed wage, it will be less than under a fixed rent system. In the absence of other constraints, the sharecropper will utilize less labor and other inputs than he will under a fixed rent contract. The landowner seeks to resolve this problem by increasing supervision and by providing nonlabor inputs. (Under a sharecropping agreement the costs of nonlabor inputs are sometimes shared.) Sharecropping therefore is a compromise developed to resolve the incentive problems under a wage contract and the risk-bearing problems under a fixed-rent contract. Supervision by the landlord is less than it is under a wage contract but greater than under a fixed rent contract. Consequently, in regions where landowners cannot supervise adequately (for example, where absentee ownership is common), leasing may not function much better than hiring workers under wage contracts.

Leasing can also be a problem if property rights are not well-defined, as is the case in parts of Africa, where the individual small farmer traditionally had usage rather than ownership rights to the land. In such a system, tenancy contracts are invalid because, by definition, the landlord is not using his land and therefore forfeits his rights over it. Latin America provides examples of the other extreme, wherein land is often purchased only partly for productive reasons. In countries with chronic inflation, landowners may find it attractive to hold land for speculative gain. Large landholdings may also be associated with social control or political power. Such noneconomic reasons for holding land lead to underutilization.

The linkage of credit and land markets. Capital is another important factor in agriculture. The capital may be fixed (for example, in the form of machinery) or it may be working capital that is used to finance inputs, storage, and marketing. In general, credit markets operate imperfectly in the rural sector because large farmers tend to have better access to credit and enjoy better repayment terms. They have this advantage because lenders naturally prefer to do business with borrowers who can provide suitable collateral to protect against default. Since land is the best collateral—and in many cases is the only possible collateral—large landowners pay less for credit.

Sharecropping remedies this imperfection in the credit market to some extent. When a landowner advances credit to a sharecropper, the collateral is the tenancy contract itself. If the sharecropper fails to repay the loan, he loses the land he held as a tenant.

At the same time, if strong legal or institutional constraints prevent large landowners from obtaining credit at a relatively cheap rate and then passing it on to their tenants, capital will be maldistributed in favor of large farms using wage labor. Furthermore, what happens to output or yield depends on whether capital is used to complement or to substitute for land and labor. Empirical evidence suggests that there is substantial substitution of agricultural machines for labor, but not for land. Thus, the availability of cheap capital to large farms leads to the replacement of labor by machines without a significant increase in the productivity of land. As

a result, the problem of dualism may grow worse—more labor may be crowded into the small farm sector without reducing the underutilization of land.

Three Examples of Economic Dualism in Agriculture

An Asian example. Productivity differences in the same sector of an agricultural economy were first noticed in the Malayan rubber industry. Bauer (1946) found that productivity per unit of land was significantly higher on small holdings utilizing family labor than on plantations relying on hired labor. Bauer argued that the difference between these two types of organization was that the former concentrated on maximizing output per unit of land, whereas the latter concentrated on maximizing profits. If there is a gap in equilibrium between the marginal product of family labor (equal to the opportunity cost of such labor) and the wage rate of hired labor, and if both groups act as profit maximizers, the input and output of labor per unit of land will be lower on plantations.

The value of inputs and outputs by size of farm has recently been measured in detail in several Asian countries. This issue gained attention in India when farm management surveys in the 1950s showed that in many areas the input per acre increased as the size of farms (measured in acres per holding) decreased. This increase in input was followed by an increase in output per acre but a decrease in output per unit of input. Thus, although greater input leads to diminishing returns, the marginal returns continue to be positive, as is well illustrated by a study of two districts in Uttar Pradesh in 1955-56 (Mazumdar 1965).

Variations in the cost of inputs by size of farm in these districts are shown in table 2. Bullock labor, the most important input in terms of cost, shows a striking increase per acre as the size of farm decreases. The value of bullock labor was determined by dividing the net cost of maintaining the animals by the number of work days in the farm and in exchange.

Table 2. Cost of Inputs on Uttar Pradesh Farms

<i>Input</i>	<i>Size of Farm (acres)</i>					<i>All farms</i>
	<i>Below 5</i>	<i>5-10</i>	<i>10-15</i>	<i>15-20</i>	<i>20 or more</i>	
Bullock labor	126.0	88.3	74.9	70.6	56.4	76.8
Human labor	64.1	55.7	53.4	48.4	39.4	50.2
Seed	17.8	16.4	15.5	15.5	14.2	15.6
Fertilizer and manures	7.1	9.8	6.7	6.9	6.2	7.5
Upkeep of implements	15.4	12.7	9.4	8.5	7.3	10.1
Rent and cess	9.0	9.0	10.1	9.9	8.7	9.3
Irrigation charges	10.0	8.7	8.8	7.6	7.5	8.3
Interest on owned capital	9.4	8.4	6.4	5.7	5.4	6.9
Total cost	258.8	209.0	185.2	173.1	145.1	184.7
Total cost less bullock labor	132.8	120.7	110.3	102.5	88.7	107.9

Source: Mazumdar (1965).

Thus, the cost of bullock labor per acre does not reflect the actual amount of input, but is related inversely to the degree of utilization of bullocks. The input of bullock labor days per acre shows little variation on farms in various size groups.

Furthermore, given the usual daily rate for hiring a bullock, it appears that if the required days of labor were supplied by hired bullocks, the cost per acre would be about a tenth of the calculated cost per acre for the smallest size crop of farms (where underutilization of bullock labor is greatest). This "uneconomic" preference for owned rather than hired bullock labor is difficult to explain. Epstein (1962, p. 48) suggests two reasons: "First, since the demand is concentrated into certain periods in the year, they are difficult to hire just when needed; secondly, ownership of draught animals and ploughs affects prestige. No farmer is regarded as fully established unless he owns a pair of draught animals and a plough." According to the Uttar Pradesh survey, however, there is no evidence of strong seasonal fluctuations that would sometimes produce full employment of bullock labor. The average period of use of a pair of bullocks there was about seven months a year (part of a day was counted as a full day). Although the intensity of bullock use increases with the size of farm, for farms of up to 10 acres (which account for almost 40 percent of the total area), the intensity of bullock use was well below the average for all farms. As the size of the farm increased, so did the number of bullocks, but even if the intensity of employment per pair of bullocks was higher on the larger farms, unused bullock labor was still substantial.

Although the evidence is less than complete, it strongly suggests that a bullock is not treated as a productive factor but is acquired as an asset, partly for financial security and partly for prestige. If this explanation is correct, the cost of bullock labor should not be included in total input costs.

In table 2, family labor and hired labor are both valued at the prevailing market wage. If it is held that the rate for family labor differs from the market rate for hired labor, the cost will have to be changed, because family labor accounts for a higher proportion of the work on smaller farms. Setting aside questions of valuation, it follows from table 2 that the input of human labor per acre increases significantly as the size of farms becomes smaller. Labor input on farms of less than 5 acres was 60 percent higher than on farms of more than 20 acres.

Capital input can be calculated by adding the expenditures on seed, fertilizer and manures, upkeep of implements, and interest on owned capital. Inasmuch as a part of these expenditures is family labor valued at the market rate of wages, the total may be open to question. However, family labor is a small part of the expenditure, affecting mainly upkeep of implements. Therefore total expenditures on capital services can be considered a reasonable indication of capital input per acre. As table 2 shows, these expenditures increased as the size of the farm decreased.

Given the labor and capital inputs, the ratio of capital input to labor input is as follows:

<i>Farm size (acres)</i>	<i>Ratio</i>
Less than 5	103
5-10	96
10-15	92
15-20	96
Greater than 20	100

As might be expected, these figures show that the ratio of capital input to labor input per acre does not vary greatly among farms of different sizes. If more labor is used

per acre, this presumably entails greater use of seed and manure as well. What is somewhat unexpected, however, is that fixed capital per acre did not increase relative to labor on larger farms.

A rough estimate of the value added per acre on farms of different sizes can be obtained by subtracting all inputs except human and bullock labor from the gross value of output.⁹ If this value added per acre is related to the input of labor in physical terms, the input of labor per acre will increase as the size of the farm decreases, while the value added increases per acre of land and decreases per unit of labor. According to our rough calculations, the index of total value added per acre for farms smaller than 5 acres is 154 (100 for farms larger than 20 acres), whereas the index of value added per unit of labor is only 82. This empirical observation is consistent with the argument developed above in support of labor market dualism.

Thus far, the larger output per acre of smaller farms has been explained by differential prices between family and wage labor. Although the marginal product of labor applied to land diminishes as farm size increases, it remains positive throughout the size range. It does not follow, however, that the marginal product of labor is lower on smaller farms unless we assume that the ratio of average to marginal product of labor is the same for farms in all size classes. If the productivity of labor per unit of land declines more sharply on larger farms, we will observe a higher average product of labor and a lower productivity per unit of land on larger farms, even when the prices of labor (and hence the marginal products in equilibrium) are the same for all sizes of farms. Alternatively, the size/productivity relationship may depend on differences in land quality between small and large farms.

One hypothesis is that the pressure of population on land gradually forces peasants who cannot make ends meet to dispose of small farms except in cases where the land is good enough to assume adequate production and, hence, income. Over time, selection would lead to the concentration of small farms on relatively good land. Bardhan has correctly pointed out that this hypothesis presupposes some imperfection in the land market that prevents the potential buyer's purchase bid from fully reflecting the seller's assessment of its economic potential (Bardhan 1973, p. 1382). Otherwise, there is no reason why the seller would prefer to sell one type of land rather than another. It might be argued, however, that land quality derives not only from the condition of the innate soil but also from the quality of farm management. Land, as well as other factors, may be better managed on small farms.

Difficult empirical problems arise in trying to judge between labor-based and land-based explanations of the size/productivity relationship. The market prices of land with different qualities are hard to collect without careful fieldwork. In farm management studies in India, the only variables affecting land quality that could be used were the availability of irrigation and the degree of cropping intensity. However, neither of these is a conclusive indicator of land quality. The availability of irrigation facilities depends on investment in the construction and maintenance of irrigation channels. Similarly, a higher cropping intensity may be as much a consequence of better land quality as it is of greater input of labor per unit of land. Despite the difficulties in interpreting relevant variables, some attempts have been made to fit production functions to cross-sectional farm-level

9. This assumption derives empirical support from the Uttar Pradesh survey, which shows that the proportion of acreage devoted to the major crops remains roughly the same for all size groups.

data in order to measure the net effect of farm management on the use of labor. Returns to scale reflecting the management factor can also be deduced from coefficients of the production function.

Bardhan's work is a prime example of such efforts. He analyzed selected districts in India in two stages. He first used a Cobb-Douglas production function that enabled him to reach some conclusions about returns to scale: "In paddy agriculture there is evidence for decreasing returns to scale, while the wheat growing districts, by and large, display constant returns to scale. This is consistent with the general impression that in paddy production, at least in some of the operations (like transplanting), one needs a more delicate and complex organization of labor involving high supervision costs" (Bardhan 1973, p. 1385). Bardhan concludes, however, that diseconomies of scale cannot be a general explanation for the greater use of inputs (especially labor) per acre on small farms because this phenomenon is observed in other regions as well.

Bardhan then tries to measure the "pure" effect of farm size on the use of labor per unit of land by estimating a labor use function in which the factors are intensity of multiple cropping, fragmentation per acre, the average wage rate for hired labor, and the net area sown. (Irrigation was omitted, presumably because all farms in the paddy districts studied were irrigated.) In West Godavari, the coefficient for size of farm was not significant, but the other coefficients had the expected signs. In Thanjavur, the size coefficient had a significant negative sign, as did the other coefficients. This result for the latter district also held when farms below a certain size were studied separately from larger farms. Thus, at least in one case labor use per acre correlates inversely with farm size even after allowing for other factors. This suggests that the hypothesis concerning labor market dualism carries some weight.

The Latin American case. Latin America, unlike Asia, has sizable concentrations of large farms alongside small farms. Latifundios in Latin America are generally defined as farms large enough to provide employment for more than 12 people. Minifundios are farms too small to provide employment to a single family (2 workers) at an adequate level of income. Between these two extremes are family farms, which provide work for 2 to 4 people, and medium-sized farms, which provide work for 4 to 12 people. Data on minifundios and latifundios in a few Latin American countries are presented in table 3.

Although a large proportion of the total farmland in these countries is concentrated in latifundios, the value of agricultural production is disproportionately smaller than in minifundios. Even more striking is the fall in employment of labor per unit of land, as can be seen by comparing the proportion of labor employed with the proportion of land area in each size group.

In Latin America, as in Asia, there is an inverse relationship between farm size and labor/land ratio. The productivity of labor increases with farm size, but not sufficiently to compensate for the fall in labor input per hectare. Hence, land productivity falls. This relationship has been studied in detail both in Latin America and in Asia (see Berry and Cline 1979). The results for Brazil are particularly interesting because two studies were conducted there: one in the late 1960s in seven of Brazil's principal agricultural states and one in 1973 in the northeast (Cline 1970; Berry and Cline, 1979).

Table 3. Minifundios and Latifundios in Selected Latin American Countries
(percent)

	<i>Minifundios</i>		<i>Latifundios</i>	
	<i>Farms</i>	<i>Occupied land</i>	<i>Farms</i>	<i>Occupied Land</i>
Argentina	43.2	3.4	0.8	36.9
Brazil	22.5	0.5	4.7	59.9
Colombia	64.0	4.9	1.3	49.5
Chile	36.9	0.2	6.9	81.3
Ecuador	89.9	16.6	0.4	45.1
Guatemala	88.4	14.3	0.1	40.8
Peru	88.0	7.4	1.1	82.4

Source: Furtado (1970), p. 54.

The percentage of farms in different size groups in 1960 was as follows:

<i>Farm size (hectares)</i>	<i>Percentage</i>
Less than 10	2.4
10-100	19.0
100-1,000	34.4
1,000-10,000	28.6
Greater than 10,000	15.6

In the same year, roughly one-third of Brazil's farm workers worked on farms with fewer than five workers, and 2.3 million of its 3.3 million farms made no use of hired labor. Consequently, Brazil had a sizable family farm sector at that time. However, farm size in Brazil (as in other countries of Latin America) varies greatly and thus makes it more difficult to determine how farm size relates to productivity. Two factors in particular have bearing on the situation in Latin America:

- The index of land productivity covers the degree of effective utilization of land as well as value added per hectare. An important aspect of Latin American agriculture is the extent to which available land is not used for growing crops or as pasture.
- Agricultural capital is an important input in the production techniques of Latin American farms above a certain size. Thus, variations in capital/land ratios by farm size need to be taken into account as much as differences in labor/land ratios. Equally, the price ratios of all three factors enter into any explanation of observed differences.

Cline investigated production efficiency in relation to farm size using detailed economic data from 17 sectors of Brazilian agriculture. His most striking conclusion was that land-use intensity and value added per acre decline continuously, and to a marked degree, with increases in farm size over the entire range of Brazilian agriculture (see table 4).

In his 1973 study, Cline tested further the hypothesis of declining productivity by controlling for product combination. Again, productivity declined with rising farm size in all product sectors, even when land prices (representing land quality) and the incidence of sharecropping were taken into account (see Berry and Cline

1979, table 4-3, p. 50). Factor combinations also shifted as expected—namely, away from labor toward capital. The elasticity of the use of labor with respect to farm size was only 0.38, meaning that the labor/land ratio declined rapidly as farm size increased. At the same time, the elasticity of capital use with respect to farm size was 0.63. That is, the use of capital also fell with an increase in farm size, but at a much slower rate than labor, so that the capital/labor ratio was consistently higher with increasing farm size. The use of purchased inputs had an elasticity of 0.69. According to Cline, the closeness between this elasticity and that for capital suggests that it is the imperfections in the capital market more than any inherent inferiority in capacity for modernization that leads small farmers to use fewer intermediate inputs (such as fertilizers) than larger farmers, relative to the labor used.

Table 4. Land Productivity in Brazilian Agriculture

Sector	Percentage of usable farm area in crops plus effective pasture		Value added per constant quality hectare of farm area	
	In smallest size group	In largest size group	In smallest size group	In largest size group
Cerea cotton	100.0	41.3	311	67
Pernambuco cotton	78.0	43.4	140	83
Espirito Santo coffee	74.8	48.1	297	132
Sao Paulo coffee	92.5	46.0	867	422
Sao Paulo cereals	90.1	47.3	845	97
Rio Grande rice	94.2	70.2	433	89
Minhas Gerais corn	93.7	14.4	683	75
Sao Paulo cattle/general	90.2	20.3	775	81
Cerea cattle	100.0	41.5	149	8
Espirito Santo cattle	97.8	36.3	40	72
Minhas Gerais cattle	100.0	14.6	400	120
Rio Grande cattle	90.7	21.2	290	21
Alagoas sugar	n.a.	n.a.	4.61	8.31
Pernambuco sugar FGV	100.0	41.8	298	305
Sao Paulo sugar	n.a.	n.a.	16.64	15.02

n.a. Not available

Source: Cline (1970), tables 12 and 14. The smallest size group is less than 10 hectares and the largest more than 1,000 hectares.

The results from Cline's two studies could only be compared for livestock and sugarcane. Cline concluded that the negative relationship between farm size and output per farm remained practically unchanged over the period, as did factor elasticities. If anything, there was a slight increase in seed/fertilizer elasticity, which suggested an accentuation of distortion against labor.

Better data on factor use from the 1973 study enabled Cline to measure the "total social productivity" farms of six size groups (in hectares): 0-9.9, 10-49.9, 50-99.9, 100-199.9, 200-499.9, and 500 or more. He related total output to the value of inputs evaluated at alternative "social" prices (to represent their true opportunity costs). A social price of 15 percent per annum was applied to the asset values of capital and

land, while shadow wage rates were applied to labor, using the regional minimum wage as the benchmark. This was done in six regions. The following patterns emerged from the analysis: (1) In general, total social factor productivity declined as farm size rose, reinforcing earlier conclusions. (2) The decline was more rapid (and the total factor productivity of small farms considerably higher) when a zero social price was applied to labor. This pattern reflects the relatively heavy use of labor as a production input on small farms. (3) When the social price of labor was half the minimum wage, total factor productivity tended to be higher in the second and third size groups than in the first, or smallest, size group. This finding indicates that when some social cost is applied to labor, the smallest farms turn out to be using too much labor (just as the larger farms, size groups 4 to 6, are using too little). (4) When the full minimum wage was used as the price of labor, total factor productivity still declined as farm size rose in four of the seven regions (see zones A, D, E, and G in table 5). This result suggests that, in addition to a higher effective cost of labor in comparison with small farms, large farms perceive a lower opportunity cost of land and capital (such that only with a correspondingly lower imputation of capital cost for these size groups would their total factor productivity rise to levels found on smaller farms, even when the full minimum wage is used as the cost of labor).

The African case. Some recent research suggests that the underutilization of land may also be a problem on large farms in Africa. In this case, however, the labor and capital markets—particularly those in Sub-Saharan Africa—are much less developed than they are in Asia or Latin America, and land markets seem to function even less efficiently. The situation in Africa can be traced to its historically low population density, abundance of land, and absence of proprietary land rights. In these circumstances, there is no market for land. The prevalent form of farming is cultivation by those occupying the land. The supply price of labor is determined by average productivity per unit of land. But since hired labor needs supervision, the productivity of labor after the costs of supervision are deducted will not be higher than the average productivity under self-cultivation as long as land is abundant and there are no diminishing returns. Thus, a market for wage labor does not develop. Since land is a most important form of collateral in a peasant sector, the absence of land sales also means that credit markets will be limited. Livestock is the most important form of wealth in Africa, but livestock constitutes poor collateral and has no effect on the formation of credit markets (see Binswager and McIntire 1984).

In many parts of Africa, however, the recent population growth has made good land more scarce. Much of the best land had already been appropriated by various groups, starting with European settlers. Once proprietary rights were established, substantial differentiation in household prosperity occurred. Survey data from Kenya, for example, show large variations in landholdings, household labor, and assets. A 1980 survey showed the following distribution of land and labor:¹⁰

The use of hired labor does little to equalize labor use per unit of land. Hired labor forms only a small component (about 10 percent) of total labor input. Furthermore, the use of hired labor in the smallholder sector is the opposite of what is needed to reduce differences in the land/labor ratio. There is a clear inverse relationship between farm size and hired labor per hectare. The estate sector within

10. Bayer (1980), quoted by Collier (1983), p. 145. The discussion here is based on Collier's study.

Kenyan agriculture gives smallholders the opportunity to sell their labor, but the contribution that this labor market makes to the equalization of land/labor ratios is ambiguous. As Collier (1983, p. 149) notes, "The difference in factor proportions between the smallest and the largest classes is reduced from 19:1 to 16:1, but the absolute difference in land per unit of labor actually widens."

<i>Farm size (hectares)</i>	<i>Population (%)</i>	<i>Land area (%)</i>	<i>Value added (%)</i>
Less than 0.5	13.5	1.5	1.5
0.5-1.9	42.0	21.0	16.4
2-4.9	27.4	41.2	41.8
Greater than 5	17.1	36.2	40.3
Total	100	100	100

Other characteristics of the farming sector reinforce the effects of market failure. First, there is a substantial degree of absentee ownership (as high as 30 percent in the Central Province of Kenya, which increases the costs of supervising hired labor. Moreover, absenteeism takes the form of husbands working for wages elsewhere while the wife remains in charge of the farms. Social anthropologists have suggested that in male-dominated societies female supervisors are likely to be less effective in controlling hired workers who are typically male. Second, the wages of hired workers must be paid before farm output is sold. Thus, there is a significant cash-flow constraint in the hiring of labor. This constraint explains why a small amount of hiring takes place but not why small farms might be hiring more labor per hectare.

The availability of subsidized credit is directly related to farm size. One explanation is that banks will make loans if the borrower is employed in the formal sector. Thus, it may be worthwhile for smallholders to work for wages and finance their land with a bank loan. Paradoxically, regular wage employment becomes a prerequisite for the use of hired labor on the farm. Although large estates provide some opportunities for wage labor that the smallholder sector is able to provide, the estate labor market suffers from extensive geographical segmentation.

As explained earlier, the imperfect working of the hired labor market is not a sufficient explanation for not equalizing factor proportions across farm size groups. The same result could be achieved by land sales and leasing transactions. The land market, however, seems to work slowly. In Bayer's 1978 survey of Kisii, only 3 percent of the total land area held by smallholders had been acquired by purchase. Another 6 percent (including land left with relatives) had been rented. Other surveys have also shown the limited extent of land tenancy in Kenyan agriculture. Sharecropping, an important institution in Southeast Asia, is virtually nonexistent in Africa. Collier (1983, p. 159) explains the lack of land leasing as follows:

Probably the most important constraint upon tenancy is that in the absence of any tradition of tenancy there is no social value system enforcing the contract. As a consequence, the landlord sees himself as risking a permanent loss of proprietary rights because of the difficulty of ensuring physical repossession of the land. Traditional East African law is complex and variable. However, a universal feature is the absence of a capitalist concept of individual property rights.

Table 5. Total Social Factor Productivity by Farm Size Group, Northeastern Brazil

Zone	Size group	At zero labor cost (1)	At labor cost one-half minimum wage (2)	With labor cost at minimum wage (3)
A	1	1.134	0.717	0.525
	2	1.177	0.814	0.622
	3	1.173	0.848	0.664
	4	0.786	0.632	0.528
	5	0.509	0.446	0.398
	6	0.601	0.527	0.469
B	1	1.254	0.806	0.594
	2	1.744	1.125	0.831
	3	1.445	0.967	0.726
	4	1.180	0.900	0.728
	5	1.036	0.676	0.676
	6	1.215	1.022	0.882
C	1	1.316	0.771	0.545
	2	1.532	1.036	0.783
	3	1.492	1.110	0.884
	4	0.689	0.600	0.532
	5	1.290	1.044	0.876
	6	0.977	0.861	0.769
D	1	n.a.	n.a.	n.a.
	2	0.833	0.603	0.603
	3	1.145	0.981	0.859
	4	0.381	0.350	0.323
	5	0.381	0.356	0.335
	6	0.257	0.249	0.242
E	1	1.885	1.422	1.142
	2	1.201	0.924	0.758
	3	1.318	1.082	0.918
	4	1.065	0.909	0.794
	5	1.218	1.016	0.871
	6	0.132	0.130	0.129
F	1	2.122	1.355	0.996
	2	1.412	1.234	1.097
	3	0.997	0.944	0.895
	4	1.395	1.306	1.210
	5	1.132	1.073	1.020
	6	n.a.	n.a.	n.a.
G	1	2.530	1.532	1.098
	2	1.157	0.884	0.715
	3	1.205	1.007	0.864
	4	0.790	0.681	0.599
	5	0.698	0.623	0.563
	6	0.351	0.298	0.259

n.a. Not available

Note: Total factor productivity equals $q/[0.15(V+k) + w^*N]$ where q = gross receipts per area, V = land value per area, k = capital value per area, N = man-years per area, and w^* = social price of labor (zero or 1/2 minimum wage for columns 1 and 2 respectively).

Source: Berry and Cline, (1979), table 4-7.

Thus, it appears that landholding arrangements in Kenya have not yet changed from the traditional system based on use to a system based on ownership rights to land. The difficulty of enforcing property rights may also explain the perverse

relationship between land and credit transactions noticed by Collier. In contrast to sharecropping, rent is generally not paid out of the proceeds of production over a period of time. Instead, all the rent is paid at the start of the contract, the rental periods being one to three years. Although the severe cash flow problems posed by this practice limit the spread of tenancy, it is not hard to see why the system endures. Since property rights are weakly enforced, landowners fear that they will be unable to ensure full payment unless they require it in advance.

Policy Implications: Dualism in Agriculture

A number of government policies may be used to combat dualism in agriculture. Such policies should be designed to bring about a better match between surplus labor resources in the small farm sector and surplus land resources in the large-scale sector. This can be done in part by redistributing land to small cultivators. Redistribution can increase agricultural productivity as well as improve the distribution of income. Despite the beneficial effects of land redistribution, it has met with substantial political opposition in many countries. In Latin America, where the effects of land redistribution would probably be particularly significant, land reform has been rare except in association with political revolutions (notably in Mexico and in Cuba).

If land reform is not possible because of political obstacles, then government policies should encourage tenancy or sharecropping. This would mean strengthening the legal and administrative structures that protect property rights and would make it easier to enforce contracts. Land reform that ignores the legal existence of tenancy without conferring rights of ownership on the tenants generally achieves the worst of both worlds. Similarly, tenancy laws (such as the *Statuta de Terra* in Brazil) that make it hard to evict tenants and limit the landlord's share of the harvest adversely affect the opportunities of workers with little or no land to become sharecroppers. Under such legal restrictions, tenancy agreements tend to be informal short-term arrangements, or else landowners attempt to divert land from tenancy to less labor-intensive operation or idleness. Economic dualism can also be made worse by policies that provide incentives for the concentration of landholdings, and those that encourage less labor-intensive production on large holdings.

Tax policy. In many countries the tax system directly or indirectly favors ownership of land. Brazil offers a case in point. Agricultural income in Brazil is, in principle, subject to income tax. However, investment is given favorable treatment, and the costs of modern agricultural inputs can be deducted from gross agricultural income. If expenditures for farm inputs and agricultural investment allowances exceed the current year's income, they can be carried forward to the next year. Virtually all agricultural income in Brazil is therefore free of taxation, and agricultural land can be used to shelter nonagricultural income. Under normal circumstances, these tax preferences are capitalized into land values—that is, the price of land is increased to reflect its tax advantages. However, this capitalization is not complete, since buyers and sellers of land are subject to different rates of taxation. When, for example, the capitalization reflects the average tax rate, those who would normally pay a higher rate will benefit from investing in land. Thus, the tax system promotes greater concentration of landholdings.

Suggestions for mitigating or reversing the effects of such tax policies have included a progressive land tax (the larger the farm, the higher the tax) or a tax on potential rather than actual farm income. Under a progressive land tax more of the land and labor on large holdings would be used to produce commodities whose returns would be needed to pay the higher tax. A tax on potential income would raise the cost of holding land idle for portfolio purposes and probably ensure that more land would be used for production.

Although it has been maintained that a land tax can usually garner more political support than land reform (see Berry 1973), there is little evidence that a land tax would be an effective instrument in dealing with economic dualism. Where this policy instrument has been used, the tax rate was minimal and failed to take inflation into account, and tax collection was not very effective. Properly applied, however, a land tax would assist in diverting underused or idle land to small farmers, even though it might encourage tenancy rather than small family farms in the absence of long-term financing for land purchases.

Credit policy. Many governments have established methods for providing cheap credit to those in the agricultural sector. This approach tends to accentuate economic dualism if it is applied to the agricultural sector as a whole since large farmers with better collateral will obtain the bulk of the subsidized credit. Similarly, interest rate subsidies will have little effect on dualism if they do not include specific provisions for channeling the funds to the small-scale sector. When Brazil, for example, arranged with banks to extend loans to small farms at lower interest rates, the loan funds eventually dried up because large landowners were able to pay higher interest rates, which were of course, to the bank's advantage. In principle, it should be possible to channel subsidized credit through special credit windows, with access limited to smallholders, but in practice such schemes have been extremely difficult to implement. Two problems, in particular, have yet to be overcome.

First, the credit subsidy creates rents of substantial magnitude in the rural economy to the extent of the subsidy. The more powerful groups in society with large land and other assets are precisely the ones most likely to succeed in capturing this rent. Second, owing to the fungibility of funds, cheap loans can be substituted for an individual's own funds or equity. The funds so freed then flow into other sectors that were not targeted to receive subsidized credit. During the 1970s in Brazil, there was a rapid increase of subsidized credit to agriculture, but a substantial part of that credit apparently found its way to the thriving industrial sector. This was no doubt the case in 1975-78 when agricultural credit reached levels equal to total value added in agriculture, and in the many instances in which "the total area for which farmers got subsidized credit for a particular crop was larger than the area actually harvested for that crop" (World Bank 1986, p. 98). Credit subsidies, amounting to as much as 5 percent of GDP, created severe resource costs in the rest of the economy and may have added strength to the country's spiraling inflation at that time.

Policies of subsidizing agricultural inputs: machinery. Many governments have used subsidies to support key inputs in agricultural production, notably machinery and fertilizer. Although such subsidies can help to increase agricultural production, they can also accentuate the problem of economic dualism. At times, subsidies may be detrimental to the distribution of income in the sector, and may also damage productive efficiency in the long run.

Explicit or implicit subsidies for agricultural machinery have been the most serious offenders in this respect. In many developing countries there has been an underlying belief in the superiority of mechanized agriculture, which is generally associated with an unsubstantiated faith in economies of scale. The problem of economic dualism is rarely understood or recognized by this school of thought, whose proponents have instead devised various methods to subsidize the purchase of agricultural machinery—such as the preferential allocation of rationed foreign exchange for machinery imports in an economy with an overvalued currency.

This method has been used in countries as diverse as Colombia, Egypt, India, Indonesia, and Pakistan. In some countries, tariffs on agricultural machinery imports have been significantly lower than tariffs on other imported goods. In other countries, tax policy—in particular, accelerated depreciation—has also favored mechanization. Brazil created a valuable tax shelter by allowing a deduction from farm income that amounted to six times the value of farm machines during their first year in use. Thus tax losses (which could be carried forward) were generated whenever large machinery purchases were made. The effective price of farm machines relative to labor and animal power was substantially reduced—livestock investment was treated much less favorably and labor costs enjoyed no preferential tax treatment.

In the extensive discussions on agricultural mechanization that took place in the 1960s, economists were unable to agree on its net welfare effects. Some of the analysis failed to take into account the differential impact of mechanization on farms of different sizes. If attention is confined to the impact of mechanization on agricultural output as a whole, it will be seen that mechanization affects profitability in two ways. First, machines substituted for human labor or animal power can increase profits. Second, machines can make certain types of agricultural operations economically feasible for the first time (that is, by shifting the production function outward). Both effects depend on wage rates and bullock costs. But the substitution effect is likely to favor mechanization at much higher wage rates than what might be called the “technology” effect. It would be highly unusual to find it socially profitable to substitute machines for labor, given the high degree of unemployment and underemployment in the agricultural sector of many developing countries. According to some authors, however, bullock and labor costs are so far beyond the low threshold that they no longer allow the farmer to employ enough human and animal resources to achieve the speed and intensity of operations required for multiple cropping. The substitution effect of machines for labor cannot be expected to increase output dramatically except in those special cases where mechanical investments have been delayed after initially showing a cost advantage.¹¹ Mechanized production, if it in fact makes certain production functions feasible for the first time, can nonetheless be expected to have large effects on production.

A correct decision can only be made through empirical rather than theoretical research. After an exhaustive survey of empirical work in South Asia, Binswanger (1978, p. 73) concluded: “Tractor surveys fail to provide evidence that tractors are responsible for substantial increases in intensity, yields, timeline, and gross returns on farms in India, Pakistan, and Nepal. At best, such benefits exist but are so small that they cannot be detected and statistically supported, even with very

11. The historical experience of Japan and Taiwan shows the high technical substitutability of bullock- and tractor-powered operations.

extensive survey research efforts. This is in marked contrast to new varieties of irrigation, where anybody would be surprised if he failed to find statistically significant yield effects, even in fairly modest survey efforts."

The consistent and strong conclusion emerging from empirical research suggests that tractors are substitutes for labor and bullock power along fairly stable production functions. It follows that the impact of subsidizing purchases of tractors and other agricultural machines will be felt chiefly on large farms, where labor costs are higher and increase with the volume of employment. That is to say, subsidies for tractors simply increase the incidence of economic dualism in agriculture, as noted in the World Development Report of 1986: "In Brazil, as industrialization took place in the State of Sao Paulo, labor was drained from rural areas to meet the growing demand for urban labor. In the face of rural labor scarcities, the degree of mechanization would have been limited by migration of labor from northeast. However, the government provided large subsidies in an effort to build a farm machinery industry and eliminated payments in kind to labor; this deterred the use of labor and enabled the southern region to compete in the production of sugarcane by neutralizing the northeast's advantage of lower labor costs. While sugarcane became profitable in the south, resources were diverted from other crops that had a higher international value" (World Bank 1986, pp. 97-98).

Evidence that subsidies for machinery increase the profitability of large farms and lead to greater land concentration is also available from South Asia, particularly the green revolution areas of the Punjab in India and Pakistan.

Policies of subsidizing agricultural inputs: fertilizer. Many developing countries subsidize fertilizer, as noted in the 1986 World Development Report: "Rates of subsidy for fertilizer in the early 1980's were rarely below 30 percent of delivered cost and were in some cases 80 to 90 percent (in Nigeria, for example). Rates of 50 to 70 percent are common" (World Bank 1986, p. 95). This type of subsidy is easy to administer, particularly when the state has a monopoly on the distribution of fertilizer.

The decision to subsidize fertilizer is usually based on the desire to accelerate the pace of technical progress using the new hybrid seeds, which have higher responsiveness to fertilizer; and the desire to help small farmers who suffer from a shortage of credit and working capital. It is not clear that the two aims are wholly consistent.

FERTILIZER PRICING AND INNOVATION IN AGRICULTURE. According to the theory of innovation in agriculture, the price of fertilizer is at the center of the story. As is well known, technical progress in agriculture can be divided into two broad types: technological innovation, which involves the use of agricultural machinery and thus increases the productivity of labor rather than that of land; and biological innovation, which makes use of better seeds and thus increases the productivity of land more than that of labor. In general, then, machine-based progress in agriculture is labor saving and is more appropriate to economies with plentiful land but shortages of labor, whereas biological innovations are land saving and are particularly suited to relieving the constraints on growth in agricultural economies with a high density of labor per unit of land. Research on technological progress in agriculture in individual countries as well as studies of variations in technology across countries have already established the importance of the relative supply of the two factors of production in determining the nature of the agricultural

technology adopted (see, in particular, Hyami and Ruttan 1971). Figure 1 gives a cross-sectional picture of countries with different combinations of fertilizer per hectare and mechanical power per worker in their farming sectors. Land-abundant countries like the United States and Australia are far out on the X-axis, as they make use of a great deal of mechanical power per worker and a relatively small amount of fertilizer per hectare. The reverse is true of densely populated countries like Japan and Taiwan, which are therefore far out on the Y-axis.

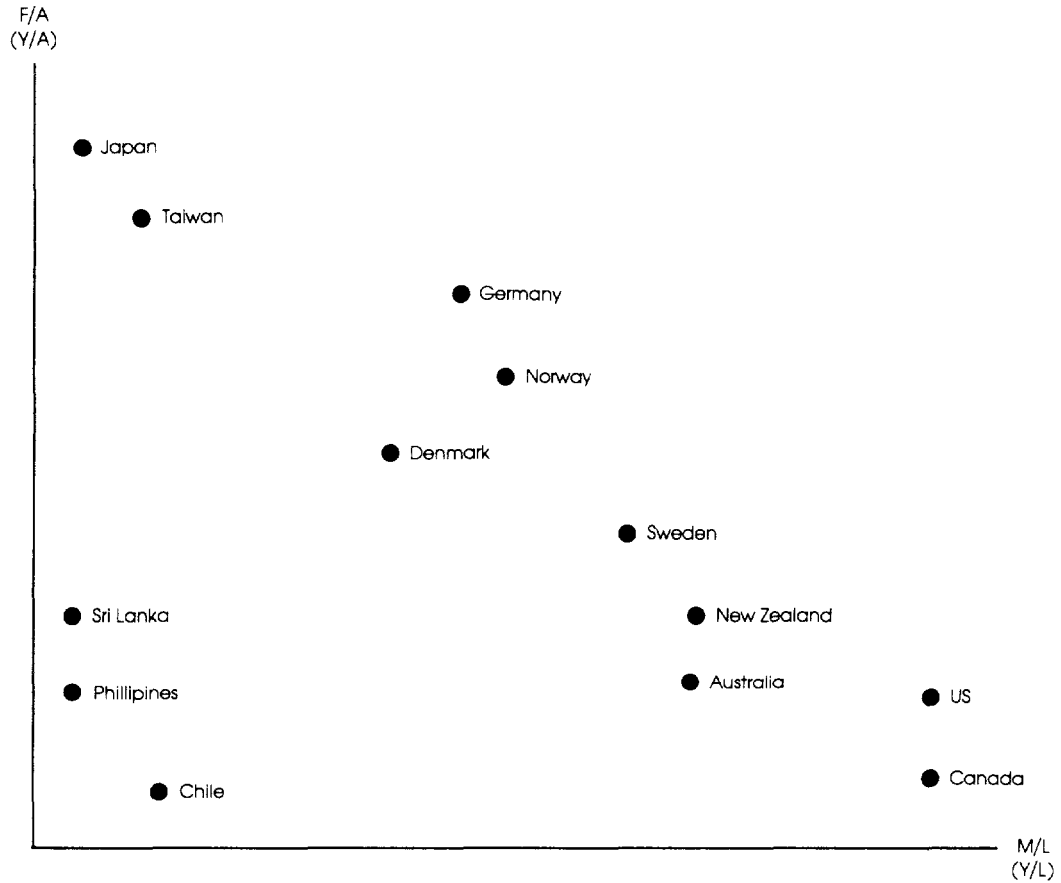
European countries occupy an intermediate position between the other two groups and are thus located in the northeast region of the graph. If we measure productivity per worker rather than machinery per worker on the X-axis, and income productivity per hectare rather than fertilizer used per hectare on the Y-axis, the general position of the countries in the graph remains unchanged. This confirms empirically the point made earlier that machine-intensive technology increases labor productivity relatively more than land productivity, and vice versa for fertilizer-intensive technology. Many developing countries are located close to the point of technological origin in the graph. They have yet to climb some distance up the available ladder of technologies and suffer from relatively low use of both fertilizer and machinery (and hence low levels of both land and labor productivity).

In studying the evolution of technologies in agriculture over time, Hyami and Ruttan have also found that countries with such diverse resource endowments as Japan, Denmark, and the United States have followed alternative paths of technological progress, responding to relative factor prices, which in turn represented reasonably accurate indicators of relative factor endowments. Countries like the United States, with their high and rising wage-rent ratios, have moved in an easterly direction on the graph, following a path of labor-saving technological progress. At the other extreme, Japan and Taiwan have moved in a northerly direction, employing land-saving innovations in response to the rising price of land relative to labor.

Another important point to note here is that the relative price of fertilizer rises in step with progress of the biological (land-saving) type. As already mentioned, the high-yielding varieties of seed are responsive to the use of fertilizer, so that one would expect this type of progress to be highly sensitive to the real cost of fertilizer. Consider, for example, the close association in Japanese agricultural history between the fall in the fertilizer/rice price ratio and the increase in the rice yield per hectare over time (table 6). Between the 1880s and 1960s the fertilizer/rice price ratio dropped to a tenth of its original value. The rice yield increased significantly in successive periods, in step with the fall in the price ratio.

Table 6 also shows that even in the 1960s the fertilizer/rice price ratio in the other Asian countries was two to three times higher than in Japan, and rice yield per hectare was correspondingly a third or less of the yield in Japan. The empirical evidence seems to strongly suggest that the fertilizer/rice price ratio is an important determinant of the level of adoption of the hybrid seed technology.

Figure 1: International Comparison of Countries
by Technology and Productivity in Agriculture



Source: Based on Hyami and Ruttan, Figures 4-1 and 4-2 (1971).

Note: Appropriate cross section picture of selected countries in 1957-62 showing levels of fertilizer per hectare (F/A) and horsepower per male worker (M/L) or, output per hectare (Y/A) and output per male worker (Y/L).

Table 6. Fertilizer/Rice Price Ratios and Rice Yields per Hectare in Selected Asian Countries, 1883-1962

Country	Currency unit	Price of fertilizer per metric ton of nitrogen (1)	Price of rice per metric ton of milled rice (2)	Fertilizer/rice price ratio (1)/(2)	Rice yield per hectare in metric ton of paddy (3)
Inter-country comparison, 1963-6					
India	rupee	1,750	595 ^a	2.9 723 ^b	1.5 2.4
Pakistan (East)	rupee	1,632	780	2.1	1.7
Philippines	peso	1,048	530	2.0	1.3
Thailand	U.S. dollar	229	70	3.3	1.6
Japan	1,000 yen	97	99	1.0	5.0
1955-57					
India	rupee	1,675	417 ^a	4.0 505 ^b	1.3 3.3
Pakistan (East)	rupee	1,322	511	2.6	1.4
Philippines	peso	962	352	2.7	1.1
Thailand	U.S. dollar	393	79	5.0	1.4
Japan	1,000 yen	119	77	1.5	4.8
Japan's time series					
1958-62	1,000 yen	100	85	1.2	4.9
1953-57	1,000 yen	113	75	1.5	4.2
1933-37	yen	566	208	2.7	3.8
1923-27	yen	1,021	277	3.7	3.6
1913-17	yen	803	125	6.4	3.5
1903-07	yen	815	106	7.7	3.1
1893-97	yen	670	69	9.7	2.6
1883-87	yen	450	42	10.7	n.a.

n.a. Not available.

a. Price in Sambalpur (Orissa).

b. Price in Bombay

Source: Hyami and Ruttan (1971), table 9.1, p. 195.

Notes: (1) Price paid by farmers. Inter-country data: average unit of nitrogen contained in ammonium sulphate; 1963-65 data are the averages for 1962/63 to 1964/65; 1955-57 data are the data for 1956/57; government subsidies of 50 percent for 1963-65 and of 40 percent for 1955-57 are added to Pakistan's original data. Japan data: average unit price of nitrogen contained in commercial fertilizers. (2) Wholesale price at milled rice basis. Japan data are converted from brown rice basis to a milled rice basis assuming 10 percent for processing cost. (3) Japan data are converted from a brown rice basis to a milled rice basis using 0.8 for a conversion factor.

Hyami and Ruttan have used this piece of empirical evidence as a point of departure for their model of induced innovation.¹² The curve marked I in figure 2 is the envelope of production possibility curves with a particular pre-“green revolution” technology, and the fertilizer/rice price ratio is given by the slope of line A. The profit-maximizing point is achieved by a representative farmer at the point A with a low level of fertilizer use. Suppose that the relative price of fertilizer now falls so that the new price ratio is given by the slope of the line B, with a new equilibrium at a point like B. The fall in fertilizer price—even with the unchanged package of available techniques—leads to a modest increase in fertilizer use and yield. But the change in the price ratio precipitates a search for new technology. Consequently, larger amounts of resources are devoted to research and development in seed varieties that are biased toward saving the increasingly scarce factor (land) and using the increasingly abundant factor (fertilizer). In due course a new envelope of production possibility curves (marked II) develops. The new fertilizer/rice price ratio equilibrium is now achieved at point C rather than point B. More fertilizer per hectare is used, giving a substantially higher yield per unit of land.

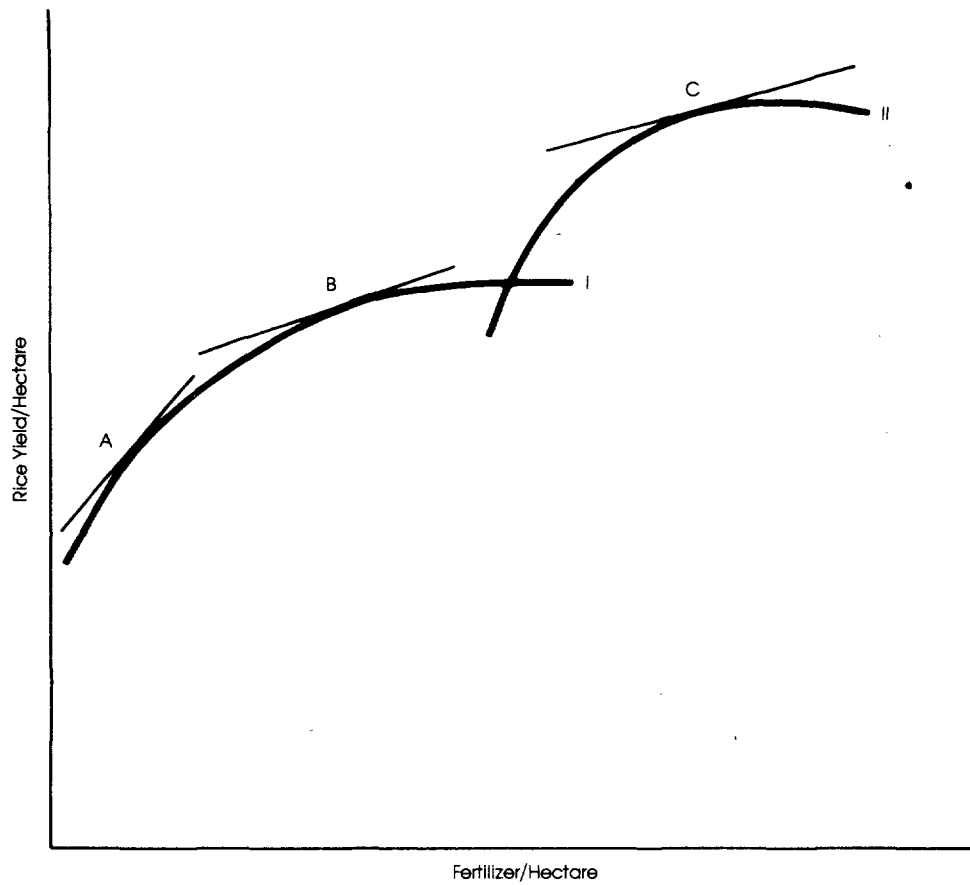
Models like that of Hyami and Ruttan help to explain the concern of many developing countries with fertilizer prices—and their policies of subsidizing the use of fertilizer. The relative decline in the price of fertilizer is, of course, not a sufficient condition for developing and applying the new technology, but it could be a necessary condition. Hyami and Ruttan also stress the importance of institutional transfer and innovation, particularly the responsiveness of public and private institutions to the pressures from farmers for progress in technology appropriate to the trends in factor supply. In part, it is the development of scientific knowledge that facilitates the transfer of technology to new areas and in part it is the building of institutions—both public and private—that provide an efficient system of delivery of inputs and a means of overseeing the process of adoption. Hyami and Ruttan noted that in the case of rice, the transfer of high yielding technology to the tropics was delayed in the 1950s by a lag in institutional research despite a fall in the fertilizer/rice price ratio. When that capacity emerged in the 1960s, the new varieties were sufficiently superior to the local varieties in many tropical areas that simple material and design transfer provided a powerful source of productivity growth in many areas.

FACTOR PRICING, INNOVATION, AND DISTRIBUTION OF INCOME IN AGRICULTURE. Economic dualism means that credit is cheaper (without being more readily available) for larger farms, and that labor is more costly. This will affect the proportions in which small and large farmers use labor and nonlabor inputs even if both groups have adopted the new technology. Insofar as the new technology imposes some capital costs—particularly a larger need for working capital—it is likely to be adopted at a slower rate by small farmers.

The varying response of small and large farms to the new technology has implications for both equity and efficiency. The importance of the green revolution for densely populated areas lies in its labor-using and land-saving bias. But if economic dualism encourages large farms that have been underutilizing their land resources to adopt the technology, the beneficial effects of the technology in

12. The model draws on earlier work by Hicks (1932) and by Kennedy (1964). See also Ahmed (1966).

Figure 2: Alternative Agricultural Technologies and Fertilizer/Rice Price Ratios



Source: Based on Hyami and Ruttan, 1971.

producing more appropriate use of factors of production may be thwarted. Indeed, some large farms facing an inelastic supply of labor may respond to the increase in volume of production by introducing mechanization. Similarly, insofar as commercial fertilizer is a substitute for farm-produced fertilizer, excessive use of the former could also reduce the demand for labor.

How does the policy of subsidizing the use of fertilizer fit into this view of the green revolution? The objective of many well-intentioned government policies is to offset the lower cost of capital to large farms by lowering the cost of fertilizer, and hence the need for working capital, for small farmers. To be successful, however, such a policy must lower fertilizer costs only for small farmers. If the cost is lowered uniformly for farmers of all size groups, it does nothing to correct the distortion created by the availability of cheap capital to large farms. In some regions, the combination of distributive systems and rural power structure is such that benefits of the fertilizer subsidy go disproportionately to the large farmers. Economic dualism is thus accentuated rather than relieved.

The difficulty that small farmers experience in securing adequate credit to meet the cost of cash inputs—including fertilizer, pesticides, and hybrid seeds—has been demonstrated in a number of field studies in India, Bangladesh, and Pakistan (see, for example, Bhalla 1979; Berry and Cline 1979; Khan 1975; and Rochin 1973). However, the general ownership of land has not yet been determined. The central problem is that technological change in agriculture is accompanied by other institutional changes affecting the distribution of ownership as well as operational holdings. Although there may be some interaction between the two—at one extreme, some authors have suggested that the technological change is the exclusive factor affecting distribution—other factors must also be considered, such as the difference between the short- and long- run effects, the differential effects on the landless and others, and on family workers and hired labor (see Lipton 1978).

Even a quick survey of available case studies shows that the green revolution has not shifted the balance of gains to small farmers. The new technology is labor using and land saving, but is not characterized by important economies of scale. Other things being equal, one might expect it to be biased toward small farms with their higher ratio of labor to land. The fact that this has not happened must be at least in part due to the preferential access of large farmers to credit, fertilizer, and new seed varieties.

Three other points should also be mentioned. First, some authors have argued that the green revolution, insofar as it augments land supply, relieves population pressure to some extent. Villages or regions that have not been touched by the green revolution will show the usual Ricardian effects of population pressing on land, with rising rental shares. Labor is better off with the green revolution than without it (see Hyami and Kikuchi 1980). That argument—and some of the evidence in support of it—is incontrovertible. What this argument overlooks, however, is the distribution of income within those areas affected by the green revolution. Labor (and labor-intensive small farmers) in these areas would have been better off and could have performed even better but for economic dualism.

Second, it is well to remember that the new technology depends on the availability and control of a water supply. Thus, the regions that have been most affected by the green revolution have generally been the more prosperous ones with developed irrigation systems. In the prosperous areas, larger farmers tend to have more control over the distribution of irrigation water. The green revolution thus emphasizes interregional disparities in yet another way.

Third, the distinction that has been made here between "large" and "small" farmers may be too simplistic. It may be that the combination of the labor-intensive aspects of the new technology (which favor small farmers) and the impact of economic dualism (which favors large farmers) benefits medium-size farms most. This trend might also be given some impetus by land ceilings and by the fact that the increase in economic returns from farming may induce many absentee landlords to return to owner cultivation (see, for example, Vyas 1980).

3. The Urban Labor Market

It has long been recognized that urban labor markets in developing countries have two distinct sectors—the formal and the informal. These parallel the “primary” and “secondary” sectors of labor markets in developed countries (Deringer and Piore 1971). This distinction is based on the belief that differences in earnings in the two segments are not entirely due to differences in the quality of the worker—as measured typically by the quantifiable human capital variables, experience and education. Certain additional factors cause the level of earnings in the informal or secondary sector to be depressed significantly below that in the formal or primary labor market. The issues are of greater concern in developing countries because the size of the informal sector, however defined, is much larger and because the self-employed working with small amounts of capital constitute an important part of the labor market in these countries.

The Formal-Informal Sector Dichotomy

The conceptual distinction between the formal and the informal sectors rests on two principles, that of free entry and mode of production. In the informal sector it is much easier for job seekers to get work and the mode of operation of productive units permits the use of “unstructured” labor, in contrast to the relatively rigid, hierarchically organized labor force in the establishments of the formal sector. This is true not only for the self-employed, but also for small firms in which the owner-operator makes use of a few hired workers.

The differentiation of the market in terms of the mode of operation of the production units is basic. This is what allows one to use labor in an “unstructured” way in the informal sector. Sometimes this difference is expressed as technological “dualism.” The formal sector firms, which make use of modern, often imported technology, need the discipline of a structured work force. Other productive units, including the one-person owner-operators (the self-employed) coexist with the modern firms, often in the same product line, employing older, less mechanized techniques. The difference in earnings between the formal and the informal sectors can be attributed in part to the difference in technology and the consequent gap in labor productivities.

The free-entry factor has more bearing on the wage employees in the informal sector than on the self-employed. The wage earners, whether they are working as casual labor for many different employers on daily contract or for a single employer in a small enterprise for a period of time, operate in a flexible wage sector. There is no institutional mechanism to hold wages at a level higher than the supply price of such labor. At the same time, the economic factors responsible for higher wage levels in large firms are much weaker. With wage flexibility there is free entry for labor in the sense that a job seeker is able to obtain some employment, provided his supply price is below the prevailing wage.

For the self-employed, however, labor is always supplied jointly with entrepreneurship and capital. Although only a small amount of capital may be needed to enter this sector, its components should not be considered negligible, except for some small groups, like shoeshine boys. The fixed capital needed in such

businesses might be small, but given the slow rate of turnover, considerable working capital might be required per unit of output. Some of the self-employed, however, might be using capital (equipment or finance) belonging to a large businessman. These self-employed are actually wage earners employed on a piece-rate system by large entrepreneurs.

Thus the self-employed can be subdivided by the amount of capital owned. Since the access to the formal credit market is limited for these people, the rate of return to capital can be expected to increase with the volume of capital owned and employed. The distribution of earnings for this group will reflect the distribution of capital. The earnings of a typical owner-operator are, in other words, a joint return to his labor, capital, and enterprise. Even if the self-employed are relatively homogeneous in terms of the opportunity cost of labor, the wide disparity in their use of capital and enterprise account for the dispersion of earnings in this sector. Although some self-employed at the bottom end of the distribution earn no more or even less than unskilled casual workers, their earnings in the upper deciles generally exceed the wages in the formal sector.

Despite the heterogeneity of the informal sector, four types of labor can be discerned here: casual labor, wage labor in small enterprises, owner-workers in small enterprises, and self-employed producers of goods and services. The first and last groups are easily identified from labor force surveys and population censuses. The self-employed in the informal sector do not include the highly paid professionals, such as doctors and lawyers, whose education, for example, provides a cutoff point. The cutoff point for the other two categories is the size of the enterprise, which must necessarily be arbitrary. In practice, the boundary between informal and formal sector enterprises is based on labor and industrial legislation. Formal sector firms are those that have to register with some licensing authority. They are covered by labor laws, and in Latin America, in particular, they have to pay social security taxes. Surveys of manufacturing industries in many countries are confined to formal sector firms defined in this way or on the basis of size (for example, they must employ more than four or five workers).

The Wage Labor Market

Types of Intervention

Although most developing countries find it extremely difficult to exert government control over rural labor markets, they have been able to intervene in many matters pertaining to wages and conditions of employment. Government intervention may take place in several ways:

- Wage levels may be controlled, either through minimum wage legislation or through wage-settlement machinery.
- Conditions of employment may be regulated, particularly by laws ensuring tenure for regular workers.
- Legislation may force employers to contribute to the social security fund.
- Public sector employment policies may have a residual effect on the wages and employment conditions in the private labor market.

A large number of developing countries have adopted minimum wage laws. In many cases the purpose of such laws is not merely to guarantee a certain level of

income for wage groups, but also to establish minimum wages for specific industries, regions, or age groups. Brazil and Mexico, for example, have set up a large number of regional zones with different minimum wages.

Minimum wage systems are common in Africa, Latin America, the Caribbean, and the Middle East. They are much less common in Asia. In India, wage levels in large-scale industries are set by tripartite wage boards composed of representatives of employers, employees, and the government. In other words, India has a system of state-supported collective bargaining. Hong Kong, Singapore, and South Korea have no minimum wage laws.

Countries with extensive minimum wage systems must periodically revise the rates. Many countries have formal methods of indexing wages to movements in price levels. The ability to change indexation rates by executive order is an important instrument of government policy.

Institutional Versus Economic Factors in Determining Urban Wage Differentials

Government intervention in the labor market is at times said to be responsible for the significantly higher wage level in the formal sector than in the informal sector. Harberger (1971), for example, argued that workers in the formal sector are "protected" from the operation of market forces by legislation operating with or without the encouragement of trade unions. There is, however, considerable evidence to suggest that basic economic forces are responsible for the wage differential between the two sectors. Institutional factors impinge on these basic forces, and may or may not widen the differential by a significant margin.

Economic factors causing wage differences. One factor that greatly affects wages is labor skills. As a result, many studies of intersectoral wage differences concentrate on the wage of unskilled labor. However, the quality of labor may vary even in the performance of unskilled tasks. Age and sex are the most important factors, although education may also be a factor in the performance of tasks requiring little skill—such as those of messengers. It is therefore customary to control for standard human capital factors—sex, age, and education—in comparing wages across sectors.

In addition, the earnings of unskilled labor often vary by type or size of establishment. In a typical urban labor market, wages increase with the size of the firm. It is therefore tempting to conclude that the low earnings prevalent in small firms in the informal sector represent a more competitive wage as determined by supply and demand. But this view ignores the strong economic forces that cause wages to increase with the size of firm, notably the different supply prices of temporary versus permanent migrants, and the different mixes in which they are used in small and large sectors; the wage-efficiency relationship; and internal labor markets in the large-scale sector.

Temporary and permanent migrants. Those who migrate from rural to urban areas fall into two main groups. Some come for short periods, usually without their families. These include seasonal migrants, those who want to earn only a specific amount of money, and those who want to experience the urban labor market without committing themselves to a long-term career there. Other migrants spend most of their working lives in urban areas but retain some links with the rural areas where they were born. This group is made up mostly of families. The supply price of

permanent (family) migrants is generally higher than that of temporary (individual) migrants. First, a family farm's loss of income because of the absence of one individual may be small, since other family members will be able to substitute their labor for that of the absent person, particularly if the absence occurs during slack periods in agriculture. Second, a family in the urban sector depends much more on the chief wage earner because women and children generally add more to the family's income through rural market activities than they do by performing wage tasks in urban areas. Third, the cost of living in town for a family is higher. Not only do housing, transport, and commodities cost more, but families must pay to protect themselves against the problems of old age, unemployment, and ill health.

Given the difference in the supply price of individual and family migrants, little family migration would take place if both types of labor were homogeneous from the point of view of employers. If urban employers perceive a strong link between labor stability and efficiency, however, they will set the wage level high enough to attract family migrants, whose urban residency is likely to be more stable. In firms or sectors where the link between labor stability and productivity is weak, wages will be lower—that is, they will be closer to the supply price of individual migrants.

Firms that use expensive machinery are likely to value stable labor more than firms that rely chiefly on manual labor. Insofar as larger firms rely on sophisticated technology, there will therefore be a positive relationship between firm size and wage level, particularly when a labor force is acquiring the skills needed to operate modern large-scale equipment. The cost of learning new work skills is high. Once a stable labor force has been formed, it cannot be replaced by a "floating mass" of workers, as demonstrated by the history of textile labor in Bombay (see Mazumdar 1973).

The wage-efficiency relationship. Urban wages high enough to attract permanent migrants from rural areas define the limits of the wage differential between higher wage sectors in which nonstable labor predominates. High wages discourage return migration to rural areas and thus counteract one of the major causes of instability in labor markets. Even so, migrants committed to working permanently in urban areas may move to other firms offering better wages. The wage required to attract stable family migrants may not necessarily be high enough to minimize turnover. Although some firms may set wages high enough to keep the rate of turnover low, the wage that minimizes labor cost per unit of output may be still higher if higher wages increase efficiency. A company with a firm-specific labor force will increase its "least cost" wages for several reasons. First, the firm is dealing with relatively few workers, so that the benefits of a wage increase are not widely shared, as they would be if employees worked for several different employers over a period of time. Second, the employer-employee relationship in a high-paying firm takes on some of the characteristics of an implicit contract. There is an understanding that the employee will work to achieve a certain level of efficiency, and the employer will not react to short-term fluctuations in product demand by cutting wages. Third, the smaller the work force, the smaller the management costs. Hence, there is an incentive for employers to increase wage rates rather than hire extra workers as long as wage increases result in greater efficiency.

Internal labor markets. One characteristic of internal labor markets is that jobs within firms there form a hierarchy. New workers are recruited principally to fill jobs at the bottom of the ladder, while vacancies at higher levels are filled as much as possible through promotion. This arrangement reduces training costs, since skills gained in performing a particular job may be useful in performing work at the next higher level. The possibility of internal promotion also increases employee incentive. In addition, the costs of hiring new employees are reduced because the ability and performance of existing employees are already known to the employer, and the costs associated with hiring new workers are lower the lower their skill level is. An elaborate set of rules and procedures for evaluating performance and determining promotions has evolved in internal labor markets. These rules and procedures together with opportunities for on-the-job training, help stabilize the labor force.

Well-developed internal labor markets are possible only in large firms. Among the workers in such firms there will be a strong relationship between experience and earnings. Although the lifetime earnings of a typical worker in a large firm will be higher than those of a worker in a small firm, there is no reason why the entry wage of an unskilled worker should be any higher in the former. Indeed, if workers were concerned with expected earnings over a long period, entry wages according to this hypothesis would be lower in large firms. If entry wages are significantly higher in larger firms, the internal labor market hypothesis will not sufficiently explain this differential. Other factors—such as the wage-efficiency relationship, or the higher supply price of stable labor discussed earlier—must also be considered.

This is not to deny that certain institutional factors strengthen the size-related wage differential. A large firm's stable labor force, which cannot easily be replaced by novice workers, can be and often is organized into unions. Such unions are often promoted by both the government and employers in the interests of industrial peace and as protection against "troublemakers" from outside. However, it may be difficult empirically to determine the residual influence of institutions on the extent of the wage differential. The only feasible way is probably through historical studies if data are available to measure the wage differential before and after the period in which institutional factors became significantly stronger.

Appendix A reports on efforts to measure the differential in wages between different parts of the labor market in a large metropolitan area—Bombay City. This research illustrates the extent of urban wage variation by size of firm in urban labor markets and the difficulty of disentangling the net effect of institutions.

The Consequence of Government Intervention in Labor Markets

Minimum wages: a static analysis. Consider first the economic consequences of institutional intervention in raising wages when they are successful in raising wages above the levels established by economic forces. Such intervention may take place through direct legislation or through wage boards in which unions have a strong influence.

The simple theory of the impact of an effective minimum wage legislation is given in figure 3. Panel A represents the equilibrium in the "protected" (formal) sector of the labor market where the impact of the intervention is felt. Panel B portrays the reaction in the unprotected (informal) sector. Note that, for reasons

discussed in the preceding section, the supply curve of labor in the latter is at a lower level, so that wages in equilibrium are also lower, before the minimum wage law wages are established at W_F and W_I . The respective employment levels are in sectors E_f and E_I . Now institutional intervention increases the wages in the formal sector to W^* . In the new equilibrium formal sector, employment falls to E_{f^*} as employers equate the demand price (marginal product) of labor to the higher wage. The workers who are no longer absorbed in the formal sector (given by the segment $E_f E_{f^*}$) swell the ranks of those who are seeking work in the informal sector. This lowers the supply curve of labor in this sector to S_I^1 , with the result that wages fall below W_I and will need to fall enough to expand employment in the sector to absorb all of the later $E_f E_{f^*}$ displaced from the formal sector. The wage difference between the sectors thus ends up being larger than what was created by the minimum wage.

Not all of the displaced labor $E_f E_{f^*}$ would, however, necessarily seek employment in the informal sector. Some may decide to wait it out by being openly unemployed. This is called quasi-voluntary unemployment for although these workers are waiting to be employed at the formal sector wage W^* (and indeed the older wage, W_F) they are unwilling to accept the new informal sector wage. The rural-urban links also have to be taken into account. Some of the displaced workers may choose to return to the rural areas rather than look for jobs in the urban informal sector. However, the higher wage in the formal sector might induce some job seekers to migrate from the rural sector. They might decide that the long period of queuing up for an urban formal sector job is compensated for by the higher wage at the end of the queue, as explained further in the next section).

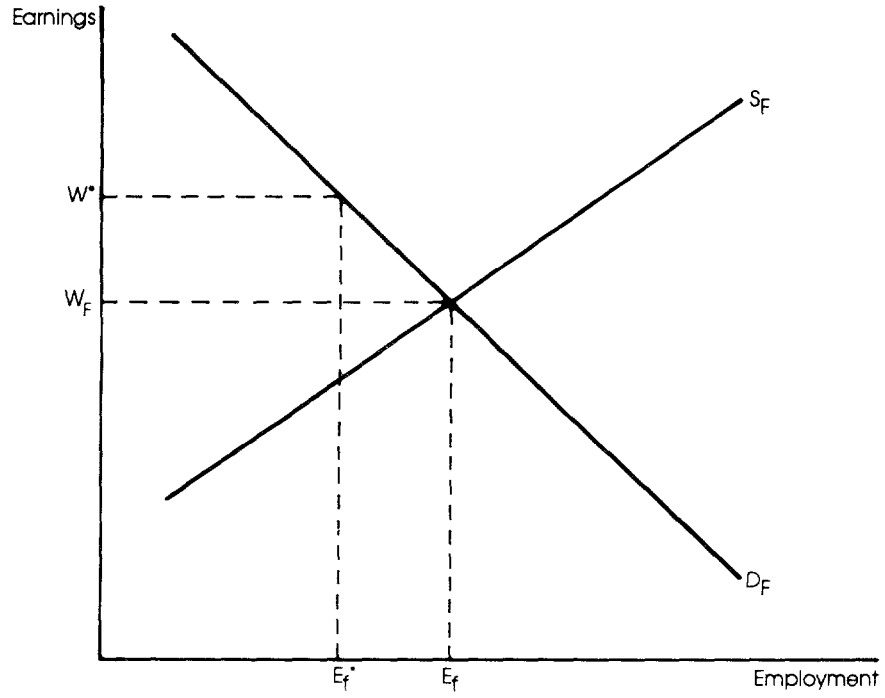
Although the direction of the effect of the minimum wage legislation is clear, the extent of its quantitative input depends on two factors: the point in the spectrum of wages below which the minimum wage law is effective; and the elasticity of demand for labor in the range of wages that is affected. The less elastic the demand curve for labor in the affected range, the less that employment will decrease in response to the increase in wages. In the extreme case when labor is more or less completely inelastic in supply, the increase in wages will have no effect on employment. It will merely cause a redistribution from profits to wages.

In many formal sector firms the wage bill is a small part of total costs because of the high capital-intensity of the technology, and they may operate in oligopolistic industries with excess profits. For such firms the labor demand function might indeed be highly inelastic. As shown in the last section (and illustrated in appendix A), however, the formal sector in urban labor markets consists of a variety of firms with different levels of wages and productivity. If minimum wages are effective, they will more than likely affect the firms in the lower range of wage levels in this structure. These firms are not likely to enjoy the sheltered position of the oligopolists, and even limited increases in their wage costs will affect their profitability significantly.

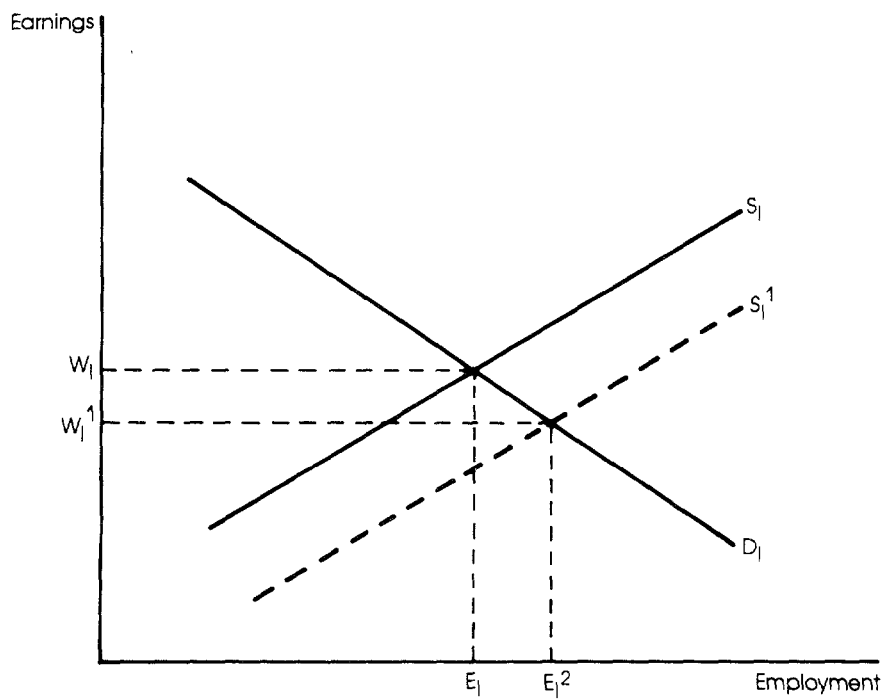
A second important factor is the effect of minimum wages on the entry of new firms into the formal sector. Existing firms that have a successfully developed or structured labor force are likely to have high labor productivity corresponding to the relatively high wage levels that have been established. As already mentioned, this might be a natural outcome of economic factors. If the high wage level becomes legally binding over all firms in the formal sector, however, it might discourage new firms from entering the sector. There will be a period of transition before the new firms are able to develop a firm-specific labor force with sufficiently high

Figure 3: The Static Effect of Minimum Wages with Two Sectors in the Labor Market

Panel A



Panel B



productivity. If such firms are legally bound to pay high wages before they attain the productivity of established firms, the high wage costs during the period of transition might be prohibitive. In many developing countries this is one of the reasons why firms in the informal sector fail to move into the formal sector.

The easier it is to substitute nonlabor factors for labor in response to an increase in wage costs, the more elastic will be the demand function for labor, and hence the greater the impact of minimum wages on employment. Too often, however, the critical nonlabor factors are identified with machinery. It is then concluded that available technological blueprints allow for only limited variations in the combination of machinery with capital. Further, once a machine is installed with a particular technology, the capital-labor ratio cannot be changed to any degree in the short run. Thus it is sometimes suggested that the short-run effects of minimum wages on the use of labor are likely to be small. This suggestion obviously exaggerates the inflexibility of technology. Even if the blueprint given in a catalogue of production technology does not allow for much variation of the machine-to-labor ratio in the central part of the production process, considerable variation is possible in the degree of mechanization adopted in the auxiliary processes such as the handling of material and packing of final products. The trouble is that this argument overlooks the role of management in the use of labor. The suggestion that the principal way to save labor would be to substitute capital for labor stems from the notion that all firms are located on the frontier of the production function. That is to say, they use the factors of production in the most efficient way. In practice, firms vary in this regard. Effective minimum wage legislation that increases the cost of labor could also lead to a general tightening in the use and deployment of labor.

This is what happened in Puerto Rico when minimum wages were introduced in response to demands from the mainland U.S. trade and labor interests, as is documented in appendix B. In this case, employment responded quickly to the imposition of the minimum wage, not because of a change in technique, but because of a desire to use labor more efficiently, which tended to reduce the quantity of labor per unit of capital, as well as per unit of output. In effect, supervisory labor was substituted for production workers, rather than the capital for labor.

The effect of the minimum wage in a heterogeneous labor market. Thus far it has been assumed that labor is homogeneous from the point of view of demand. But even if we consider only labor of little or no skill, groups might differ greatly in terms of productivity. As already noted, one of the major characteristics of urban labor markets in developing countries is that they receive two types of migrants from the rural areas—"circulatory" individual migrants and more permanent family migrants who have a greater commitment to urban work and residence. The different labor systems that have evolved in different parts of the world have made use of this heterogeneous supply of labor in different ways. In India wages in industry were set by employers at a high enough level to attract stable workers, and the unskilled individual migrants were used only as temporaries (see Mazumdar 1973). In much of Africa, however, the modern urban sector before independence depended on the migratory labor system. Wages were at such low levels that they only attracted the single, circulatory migrants. The turnover of labor was very high and productivity low. Theoretically, both systems might yield similar wage costs, as the low productivity of migrant workers could be offset by low wages. The low wage and low productivity alternative might seem preferable because it gives employment to a larger number of people at a wage that is at least higher than their

alternative earnings (for otherwise they would not come to the market at all). But the system has serious disadvantages with respect to the long-term growth of the economy. It does not promote the acquisition of skills in the urban economy since labor does not have enough experience in firms to benefit from on-the-job training. Thus only a limited number of industries could develop using native labor, and skilled workers with high wages tend to be recruited largely from foreign countries—generally the countries controlling the colonies (see appendix C).

Once they became independent, countries with migrant labor systems decided to change them. Independent employers, acting on their own, could not be expected to develop a stable labor system on their own. Stability could only be achieved by raising wages substantially. Although stable labor could be expected to offset the higher wages in due course with higher productivity, there was the problem of high labor cost in the period of transition. Moreover, a labor force with stable urban residence required at least a large number of employers to increase wages simultaneously. The new independent governments attempted to achieve a stable labor system by increasing the minimum wage regularly over time.

Real wages in the formal urban sector of East Africa experienced spectacular growth rates during the 1960s (see appendix C). Viewed in the context of the objective of changing the migrant labor system, this government-induced inflation of real wages does not appear perverse. It did achieve a drastic reduction in turnover rates, although at the cost of declining employment. The increase in real wages might also have overshot its mark. Another problem was that minimum wages at the lower end of the wage structure tended to squeeze differentials to the point of seriously weakening incentives for more skilled workers.

Nonetheless, the use of minimum wages in East Africa did have a laudable socioeconomic objective, whereas other countries with heterogeneous labor have used them as instruments of discrimination. If there are two groups with different levels of productivity, then the group with lower productivity will be employed by private employers only if they are paid at a lower rate than the more productive group. It is then in the interest of the latter to demand minimum wages to raise the wages of the less productive group above their marginal product, thereby making it unprofitable for them to be used. A classic example of this situation can be found in the labor history of South Africa. Most of the native migrants who moved from the rural areas into townships had lower productivity than the white urban inhabitants. This was due to the migratory characteristics of the black laborers, who were not allowed to settle in the towns except as marginal urban dwellers. The trade unions representing white workers sought and won minimum wage levels in a range of occupations, which allowed employers to use white labor profitably. Black workers with lower productivity than the minimum wages were in effect excluded from these urban jobs.

Minimum wage laws have also been used to perpetuate regional inequality. The prosperous regions of an economy tend to develop high wage levels together with high productivity over a period of concentrated growth. After a time, industry begins relocating in less developed regions where wages are lower. This process of decentralization can be hampered if unions in the prosperous regions insist on minimum wage levels in the backward regions. The latter would not have yet reached the labor productivity levels characteristic of prosperous regions after a long period of development. Relocation in these less developed regions would not be profitable for employers if wages were set institutionally at the same levels as those in prosperous regions.

The dynamic effect of minimum wages: employment elasticity. In some economies, and in some periods of history, minimum wages have been increased successively over a period of time. The objective is to push the wage to a much higher level, but in order to avoid disruption, it is done in steps. This was done in Puerto Rico and East Africa. In both cases the rate of growth of employment relative to that of output (or the employment elasticity) was seriously reduced.

The effect can best be illustrated by comparing the results of a rising minimum wage with what was visualized in the classic model of economic growth in developing countries formulated by W. Arthur Lewis in 1954. In Lewis's model labor could be attracted to the expanding urban sector at a constant real wage, which might be at a slightly higher level than alternative earnings in the rural areas but would not increase as the volume of employment in the urban economy increased with an almost perfectly elastic supply of labor. The expansion of employment in the urban sector would proceed as portrayed in figure 4 (A).

The wage at which labor would be available to the urban sector is given by W . The marginal productivity of the labor schedule in the initial period is MP_L , so that the amount of labor employed in the urban sector would be OE . The "net surplus," or profit, generated by this amount of employment is given by NQW , which Lewis assumed would be reinvested. The next period, therefore, would begin with a higher capital stock and a resultant marginal product of labor schedule MPL_2 , to the right of the schedule in the first period. With an unchanged wage rate, employment would expand from OE to OE_3 . This in turn would create greater profits, more reinvestment, and more employment. In short, as long as the wage rate remained constant, the urban sector would expand indefinitely.

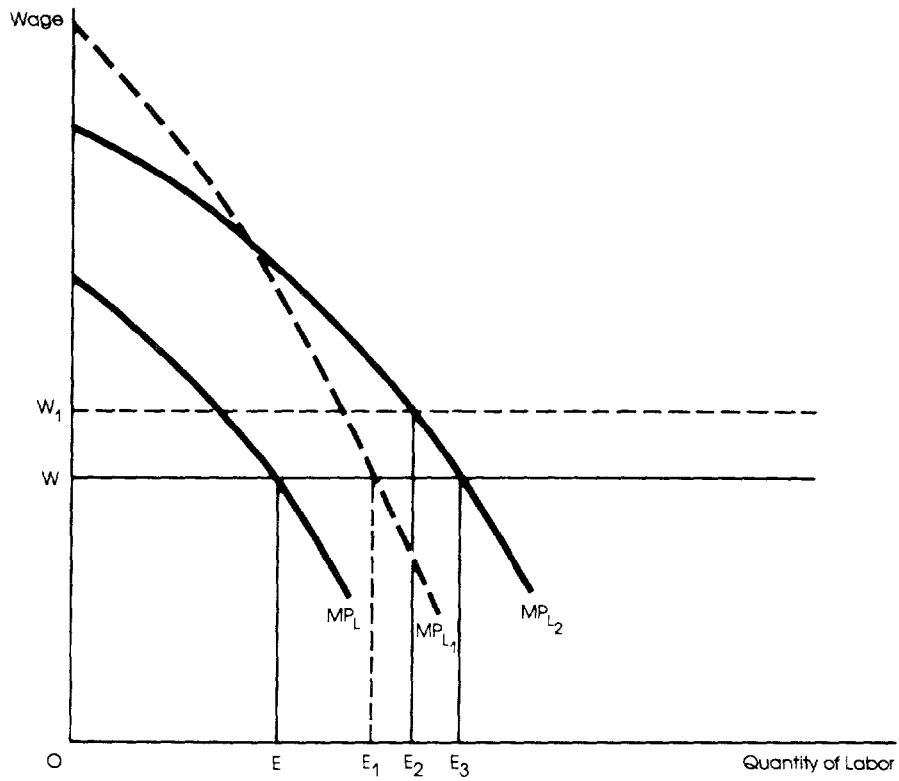
We can now see the impact of minimum wage legislation that increases wages in the second period, from W to W_1 . Such a wage increase causes management to seek labor-saving production methods, so that the marginal productivity schedule of labor tilts to MPL_1 (as shown by the dotted line in Figure 4). The profit-maximizing level of employment in this period is therefore OE_1 , and not OE_3 , as would have been the case if wages had remained unchanged. Potential employment is reduced because of two effects. The increase in the minimum by itself reduces employment from OE_3 to OE_2 . Labor-saving innovations then reduce employment further, to OE_1 .

If wages are raised successively from one period to the next, management will also seek labor-saving innovations during each period. Thus, the wage/employment path will move to the northeast along path II, rather than horizontally along path I, as was envisaged in the Lewis model (figure 4B).

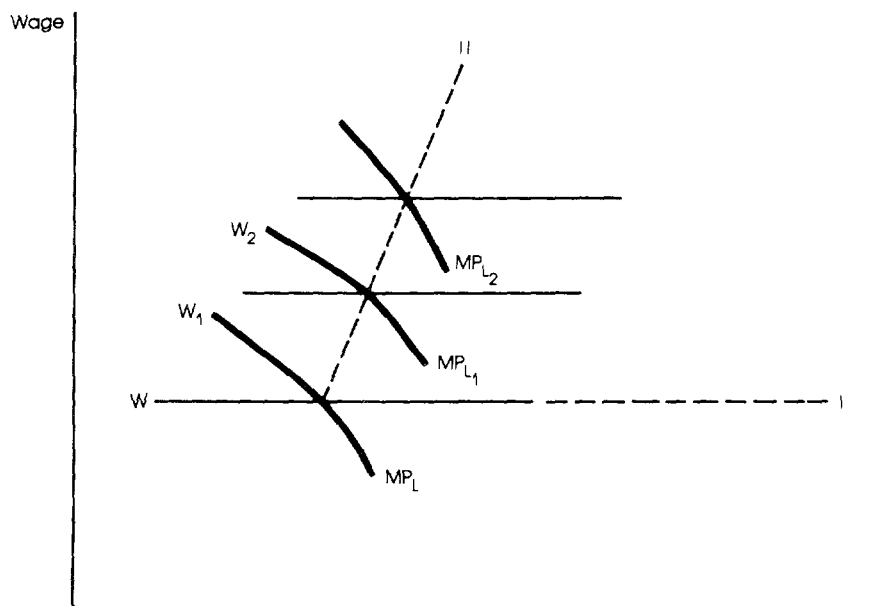
Employment lag, particularly in the large-scale manufacturing sector, has been of wide concern in the literature on urban labor markets in developing countries. The rate of growth of output has exceeded the rate of growth of employment by a substantial margin in many countries.¹³ There can be no doubt that labor absorption has been seriously thwarted by this somewhat unexpected development in the manufacturing sector. Even if institutionally determined, increases in wages have been one of the factors responsible for the employment lag, although not necessarily the only factor, or even the most important factor in all countries at all times. Puerto Rico and East Africa are extreme cases in which minimum wage policies were vigorously pursued in response to special

13. For a review of the evidence and analysis of its causes, see Morawitz (1974). Also see Squire (1981).

Figure 4: A. The Expansion Path In the Lewis Model



B. The Expansion Path With Increasing Levels of Minimum Wages



Source: Reynolds Figs. 2 and 3, pp. 36-37.

circumstances (see appendixes A-C). Distortions in the capital markets have been just as responsible for a lower capital/labor ratio than desired. In many countries, large industrial firms have been given the advantage of low (or even negative) rates of interest on borrowed capital. Then, too, frequent overvaluation of exchange rates has kept the price of imported capital goods low. In addition, the pattern of industrialization in developing countries—with their emphasis on imported technology—must share the blame for the lag in employment.

The dynamic effects of minimum wages: wage indexation. A notable example of the application of minimum wages over time can be found in inflationary economies, particularly those in Latin America. Nominal wages have to be adjusted frequently in such economies to prevent serious erosion of real wages as the rate at which prices increase fluctuates from year to year. Many governments have tried to bring some order into the determination of real wages enacting wage indexation schemes that provide for periodic, across-the-board, nominal increases. These wage adjustments are based on past inflation rates. They represent the minimum increase in wages that employers have to pay.

Because wage indexation is such a complex topic, we will cover only a few of the major issues.¹⁴ Wage indexation and wage settlements are governed by past inflation rates. Consequently, the scheme provides a basis for “inertial inflation,” in that past inflation rates are carried forward automatically into future wage-price spiral. But there are several points to consider before accepting this proposition in all cases.

Wage bargains may be based on past inflation rates without formal indexation schemes. In many industrial countries expectations of future inflation “adapted” from past experience have been a dominant factor in wage formation. Even in developing countries, formal sector workers, particularly if they have been divided into firm-specific groups, must expect their nominal wage increases to reflect past inflationary trends. As discussed earlier, the same forces that establish a wage differential favoring workers in the formal sector would also tend to protect the real wage of these workers.

Given that adaptive expectations of price increases are generally built into the process of wage determination, it is not clear that formal indexation necessarily adds fuel to inflation. In fact, it may even act as a stabilizing force. If workers are assured that they will be protected against past price increases, they may refrain from anticipating larger price increases in the future, and thus from setting in motion an explosive wage-price spiral. In a disorganized labor market, in which wages are set at a multitude of points, indexation schemes might provide an opportunity for introducing some central direction in wage policy. In Israel, for example, the government cooperated with the Trade Union Federation (Histerdurst) in its fight against inflation, and the latter has at several times agreed to take a cut in real wages by foregoing an indexation adjustment. As Stanley Fischer has noted, “such coordinated wage reductions are not easy to achieve in most economies. Wage indexation in Israel has probably helped obtain needed real wage flexibility, rather than hindering it” (reported in Williamson 1985, p. 80).

14. Wage-indexation is one of the subjects which will be discussed in detail in the ongoing project on Labor Markets in an Era of Adjustment (Kanbur and Mazumdar 1988).

The relationship between real wage changes and the rate of inflation is complex in indexed regimes. It depends on the extent of indexation, the degree of indexation (that is, whether it is 100 percent or less), and the periodicity of adjustment, (that is, the time period after which wage contracts are adjusted to take account of the increase in price). The third factor is particularly important to consider.

It is sometimes felt that 100 percent indexation will keep real wages constant. This is, however, a mistaken proposition because there is a lag in the adjustment of wages to price changes. In figure 5, W_0 is the real wage at time t_0 . At a certain rate of inflation, the real wage falls to W_1 at the next time period t_1 when wage contracts are adjusted under the indexation scheme. If indexation is 100 percent at time t_1 , the real wage is restored to its previous level W_0 . But the average wage over the time period t_0t_1 has fallen below its initial level to a value of W_1 . If the rate of inflation remains constant between t_1 and t_2 , then the story is repeated in the next period before adjustment, so that the real average wage stays at the level W_1 even though in each period wages are restored to their initial level, W_0 . The only way to increase W_1 to a value nearer W_0 over a period of time is to shorten the period of time after which wages are adjusted.

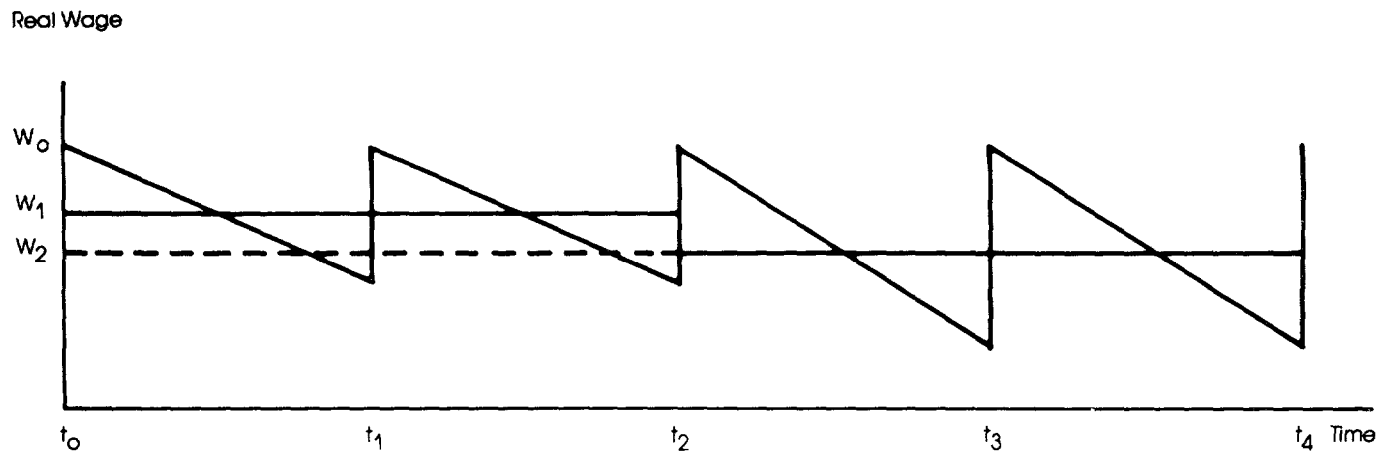
Now consider what happens if the pace of inflation quickens but the period of adjustment remains unchanged. Between t_2 and t_3 real wages fall faster than in the previous period; they do the same between t_3 and t_4 . In this case, even if real wages are fully restored to W_0 at t_3 and again at t_4 , the average real wage over the entire period falls to W_2 .

This argument yields the important conclusion that, given the periodicity of adjustment, an acceleration in the rate of inflation will lead to a fall in the average real wage. Conversely, a slowing down of the rate of inflation will produce a higher average real wage. This relationship, which is sometimes referred to as the "saw tooth" effect, has considerable bearing on the strength of inflation. Suppose that the economy experiences an external shock such as a sharp and substantial increase in the price of imported oil. The real wage that will preserve macroeconomic balance has to fall. But if wages are indexed and the parties to the wage setting do not immediately see the need to lower real wages (by foregoing a period or two of indexation adjustment as they did in Israel), then the system can only adjust itself if inflation accelerates enough to reduce the real wage to the sustainable level. Even if workers are later reconciled to the lower real wage, the system of indexation will perpetuate the higher rate of inflation.

One way that workers may attempt to project their real wage in a situation of accelerating inflation is to shorten the period in which wages are adjusted to price change. But this procedure may create more problems than it solves. The earlier increase in nominal wages, which comes from reducing the period of adjustment from one year to six months, for example, provides an additional impetus to inflation, helping it to accelerate. A vicious circle thus develops, in which shortening the period of adjustment to protect the real wage accelerates inflation—which causes the real wage to fall again and necessitates a further cut in the period of adjustment, and further quickens the pace of inflation, and so on. If allowed to go unchecked, this process can lead to hyperinflation, which would make it necessary to adjust wage contracts by the day or even by the hour, and would weaken the entire economic system.

Nonwage labor costs. Labor costs in the formal sector of many developing countries are inflated by nonwage labor costs (NWLC) other than direct remuneration. These costs include fringe benefit payments, obligating social

Figure 5: Behavior of Real Wages under Indexation and Rapid Inflation



welfare contributions to various funds, payroll or employment taxes, and nonregular bonuses.¹⁵ Together they amount to a substantial proportion of the total labor cost of a firm in the formal sector. Riveros (1988) has collected data on the proportion of NWLC to labor earnings for a number of countries. These are presented in table 7, which shows that within the developing world labor costs are highest in Latin America (approaching the levels found in some industrial countries), followed by Asia. Table 7 also shows the ratio of NWLC to per capita income. The latter might be used to approximate the shadow (or real) cost of labor so that this ratio is a rough indication of the markup on the supply price of labor or the "distortion" caused by NWLC in the labor market for the formal sector. Viewed in this way, the ranking of countries changes significantly from that given by NWLC/wage ratio. For instance, India leads in table 7, followed closely by Zimbabwe, Greece, and Morocco. Note that most of the African countries, with the exception of Nigeria, appear to have high NWCL relative to their development.

It is farfetched, however, to regard all of NWLC as a "distortion" imposed on the supply price of labor. NWLC may be due to voluntary action by firms, particularly those acting in conjunction with unions. As already discussed, individual firms have an incentive to form firm-specific labor forces in the interest of enhanced productivity. These economic forces have some bearing on the use of NWLC. Many of the benefits that workers derive from several components of NWLC—notably deferred fringe payments that favor senior workers, such as pensions, insurance coverage, and vacation pay—are related to length of service. The payment of fringe benefits in this case is not considered an addition to wages, but a portion of the worker's compensation. The amount devoted to fringe payments is determined by the supply price of fringes (the decrease in wage that the worker is willing to take for a given increase in fringes) on the one hand, and the productivity-enhancing effect on fringes relative to wages on the other.

Fringe payments are also determined in large part by government legislation. In the industrial market economies, state-sponsored fringe benefit schemes have expanded greatly in the wake of the growing emphasis on social welfare and in reaction to the Great Depression of the 1930s. The schemes were to provide a substitute for private saving, which the Depression had severely reduced, leaving many families unable to deal with the calamities of long illness, industrial injury, and unemployment or to provide for retirement (Feldstein 1977). Many developing countries have sought to emulate the practices of the industrialized countries in this regard. Although their efforts have been confined by and large to the formal sector, the "modern" standard has been introduced wherever the state has the power to enforce it and the levels of productivity are high enough to sustain it.

A relevant question to ask at this point is: To what extent can employers pass on social welfare taxes to their employees through backward or forward shifting? Backward shifting means restraining wage growth to offset tax increases, while forward shifting implies passing on the tax to consumers in the form of higher prices. The answer to this question depends on the same factors that affect minimum wages. Firms are more able to shift taxes backward as the supply curve

15. The social security funds include medial insurance schemes, unemployment and severance compensation funds, housing, and education funds. Payroll taxes are generally used to finance pension funds.

Table 7. Nonwage Costs of Labor (percentages)

	1965	1970	1975	1980	1985
Latin America					
Argentina	0.33 (0.48)	0.33 (0.52)	0.35 (0.50)	0.46 (0.61)	0.46 (0.64)
Brazil	0.34 (0.60)	0.34 (0.53)	0.35 (0.39)	0.36 (0.38)	0.38 (0.42)
Colombia	0.31 (0.10)	0.43 (0.24)	0.52 (0.49)	0.62 (0.60)	0.62 (9.69)
Chile	0.36 (0.39)	0.43 (0.49)	0.51 (0.42)	0.26 (0.25)	0.25 (0.24)
Mexico	0.37 (0.75)	0.37 (0.67)	0.39 (0.71)	0.41 (0.57)	0.45 (0.50)
Peru	0.24 (0.37)	0.24 (0.36)	0.24 (0.37)	0.25 (0.28)	0.35 (0.23)
Africa					
Kenya	n.a.	0.13 (0.88)	0.13 (0.71)	0.13 (0.62)	0.13 (0.64)
Morocco	n.a.	0.14 (0.84)	0.19 (0.92)	0.19 (0.77)	0.19 (0.79)
Malawi	n.a.	0.14 (0.91)	0.114 (0.68)	0.13 (0.64)	0.13 (0.45)
Nigeria	0.09 (0.31)	0.10 (0.20)	0.10 (0.14)	0.10 (0.18)	0.10 (0.25)
Tanzania	0.10 (0.63)	0.10 (0.68)	0.10 (0.66)	0.12 (0.56)	0.12 (0.44)
Zambia	0.09 (0.22)	0.09 (0.24)	0.09 (0.34)	0.09 (0.38)	0.09 (0.37)
Zimbabwe	0.15 (0.73)	0.15 (0.69)	0.15 (0.67)	0.18 (0.93)	0.18 (0.92)
Asia					
India	0.22 (0.95)	0.22 (1.06)	0.24 (1.24)	0.23 (1.18)	0.25 (1.03)
Hong Kong	0.11 (0.08)	0.11 (0.09)	0.15 (0.10)	0.20 (0.10)	0.20 (0.10)
Korea,					
Republic of	0.20 (0.24)	0.20 (0.25)	0.20 (0.20)	0.20 (0.21)	0.20 (0.21)
Pakistan	0.15 (0.80)	0.15 (0.68)	0.15 (0.41)	0.15 (0.39)	0.15 (0.42)
Singapore	0.11 (0.14)	0.14 (0.09)	0.28 (0.14)	0.29 (0.12)	0.35 (0.17)
Sri Lanka	0.25 (0.71)	0.25 (0.62)	0.25 (0.53)	0.25 (0.34)	0.33 (0.38)
Europe					
Greece	0.53 (0.53)	0.50 (0.49)	0.55 (0.54)	0.55 (0.66)	0.55 (0.80)
Portugal	0.18 (0.21)	0.21 (0.24)	0.24 (0.40)	0.28 (0.37)	0.30 (0.35)
Austria			0.76 (0.77)	0.81 (0.73)	0.86 (0.76)
France			0.70 (0.65)	0.74 (0.68)	0.83 (0.73)
Germany, Federal					
Republic of			0.60 (0.74)	0.69 (0.78)	0.75 (0.77)
Spain			0.50 (0.65)	0.40 (0.67)	0.40 (0.67)
Sweden			0.45 (0.56)	0.62 (0.70)	0.67 (0.68)
United Kingdom		0.23 (0.33)	0.36 (0.51)	0.33 (0.38)	
United States			0.32 (0.43)	0.35 (0.44)	0.37 (0.44)
Canada			0.23 (0.31)	0.25 (0.33)	0.28 (0.35)
Japan		0.14 (0.18)	0.16 (0.16)	0.17 (0.17)	

n.a. Not available.

Note: NWC are expressed as a proportion of labor earnings. The ratio formed by the year equivalent monetary value of NWC of labor and the hourly per capita income is presented in parentheses.

Sources: Riveros (1988). For developing countries, see Riveros (1988), appendix 1.

of labor becomes more inelastic, and they are able to shift taxes forward depending on the elasticity of demand for their products. If the firm is a large employer in a

monopolistic industry, then both the supply and derived demand curves of labor might be expected to be inelastic, and the scope for both types of shifting should be considerable. But when social security taxes are imposed on a large number of firms over the entire spectrum of industries, the relevant supply and demand functions are likely to show considerable elasticity. It is unlikely that the individual firm would be able to shift the taxes either way without doing considerable damage to itself, both with respect to the availability of efficient labor and its share of the market for its products. Econometric studies in the United Kingdom (see Beach and Balfour 1983) and the United States (see Hammermesh 1979) have suggested that only a fraction of welfare taxes have been shifted back to the employees.

Note that if shifting does occur it takes place over a long period of time. In the short run firms will try to adjust to the mandated nonwage costs by reducing their labor force relative to output or the stock of capital, much as in the case of an effective increase in minimum wages. In fact, such a substitution of capital and/or supervisory labor for production workers is to be expected when the burden of taxes shifts to workers because there are fewer jobs per unit of output.

Without doubt, the great increase in mandated nonwage costs in recent decades has pushed up the cost of labor to formal sector firms in developing countries, whereas minimum wages have often merely validated the wage levels established by economic forces in the formal sector. It would be interesting to know if in inflationary regimes indexation rules have permitted less erosion of nonwage benefits than the basic wage itself. However, further research is required to answer this question.

One other source of nonwage costs that has become increasingly important in the formal sector of developing countries is the job security provided for regular workers in formal establishments. As a result, the cost of dismissing "tenured" workers is often substantial. Apart from having to make retrenchment payments, firms may be required by law to go through elaborate procedures in labor courts before they can dismiss a worker (see, for example, Peter Fallon, 1987a and b). Labor legislation in this case reinforces and intensifies the effect of economic forces favoring the creation of a firm-specific labor force. It makes labor more of a fixed cost of production than would be the case under free-market conditions. The firm's decision to vary the size of its labor force then becomes akin to its decision to invest in other fixed factors like plant and machinery. It will be more sensitive to long-run factors than to short-run fluctuations in market conditions. Although this tends to reduce the extent of labor shedding during downswings, it might on balance reduce the employment elasticity of output in the long run as firms add the cost of uncertainty to that of labor compensation in assessing the cost of a regular worker.

Many firms, however, are able to escape the impact of job security legislation by increasing the percentage of temporary workers on their payroll. Labor legislation or union rules might seek to limit the number of temporaries in the total work force and/or the length of time that a worker might be used as a temporary. Such rules are often evaded, however, especially if it is in the interests of both workers and employers to work around them. Employers reduce labor costs by having more flexibility in the use of labor and by being able to screen potential workers as temporaries before they are granted regular status. Meanwhile, workers might accept temporary status willingly if the expected lifetime earnings from a regular formal sector job greatly exceeds their alternative earnings elsewhere in the economy. Another point to consider is that the extent of downward inflexibility of

employment might be exaggerated. Recent worldwide depression suggests that, rather than see the firm go bankrupt, many workers would be willing and able to work out agreements on temporary layoffs or work sharing.¹⁶

Linkages between the Sectors

Thus far the discussion has concentrated on the impact of high wages—as influenced to some extent by institutional pressure—on the absorption of labor in the formal sector. Another important factor to consider is the interrelationship between the formal and informal sectors—particularly the impact of the high-wage formal sector on earnings and employment in the informal sector, and thereby the effect on the distribution of income in the urban labor market as a whole.

The Harris-Todaro Model

Harris and Todaro have proposed a relatively simple model by which to link the urban formal, urban informal, and rural labor markets. Their basic assumption is that workers migrate from rural to urban areas not because of the higher wages they will get through urban employment, but because of a variable called the “expected wage.” Suppose that wages are maintained at a high level in the urban formal sector owing to a combination of economic and institutional factors. Suppose also that the only alternative to getting a job in the formal sector is open employment. The probability of a migrant obtaining a job in the formal sector falls as the supply of job seekers begins to exceed the number of jobs available. The expected wage is defined as the product of the actual wage (W_f) and the probability of securing a job (p). The Harris-Todaro model postulates that rural-to-urban migration will continue until the expected urban wage is equal to the wage in rural areas. That is to say, in equilibrium the volume of migration is such that there is an excess supply of labor in the market, and the rate of unemployment is such that $pW_f = W_r$ (where W_r is alternative earnings in the rural sector, and the value of p is less than unity).

Rural migrants, in other words, continue to travel to urban markets even if there is a probability of unemployment because they hope to find a high-wage formal sector job. Unemployment then becomes a kind of investment that the migrants are prepared to shoulder in the hope that a higher stream of earnings will come to them in the future.

This simple model is easily extended to the urban informal sector. While a migrant is searching for a formal sector job he usually has the option of earning something in the informal sector, where entry is easy. Informal sector employment will impede the search for formal employment to some extent, so that some migrants will decide to take a temporary job whereas others will not. In any case, the supply of labor to the informal sector increases because of the high wages in the formal sector. Consequently, earnings in the informal sector are lower than they would be if wages in the formal sector were lower.

16. Garcia and Tokman (1984, p. 111) report a considerable rise in visible underemployment of persons who work fewer than 35 hours and would like to work more in a number of cities in Latin America.

In short, the message of the model is that high wages in the formal urban sector are responsible for overurbanization. As migrants try to maximize private gains, there is a social loss insofar as more migrants are attracted to urban areas than are necessary to equalize wages in the rural and urban sectors. Increased pressure for urban services increases social costs. The urban informal sector serves as a kind of "parking lot" for migrants while they seek a better job in the formal sector. Thus, the informal sector also contributes to overurbanization. Some countries have tried to discourage operations in the informal sector through administrative harassment, taxes on urban land used for trade, and so on. The pessimistic view toward urban policies is reinforced by the suggestion that any attempt to reduce unemployment in the urban economy will be self-defeating as long as wages in the formal sector remain high. An increase in the rate of job creation in the formal sector will increase the probability of getting a high-paying job but will also cause more immigration, a higher rate of unemployment, and lower earnings in the informal sector.

Critique of the Harris-Todaro model. The Harris-Todaro model rests on certain assumptions about the nature of the urban informal sector, the recruitment of labor in the formal sector, and the economics of rural/urban migration. Much empirical research in recent years has cast serious doubt on these assumptions.

The nature of the informal sector. The view that the informal sector is predominantly a transition stop for migrants moving from rural areas to the formal sector is not supported by empirical evidence. As noted earlier, the informal sector is extremely heterogeneous. Although transitory migrants are an important part of it, many of them are circulatory migrants who divide their time between town and country, and many others are there to stay. Many also perform specialized tasks not generally undertaken in the formal sector, such as domestic service. Self-employed persons in the informal sector tend to show a steep rise in earnings as they grow older and become more experienced. Furthermore, the informal sector contains small-scale enterprises that produce the same product lines as large firms there, but their output is generally at the low end of the quality spectrum and they use different technology and different factor proportions. The empirical evidence on mobility of labor between the two sectors of the urban labor market indicates that overall labor is as likely to move in the direction of the informal sector rather than the other way around, the reason being that some segments of the informal sector require capital investment. Thus, the factory workers in the high-wage sector often build up the required capital out of their savings and set themselves up as independent entrepreneurs in their middle years.

Recruitment to the formal sector. The Harris-Todaro view that the path to a formal sector job is predominantly through the informal sector is not supported by empirical research. Banerjee (1983), for example, compared the probability of a migrant from the rural areas to Delhi getting a formal sector job directly in a particular year with the probability of landing a formal sector job within a couple of years of first entering the informal sector. He found that the former was nearly six times as high as the latter. Studies in Bombay (Mazumdar 1984) and Ahmedabad (Poppola 1977) also suggest that recruitment to formal sector jobs occurs directly from the rural areas much more often than it does through the urban informal sector. The reasons for this lie partly on the supply side of the labor market and

partly on the demand side. On the supply side, circular migration and low wages have a sustained impact on the potential efficiency of a worker seeking entry into the formal sector. Employers tend to choose fresh entrants into the labor market who have not been exposed to the different work patterns of the informal sector. On the demand side, since employers attach great value to social solidarity, they often rely on existing employees and supervisors to find new applicants for vacancies. Studies in India and Africa have repeatedly noted the importance of kinship ties in the recruitment process—what Poppola (1977, p. 153) has called “a de facto closed-door system.”

The economics of rural/urban migration. The Harris-Todaro model assumes that the ordinary migrant is a gambler who hopes to take advantage of an expected high wage in the urban labor market. Research on internal migration suggests, however, that the risks of migration have been underestimated by this characterization of the rural/urban migrant (for a review of the literature, see Mazumdar 1987). It is true that new migrants are often helped by relatives and friends who have preceded them into the urban economy, but the help rarely extends to financing the migrants for an indefinite period while they look for work. The costs of migration itself are significant, and most studies show that distance is often a significant deterrent to migration. Hence, migrants typically do not come from the poorest villages or the poorest households, but rather from more prosperous villages or from households with some assets. Several studies have shown that migrants usually get their first job after a short waiting period. One-fourth of the workers surveyed in the Bombay study said that they had migrated after getting an actual job or a firm offer of one; one-third said they suffered no unemployment before obtaining their first job; and about half said they needed no support from their families because they did not have to wait long to get a job. Data collected on worker unemployment before they obtained their first job showed that only about 15 percent of the migrants in the factory sector were unemployed six months or more (Mazumdar 1984, p. 179).

The Theory of Segmented Labor Markets

Although the Harris-Todaro model has pessimistic implications for overurbanization, it postulates relatively easy movement of workers from the informal to the formal sector after a period of waiting. The literature has leaned toward an alternative view, which hypothesizes that the urban labor market is segmented in the sense that, although new workers may find it relatively easy to enter the informal sector, their further progress into the formal sector is difficult or limited. This hypothesis, if true, has serious implications for the distribution of income in the urban labor market. The large difference in earnings between the two sectors along with limited entry into the high-wage sector creates a “labor aristocracy” in the urban labor market. A relatively small proportion of the labor force employed in the sector shares in the high income generated in the modern economy, whereas a large number of workers are left more or less permanently in the low wage-low productivity sector.

In examining the conceptual and empirical basis of the hypothesis of labor market segmentation, it is important to consider the long-term trends in the shares of the two sectors in total urban employment, as well as the response to recent cyclical shocks.

Labor movement into the high-wage formal sector may be restricted owing to institutional factors, such as the "closed shop" practices of unions. However, it is unusual for such restrictions to exist in formal collective bargaining agreements. If employers are found to depend heavily on union representatives to fill vacancies, there must be strong economic reasons for it. As already noted, employers attach great importance to the social solidarity of the work force in large establishments. Where unions are strong, union leaders and management both tend to want to achieve a socially integrated and motivated work force. Managers might well depend on unions to introduce new recruits. Nonetheless, a "closed shop" might operate even without unions. If employers attach more importance to the productivity-augmenting effects of a cohesive work force than to getting new workers at the lowest wage possible, they will depend on the foremen and senior workers to help in recruitment. As a result, the field of new recruits may be restricted to the set with close kinship or community ties to those already employed.

A second factor inhibiting mobility from the informal to the formal sector is the operation of internal labor markets in large establishments. Firms that encourage a lifetime commitment in their workers typically recruit them at a young age at a relatively low point of the career structure. Vacancies higher up the structure are filled by promoting workers internally rather than by recruiting older workers from outside. Thus, the opportunity to move into a formal sector job decreases significantly with the years spent in the informal sector.

The foregoing factors lie on the demand side of the labor market. Segmentation can also occur when labor with different attributes is offered to the market. When these attributes are used as "labels" in the hiring of employees, the labor market may split up into noncompeting groups. The most important of these supply-side attributes are sex and education.

Because of the traditional concentration of women in the service sector, especially in domestic service, a disproportionate number of women work in the informal sector (see Mazumdar 1976). Even when women workers are used in the large-scale manufacturing sector, they are usually concentrated in certain occupations or industries. Young unmarried girls in Japan, for example, tend to work in textile industries. In India's textile industry, women workers are employed only in specific occupations labeled "magi" (female) jobs. The proportion of females in industrial employment in the formal sector has been small and has declined over time.

When jobs are labeled in this way, female job seekers are "crowded" into certain occupations. Earnings in these occupations are low, partly because of traditional institutional factors, and partly because female job seekers are driven into a narrow band of the market. Occupational crowding drives down the supply price of women throughout the economy, so that even the relatively small number who manage to get jobs in other parts of the labor market have lower earnings than men in the same occupation.

Table 8 presents some data from a recent survey of the urban labor market in Montevideo, Uruguay (Portes, Blitzer, and Curtis, 1986). Female workers are about twice as likely to be employed in the informal sector as men. Furthermore, they are employed in lower-earning subsectors of the informal sector. Their representation among the informal employers—the high-income petty entrepreneurs—is small; it totals only one-third of the men. Moreover, the average earnings of a female worker in the informal sector are nearly 25 percent less than those of a male worker in the same sector. This relatively low level of earnings depresses the supply price of females throughout the urban economy. Thus, although nearly two-

thirds of all female workers in Montevideo find employment in the formal sector, their earnings, even though they may be higher in absolute terms, continue to be below those of males as much as they are in the informal sector.

Table 8. Employment and Monthly Income by Sex, Montevideo, 1984

<i>Item</i>	<i>Full of part-time formal sector</i>	<i>Full-time informal worker</i>	<i>Informal Employer</i>	<i>Total</i>
<i>Employment (%)</i>				
Male	74.3	17.3	8.4	65.3
Female	66.7	30.5	2.8	34.7
Total	71.6	21.9	6.5	100.0
<i>Monthly Income (US\$)</i>				
Male	189.02	94.48	360.55	193.80
Female	122.52	71.31	n.a.	103.90
Total	183.97	88.30	360.55	185.30
<i>Analysis of variance on monthly income</i>				
<i>Effects</i>		<i>F</i>	<i>Significance</i>	
Employment status		23.339	0.000	
Sex	3.388	0.067		
Joint main effects		23.339	0.000	
Two-way-interaction		0.485	n.a.	

n.a. Not available.

Source: Portes et al. (1986), tables 4 and 5, pp. 735-36.

The picture given in table 8 refers, of course, to a situation at a specific point in time. We do not know how the share of females in the formal sector or their relative earnings have changed since then. Nevertheless, sex clearly makes it difficult for female workers to enter the high-income segments, both in the informal and in the formal sectors.

Another important factor affecting the availability of certain types of jobs to specific groups is education. In many developing countries the public sector, in particular, insists that job seekers meet certain minimum educational standards. In Jakarta, large multinational firms tend to use education and knowledge of English as essential qualifications for their recruits even when hiring workers of low skill. They can afford to do so because they offer relatively high wages. In other words, some parts of the formal sector use education to reduce the number of applicants who are attracted by the high wage. This widespread practice is known as "education credentialism." This means that education is used as a factor in defining noncompeting groups in the labor market and in reducing the upward mobility of workers with low levels of education.

There have been only a few empirical studies of worker mobility in the urban labor markets of developing countries, but they tend to support the segmented labor market hypothesis rather than the Harris-Todaro one. A few studies provide information on the sector of current employment and the sector in which the worker had his first job, but details of the period of time spent in the labor market are lacking. Nevertheless, the "transition matrices" give some idea of the percentage

of workers who have been in the formal sector since their first job. In the survey of Bombay City, 67 percent were in this category (Mazumdar 1984, p. 190). In urban Malaysia, the figure reached 82 percent in Kuala Lumpur and 62 percent in the smaller towns of the East Coast, although within these groups a sizable proportion moved from medium to large firms (Mazumdar 1981, table 12-3, p. 234). Tokman (1988, pp. 19-21) reports that 61 percent of Costa Rican employees in large formal firms (with 15 or more employees) had their first job in similar establishments and another 22 percent had their first job in smaller formal firms (with 5-14 workers). Thus both Costa Rica and Malaysia show signs of some lifetime movement to larger units within the formal sector, but the movement from the informal to the formal sector is small.

One important finding in the Malaysian survey was that the self-employed sector in the transition matrix was a net gainer of labor. Over the lifetime of the workers surveyed, more people entered the self-employed category than left it, and nearly half of the entrants came from large or medium-sized establishments. The self-employed component of the informal sector here differs markedly from that in the Harris-Todaro model. It may indeed be more useful to view self-employment as a sector of advancement than a reservoir of labor seeking more lucrative wage employment. This alternative view was put forward in a major study of mobility in Monterrey, Mexico, about the same time as the Harris-Todaro hypothesis was being formulated in East Africa, but without the benefit of empirical evidence. Although self-employed male workers in Monterrey, Mexico constituted a heterogeneous category, there was a large intermediate group in the "middle levels of the stratification hierarchy" of self-employment that provided workers an opportunity to enter without much capital (material or human) and offered the prospect of a decent income: "It is such positions to which manual workers can and do aspire to move" (Balan, Browning, and Jelin 1973, p. 216). The authors (p. 215) also noted that "self-employment is an important goal for many men both in industrial and industrializing societies, for it signifies independence which is highly valued. Self-employed men are often evaluated as holding better positions than employees, even when there is little difference in income and level of living." In Monterrey more than half the moves to self-employment (57 percent) among the men aged forty-five or older involved an upward move in the study's classification of occupational grades. "In the majority of cases it was an unskilled manual worker becoming either a grocery store owner, an independent craftsman, or a driver-owner of a vehicle.... On the other hand, fifty-four percent of the men who left self-employed positions entered an occupation at a lower level" (Balan et al., pp. 221-22). Several factors tend to suggest that self-employment indeed represents a source of upward mobility in the labor markets of developing countries. First, the move to self-employment in a developing country depends more on human than financial resources. The self-employed may require some capital, but the cash outlay is often quite minimal. With sufficient energy and imagination, the entrepreneur can go a long way by using his own labor to build up the required capital (including the physical structure he may need), and need not start out with substantial funds. Often the assets created are a classical example of "congealed labor." Since wage labor does not provide an opportunity for capital formation in this way, self-employment represents an appealing opportunity for those who have been able to identify a promising area of the market to exploit.

Second, there may be few opportunities for workers at the bottom of the skills hierarchy to develop skills, especially in economies having a labor aristocracy. In such an environment, lower-paid workers are prevented from advancing by

formal craft unions or informal pressure groups among the more skilled workers, which tend to adopt a closed shop policy toward the less skilled. Discrimination against ethnic or linguistic groups, with or without the support of the state, is an added problem in some countries. Under such conditions a move to self-employment becomes not merely an attractive possibility, but a logical necessity for the ambitious worker with a low position in the formal hierarchy.

Third, macroeconomic policies in many developing countries can adversely affect the growth rate of the sectors of the urban economy that provide wage employment. Although this is not a serious problem in Malaysia, there are cases in which government fiscal and monetary policies have led to inflation and caused real wages to fall in the wage-earning sector. The only way for workers to protect their living standards may be to seek a niche in the self-employed sector—even on a part-time basis. Self-employment is often associated with risk, but this risk may be no greater than that of wage employment when inflation is on the rise and the government has put controls on wages and salaries. If wages are held steady, living standards can even deteriorate.

Product Market Linkages

The formal and informal sectors are linked through the markets for goods and services, as they are through the labor market. Since a large number of workers in the informal sector are petty producers, their earnings are determined to a large extent by the nature of product market linkages. These linkages also enable producers in the informal sector to compete with the large-scale or formal sector businesses. As a result, the informal sector has experienced more sustained growth in the developing countries than the the developed ones. This has been the case even in Latin America, where rates of growth have approached those enjoyed by the developed countries in comparable periods of development.

A major part of the informal sector is concerned with producing a service that only it can generate, namely, domestic service. It is predicated on the existence of a large difference in incomes between the suppliers of this service and their users. It will continue to be an important part of the urban economy as long as wide disparities exist in the distribution of income. Domestic service was a source of employment for large numbers of workers in nineteenth-century Europe. These numbers declined during the period of economic growth between 1870 and World War I, as manual workers' wages moved closer to middle-class salaries. In many parts of the developing world, however, domestic services continue to be an important source of employment because economic growth has not had as much impact on income differences. The situation is attributed in large part to the more rapid growth of population and more unequal distribution of assets in these countries.

Part of the goods-producing sector of the informal economy is in a complementary relationship to formal sector firms and is not threatened by the expansion of the latter. The relationship arises from the subcontracting undertaken by large firms wanting to take advantage of lower wages and to avoid the costs imposed by labor legislation. Castells and Portes (1986) have drawn attention to international economic development that might be a factor in the universal existence and recent expansion of the informal sector. Firms in developed countries have been forced by intensified international competition to reduce costs and achieve greater flexibility in production by having subcontracting

relationships in developing countries. The subcontractors are often small-scale units even if they fall under a large financial or marketing organization.

Outside these segments of complementarity, informal sector products are generally in competition with products of the formal sector. The two types of units coexist in the same urban area for several reasons; beginning with the difference in the ratio of factor prices in the two sectors. Informal sector producers face lower wages and higher interest rates because of their limited access to credit markets.

Second, even if the two types of units are producing what might be called the same product, they often emphasize different qualities or "attributes" of the product. In particular, informal sector firms catering to the low-income segment of the market will be producing goods more like necessities, and less like luxuries. Numerous examples of this type of difference were found in research on small manufacturing firms (Little, Mazumdar, and Page 1987). In South Asia informal sector firms producing laundry soap used nonmechanized methods to produce a coarse variety of soap having washing power but few other attributes. In contrast, large firms adopted mechanized processes to produce soap that was smooth, frothy, and scented. In India a large part of the output of handlooms located in household units consists of cloth woven from coarse cotton yarn and bought disproportionately by the low-income groups.

Third, in the large trade and commerce sector, small units are often in direct and growing competition with modern supermarkets and other large establishments. The economies of scale in bulk buying and marketing, which the latter typically enjoy, could make the trade margins lower for the large firms. Small retail outlets nevertheless hold their own because they are able to provide specific services that are particularly valued by low-income consumers. Tokman (1978, p. 1189) notes: "The small purchasing power of the majority of consumers combined with their income instability and the need to consume a basket of goods with some diversification, result in a pattern of demand characterized by purchasing daily small quantities of different products." The very factors that enable the large units to achieve economies of scale in selling make it impossible for them to sell their goods in small units. Second, the high purchasing frequency of the low-income groups means that the shops catering to their needs must be accessible in terms of location and hours of opening. Thus the PREALC survey in Santiago found that 80 percent of the supermarkets were located in high-income districts while 60 percent of the small shops were located in low-income areas, often in secondary streets and dead ends without public transport. An added advantage of the small retailer is his ability to establish a close relationship with his customer. This is particularly important in assessing credit worthiness—remember that credit is an important part of selling to low-income customers.

Tokman found that the prices of similar products were about 10 percent more than in the supermarkets. But consumer demand did not shift over time to the latter. In fact, one of the big chains closed all its branches in the low-income sectors in Santiago at the time of the survey, after trying for 10 years to break the competition coming from the small shops.

The persistence of the urban informal sector can be traced to the large numbers of people with low incomes in the urban economy. They provide the market for a substantial part of the goods and services produced by the informal sector. At the same time they provide a source of relatively cheap labor for the informal sector firms that enable them to survive even when they are competing with formal sector units with superior technology and productivity. In turn the low incomes in the informal urban economy can be traced to the underemployment and low

productivity of workers in the rural sector, which puts a lid on the supply price of labor coming into the urban labor market. Only when the supply price of rural-urban migrants begins to increase with an increase in labor productivity in the relevant groups can we expect to see a significant decline in the size of the urban informal sector or in the differentials in wages and productivity between the formal and informal sectors.

How far is it possible for informal sector firms or businesses to graduate into the high-productivity formal sector? Empirical work on the upward mobility of firms in developing countries is even rarer than work on the mobility of workers. However, a few relevant points can be made in this connection.

First, informal sector firms are not just small in size. They also employ techniques of production that are qualitatively different from those employed in formal sector firms. In order to economize in the use of capital, they use nonmechanized techniques or secondhand machines of older vintages. There is thus a discontinuity in the production function that describes the entire spectrum of techniques used by formal as well as informal sector firms. Below a certain volume of capital per unit of output, there is a quantum jump to a much lower level of capital-labor ratio and labor productivity. Tokman (1988, pp. 8-9) reports: "Empirical evidence from surveys and case studies undertaken in Lima, Caracas and Guayaquil, show that the average capital labor ratio estimated for modern activities is between 35 and 50 times larger than registered for informal activities. If US\$1000 per person is adopted as the maximum value of capital per unit of employment in the informal sector, the size of the sector (without including domestic services) calculated is 33 percent of the non-agricultural labor in Guayaquil, 33 percent in Lima and 30 percent in Caracas. If the norm used for capital-labor ratio is increased to US\$2000 or US\$3000, the size of the informal sector increases only up to 1.5 percentage points its share in the labor force (Carbonetto and Carazo)."

Second, a major factor reinforcing the impact of discontinuity in the production function in reducing the graduation of firms from the informal to the formal sector is the segmentation of capital markets in developing countries. Formal sector firms have access to the organized capital markets in which interest rates are considerably lower and are often kept at an artificially low level by government monetary and fiscal policies. Informal sector firms have to depend on their own savings or on the "curb market" where interest rates are several times the level in the organized credit market. Moreover, the amount that can be borrowed is limited by the value of assets that the small firm currently possesses. The financing needed to enable the informal sector firm to make a quantum jump across the spectrum of techniques is just not available. The difference in the supply prices of capital is reflected in the gap in the marginal product of capital between the two sectors. Informal sector firms will have a significantly higher marginal product of capital. They can therefore be expected to show a higher rate of profit and a higher share of value added going to profits.

Informal sector firms are generally not covered by the regulations affecting the larger establishments in the formal sector. They thus escape the costs imposed by labor laws as well as laws imposing limits on the economic operation of firms. At times it appears that the informal sector firm is reluctant to expand into the formal sector because it wants to avoid these costs. Empirically, however, this is probably not a significant point. In many lines of production the gap in the levels of productivity and capital requirements between the informal microenterprises and formal sector firms is so great that costs of regulation are of small importance as a

deterrent to growth, compared to other factors such as the availability of financing. It is true that if the microenterprises were asked to bear the costs of regulation many of them would go out of business, but it is unlikely that reducing the burden of regulatory costs in the formal sector will help many of the informal businesses to grow.

The situation might be different in countries where small industries have developed extensively, notably in Asia. In these economies small manufacturing firms cannot be described as microenterprises. They are to be found in many modern industries. They take advantage of low wages as well as the absence of regulatory costs to compete with the formal sector firms. The technology gap in these cases is not too great to discourage growth. The differential impact of regulatory costs on the two sectors might indeed be a factor affecting the decision of firms to enter the formal sector. India is a classic case of an economy that has encouraged extensive development of small-scale enterprises through a series of measures including physical limitation of the capacity of large firms. In many Indian industries the costs of labor and other legislation could be prohibitive if the firms expanded beyond a certain size. Industry has therefore been characterized by a conspicuous underdevelopment of medium-scale firms (see Little et al. 1987 for a detailed discussion).

The Role of the Informal Sector in the Urban Economy

Trends in the Share of the Informal Sector

Is the informal sector more or less a permanent feature of the economy of developing countries? How does it respond to the growth of the economy over time? These important questions have been explored in depth in Latin America through the efforts of PREALC (see Tokman 1982; Garcia and Tokman 1984). In this research the urban informal sector is statistically identified with own-account workers, except for professionals, plus unpaid family workers. Self-employed professionals are excluded by adopting a cutoff point for the educational attainment of the workers. Clearly this definition underestimates the size of the informal sector by excluding small business that make use of a few wage workers—the enterprises outside the “registered” sector covered by labor and industrial legislation.

Despite this limitation, the major findings of the PREALC studies are quite informative. They note, for example, that between 1950 and 1980 there was a massive transfer of labor in Latin America from agricultural to nonagricultural activities. The share of agriculture in total employment fell from 54.7 to 32.1 percent. The magnitude of this shift can be appreciated if we remember that the rate of growth of the total labor force was on the order of 2.5 percent per annum in this period. The growth of urban employment in the United States in the period 1870-1910, when it was being fed by massive immigration, is one of the highest on record. Comparable figures show that the growth rate of the nonagricultural labor force in Latin America exceeded even that of the United States in its great period of expansion, even though the rate of growth of the total labor force was somewhat less than that in the United States.

The difference in the experience of the two regions can be seen in the composition of employment in the nonagricultural sector or in the urban labor force (see Tokman 1982, tables 4 and 5). In the three decades after World War II the growth rate of employment in the modern nonagricultural sector of Latin America was high enough to keep pace with the growth of urban employment as a whole, but the large outflow of labor from agriculture did not significantly reduce the share of the nonagricultural labor force absorbed by the informal sector. In contrast, in the United States the relative size of the urban informal sector decreased by more than a third between 1900 and 1920 in the nonhousehold occupations, and the share of household (domestic) services declined even more. Second, in the United States the informal sector in the urban labor market was concentrated in the service sectors in the early years of this century, the proportion of own-account workers in manufacturing being only 7 percent in manufacturing, in contrast to 22 percent in the urban economy as a whole. In Latin America, however, the share of informal employment in the total was slightly higher in manufacturing than in the total urban labor market both in 1950 and in 1970.

The employment problem in Latin America, associated with the different composition of the nonagricultural labor force, can best be understood by comparing the intersectoral difference in productivity in Latin America with the situation in the developed countries (see Tokman 1982, table 6, p. 129). The productivity of labor in agriculture relative to either manufacturing or the nonagricultural sectors on a whole is strikingly lower in Latin America than in the United States, Sweden, or Japan. Moreover, although the relative productivity in agriculture increased significantly in the developed countries during 1950-80, it remained stagnant in Latin America. Now it is the level of productivity in agriculture that determines the supply price of labor migrating from the rural to the urban sector. In particular, it will fix the level of productivity and wages in the urban informal sector, where entry is easy and technology is labor-intensive. The much smaller ratio of agricultural/nonagricultural productivity observed in Latin America therefore implies a much wider difference in productivity between the modern formal sector of the urban economy and the traditional informal sector.¹⁷ It leads to a greater inequality of incomes in the urban areas. Although owners of capital take a lion's share of the productivity gap between the formal and informal sectors, labor also participates in the process of differentiation. As already mentioned, wages are significantly higher in the urban formal sector in Latin America, as is the case in other developing countries.

The inability of the high-productivity formal sector to absorb more of the labor shifting out of agriculture in Latin America cannot be ascribed to a low rate of growth compared with the United States in the period when it transferred its structure of employment. Tokman (1982, p. 106) writes: "The investment coefficient for Latin America as a whole averaged 21.5% between 1950 and 1980: a figure similar to that recorded in the United States between 1870 and 1900, when that

17. Using data from Simon Kuznet's work, Tokman (1982, pp. 129-30) points out that in the United States in 1870 productivity in "other services" was about 30 percent less than in the rest of the tertiary sector (commerce, transport, finance, government, and basic services), but that this differential had disappeared by 1920. In Latin America, however, the average differential in the 10 countries for which data were available around 1950 was more than 45 percent. Similarly, within manufacturing productivity difference between small firms (those with fewer than 20 workers) and large ones (those having about 500 workers) was less than 5 percent in 1972, whereas for Brazil and Mexico the difference exceeded 60 percent.

country's rate of accumulation of capital was one of the highest among the countries now classified as developed. Similarly, the growth rate of the product in Latin America was 5.5% per annum on the average, in comparison with 5% in the United States in the aforesaid period." Tokman and his associates attribute the persistence of the large urban informal sector and the equally large intersector productivity differentials to two factors: the nature of technological change, and the inequality in the ownership of assets—capital and land.

The period in which the structural change in the labor force took place in Latin America came much later than in today's developed countries. The modern sector borrowed from and used technology geared to the needs of the labor-scarce economies of the industrial countries. This explains the relatively high productivity of the urban formal sector. Because a large amount of capital per worker was required, however, only a part of the increase in the urban labor force could be absorbed by this sector, even though the rate of capital accumulation was quite high.

Labor productivity in agriculture or the rural sector continued to be low primarily because of the inequality in the distribution of land (as discussed in chapter 2). The outflow of labor from the rural sector was still not large enough to increase significantly the relative productivity in agriculture. The persistence of low productivity in the urban informal sector is a response to the high cost of creating jobs in the formal sector, on the one hand, and the continued low productivity of agriculture, on the other.

The Informal Sector and the Recent Crisis

No discussion would be complete without some reference to the behavior of the informal sector during economic reversals like those that hit the developing countries during the 1980s. Several research projects on the labor market consequences of the external shocks and adjustment programs at the heat of this downswing are under way, and some broad trends are already clear.¹⁸

The formal urban labor market has adjusted to the downswing sharply and swiftly through work sharing in the form of reduced hours, a significant rise in open unemployment, and a significant fall in the real wages of those who continue to be employed. The response of the market has shaken the view that the formal sector is characterized by rigid wages. In addition, adjustment policies have been widely accepted, often at the behest of international agencies, which see the reduction of real wages as the best way to improve competitiveness, achieve a reallocation of resources toward the sectors of tradable goods, and to slow down inflation. In many countries political changes have affected the power of unions to resist such wage cuts.

The wage statistics compiled by PREALC are reproduced in table 9, which shows a fairly general decline of real wages, irrespective of the wage index used, except in Colombia. It should also be remembered that real wages did not increase all that much in the 1970s, with the result that in many countries the real wage in industries of the formal sector was no higher in 1983 than in 1970.

18. One of these, which is being carried out at the Economic Development Institute by the author, is expected to comprise 10 case studies in Latin America, Asia, and Africa.

Table 9. Evolution of Real Wages (indexes 1970 = 100)

<i>Countries</i>	<i>Minimum wages</i>					<i>Industrial wages</i>					<i>Construction wages</i>				
	<i>1979</i>	<i>1980</i>	<i>1981</i>	<i>1982</i>	<i>1983</i>	<i>1979</i>	<i>1980</i>	<i>1981</i>	<i>1982</i>	<i>1983</i>	<i>1979</i>	<i>1980</i>	<i>1981</i>	<i>1982</i>	<i>1983</i>
Argentina	46.8	55.0	53.6	56.8	84.1	83.1	93.1	83.1	74.4	96.2	56.4	66.5	58.7	52.8	80.2
Brazil	99.4	101.7	100.6	101.1	89.3	147.5	155.5	165.6	177.9	156.3	113.1	113.7	115.4	120.0	101.1
Colombia	96.0	127.3	124.7	130.7	139.1	97.4	97.6	97.8	101.6	104.6	109.3	117.2	110.8	n.a.	n.a.
Costa Rica	151.5	153.5	138.9	1131.9	152.7	131.6	131.8	119.0	98.2	112.7	133.3	133.7	117.8	93.5	96.6
Chile	75.8	76.0	75.8	73.9	59.5	92.5	103.8	115.9	112.5	99.9	101.0	102.3	108.1	105.0	78.5
Ecuador	115.2	203.7	175.0	154.2	129.2	140.2	167.9	160.9	157.2	n.a.	97.7	123.0	128.9	130.5	n.a.
El Salvador	104.2	118.8	110.4	99.0	89.5	81.9	95.3	87.6	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Guatemala	53.2	85.1	91.5	91.5	87.2	69.1	68.6	76.4	78.8	81.8	106.0	111.6	136.4	135.9	126.5
Honduras	85.5	78.3	74.7	80.7	70.3	150.0	103.7	112.5	122.1	123.5	109.2	97.6	110.4	119.0	117.8
Mexico	117.7	110.0	110.7	99.9	80.2	128.0	115.4	119.0	117.3	88.0	114.2	118.5	111.1	102.2	n.a.
Nicaragua	89.3	75.1	67.8	55.8	42.5	23.6	60.0	60.8	53.1	41.1	62.2	53.5	54.2	53.4	41.3
Panama	84.2	74.1	69.0	66.3	74.3	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Paraguay	65.6	66.2	69.0	68.7	67.5	26.6	88.0	93.7	90.9	83.8	74.6	71.8	75.9	72.5	64.2
Peru	67.3	83.2	70.8	65.2	62.3	73.8	87.8	86.1	86.9	68.5	78.0	87.4	86.4	93.6	78.6
Uruguay	84.6	80.7	82.7	83.4	n.a.	50.3	47.8	51.4	50.8	39.3	68.6	65.3	65.0	56.1	46.2
Venezuela	64.9	106.9	92.0	84.0	n.a.	121.1	122.0	118.4	122.0	118.2	122.5	119.0	110.1	n.a.	n.a.

n.a. Not available.

Source: Country data compiled by PREALC.

The impact of the downturn on the urban informal sector is not yet known in great detail. One would expect the contraction of incomes in the urban informal sector to be generally greater since it is a multiple of the fall in income in the formal sector. This can be seen from the following simple model, in which the basic (realistic) assumption is that part of the income of the formal sector is spent on goods and services of the informal sector, but the latter buys little or nothing from the former:

- Let a = marginal propensity to consume informal sector goods for the formal sector income earners,
 Let b = marginal propensity to consume informal sector goods by informal sector earners.

Thus, when formal sector income falls by \$1, the income of the informal sector falls initially by \$ a (<1). But this sets up a multiplier process, by which ab is the fall in income in the first round; ab^2 is the fall in the second round, and so on. The total decrease in income when the multiplier has worked itself out is thus $a/1 - b$. This will be greater than one if $a + b > 1$. Unless the propensity to consume informal goods (a) is very low or the propensity to save in the informal sector ($1 - b$) is substantial, we would expect the inequality to hold. Increases in the informal sector will fall more than the fall in income in the formal sector.

But what happens to average earnings in the informal sector? This depends on the supply of labor that would share in the total income generated in the sector. One component of the increase in supply will come from the formal sector workers who have lost their jobs. The net change in labor supply will depend on the impact of the downswing on net rural-urban migration. It is possible for net migration to be larger in spite of the fall in income in this sector. First, rural increases and wages may have declined even faster. Second, single migrants and secondary workers might still want to migrate to the urban informal sector as long as their urban earnings exceed their marginal product (or marginal contribution to the family income) in the rural areas. Net migration might continue even if average incomes in the rural sector equaled or exceeded the average earnings in the urban informal sector. Indeed, it might increase in volume if the marginal product in rural activities fell faster than average informal sector earnings.

The last point suggests a scenario in which a drastic change in the composition of migrants, and hence in the pattern of economic activities in urban areas, takes place in response to a substantial economic shock. If there is a precipitous fall in urban earnings both in the formal and in the informal sector, as has taken place in parts of Africa, migrants who have been induced to settle in town on a semipermanent basis by the high wage policy of the 1960s, will no longer find urban earnings adequate to support a family. If they still have access to family farms in their rural areas of origin, they may find it profitable to return to the rural areas. Since the capacity of the farms to absorb labor is limited, however, the marginal product of rural workers will fall to low levels, thus encouraging migration of single temporary workers to the urban labor market. The ratio of temporary to permanent workers would increase in the urban economy. Economic activities that depend significantly on permanent, stable labor (for example, small industries using skilled labor) would shrink in size, and there would be more labor in such occupations as casual work and petty trade. No empirical evidence is yet available to indicate whether such a reversal to the pattern of the pre-1960 urban activities has

taken place in Africa, but economic analysis of the drastic fall in urban wages suggests that this might well have occurred.

In Latin America urbanization is both more extensive and more permanent. The ties that many workers had with the rural sector have long been severed. Circulating male migrants who divide their time between the urban and rural areas are much more prevalent in African and Asian towns than in Latin American ones (see Nelson 1976). Consequently, the sharp downturn in formal sector employment in Latin America is not likely to result in too much reverse migration to the rural sector. Rather, the evidence suggests that there has been a significant rise in other unemployment. For Latin America as a whole, PREALC estimates that the rate of urban unemployment increased from 6.9 percent in 1980 to 10.4% in 1983, the increase being particularly severe in countries like Chile, Uruguay, Costa Rica, and Bolivia (Garcia and Tokman 1984, table 5, p. 111). At the same time, the characteristics of the unemployed have changed somewhat during this severe downswing. Garcia and Tokman (1984) found that the rate of unemployment increased less among the secondary workers—women who are not heads of households and young persons—than among the primary workers who are heads of households. Within the pool of the unemployed, there was a rise in the proportion of men, of persons in more active age groups (24 to 44 years), and of those with less education. Garcia and Tokman (p. 110) concluded: “The indicators suggest that unemployment is affecting the primary labor force and is not, as in the past, merely reflecting insufficient absorption of new entrants into the labor market.

Two questions are suggested by this evidence. First, why did unemployment increase in spite of the steep fall in real wages in the urban formal sector? Second, why did so many workers choose to remain unemployed rather than enter the informal sector?

With regard to the first question, the evidence strongly suggests that unemployment in the short run in the urban economy of Latin America had a strong Keynesian element. As a result, it increased with the fall in aggregate demand. Downward flexibility of real wages was not sufficient to clear the market, and may even have caused demand to contract by decreasing the purchasing power of workers.

In the case of the second question, some economists have argued that although entry into the informal sector is easy and wages are completely flexible, the unemployed who have lost their jobs in the formal sector would prefer to “wait it out” rather than accept the low earnings in the informal sector. Real wages might have fallen significantly in the formal sector, but the income per worker would be even lower in the informal sector. Unemployment for many, in other words, is quasi-voluntary, as explained earlier. Workers are willing to accept employment at the still higher formal sector wage, but not at the level of wages in the informal sector (see Edwards and Edwards 1987).

This explanation is probably not quite complete. As we have seen, the ease of entry into the informal sector is sometimes exaggerated. Although petty traders might need only a small amount of capital, it might be beyond the resources of a dismissed worker in the formal sector. As far as wage in the casual labor market is concerned, its downward flexibility is not infinite. Many of the same forces contributing to disguised unemployment in the rural sector (see chapter 2) will be operating in this market. A new job seeker at the going wage rate may not get more than a few days’ work a month even though he may want more work at that wage.

Policy Implications

The foregoing discussion clearly points to the importance and long-run viability of the informal sector in the urban labor markets of developing countries. It also plays an essential role in the short-run adjustment of the labor market to economic shocks. The urban informal sector will continue to play this role as long as low labor productivity in the agricultural sector persists. Given the current rates of population growth and the limited capability of the formal urban sector to absorb labor, this situation is likely to continue for some time in most developing countries.

Consequently, policymakers should make every effort to avoid restricting the informal sector through zoning laws, licensing requirements, and outright physical intimidation. Since production in the informal sector is much more competitive than in the large-scale formal sector, attempts to extend the scope of minimum wage legislation to this sector are likely to place even greater restrictions on employment than minimum wages in the large-scale sector do.

Should government policies actively promote the informal sector? Various countries have tried to do this by subsidizing certain inputs, particularly credit; strengthening infrastructure services—for example, by providing electric power and decent roads; or reserving parts of certain markets for items produced by small-scale firms. The last approach has been followed especially vigorously in India. However, little has been said about the reasons why small-scale enterprises need to be protected or subsidized.

In view of the wage gap that favors the large-scale sector of the labor market, it appears that distortions of the market will invariably favor the informal sector and hence that government policy should be designed to protect the large-scale sector. This familiar argument oversimplifies matters. Only a part of the wage gap is explained by noneconomic factors. The difference in wages per unit of labor of standard efficiency is much less than the difference in actual wages per man. In other words, the labor cost advantage in the formal sector may not be as great as the difference in earnings would suggest.

As far as the market for other inputs (for example, raw materials or credit) is concerned, the large-scale sector clearly has the advantage. The economies of bulk buying of raw materials and the operations of the organized credit market favor large firms, which are also in a better position to market their products, particularly abroad. By maintaining an overvalued exchange rate, countries enhance official subsidization of the large-scale sector, which can thus make greater use of imported intermediate goods and obtain licenses for key imports with less difficulty.

In most developing countries the small-scale sector needs special help to correct such distortions. Perhaps an even more important reason for protecting the small-scale sector is the difference in product markets served by the formal and informal sectors. The informal sector typically produces goods and services that cater to the needs and tastes of poor consumers. This is even true of products ostensibly produced within the same narrowly defined industry.

The coexistence of firms of different sizes and capital/labor ratios in the same narrowly defined industries is explained in part by factor price differences and in part by the market segmentation caused by different product qualities (see Little, Mazumdar, and Page 1987, chapter 14). If informal sector firms are found in the "inferior" part of the market and formal sector firms are found largely in the "superior" segment of the market, is there any reason to interfere with this

costs like fees and indirect costs of earnings forgone during the period of additional schooling).

Table 11. Estimates of the Mincerian Earnings Functions for Selected Countries

<i>Country and year</i>	<i>Variance in log of earnings (ea)</i>	<i>Variance in schooling (years)</i>	<i>Coefficient of schooling (estimate of r)</i>	<i>Goodness of Fit (R²)</i>
Britain, males, 1970	0.436	4.805	0.097	0.316
United States, non-South white males, 25-64, 1959	0.423	11.42	0.06	0.11
United States, South, white males 25-26, 1959	0.548	15.21	0.08	0.20
Canada, nonfarm males, 25-64 1961	0.462	11.42	0.08	0.15
Mexico, urban males, over 25, 1963	0.624	18.15	0.14	0.56
Malaysia, urban males, employees, 1970	0.578	19.44	0.14	0.49
Panama, males, 25-64, 1983	1.94	22.45	0.17	0.34

Sources: Britain: R. Layard and G. Psacharopoulos (1979). United States: Chiswick (1974), p. 50. Canada: Chiswick (1974), p. 84. Mexico: Chiswick (1974), p. 85. Malaysia: Anand (1983), Table 7.1, p. 246. Panama: Heckman and Hotz (1987), p. 516.

The most common distinction made in estimating earnings functions is between primary, secondary, and higher levels of education. Psacharopoulos (1985) has summarized the results from a large number of studies (see table 12). For all regions other than advanced countries, there is a sharp decline in the rate of return to education between primary and secondary levels. The high profitability of primary education is the result of the low cost of this level of education (relative to others) and the substantial productivity differential between those with primary education and those who are illiterate.²² Furthermore, the returns to education for each level are inversely related to per capita income. The returns are highest in Africa, since human capital is scarce relative to other assets (such as land) in low-income countries.

22. The higher productivity of primary school graduates has also been confirmed in present agriculture using physical output rather than earnings as a criterion of performance.

Table 12. Average Returns to Education by Country Type and Level (percent)

<i>Region/ country type</i>	<i>Social</i>			<i>Private</i>		
	<i>Primary</i>	<i>secondary</i>	<i>Higher</i>	<i>Primary</i>	<i>secondary</i>	<i>Higher</i>
Africa	26	17	13	45	26	32
Asia	27	15	13	31	15	18
Latin America	26	18	16	32	23	23
Intermediate	13	10	8	17	13	13
Advanced	n.a.	11	9	n.a.	12	12

Note: n.a. not available because of lack of a control group of illiterates.

Source: Based on appendix table A-1, latest year available.

The returns to levels of education higher than secondary fluctuate considerably, and within this group, returns to college or university education are often higher than those to other forms of postsecondary education. These variations reflect the institutional structure of the white-collar labor market, particularly the influence of public sector employment and pay policies, as explained in the next section.

The Productivity of Education

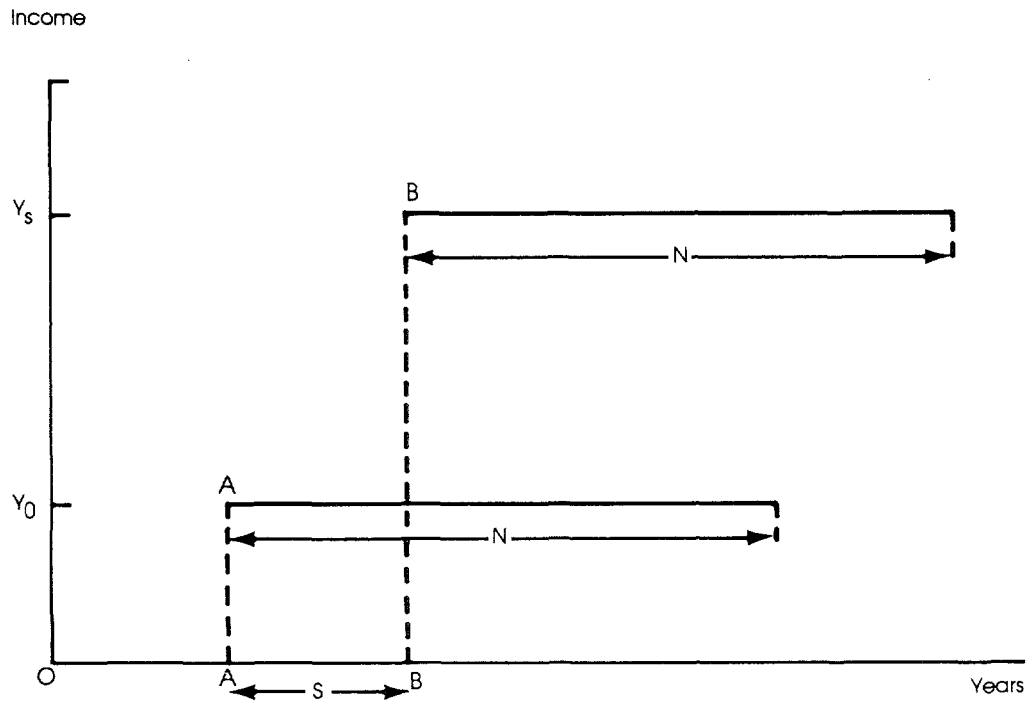
The coefficient of schooling in the earnings function can be interpreted to signify the private rate of return to education. The data used in estimating the function are observed earnings of workers with different levels of education. But the earnings of workers will reflect their true productivity only if several sweeping assumptions are made, as follows:

1. Wages are determined competitively at all levels of education. In particular, the higher pay for more educated labor is not due to administered pay policies of, for example, the public sector.
2. The supply price of educated labor reflects its "social" opportunity cost.
3. The cross-sectional pattern of earnings gives a reasonable idea of future trends.

Assumption 1. The relative importance of institutional factors in the determination of earnings in the urban formal sector is likely to increase as the skill and educational level of the workers increase. This occurs because the public sector plays a dominant role in the market for nonmanual labor in many developing countries. Wages are determined in the public sector by administrative decrees. Even when government wage-setting institutions attempt to set wage levels by looking at "comparators" in the private sector, they can only do so at infrequent intervals. Moreover, when the public sector is large, private sector wages will be determined by the levels set in the public sector, at least for the categories of labor used extensively by the latter.

Government wage scales pay particular attention to seniority and levels of formal schooling. Jobs are classified into grades, and the entry-level wages, as well as the level of education required for the different grades, are fixed by the wage-setting authorities. Within each grade, wages increase with the length of service. The Mincerian human capital model performs well in this sector as earnings are closely related to experience and education. But this relationship does

Figure 6: Earnings Profiles with Different Levels of Schooling



Note: Expected Income at Y_0 with no schooling and at Y_s with S years of schooling, with a work life of N years independent of S .

Source: Behrman and Birdsall (1983).

situation by giving special consideration to small-scale enterprises? The case for special treatment rests on two basic arguments.

The first has to do with the distribution of income. The larger the proportion of income going to poorer sections of the community, the greater will be the demand for the products of informal sector firms. Since the informal sector offers more employment at lower wages than the formal sector, and since profits in the informal sector are lower,¹⁹ any increase in the output of the informal sector relative to the formal sector will tend to shift the distribution of factor income toward lower-income groups. Thus, an expansion in the supply of informal sector products tends, to some extent, to create its own demand. In other words, the size of the informal sector depends on the distribution of income, and one of the variables affecting both its size and income is the degree of protection it receives.

The demand for high-quality formal sector goods is at times said to be exaggerated by inappropriate imitation of the products of western technology. The public sector, by encouraging firms to use the more advanced technologies, may be responsible for such "distorted" patterns of demand, or the distortion may be caused by expensive marketing and advertising campaigns that the informal sector cannot match (see, for example, Stewart 1977). The response of production to distorted demand patterns gives rise to further repercussions by worsening the distribution of income and hence increasing the demand for formal sector products.

Although both these points are theoretically valid, the question of whether the informal sector is smaller than socially desirable can only be answered by considering a country's experience and stage of development. Since formal sector products are more appropriate to the world market, an important issue is a country's efforts to develop export markets. India may be a country in which small-scale enterprises were overprotected, whereas Indonesia and several countries in Africa may have gone too far in encouraging production by their large-scale sector (for some country-specific studies, see Stewart 1977; and Little, Mazumdar, and Page 1985).

Education and the Labor Market

Still another important factor to consider in a discussion of urban labor is skill differentiation. A convenient framework for examining markets for labor with different skill levels is the human capital theory.

Human Capital: Theory and Evidence

The human capital theory as formulated by Mincer is illustrated in figure 6.²⁰ The earnings stream over the lifetime of workers due to a schooling level Y_0 , is represented by the graph AA, where OA is the period of no income while the worker is at school; he then earns a positive amount Y_0 for the entire period of N years of his working life. With a higher level of schooling S, the period of no earnings is extended from OA to OB, but the level of earnings in each year of his working life is

19. This follows from the proposition that the capital/labor ratio is lower in the informal sector, even if the rate of profit on capital is equalized.

20. This section is based on Behrman and Birdsall (1983).

not depend on the higher productivity of more educated and experienced labor, as assessed by the employers. Rather, it reflects the administrative practices of public institutions.

One method suggested to get around this problem is to run separate earnings functions for the "competitive" and "noncompetitive" sectors of the labor market. This procedure will not work, however, if the public sector is large enough to determine wages in the private sector. Second, not all of the private sector can be considered "competitive" from the point of view of wage setting. It has been noted that large firms practice "credentialism" in their hiring practices as much as the public sector.

Assumption 2. Even if the estimated rate of return to schooling accurately reflects the marginal productivity of educated labor, it cannot be used as a guide for setting policies on investment in schooling without further information. The private rate of return might be inflated above its true value with respect to the economy as a whole because the state bears many costs of education. The subsidy is financed by the general taxpayer and not by those investing in education. It is therefore a cost for the economy but not for the individual. The social rate of return to education adjusts the private rate downward to take this subsidy into account. Table 13 reproduces Psacharopoulos's data on subsidization of education for different regions of the world by type of education. After adjusting for these subsidies, Psacharopoulos showed that for his sample of countries in Africa the rate of return to education no longer turns upward after the secondary level. Rather, it falls continuously from primary through secondary to higher levels.

Table 13. Index of Public Subsidization of Education by Level and Region

<i>Region/country type</i>	<i>Educational level</i>		
	<i>Primary</i>	<i>Secondary</i>	<i>Higher</i>
Africa	92	51	157
Asia	58	13	9
Latin America	104	47	50
Intermediate	51	6	7
Advanced	n.a.	21	44

Note: The subsidization index for a given level of education is defined as the percentage by which the private rate of return exceeds the social rate.

Source: Based on strictly comparable rates in Psacharopoulos (1985) appendix table A-1.

Assumption 3. Earnings functions are generally estimated from cross-sectional data pertaining to a single year. The lifetime profile of earnings of workers with a particular level of education is assumed to be approximated by the combined experience of earnings of the sample having that education but belonging to different age cohorts. However, the quality of education generally changes over time. This affects the estimated return to education for different years or levels of schooling in a systematic way.

The point can be clarified by referring to figure 7. Suppose that we are dealing with an economy that is improving its quality of education steadily over time. Line A represents the hypothetical age-earnings profile for a certain level of education for the 1980s. Line B portrays the earnings profile for the quality of education

prevailing in the 1960s and is at a lower level. An econometric estimation of the age-earnings profile based on cross-sectional data would not reflect either of the two curves. The points of observation of a study made in the 1980s would lie along the dotted line of figure 7 and would lump together the returns to education of both the new labor market entrants with a 1980s education and the surviving older workers with a 1960s education. The earnings profile is therefore flatter than the real profile. The discounted value of the return to education is accordingly an underestimate.

Over time, of course, the quality of education could change in either direction. In recent decades many developing countries have witnessed a rapid expansion in education, particularly at the postprimary levels. It is quite likely that this expansion has caused educational standards to deteriorate. In this case, the relative positions of the two earnings curves are reversed in figure 7. The rate of return to the particular level of education is then overestimated.

Human Capital Theory and Labor Market Segmentation

Labor market segmentation occurs not only because of wage differences facing unskilled manual labor in different parts of the market, but also because the labor market is made up of all types of labor with different human capital endowments. Segmentation in this broader sense can be analyzed by fitting separate earnings functions for groups of workers in the different parts of the market. The central question then is how to identify and separate the different segments of the market. If this could be done in a meaningful way, there would be at least three aspects of the use of the earnings function to consider in identifying segmentation. First, the constant term in the estimated earnings equation could be expected to be lower for the workers in the "inferior" part of the market. This means that the entry-level base wage for a worker without any education or experience would be at a lower level. Second, the coefficient of schooling (that is, the rate of return to education) could be significantly lower for these workers, because "credentialism" is practiced in a significant way in the "superior" market, where educated workers get a premium over and above their marginal productivity, as measured by the returns to education in the more competitive "inferior" market. Third, the coefficient of experience could also be lower in the latter. The relatively steep age-earning profile in the "superior" segment is due to the operation of internal labor markets, as already observed in large firms and the public sector.

In the literature on dual labor markets in the industrialized countries, the two segments of the labor market are sometimes identified by classifying occupations according to a socioeconomic ranking score (see, for example, Osterman 1975). In developing countries the formal and the informal sectors are usually differentiated according to the criteria discussed earlier. This type of classification creates a problem because there is generally a strong correlation between the criteria for differentiation and income. Thus, dividing the sample of earners into two groups is tantamount to classifying them by the dependent variable of the human capital function that we are estimating, namely, earnings. The separate functions identified for the two groups and the implicit rejection of the

higher, as shown by the line BB. The individual choosing between the two levels of schooling will compare the cost of longer years of forgone earnings with the extra income he gets for each year that he will be working. We make the following assumptions:

- The level of schooling does not affect the length of the working life.
- The rate of discount (r , reflecting the cost of waiting for future income) is the same for all workers.
- There is no risk aversion for the different groups of workers.
- There is no "rationing" in the labor market for the more highly educated, so that all workers who manage to get the level of education S are able to have an earnings stream corresponding to that level of education.

The potential worker will decide on what to invest in schooling by comparing the two income streams AA and BB— V_0 and V_S should be equal. That is,

$$(1) \quad 1 = \frac{V_S}{V_0} = \frac{Y_S \int_0^{S+n} e^{-rt} dt}{Y_0 \int_0^n e^{-rt} dt} = \frac{Y_S e^{-rS} (1 - e^{-r(S+n)}) / r}{Y_0 (1 - e^{-rn}) / r}$$

or

$$1_n Y_S = 1_n Y_0 + rS.$$

The semilog earnings function defined as (1) ignores any role of post-school investment in augmenting the individual's earning capacity. Mincer has, however, stressed the importance of on-the-job training in skill formation. The scope for the latter depends on the length of time that the worker is in the labor market. This is measured by his "experience," which is his age minus the time spent in schooling. The productivity of experience can, however, be expected to decline with age, since both firms and workers reduce the amount of on-the-job training undertaken as the period over which the returns to such investment can be enjoyed diminishes and retirement age approaches. Thus the standard earnings function adds a quadratic in experience (E) to equation (1):

$$(1) \quad 1_n Y_S = 1_n Y_0 + rS + aE + aE^2.$$

Equation (1') has been statistically estimated in both developed and developing countries. The results indicate that the rates of return to education (the coefficient of S) tend to be substantially higher in developing countries (see table 10). The reasons for this are that the differential in earnings between manual and nonmanual workers are significantly higher in developing countries. Since higher education is a prerequisite for nonmanual jobs, the returns to education also tend to be higher in developing countries (see, for example, Kothari 1970).

Second, the power of formal education as an explanatory factor in earnings is significantly greater in developing countries. Table 11 compares the relevant statistics from a few selected earnings functions estimated for advanced as well as developing countries. The variance in the years of schooling and the rate of return to schooling are significantly greater in the developing countries. The value of R^2 for the estimated Mincerian earnings functions is accordingly much higher. In fact, it has been noticed both in the United States and Britain that, within the

framework of the earnings function, the share of schooling in the explanation of earnings inequality is substantially less than the share of experience. If only schooling (in years), and not experience, is used to explain earnings in the Mincerian model, its explanatory power in Britain, for example, is only 4.5 percent (whereas the overall R^2 is 32 percent) (Layard and Psacharopoulos 1979). In developing countries, however, schooling alone is of substantial importance. In Malaysia alone, schooling explained as much as 38 percent of the lay variance of earnings, compared with the total of 49 percent explained by the whole model.²¹

Table 10. Mincer-Type Returns to Education by Country Type

<i>Region or country type</i>	<i>Coefficient on years of schooling (percent)</i>
Africa	13
Asia	11
Latin America	14
Intermediate	8
Advanced	9

Note: The following countries are included in each category: Africa—Ethiopia, Kenya, Morocco, Tanzania; Asia—Hong Kong, Malaysia, Pakistan, Singapore, South Korea, South Vietnam, Sri Lanka, Taiwan, Thailand; Latin America—Brazil, Chile, Colombia, Costa Rica, El Salvador, Guatemala, Mexico, Venezuela; intermediate—Cyprus, Greece, Iran, Portugal; advanced—Australia, Canada, France, Germany, Japan, Sweden, United Kingdom, United States.

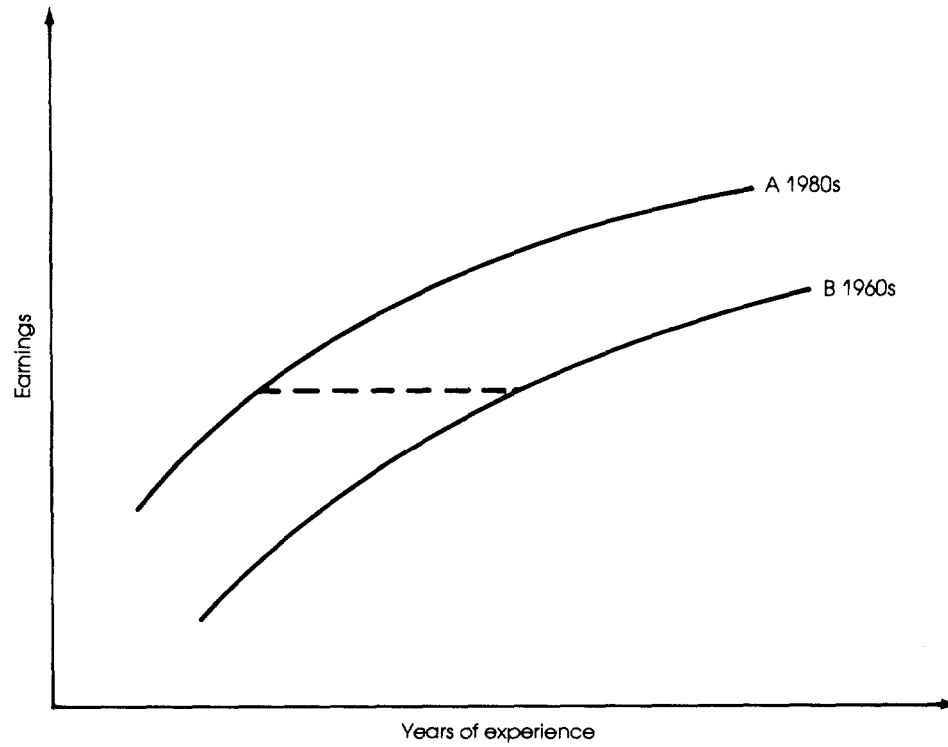
Source: Master table listing the individual country rates is available from Psacharopoulos (1985) and is available on request.

In the Bombay labor market, as already mentioned, the sector of work relative to the size of the firm was the major determinant of earnings for urban workers, rather than education (after controlling for age). This finding does not contradict what has been said here about the role of education in the earnings functions in developing countries. The Bombay case study dealt with the earnings of male manual workers only. The discussion here is concerned with the entire earnings structure, including manual and nonmanual workers.

Varying returns to different levels of education. A calculation of the summary return to education across all levels does not always provide the information needed for policy prescriptions. It is more important to know how the returns vary by levels of education. This information can be obtained by using educational attainment as categoric variables (each category representing a different level) rather than years of schooling as a continuous variable. This has often been done in studies of the earnings functions. The coefficient of an educational “dummy” (say, secondary schooling) shows the increment in earnings associated with that level relative to the base (which could be “no education,” depending on the specification). The rate of return can then be calculated by taking into account the additional costs incurred in being educated up to this level. (This includes direct

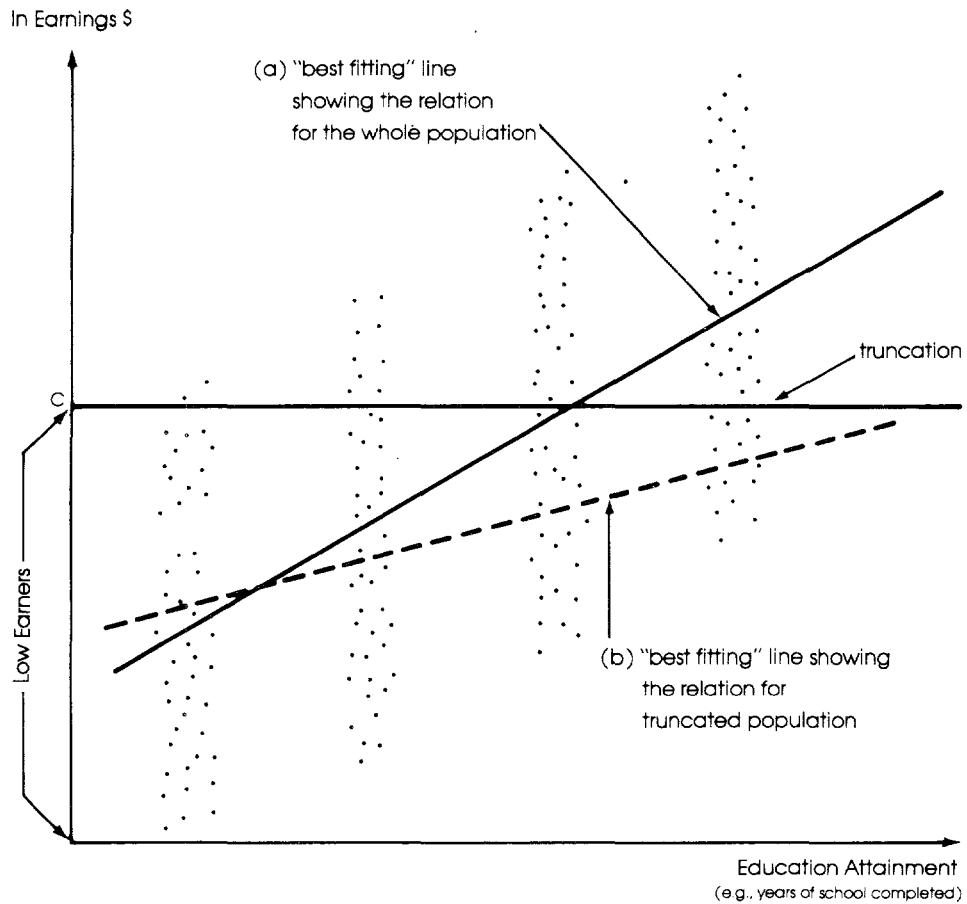
21. The contribution of schooling to the explanation of earnings, holding experience constant, is equal to: (coefficient of S)² times Var(S).

Figure 7: Hypothetical Returns to Experience for Two Generations



single market hypothesis are thus simply the result of a sample selection bias in the statistical procedure, as illustrated by figure 8.

Figure 8: Scatter Diagram and Regression of Earnings on Educational Attainment, with and without Truncated Earnings



Source: Cain (1976).

Suppose that, in fact, there is no segmentation in the market. The solid line in the figure describes the earnings function for all workers in the sample. We now create a subsample of workers by using a criterion that is based on their earnings. Thus all workers with earnings below C are included in the subsample for the lower part of the market. Running separate regressions for the two subsamples would then create biased estimates of the true regression function. For the subsample with the earnings less than C , the proportion of people in this category declines as the level of education increases. The dashed line in figure 8 indicates the impact of the bias on the estimated regression equations. Low-income workers appear to have a separate earnings function with a lower coefficient of schooling (the dashed line), although the entire sample has a single common earnings function (the solid line) with a higher return to schooling. The distinct earnings function for the lower segment is a result of our statistical procedure and does not represent real labor market outcome.

Theoretically, it is possible to test for this bias using techniques developed by Heckman (1976), but the statistical requirements for such tests are fairly stringent (for a recent discussion, with applications to Panama, see Heckman and Hotz 1987). In particular, it is necessary to know the precise functional form of the regression equation under the null hypothesis of no dualism. To some extent, however, whether the statistical critique of segmentation is valid or not depends on one's knowledge about how the labor market works. Empirically, the critical issue is the degree of mobility from the low-income to the high-income sector. If, as suggested earlier in the paper, there is some empirical basis for the view that the probability of a worker graduating from the informal to the formal sector is quite low in many developing countries, the division of the total sample of workers into two segments in figure 8 is not an arbitrary statistical act. The point C represents the upper boundary (in terms of earnings) of the informal sector. The fact that fewer of the higher educational categories are found in this sector only reflects the use of educational credentialism during the selection of workers in the formal sector.

Discrimination

Samples may be divided into two or more groups without too much objection when the labor market is segmented by objective, easily identified criteria, as in the case of discrimination against particular groups based on race, sex, or caste. Discrimination is usually associated with a lower level of human capital in the disadvantaged group, as a result of less education and labor market experience. In addition, the impact of discrimination shows up in the parameters of the separate earnings functions. As already discussed, the earnings equation for the disadvantaged groups could be expected to show a lower value of the constant term and lower values of the coefficients of schooling and experience.

If labor of the disadvantaged groups is supplied at a lower wage, why do profit-seeking employers not employ them in preference to the high-wage workers from the privileged group? One would expect that the demand for the former would rise relatively faster and thus reduce the wage gap over time. The persistence of the wage gap and discrimination suggest that other strong forces are seriously weakening the profit-maximizing forces. Some have suggested that the wage gap is offset by a productivity gap between the two classes of workers. There are at least two objections to this argument.

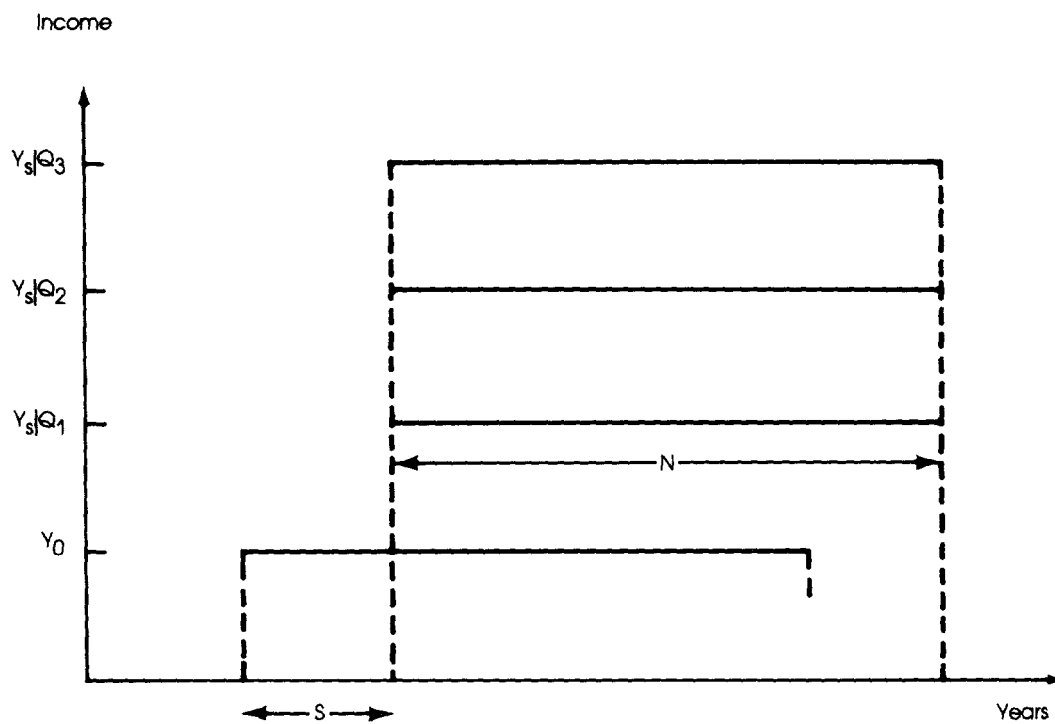
First, a significant part of the lower productivity of the disadvantaged group can be traced to its smaller stock of human capital. The lower rate of acquisition of human capital is itself a result of discrimination. Second, discrimination in the labor market often consists of "crowding" the disadvantaged group into a narrow band of occupations. Members of this group will find it difficult if not impossible to find employment outside this range. Female employment in both developed and developing countries has generally been concentrated in a few occupations. Domestic service, teaching, nursing and low-grade sales and clerical jobs have been the traditional preserve of female workers (see Bergmann 1986, especially chap. 4). In many developing countries, particularly in urban areas, the employment of women is restricted even in the sales and clerical categories. When women are employed in modern industry, they are often used in specific occupations; in India such occupations are marked by a special label; they are called "magi" jobs. Occupational crowding implies that productivity is difficult to compare in a wide range of occupations in which there is little representation of the disadvantaged groups. The phenomenon also serves to focus attention on the mechanism used to keep members of the disadvantaged group from entering particular labor markets. This exclusion is also responsible for lowering the level of wages that such workers can command in the market. It also lowers the supply price of this group throughout the economy.

When the labor market discriminates against particular groups in this way, it may take more to alleviate the situation than expanding educational opportunities for the underprivileged groups. Specific policies to reduce occupational crowding may be required. In most cases the state may use its power as an employer of the last resort to reserve a quota of jobs in the desired occupations for the target groups. Private employers may also be forced to observe quota requirements. Unfortunately, in many cases the state offers employment to the groups whose support it needs—and more often than not such action augments the privileges of the favored groups, rather than reducing it. Malaysia is one of the few documented cases in which the state was controlled by the hitherto underprivileged Malays after independence. State power has been widely used to improve their labor market situation.

Quality of Education

Educational productivity depends not only on the years of schooling, but also on quality. If excluded in the estimation of the earnings function, it could seriously bias some of the results. The level of income stream obtained from S years of schooling is shown in figure 9 to vary with the level of quality available, $Q_3 > Q_2 > Q_1$. Thus the private rate of return to a given number of years of schooling is a direct function of the level of quality. Each individual would still wish to invest in years of schooling until the point where the private rate of return is equal to his rate of discount, but this now depends on the quality of education that is exogenously given. For example, in societies where discrimination is significant, the favored groups will be offered schooling of superior quality. Similarly, school quality would be higher in more prosperous or developed regions. An individual from a favored group or region would thus invest in more years of schooling than an identical individual from a disadvantaged group or area. This suggests that regions or groups that start with disadvantages in the quality of education tend to fall further and further behind in the accumulation of human capital.

Figure 9: Earnings Profiles for Schooling Levels with Different Qualities of Education



Note: For "S" years of school, expected income is conditional on school quality with $Q_3 > Q_2 > Q_1$.

Source: Behrman and Birdsall (1983).

Since there is a positive association between the quantity and quality of schooling, an earnings regression that omits the quality variable will give an upward biased estimate of the private returns to years of schooling. Unless the cost of providing schooling is also adjusted to take into account varying qualities of schooling, the social return to education will also be biased upward. This is another reason why simple estimates of rates of return to education provide imperfect guides for policies concerned with expanding investment in education. In fact, investment in the quality of education (through better teacher-pupil ratios, or better training of teachers) is often an alternative to investment in the capacity to provide more schooling years per capita. There is clearly a tradeoff between increase in quality and quantity. In extreme cases expansion in quantity may be offset by decreasing quality so that the marginal productivity of investment in quantity falls to zero and the only way to increase the returns to education is to increase quality.

Behrman and Birdsall (1983) have tried to estimate earnings functions for Brazilian males by incorporating a measure of quality in the schooling variable. The work is interesting both because it shows the difficulties of extending the standard human capital model and because it gives some idea of the relative magnitudes involved when quality is incorporated. They adopt a measure of school quality that is easily constructed from relatively large data sets: the average schooling of teachers in the area in which an individual obtained his schooling. As expected from the a priori considerations mentioned earlier, this measure was positively associated with years of schooling (with a correlation coefficient of 0.5). They looked at several equations with different specifications of the way in which the quality variable is incorporated. The most statistically acceptable equation was

$$(2) \quad \ln Y = \ln Y(O) + (rO + r_1Q + r_2 Q^2)S + aE + bE^2 + W,$$

where Q is a measure of the quality of schooling, W is a stochastic term, and the other variables are as defined in equation (1).

The estimate of equation (2) was compared with the estimate of the standard human capital model of equation (1) for a sample of Brazilian males aged 15-35 in 1970. An upward bias of about three-quarters was found in the standard estimates of the private return to years of schooling owing to the omission of the quality variable. Accordingly, any recommendations to increase investment in schooling at existing quality levels based on a standard calculation of the rate of return to schooling could be misguided. In fact Behrman and Birdsall found that the estimated internal social rate of return to investment in school quality for their sample was significantly larger than the return to investment in school quantity. That is to say, productivity increased more with deepening than with widening of schooling.

This implies a sharp equity-productivity tradeoff in investment decisions in education. Since the return to investment in schooling quality is higher, the economy benefits from concentrating a given total of resources among fewer children, but increasing the quality of education. The higher return to quality would not exist for all levels of quantity. As the mean level of quality increases relative to quantity, the differential in the rates of return to the two types of schooling investment will alter. The point is that at the existing mean levels there is a significantly higher social benefit to be derived from increasing quality and curbing expansion in numbers.

time. Open urban unemployment in developing countries seems to depend on the relative importance of specific types of labor in the labor market and the way the market clears for them, rather than the condition of the market as a whole.

Unemployment in developing countries has two notable characteristics. First, it is heavily concentrated among the young. Although this is generally true of all economies, unemployment among young people seems to be much more widespread in developing countries. In Malaysia, for example, those in the 15-19 age group alone accounted for half of the unemployed in 1967 and those aged 15-24 accounted for 75 percent. In contrast, teenagers in the United States aged 16-19 accounted for about 25 percent of all the unemployed in the late 1960s. Malaysia had a sustained rate of growth of nearly 7 percent per annum in the 1970s, and the overall unemployment rate dropped from about 10 percent in 1967 to 4.5 percent in 1982. Even so, the rate of unemployment among the young (aged 15-24) fell only slightly, and this group continued to account for 70 percent of the unemployed (World Bank 1988, vol. 2, table 3.3, p. 134).

Second, urban unemployment in developing countries is concentrated among those with secondary education. Many of these countries have witnessed a rapid expansion of education in the postprimary stages. Although, the demand for people with college or technical education has increased more or less fast enough to meet the increased supply, those with secondary education have often suffered a high incidence of unemployment. The experience in Malaysia after 15 years of economic growth illustrates this phenomenon (table 14).

Table 14. Education-Specific Unemployment Rates Relative to the National Average, Peninsular Malaysia

<i>Level of education</i>	<i>1982</i>	<i>1985</i>	<i>1986</i>
No formal	0.314	0.453	0.394
Primary	0.486	0.585	0.662
Lower secondary	1.343	1.358	1.296
Middle secondary	2.143	1.623	1.535
Upper secondary	0.514	0.774	0.592

Source: World Bank (1988), vol. 2, table 3.5 [a], p. 135. The problem of unemployment among secondary school leavers in the late 1970s is discussed in detail in Mazumdar (1981).

Despite the high incidence of unemployment among secondary school leavers in developing countries, the rate of return to secondary education has continued to be high and the demand for secondary education has continued to be strong. Consequently, some argue that the market for educated labor does not work smoothly. The demand price for such labor is rigid in the face of oversupply of labor, and unemployment does not give the expected signal to young people wanting to invest in secondary education. One model widely used to explain rigidities in the educated labor market is popularly known as the "bumping" model. It can be summarized as follows:

- As educated workers enter the employment market they find that the wage structure is fairly rigid—that is, relatively insensitive to supply and demand factors.
- Years of education are used by employers as a screening criterion. This implies that the rate of return to education below a certain number of years of

One other result from the Behrman-Birdsall study should be mentioned. Regional differences in income per worker are very large in Brazil, partly because of the differences in schooling years in the regions. Even if schooling levels are held constant, however, income levels vary greatly. The authors found that quality of education also varied among the regions, and, as in the sample, quality differences nationwide were associated with quantity differences. When a quality-inclusive earnings function of the type in equation (2) was fitted to the sample, the unexplained regional differences were reduced substantially: southeast-northeast differentials were almost cut in half, and southeast-frontier and central differentials were basically eliminated.

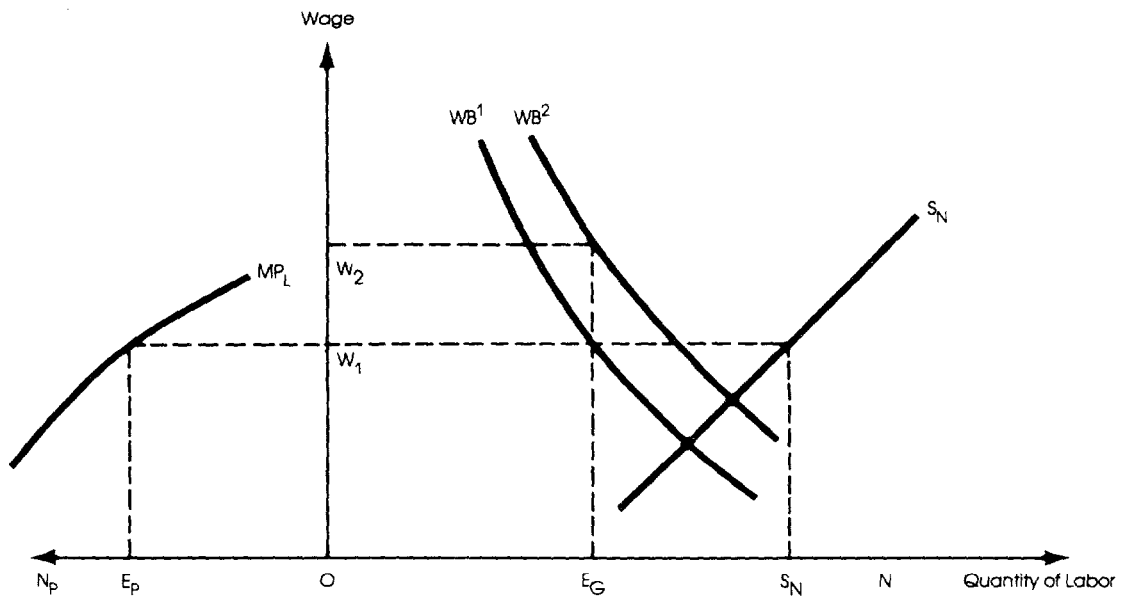
The finding that differences in the quality of schooling explain a large part of regional income differences is of major importance in the understanding of labor markets in developing countries. Wide differences in earnings in the same political unit in which labor is free to move have been noticed not only in large countries like Brazil, but also in many small countries. Heckman and Hotz report that the per capita income in the richest province of Panama is four times the level of the poorest state. Rates of return to education in the Mincerian sense of equation (1) also differed across regions. The fact that labor earnings in different regions of the same country remain so wide apart has been ascribed to geographical segmentation of the markets. Internal migration is far from being high enough to iron out income differences. Migration from the poor regions is restricted because the quality of education embodied in the potential migrant is of lower value. Labor migrates in response to the possibility of earning higher current income more than it does because of the prospect that future generations will enjoy a higher quality of education. Admittedly, this is not the sole or even the predominant explanation of geographical segmentation, but it is an important one for policymakers to consider.

Urban Unemployment and Education Policy

Open unemployment in the urban areas of many developing countries is high, and its political and social costs are at least as noteworthy as its economic costs. Squire assembled data on employment for selected countries and concluded that in 6 of the 14 cases examined, the rate of urban unemployment is at least twice that of rural unemployment (1981, p. 68). Moreover, with the notable exceptions of Iran and Sri Lanka, the rates of rural unemployment are not especially high. In 5 of the 14 countries, the rate of urban unemployment was well above 10 percent. Urban unemployment rates of 10 percent or more are not difficult to find in country reports.

Urban unemployment rates can differ markedly among countries in the same region. What is interesting is that the differences do not necessarily correspond to differences in labor surplus conditions in the economy as a whole. According to data on selected Asian countries from the late 1960s, the rates of urban unemployment in Peninsular Malaysia, Sri Lanka, and the Philippines were 9 percent or more, whereas the rates in India and Thailand were only slightly more than 1 percent (Mazumdar 1981, pp. 276-77). Indonesia occupied an intermediate position, with a rate of about 5 percent. Although one could say that Thailand had a reasonably high utilization of labor, few would seriously argue that the remarkably low rate of open unemployment in India reflected tight labor markets. The different rates between countries did not stem from differences in statistical practices or definitions and apparently remained constant over long periods of

Figure 10: Employment in the Public and Private Sectors with Alternative Budget Constraints



Note: $E_g S_N = O E_p$

Source: Lindauer (1987).

employment and the resource cost of the public employment wage bill as given by the budget constraint WB^1 .

Case II. Consider now a case in which the budget constraint is a larger WB^2 , but through miscalculation about the supply curve of labor S_N or the demand curve for private sector labor MP_L , the government sets the wage/employment combination W_2, E_G . In this case a wage gap is established in favor of the public sector ($W_2 - W_1$), with the same levels of employment in both sectors.

It is clear that case II is a less desirable outcome than case I. Public sector employment is no different from case I, but the resource cost (WB^2) is higher, and the public/private wage gap means additional costs for the economy. Higher-paid public sector jobs will have to be rationed among applicants, and there is likely to be greater unemployment as applicants queue up for jobs in this sector. "Rent seeking" by potential employees in the public sector will cause them to devote real resources (for example, by means of bribes or time-consuming efforts to see influential persons) to securing a public sector job. This case emphasizes the importance of sufficient flexibility so that short-run adjustments in public sector wage levels are possible. Since the relevant elasticities of supply and marginal productivity schedules of labor are not known in advance, the outcome depicted in case II is quite possible.

Thus far we have considered the possibility of public sector wages exceeding those in the private sector. Is the opposite outcome possible? At first sight it may appear that such an outcome could be only a short-run phenomenon. If public sector wages are significantly lower than private sector wages, public sector managers will soon find that they either have a shortage of labor or must downgrade the quality of their employees. Here we come to a point that has been of great significance in the recent history of a number of developing countries. Insofar as private employers are profit maximizers, the efficiency/wage relationship will provide a floor to the downward flexibility of real wages. Wages in the private sector cannot fall below the point at which a further reduction will lead to a more than proportionate fall in efficiency, since this will push up the cost per unit of labor supplied. The public sector, in contrast, does not have profit maximization as its objective. Wages are then free to fall in the public sector without any sign that efficiency costs are increasing. Nor are public managers under as much pressure to minimize labor costs per unit of output. It is therefore possible for the labor market to be in equilibrium over a long period of time even though public sector wages are significantly below wage levels in the private sector.

Another important factor to consider is the link between the public and private sectors established through moonlighting. If public sector wages are low, public sector employees will resort to moonlighting on a large scale to make ends meet. The typical public sector moonlighter will not enter the formal private sector, which depends largely on a regular full-time labor force. Instead, he will seek part-time employment in the informal sector. Along with temporary (circulatory) migrants from rural areas, these part-timers will help to keep wage costs low in the informal sector. A low-wage policy in the public sector thus provides the small-scale sector with an artificial advantage in labor costs. In effect, the public sector then subsidizes the small-scale sector.

The welfare implications of such a development are complex. Employment in the private sector will be larger than might otherwise be the case because small-scale firms use more labor-intensive technology. However, the long-run profitability of formal-sector firms with more modern technology and better

education is quite low. Above this critical level, the rate of return is very high.

- There is then a strong incentive among potential workers to invest in education to surpass the critical level. This incentive persists as long as the rate of return to education at the higher level does not fall. This is compatible with a stable but high rate of unemployment among educated new entrants to the labor market.
- What happens when the supply of educated labor continues to outrun the demand for labor in those jobs for which the educated are typically employed? Over time, employers respond to the excess supply by raising the minimum educational requirement for those jobs. Thus, the more highly educated job seeker is able to secure employment in these jobs more easily than the less educated. Even if the wage rate in the new range of jobs is lower, the expected return to education does not fall because there is no waiting. The educated worker “bumps” the less educated worker out of these jobs. When bumping occurs, educated workers choose between the older and the newer range of jobs in a way that equalizes the present value of lifetime earnings in each range. As long as there are job seekers with fewer years of education who are being crowded out, the rate of return to education will not fall.

The “bumping” model rests on the assumption that both rigid wages and educational screening are important features of the labor market. These assumptions are probably true in countries where the public sector is a large employer, since pay scales in the public sector are administratively determined and employee selection depends heavily on formal qualifications.

Some observers have suggested that these assumptions may have been overdrawn. Public sector wages have been known to fluctuate with economic conditions, and even if the pay scales remain relatively rigid, lifetime earnings may be unpredictable because rates of promotion may change. Similarly, although years of education are one criterion for recruitment, other criteria have often been added to it because of an excess supply of labor. These additional criteria include grades attained in entry-level examinations and age at recruitment.

An alternative—or perhaps, parallel—explanation of the persistence of educated unemployment takes into account the quality of education, as discussed in the preceding section. The increasing enrollment that many developing countries have experienced has eroded. In response, employers have become more careful and selective in their recruitment. Thus, although the supply of secondary school leavers as a group has increased, the supply of those of the requisite quality has not increased relative to the demand for such labor. As a result, the wage rate offered to secondary school leavers remains unchanged, and there is a higher incidence of unemployment among those who do not meet the standard. The signal indicating selection by quality may be ambivalent or slow to be transmitted, so that the demand for secondary schooling does not fall.

Public Sector Wage and Employment Policies

In many (if not most) developing countries the public sector is very large in relation to total nonagricultural employment. It is even larger if the informal sector is excluded from total nonagricultural employment.

*Interrelationship between the Public and
Private Sector Labor Markets*

In most developed countries, the public sector is a price taker in the labor market—that is, wage levels in the public sector are determined by the wages earned by labor of similar grade in the private sector. When the public sector is large in terms of total wage employment (as it is in many developing countries), wages in the public sector will heavily influence wages in the private sector. This conclusion does not hold, however, if the supply of labor to the nonagricultural sector is perfectly elastic, but that is unlikely to occur except in the case of raw unskilled labor. It follows that public sector wages in most developing countries can be made equitable with private sector wages only by a process of trial and error.

The problem of evaluating public sector wage and employment policies is complicated by the fact that, whereas the private sector tends to be profit-maximizing and hence seeks to attain a combination of wage rates and employment levels that meet on the demand curve for labor, the public sector is not concerned with making a profit. Many of its products have no ascertainable price, nor is the productivity of labor in the public sector defined in terms of efficiency. Even among parastatals, profit maximization is not generally one of the primary goals of managers. Although the public sector operates within budget constraints that define its total wage bill over any given period of time, various combinations of wages and employment levels are possible within these budget constraints. There are no clear guidelines as to which wage/employment configuration will best attain the various objectives being pursued by the public sector. The problem can be illustrated by the following cases.²³

Case I. In figure 10, public employment is measured along the X-axis of the right-hand quadrant and private employment is measured along the X-axis of the left-hand quadrant. The supply curve of labor to the nonagricultural sector (private and public sectors together) is given by S_N . Let WB^1 be the budget constraint under which the public sector operates—that is, any combination of wages and employment can be attained along the rectangular hyperbola WB^1 . The government announces that it will follow a policy of wage parity between the private and the public sectors. Given the marginal productivity schedule of labor in the private sector (MP_L) and profit maximization by private employers, the policy of wage parity fixes the wage/employment combination (W_1, E_G) for the public sector. At wage W_1 , and given the budget constraint WB^1 , OE_G amount of labor is employed in the public sector and OE_P in the private sector. The distance $E_G S_N$ is equal to OE_P , so that at the wage offered OW_1 , a total of OS_N workers are attracted to the nonagricultural sector, which is just sufficient to meet labor demand in the private and public sectors together.

A policy of wage parity, however, may not be optimal from the point of view of society. Although such a policy does attain one goal that many might consider desirable—that is, that workers in either sector do not earn a monopoly rent protected by institutional policy—neither the budget constraint WB^1 nor the relative size of public sector employment OE_G/OS_N are optimal in any self-evident way. No judgment about the correctness of a policy of wage parity is possible without evaluating the contribution to national productivity of OE_G amount of public

23. The analytic framework is borrowed from Lindauer (1987).

prospects for competing in world markets is diminished, because of intensified domestic competition from small-scale labor intensive firms.

Expansion of the Public Sector in Developing Countries

A striking feature of employment growth in developing countries since World War II has been the large role played by the public sector. This increase in employment has been located primarily in the urban sector. By definition public sector jobs belong to the formal economy. The public sector has therefore been instrumental in expanding the formal urban labor market in many developing countries.

The most well-known study of the relative importance of employment in the public sector in a cross section of countries is by Heller and Taite. In the 23 developing countries for which data are available, the public sector accounted for an average of 44 percent of total nonagricultural employment. This contrasts with the corresponding figure of 24 percent for the 14 industrialized countries in the sample (Heller and Tait 1983, table 1, p. 7). In some developing countries the proportion of nonagricultural employment in the public sector is much higher than the average. India, Ghana, Tanzania, and Zambia, for example, had a ratio in excess of 70 percent.

According to recent time-series studies, today's industrialized countries have experienced a gradual increase in the relative size of public sector employment at the same time that their per capita income has grown (Musgrave and Musgrave 1980, pp. 142-49). Data brought together by Knight and Sabot (1988) and reproduced in table 15 show that in the 14 developing countries for which time-series data were available public sector employment has expanded much faster in the 1960s and 1970s. The median share of the public sector in the increase in wage employment was 71-87 percent.

The ratio of the mean government wage to national income per capita in the Heller and Taite sample was 4.6 for the low-income countries and 1.7 for the high-income countries. This difference may partly reflect the fact that the gap between manual and nonmanual wages in developing countries is considerably larger. When the public sector is such a dominant part of the formal labor market, particularly in the market for nonmanual labor, the relatively high wages in the public sector must be at least partly due to the institutional influence of public pay policies rather than economic factors reflecting the relative shortage of skilled labor.

There are several reasons for the large expansion of the public sector in the newly emerging countries since 1950. First is the strong ideological bias in favor of state intervention. The state was widely expected to substitute for the private sector as an engine of growth since the latter had failed to provide balanced economic growth in different parts of the world. The state could also supplement the supply of entrepreneurial talent, which was limited in the underdeveloped economic environment.

Second, once the public sector has become established, persons in power soon see it as a provider of political favors for pressure groups. Because economic criteria of efficiency are rarely applied, political decisions govern the size and growth of the sector. It is subject to all the lobbying and rent-seeking activities that develop whenever rents are created for distribution to the favored groups. The larger the gap between public sector wages (both direct and indirect) and the supply price of labor, the larger will be the extent of the rent per job created in the sector. The difference

between workers' unions and political lobby groups may be noted in this connection. In some situations unions are interested in maximizing the net income going to their own members. In such cases they might want to increase wages and benefits per worker and not necessarily increase the number of jobs. Politicians in control of the state, however, have an ever-extending network of client groups whose support they may want to use. When different sets of politicians are competing for the support of client groups, there is an explosion of new public sector jobs.

Table 15. Selected Developing Countries: Growth of Wage Employment in the Public and Private Sectors

Country	Period	Average growth (percent per annum)			Percentage share of public sector in increase of total wage employment
		Public	Private	Total	
Brazil	1973-83	1.4	0.0	0.3	92
Costa Rica	1973-83	7.6	2.8	3.5	34
Egypt	1966-76	2.5	-0.5	2.2	103
Ghana	1960-78	3.4	-5.9	-0.6	-
India	1960-80	4.2	2.1	3.2	71
Kenya	1963-81	6.4	2.0	3.7	67
Panama	1963-82	7.5	1.8	2.7	45
Peru	1970-84	6.1	-0.6	1.1	140
Sri Lanka	1971-83	8.0	0.9	3.9	87
Tanzania	1962-76	6.1	-3.8	1.6	190
Thailand	1963-83	6.3	5.5	5.7	33
Trinidad	1970-84	4.7	1.2	1.9	51
Venezuela	1967-82	5.1	3.4	3.7	27
Zambia	1966-80	7.2	-6.2	0.9	418
Unweighted mean		5.5	0.3	2.4	

Source: Knight and Sabot (1988), table 1.

Third, politicians in many developing countries are particularly sensitive to the unemployment among urban workers, particularly the more educated members of this group. These are the most vocal political or social agitators and their support is often needed to keep the government in power. Thus ailing private firms may be taken over by the state rather than be allowed to close down and release their workers. Faced with budget problems, governments are more able to cut wages than reduce employment in the civil service. A number of governments—for example, those in Egypt, the Ivory Coast, Mali, Mauritius, and Sri Lanka—have at various times explicitly acted as “employer of last resort,” particularly for high school or college graduates.

The cost of the explosive growth of public sector employment could be great, particularly if resources are misallocated in a static sense. The marginal productivity of labor could be low in the public sector even if it cannot be measured exactly, and indeed could be lower than in the other sectors of the economy. The difference in marginal products measures the static loss in output per public sector worker. Quantitatively, the dynamic impact on the growth of the economy is far more important. The public sector pays a positive wage even if the marginal

product of its workers is close to zero, and in many cases it pays a wage well in excess of the alternative earnings of such labor. The wage bill as well as the associated costs of cooperant factors such as land and capital have to be financed by the government from other sectors. In the absence of foreign borrowing (which cannot go on indefinitely), financing has to come from private savings, even when it is "forced" through inflation caused by a budget deficit. The reduced investment in the more productive sectors of the economy has a cumulative effect, which reduces its growth rate drastically in the long run. Knight and Sabot (1988) illustrate the effects of the reduced savings in the economy by some simulation exercises conducted with a simple macroeconomic model. There is one other effect built into their model that may not be as valid. This is the Harris-Todaro effect on urban unemployment due to job creation in the public sector. The relatively high wage in the public sector creates a certain level of unemployment as job seekers queue up in the expectation of being hired. The government responds by increasing public employment to reduce the urban pool of the unemployed, but, as long as the wage gap with respect to the alternative earnings of labor exists, the increase in public employment will merely trigger further migration into the urban sector in the familiar Harris-Todaro way discussed earlier. Urban unemployment will increase again, and, if the government persists in creating more jobs to absorb the new job seekers, the migration and urban unemployment will increase from period to period. Although there are persuasive reasons to doubt the validity of the Harris-Todaro mechanism as a general phenomenon of urban labor markets or of migration, it might be a valid description of specific labor markets, such as the market for educated labor.

In any event, when the effect of reduced private savings is added to the Harris-Todaro effect, the results may be spectacular, as Knight and Sabot have demonstrated. Over a 13-year period, the combination of static and dynamic effects reduced the annual average rate of growth of output per worker from 2.5 percent in the baseline case (in which there is only the cost of static misallocation of labor but no other effect) to 0.5 percent per annum. The cumulative increase in labor and cooperant factors in the public sector "sink" virtually eliminates all improvements in living standards. Moreover, any attempt to reduce urban unemployment is futile: The unemployment rate ends up being higher than it was to begin with.

The Knight-Sabot conclusion might indeed never be reached in the type of economy they are simulating. Before we reach the thirteenth period, the course of the economy will most likely be interrupted by economic crises caused by budget deficits, balance of payments problems, and high rates of inflation. Such economic crises are obviously not always the result of tremendous growth in public sector employment, but in many cases that has been so. The question that logically arises next is how have economies tackled the problems of adjustment in the public sector when faced with the economic crises of the 1980s?

*Labor Market Adjustments in the Public Sector
during the Downswing: The African Case*

The special problems of establishing public sector wage and employment policies, particularly in Africa, can be seen in African wage policies. These policies have followed a cyclical pattern in the era of independence. The new African governments inherited the colonial system of pay, in which high salaries for expatriates coexisted with low wages for African staff in both the public and private sector. In an effort to reduce this difference, the government devised a

policy of high wages in the public sector as the civil service was Africanized. Wages in the formal private sector were also raised through minimum wage policies aimed at stabilizing the labor force. Reversal of these policies began at the end of the 1960s. In Zambia, for example, the Turner Report of 1969 led to a temporary voluntary wage freeze. Since then, government wage policy has developed in two directions. First, nominal wages as opposed to real wages have been restrained. Second, there has been "a narrowing of the gap" among all wages. A squeezing of wage differentials is a necessary consequence of wage restraint enunciated (as it often has been) in terms of constant absolute increases for all grades. In addition, the O'Riordan (1972), Mwanatakatwe (1975), and Muchangwe (1980) Commissions all recommended differential percentage increases to reduce the gap between higher and lower wages.

A set of studies on government pay and employment policies by Lindauer, Meesok, and Suebaung (1986) in a number of African countries—including Ghana, Malawi, Sudan, and Tanzania—has documented the results of these policies over the past 15 years, as follows:

- Real wages in the public sector of these countries have plummeted since the early 1970s. In Sudan, for example, the real value of an unskilled government worker's wage at the end of 1983 was about 26 percent of what it was in 1970. In countries where civil servants' pay is partly given in kind (for example, in the form of free or subsidized housing), the fall in the real wage has been mitigated, but only to some extent. Although real GDP per capita has fallen during the period under consideration in most of these countries, the fall in real wages in the public sector has often been even more severe, particularly for workers at higher skill levels.
- There has been a tremendous compression of the pay structure as governments have tried to protect the real wages of the unskilled at the expense of the more skilled. In many cases, differential pay for higher skills in the public sector is out of line with the differential in the private sector. In Ghana in 1985, for example, the ratio of basic compensation from top to bottom was about 10:1 in the private sector and 2:1 in the civil service (see World Bank 1985, p. 139).
- The private/public sector wage differential has narrowed over the period in favor of the private sector in many countries.
- In contrast, employment in the public sector has consistently increased more than in the private sector in every country except Uganda. Growth rates of 8 percent or more per year are not uncommon for public sector employment.

When faced with a contradicting budget, governments appear to slide down the employment/wage tradeoff curve (WB in figure 1) toward the high employment/low wage option. In Ghana, for example, public sector employment increased at an annual rate of 15 percent between 1975 and 1983, while wages in the sector declined at about the same rate (World Bank 1985, annex E, table 2, p. 140).

The consequences of this pattern must be considered detrimental to national economic efficiency and growth. Although it is difficult to evaluate the social productivity of labor employed in the public and the private sectors at any point in time, the relative rates of growth of employment in the two sectors strongly suggest that the productivity of workers in the public sector has fallen sharply below that of workers in the private sector. There is nothing to indicate that personnel requirements in the government should have expanded at such a fast rate. Furthermore, the fall in the real wages of public employees has led to an expected

fall in efficiency. There has been a decline in morale and skill formation, and moonlighting is a commonly reported problem.

Employment in the public sector could be reduced and wages raised without increasing the size of the government's budget. Since retrenchment could be achieved only through early retirement and attrition and retirement benefits are often substantial, a policy of early retirement may not be feasible in many countries. The best way to handle overemployment in the public sector in these countries is to stimulate economic growth. As employment opportunities in the private sector increase, labor will be diverted from the public to the private sector—assuming, of course, that the wage differential does not favor the public sector. The problem is that rationalization of government hiring and wage policies is probably one of the preconditions of accelerated economic growth.

Conclusion

At the beginning of this paper we outlined the main differences between rural and urban labor markets. In succeeding chapters we showed that governments adopt policies that are expected to improve the functioning of these markets—that is, to improve the absorption of workers into the rural and urban work force. Government intervention in both the rural and urban labor markets of the developing countries has often been less than successful, sometimes because their policies were based on incorrect assumptions. At other times, these policies have achieved less than was expected because the government also adopted other policies that tended to contradict the goal of providing jobs. In this concluding chapter we reiterate some of the important points that have arisen in this discussion, beginning with certain important differences between the rural and urban labor markets.

What we find in rural labor markets is a great preponderance of self-employed workers (mostly farmers) spread out over large geographic areas, along with a small proportion of wage employees. Because of these circumstances—as well as the political influence of large landowners—governments in developing countries often find it difficult to regulate rural labor markets. Rather, policies affecting the price of farm outputs and inputs have a much more pronounced effect on the earnings of the self-employed.

In urban labor markets, however, the governments of developing countries are often able to exert considerable influence through formal legislation. Since urban labor markets typically include large masses of wage workers, the governmental apparatus needed to enforce the laws is more effective in cities than it is in the broad reaches of the countryside. In rural labor markets, the challenge is to try to improve labor absorption by adopting policies intended to rectify disguised unemployment and economic dualism. Disguised unemployment—rural farm unemployment clearly exists, even though it is hard to measure in formal terms—is common. Economic dualism refers to the surplus labor and high labor productivity frequently found on small farms, and the surplus land and low labor productivity on large farms. Developing country governments have tried to reduce disguised unemployment by initiating large public works projects. Experience has shown, however, that such projects frequently encounter problems that reduce their effectiveness.

It has become more and more difficult to identify good prospective projects. It is equally difficult to establish wage rates for those working on such projects without disturbing other rural wage patterns. The distribution of the benefits of public works projects has not always been equitable—despite strong efforts to ensure equity—nor has it been easy to find ways to finance such projects.

Economic dualism is a significant problem throughout the developing world, at least in the sense that large farms generally absorb little labor. Large landowners tend to substitute other inputs (fertilizer, machinery) for labor; they are often helped to do so through various tax laws, through improper diversion of government credit to their operations, and through government subsidies for nonlabor inputs. These subsidies are rationalized on the grounds that agricultural production must be increased, and it is true that subsidies for fertilizer and machinery have often helped to raise agricultural production.

economy. When the true social costs of benefits have not been evaluated, labor markets in developing countries have experienced undesirable developments. One important example is the widespread problem of urban unemployment among the more educated groups. A tradeoff may exist between the goals of equity and efficiency related to the choice between quality and quantity of education. In many developing countries this basic problem has not been properly addressed. In situations where expansion in quantity of education has taken place at the expense of quality, labor market inefficiencies have developed, together with unemployment. At the same time, private returns to education continue to give wrong signals to policymakers.

Some developing countries also have to deal with discrimination against racial or tribal groups, and most find gender discrimination an issue of concern. Educational expansion for the underprivileged may be a necessary but is not a sufficient condition for improving their labor market status.

The problems of the labor market for the educated are closely tied to the evolution of employment and pay policies of the public sector. In many developing countries employment in the public sector has expanded rapidly, and those hired by this sector have received a significant wage premium. It is likely that overexpansion has taken place, which has been costly to their economies in terms of both efficiency and equity objectives.

In more recent years many governments have been forced to cut public sector wages in response to budgetary problems. As the economic situation has deteriorated, it has not been easy to resist the pressure to maintain or even increase the volume of employment in the public sector. Thus the low wage-high employment scenario has produced a "sink" of unproductive labor that does little to arrest the deteriorating quality of administration. Higher rates of economic growth would help to resolve this problem by allowing the transfer of workers from the public to the private sector.

Economic dualism has sometimes been overcome through government-sponsored land reform—usually following a political revolution. It can also be corrected by strengthening land-ownership laws (thus giving large landowners more incentive to let their lands be worked by tenants and sharecroppers) and by establishing progressive taxes on unused agricultural land.

Direct government intervention in urban labor markets is common in developing countries. The principal instruments are wage setting, either through legal minimum wage laws or state-supported wage boards; legislation affecting workers' security of tenure and their non-wage benefits; educational policies that boost the supply of skilled labor even though the government is a major employer; and employment and wage policies in the public sector, which in many countries is a large part of the urban labor market.

The impact of legislation on wage levels can sometimes appear to be more significant than it really is. We have discussed at length reasons why even under free market conditions wages can be and are known to have been established at a higher level in the modern or formal sector of the urban labor market.

In their efforts to improve the operations of urban labor markets, governments in developing countries have at times established and then sharply raised minimum wages in the formal urban sector. In most developing countries, the original motive for establishing high minimum wages was to correct the imbalance in the compensation of supervisors and workers that was typical prior to independence. In some instances governments have also supported increasingly high minimum wages in the belief that they help to stabilize work forces and hence make them more productive—something that private employers have themselves done in some regions, but not in others. Experience has shown that high minimums cause a slowdown in labor absorption and tend to reduce worker initiative when they squeeze wage differentials between more skilled and less skilled workers. High minimums also create equity problems in society at large: Should a country adopt a high-wage but low employment policy, or should it adopt a low-wage but high employment policy? For a long time, the answer to this question was somewhat muddled by the Harris-Todar theory that high wages in the formal urban sector lead to overurbanization and to a poorly paid informal labor sector. Overurbanization occurred, according to the theory, because numerous workers were attracted to urban areas by high wages, despite the fact that relatively few high-wage jobs were available. Much of the surplus labor then joined the poorly paid informal sector.

Recent empirical studies have shown, however, that wages in the informal sector vary considerably. These studies have also shown that many informal sector workers do not seek to enter the formal sector. They expect to find greater rewards in the informal sector, often through some kind of entrepreneurial activity. Governments should therefore adopt policies that encourage the informal sector rather than discourage it, as has often been the case. The informal sector, it should be remembered, serves valuable social purposes, particularly in providing goods and services for the poor.

Educational policy is an important means of influencing various aspects of the urban labor market, including the distribution of earnings between the more and less educated, between the formal and informal segments of the market, and between racial and gender groups. Private rates of return to education are often exaggerated because of the state subsidization of higher education, "credentialism" in the pay and hiring policies for educated labor, and the neglect of quality issues during periods of educational expansion. Educated labor is a productive asset to the

In that study the earnings were for unskilled workers in all factories taken together; the differential was on the order of 65 percent. Factory workers in 1978 were earning about 118 percent more than workers in small-scale units in gross terms; if the adjusted figures are used, they were getting 80 percent more. So there was a rise in the years after the 1950s. The upper limit was something like 50 to 60 percent.

Further details appear in my 1973 article in *Economic History Review*, which looks at historical material on wages in factories, particularly textile factories, in Bombay. Although the material available from Royal Commissions for that paper was not based on systematic wage surveys, it is quite clear from the evidence that factory wages were higher than wages in other activities as early as 1892. There was no question of institutional influence then, or in the early part of the twentieth century, or in the interwar period.

It can therefore be concluded that there were economic reasons for higher wages in large factories, even though institutional factors also helped to push up wages in the 1950s, 1960s, and 1970s.

Appendix B: The Example of Puerto Rico

The impact of minimum wage laws on the labor market in Puerto Rico was studied thoroughly by Reynolds and Gregory (1965) (see summary in Reynolds 1966). Puerto Rico depends on the United States for most of its imports of consumer and capital goods. This means, first, that any wage increase has a limited impact on aggregate demand (since leakages from the economy are substantial), and second, that the prices of finished goods are determined externally. Thus, the consequences of a wage increase could be significant as far as the demand function for labor is concerned, but there would be less danger of such effects being swamped by wage-induced changes in macroeconomic variables.

During the period discussed by Reynolds and Gregory (the 1950s and early 1960s), Puerto Rico was a "labor surplus economy." About one-eighth of the labor force was wholly unemployed, and another quarter worked less than 35 hours a week. Moreover, "There were doubtless others who could be withdrawn from agriculture, trade and services with little loss of output." Despite the apparent abundance of labor, industrial wages rose at a substantial rate. Between 1950 and 1963 the average hourly earnings of production workers almost tripled. Similar wage increases took place in other nonagricultural sectors. The differential in wages between the agricultural and the nonagricultural sectors also increased considerably during this period. An agricultural worker who was earning one-half the wage of an average factory worker in 1952 was earning less than a third of the average factory worker's wage in 1962.

The increase in nonagricultural wages could not be traced to the free play of market forces, or to the trade unions, which were relatively weak in Puerto Rico. It was mainly the result of U.S. and Commonwealth government raises in the legal minimum wage. Reynolds (1966, p. 28) comments:

We are accustomed to regard minimum wage regulation in the mainland United States as rather unimportant. The reason is that the legal minimum is a flat rate, infrequently revised, and set well below the prevailing wage level of most industries. The control structure in Puerto Rico is quite different.... The minima are geared to the estimated wage-paying ability of each industry, and there is at any time a wide range between the highest and the lowest industry rates. Most workers in each industry earn very close to the minimum rate; and as the minimum is raised, which happens every year or two, the industry wage level is forced up by a proportionate amount.

These wage increases could have had an adverse effect on employment growth for two reasons: They might have deterred mainland companies from establishing branch plants in Puerto Rico or slowed down the expansion of existing plants; and they might have caused a change in factor proportions—that is, they could have reduced the amount of labor per unit of output. Yet the rate of growth of output in the manufacturing sector during the period was substantial, although it is possible that the increase in output would have been even greater if there had been a more moderate increase in wages. In any case, manufacturing output tripled in real terms between 1950 and 1962.

Employment in this sector, however, did not increase at nearly the same rate as output growth, rising only 65 percent during the same period. To what extent was this lag in employment a result of the substitution of capital for labor in response to steady increases in the minimum wage?

Appendix A: Wage Differentials in Bombay City—Were They Due to Government Intervention?

The World Bank conducted a study of workers in Bombay in association with the Economics Department of the University of Bombay to obtain a quantitative picture of wage differentials in 1978 among workers with the same skills in one city.

Table 16 presents wages by sector, controlling for other factors in a multivariate framework. The multiple-classification analysis program of the SPSS was used to make this analysis.

The dependent variable was average monthly earnings of male manual workers, including in-kind wages. The analysis is presented in terms of the natural logarithm of earnings. The mean for the entire sample, which appears at the top of table 16, was 5.73. Earnings in each of the categories in the first column are expressed as deviations from the mean. Column 2 gives gross deviations from each category. For example, workers in factories with 10 to 99 employees had monthly earnings with a log of 5.73 plus 0.11 in gross terms. Column 4 gives the net deviations from the mean in each category after controlling for the influence of the variables listed in column 1. Column 6 gives net deviation after controlling for two additional variables, called covariates. These were Age and $(\text{Age})^2$.²⁴ For example, the category of 10 to 99 workers in a factory shows monthly earnings with a log value of 5.73 plus 0.06 after controlling for such factors as knowledge of English, degree of training, level of education, occupation, age, and age squared.

Another important point is the beta values in column 6. These correspond to partial regression coefficients in regression models and give an idea of the degree of explanatory power of each of the categories in table 16.

Table 16 illustrates the importance of establishment size in comparison with other variables. In a developed country such an analysis would probably show that human capital factors like education topped the list of explanatory variables. Here the size category is the dominant factor, whether measured by the beta values or by the net earnings differential. For instance, the difference in earnings between casual workers and workers in large factories (larger than 1,000 employees) gives a value in terms of log of 0.85. This indicates that workers in large factories (after other factors are controlled for) earn nearly twice as much as casual workers. Table 16 also shows that earnings rise in step from casual workers to workers in small-scale units to workers in factories of gradually increasing size.

How much of this differential is due to institutional factors? The wage differential between smaller factories and larger factories is considerable. Since the Factory Act defines the sector that falls under the purview of labor legislation, and since the determination of institutional wages is enforced through a combination of trade union pressure and labor legislation, "factories" have been expected to be the cutoff point between the low- and the high-wage sector. Analysis reveals, however, that although wages in small factories are higher than in small-scale units outside the legally defined "factory," sector wages in the larger

24. The variable $(\text{Age})^2$ is included because the relationship of earnings to age is generally nonlinear.

factories are much higher. The cutoff point occurs when the factory has about one hundred workers.

Note, too, that institutional influences on wages became very important after countries gained their independence. There was a spate of labor legislation, and support of labor unions by official tribunals took an upward jump. The impact of these changes can be seen from reports on wage differentials in Bombay during an earlier period, when institutional influences were weaker. The best earlier report was done by the University of Bombay in the early 1950s.

Table 16. Log of Monthly Earnings of Male Manual Workers in Bombay (1978)

Variable + Category	N	Unadjusted		Adjusted for independents		Adjusted for independents + covariates	
		Dev'n	ETA	Dev'n	BETA	Dev'n	Beta
Size							
Factory 10-99	498	0.11		0.10		0.06	
100-499	452	0.43		0.40		0.35	
500-999	174	0.58		0.50		0.41	
1000+	1339	0.54		0.53		0.41	
Small	1580	-0.35		-0.34		-0.26	
Casual	900	-0.57		-0.54		-0.44	
			0.77		0.73		0.58
English							
No English	3878	-0.07		-0.03		-0.02	
Some English	1065	0.25		0.10		0.07	
			0.22		0.09		0.06
Training							
Trained	1233	0.28		0.09		0.08	
Untrained	3710	-0.09		-0.03		-0.03	-0.03
			0.27		0.09		0.08
Education							
literate	1022	-0.10		-0.04		-0.10	
Literate, no schooling	53	-0.34		0.08		-0.01	
Grades 1-3	507	-0.03		-0.01		-0.05	
Grades 4-6	1319	-0.03		0.02		-0.00	
Grades 7-10	1029	-0.02		-0.02		0.02	
Grades 11-12	943	0.17		0.02		0.10	
Diploma and degree	70	0.33		0.18		0.23	
			0.17		0.05		0.12
Occupation							
Skilled blue collar	1031	0.20		0.07		0.07	
Unskilled blue collar	3912	-0.05		-0.02		-0.02	
			0.18		0.06		0.06
Multiple R squared					0.619		0.688
Multiple R, .830						0.787	

Note: Grand mean = 5.73

Source: Mazumdar (1984).

Reynolds and Gregory distinguish two causes of the increase in the ratio of capital to labor, one due to a change in the overall composition of industry, one due to an increase in this ratio within industries. There was considerable evidence of capital intensification due to structural changes in industry, and classification of firms by asset size provided a rough classification by capital intensity as well. Between 1954 and 1961 firms with assets of less than a million dollars doubled in number, while those with assets of more than a million increased fivefold. The total capital of the smaller firms tripled in size, but it increased sevenfold in the larger firms. Reynolds and Gregory concluded that this shift in the industrial structure toward greater capital intensity (which reflects in part the faster development of capital-intensive industries) "cannot...be attributed solely or even mainly to the sharp rise in wage levels." There was no evidence to suggest that the profit margins of the smaller firms were squeezed because of rising wages. Puerto Rico also witnessed substantial increases in the capital/labor ratio within individual manufacturing industries. The weighted average ratio of capital to labor for all reporting firms more than doubled during the period 1954-61. This increase was invariably accompanied by an increase in labor productivity.

An increase in the capital/labor ratio, whether at the individual firm or the industry level, may be a consequence of factor substitution or may be caused by technological progress that has no relation to changes in factor prices. It is often hard to distinguish clearly between the two effects, but it is important to have some idea of their relative importance in order to evaluate the consequences of the increase in wages. If capital intensification takes place as a response to the wage increase, we would expect to see an increase in both the capital/labor and capital/output ratios. Reynolds and Gregory found that "the period of accelerated wage increase seems to have brought little change in capital/output ratios. There was a sharp reduction in the use of labor relative to both capital and output." On the face of it, this might suggest a process of labor-saving technical progress rather than a substitution of capital for labor. There were other elements in the history of the period, however, that the ratios tended to conceal, and the authors draw attention to these elements. Studies of individual plants revealed that the introduction of labor-saving machinery in response to wage increases was not of major importance in Puerto Rico. In many of the plants, which were branches of mainland companies, the capital equipment was already relatively new, but there was considerable scope for improvement in the selection and management of the labor force. Wage increases seem to have triggered a desire to use labor more efficiently, which tended to reduce the quantity of labor per unit of output. Reynolds (1966, pp. 32-33) writes:

Efficiency would undoubtedly have risen over the years through normal learning. But the rising wage level was a powerful stimulus to learning. Each time a minimum wage increase was impending, most managements reviewed their personnel policies and production standards to see what might be done to offset the higher wages; and usually something could be done. Managers and supervisors were replaced, job layout was imposed, work crews were trimmed down to minimum size, waste of materials and products was reduced through better training and supervision, standards of expected output were raised, costs of turnover and absenteeism were lowered

The Puerto Rican example thus illustrates the rapid response of employment (that is, downward) to a strong minimum wage policy, and shows the source of the labor saving in the short run. It was the substitution of supervisory labor for production workers, rather than the substitution of capital for labor.

*The Effect of the Minimum Wage in a
Heterogeneous Labor Sector*

Even if attention were confined to the unskilled labor force, there is considerable heterogeneity in the quality of labor attracted to the urban market. In particular, it is important to distinguish between unstable labor with low productivity (circulatory migrants) and stable labor with relatively high productivity (migrant families). Circulatory migrants are available at a much lower price than workers from migrant families. Thus, the difference in wage costs to the employer will be much less than the difference in wage rates at which they can be employed. Relative wage costs depend on the size of the productivity difference between the two types of labor and the difference in their supply prices. In theory, it is possible for either type to be more costly from an employer's point of view, depending on the organization of the industry and the strength of the stability/productivity relationship. If the lower wage of unstable labor outweighs its lower productivity, the labor system will be dominated by circulatory migrants with a high rate of turnover. In some situations an industry may create a mixed system in which both unstable and stable labor are used.²⁵ Often, the type of system established depends less on objective assessments of relative supply prices and productivity than on employers' perceptions of what these are likely to be. During the colonial era in Africa, an important element in the development of a circulatory migrant labor system was the supposed prevalence of a backward-bending supply curve of labor to the cities. Many employers convinced themselves that any increase in wages would not attract workers who wanted to become permanently urbanized but would merely cause each worker to spend a shorter amount of time in town in order to earn their "target" income.

The establishment of minimum wages at a significantly higher level in a labor market involving both types of migrants will generally lead to the substitution of high-productivity stable labor for unstable labor with lower productivity. Labor costs will not rise nearly as much as wages, and in extreme cases may be identical or may even decline (if employers underestimate the higher productivity of stable labor).

The difference between a heterogeneous and a homogeneous labor force is profound as far as the impact of the minimum wage is concerned. In the case of homogeneous labor, the increase in wage costs will be the full extent of the wage increase. The resultant loss in employment, whether due to the direct increase in costs or the substitution of capital or management for labor, will be a real welfare loss due to "distortion." That is to say, output and national welfare will be higher if the wage increase is not mandated by the government. In the case of heterogeneous labor, the employment loss does not imply an output loss of similar magnitude because labor productivity increases with little increase in cooperant factors. Consequently a smaller body of workers is rewarded with a higher wage as opposed to a larger body of workers rewarded with a lower wage. The choice between the two systems is then not so much a matter of efficiency as of equity. In an economy with limited opportunities for labor, it may seem obvious that the high-employment/low-wage option will be preferable. A minimum wage that results in a low-employment/high-wage system may at first sight appear to be deplorable.

25. An example of such a system can be found in the early history of the Indian textile industry. See Mazumdar (1973).

A system of circulatory migrant labor does not promote the acquisition of skills by workers and therefore is detrimental to the long-run development of an industrial economy. This factor is widely considered to be responsible for perpetuating economic backwardness, in spite of the sustained development of the agricultural export sector during the colonial era (see Myint 1964).

Appendix C: An Example from East Africa

During the past few decades a conscious effort has been made in East Africa to change from a migrant labor system to a stable labor system by establishing minimum wage policies. The Carpenter Committee on Africa Wages found that in 1953 the median period of employment in the private sector in Nairobi was a meager 1.1 years. The committee concluded that the minimum wage had to be based on family rather than individual needs in order to maintain a more stable labor force. It recommended increases in the minimum wage according to a definite timetable. Under such a plan the family minimum wage in 1965 would have been almost four times the statutory minimum wage of 1953. The committee suggested that its recommendations should be accepted throughout East Africa.

The committee recognized that employers found it difficult to promote the new system because they had no way of distinguishing between job seekers who intended to stay on the job and those who would be migratory even at the higher wage. This problem was handled by making the family minimum wage payable only to adult male workers who satisfied an age and service qualification (21 years of age and 36 months' continuous employment outside native regions). The committee acknowledged that the dual minimum wage system would have to be reinforced by "requiring all employers to employ a specified percentage of workers on wages at or above the family minimum." This was to prevent employers from employing workers only at the lower rate during the transition period, when the higher productivity of stable labor had yet to be demonstrated.

But in 1955 the Royal Commission on East Africa found the committee's recommendations to be inequitable and administratively awkward. It recommended a family minimum rather than implementation according to a timetable. The commission was particularly concerned that a high minimum wage would in effect overlook differentials in skills.

After gaining independence, most of the new governments of East Africa aggressively pursued a policy of continuous increases in minimum wages. The Carpenter Committee's concern about stabilization of the labor force was supplemented by a desire to decrease the enormous wage gap between unskilled labor (largely African) and skilled labor (largely expatriate). Table 17 shows the extraordinarily large increases in wages that occurred in most of the countries of the region between 1961 and 1970.

Table 17. Rates of Growth of Money Wages, Prices, and Real Wages in East Africa in the 1960s (average annual percentage)

Country	1961-65			1965-70		
	Money Wages	Prices	Real Wages	Money Wages	Prices	Real Wages
Kenya	9.9	1.9	8.0	8.7	1.7	6.0
Uganda	11.4	2.9	8.5	6.5	4.0	2.5
Tanzania	16.5	1.3	15.2	7.6	3.0	4.6
Zambia	15.4	3.0	12.4	10.9	6.2	4.7

Source: ILO Yearbook. Note that the data on wages are for workers in the formal sector only.

Note that although the rate of increase in wages was well above the rate of growth of GDP per capita, there was little evidence of any wage/price spiral. Presumably wage inflation was confined to a relatively small sector with limited linkages to the rest of the economy. The production of wage goods was not affected by the costs of rising wages because of an increase in labor efficiency, and demand pull was relatively weak because wage income was a small proportion of total country income. This differed from the situation in Latin America, where large increases in money wages have often gone hand in hand with almost equivalent rates of inflation.

Although the increase in the level of minimum wages was less than the increase envisaged in the Carpenter Committee recommendations, wages in the covered sector moved further away from rural incomes because of a much higher rate of growth in wages relative to that of GDP per capita. This may have led to an increase in urban unemployment, since migrants flocked to the cities in the hope of gaining employment in the high-wage sector. Unemployment induced by high-wage policies in the formal sector received much attention in the late 1960s.

The increasing level of minimum wages also affected the rate of growth of employment in the covered sector. Table 18 presents figures on employment growth for the four countries of East Africa for the periods 1959-64 and 1964-70. The negative rate of growth in the first period was fairly typical of many other African countries. Employment growth rates then picked up somewhat in the second period as increases in wages slowed. The differences between the two periods cannot be ascribed entirely to the difference in growth rates of wages, since the macroeconomic environment did not remain unchanged. But the data suggest that the pace of increases in wages was an important element in determining the magnitude of employment growth. The objective of the minimum wage policy was to increase labor productivity by encouraging stabilization. If the increase in productivity was not large enough to support the increase in wages, however, labor costs would increase. That, in turn, would have a dampening effect on output and, hence, employment. To some extent, this is what seems to have happened.

Table 18. Growth Rates in Selected East African Countries
(annual percentage rate)

	1959-64		1964-70	
	Nonagricultural		Nonagricultural	
	Employment	Wages	Employment	Wages
Uganda	-2.0	+13.1 ^a	+7.1	+6.7
Tanzania	-0.1	+15.5	+5.5	+10.3
Kenya	-2.1	+9.3	+2.8	+8.1
Zambia	-0.4	+8.3	+7.6	+13.1

a. 1956-64.

Source: ILO Yearbook; statistical abstracts, various years

In addition, the public sector played a large role in nonagricultural wage employment. It accounted for about 50 percent of the employment in most East African countries during this period. The growth rate of government employment is directly affected by the rate of wage increase. It is arithmetically equal to the rate

of growth of government expenditure less the rate of growth of the average wage or salary paid by the government.

Since the rate of growth of employment in the organized sector lagged behind the rate of population growth, it appears that a growing proportion of job seekers in the urban market were absorbed into the informal sector during this period. Policies on the informal sector claimed a great deal of attention, as exemplified in a report by an ILO mission to Kenya in 1972.

*A Critique of Minimum Wage Policy
as an Instrument for Labor Force Stabilization*

Did the minimum wage policy, apart from the several negative consequences discussed above, succeed in developing a stable labor system in East Africa? Data from Kenya show that there was a substantial decrease in instability during this period (see table 10). Although high quit rates are typical among migrant workers, in 1968 most quit rates for this group of workers were between one-third and one-quarter of their levels in 1953 (table 10).

Table 19. Estimated Quit Rates among African Wage Earners in Nairobi

<i>Length of service (years)</i>	<i>1953^a</i>	<i>1957^b</i>	<i>1968^c</i>
0	0.48	0.15	0.12
1-2	0.38	0.22	0.10
2-3	0.37	0.20	0.13
3-4	0.30	0.08	0.12
4-5	0.21	0.06	0.15
5-6	0.27	0.07	0.12
6-7	0.25	0.07	0.09
7-8	0.17	0.07	0.14
8-9	0.20	0.08	0.17
9-10	0.25	0.09	0.20

Note: Estimated from distribution of the labor force by years of experience. The quit rate for those with experience t_1 to t_2 is estimated as the percentage of the labor force with at least t_1 experience minus the percentage with at least t_2 experience divided by the percentage with at least t_1 experience.

- a. Carpenter survey.
- b. Forrester survey.
- c. Thias and Carnoy survey.

Source: Table reproduced from Collier and Lal (1985).

Some countries have questioned the appropriateness of using minimum wages to help stabilize the labor force. Although minimum wages may help to stabilize the work force, they undermine the seniority wage structure and thus deter workers from trying to improve their skills.

There is a distinction between general skills acquired by workers that are marketable because all firms can use them profitably and specific skills that are usable only in the firm where the worker is employed. Employers are usually unwilling to invest in a worker's general skills, since they enable him to find a job elsewhere. In modern industry, however, many skills are specific to the production

process or organization of the firm. While employers are willing to invest in such training, they want to keep the fruits of their investment, and the best way to do so is to establish a pay system based on seniority. As a result, initial wage rates are low—indeed, lower than the new employee would get at firms with a flat wage scale. In short, workers share in the cost of their training through reduced earnings in the early years. They get a return on their investment as their earnings rise with years of service. Minimum wage legislation, however, forces employers to raise entry-level wages. It then becomes costly to maintain a sharply graduated seniority scale, and employers may be discouraged from investing in the training of workers, since one of their methods of securing lifetime attachment to the firm has been weakened.

The squeeze on wage differentials caused by a mandated minimum wage may be less severe if wages are established by industrial tribunals that decide on the pay scales of different classes of workers. Since it is neither possible nor desirable for an administrative body to specify wage rates in detail, the problem of artificially squeezing wage differentials will exist in all types of government intervention in setting wage structures.

From the Minimum Wage to an Incomes Policy

Slow growth in employment and increases in urban unemployment in the late 1960s and early 1970s led most governments in East Africa to abandon their high-wage policies. In Kenya, for example, the government announced its intention to regulate urban wages in its Development Plan for 1970-74. Kenya's incomes policy, as it was called, was to be accomplished with the help of an Industrial Court, which would register and approve all collective bargaining agreements. The minister of finance issued guidelines to the Industrial Court to make sure that "increases in wages and salaries do not exceed the rate of growth in the economy as a whole," but the guidelines have been changed repeatedly. In January 1975, for example, it was announced that productivity would no longer be the basis for wage increases, and that additional compensation to keep pace with increases in the cost of living would be allowed only to workers with earnings below a specified level. The guidelines have tended to fluctuate in accordance with economic conditions, almost on a year-to-year basis.

Incomes policies of this type serve a purpose during periods of major shifts in wage policies and also provide information about the short-run prospects for the economy. In the absence of a centralized bargaining process (such as exists in Scandinavian countries), however, the guidelines may or may not be effective in determining the extent of wage changes. Bigsten (1984) and Collier and Lal (1985), have argued that wage agreements negotiated in Kenya in the 1970s were well below what was permitted under the guidelines. Bigsten also adds that "given the construction of the guidelines with special attention to the lowest paid workers, it is not unlikely that they have had some effect on the gap between high and low income earners."

In any event, the abandonment of minimum wages led to a reversal of the rising trend of wages in Kenya's formal sector, as can be seen from table 20.

Table 20. Average Annual Percentage Increase of Real Wages and GDP in Kenya

	1953-68	1968-72	1972-77	1977-84
Real wage of skilled manual labor	4.7	-0.7	6.7	n.a.
Real wage of unskilled manual labor (nonagricultural)	6.7	-1.7	-3.5	n.a.
Real wage of all urban private labor	n.a.	3.7	-6.3	-4.5
Real wage of all public labor	n.a.	0	-1.7	-1.1
GDP per capita	1.7	3.3	0.2	-0.5

n.a. Not available.

Source: Fallon (1985). Figures calculated from Collier and Lal (1985).

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