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CENTER DISCUSSION PAPER No. 46

RELATIVE EARNINGS AND MANPOWER ALLOCATION  
IN DEVELOPING ECONOMIES

Lloyd G. Reynolds

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## Relative Earnings and Manpower Allocation in Developing Economies

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Lloyd G. Reynolds

### I. Introduction

The less developed countries present two kinds of challenge to economists. First, they invite us to develop hypotheses about how economic growth begins and about structural changes during the early decades of growth. Second, they provide a fresh terrain on which functional specialists in public finance, industrial economics, or what not can test accepted notions about economic behavior.

For investigations in labor economics, the structure of earnings provides a convenient starting point. (It is best to say "earnings" rather than "wages" because most workers in the LDC's are self-employed.) Analysis of earnings requires an examination of manpower supplies and requirements. This leads into the economics of agriculture, industry, government, and other labor-demanding sectors on one side, and into a study of education and other skill-producing agencies on the other. Thus by starting with the earnings structure, one is led rather directly into the heart of the economy.

Some readjustment of ideas is necessary at the outset in view of basic differences between the LDC's and the advanced industrial countries. Certain wage issues which are important in Europe and the United States do not bulk large in the present context. Cost-push pressure on the price level, and the problem of reconciling high employment with price stability, are not major issues. The concept of income distribution as a division between profits and wages is applicable only within the small sector of "modern industry." The concept of a general wage level, with the implication that particular wages move in a synchronized way, is not useful. The interesting problems concern relative earnings in

different areas, sectors, firms, or occupations, i. e., they are problems in micro-economies.

A serious difficulty is that there is no such thing as a "typical" less developed country. The range of variation is much wider than in the North Atlantic world. Consider the differences between Malawi and Mexico in income level, composition of output, skill-distribution of labor force, weight of government in the economy, wage-determining institutions. In most respects the countries of tropical Africa cluster toward a "least developed" pole, some of the Latin American countries toward a relatively advanced pole, with other LDC's somewhere in between.

Admitting this difficulty, let us examine a fictitious or "median" LDC with the following characteristics:

First, it is a "mixed economy." Government operates public utility industries and perhaps certain branches of manufacturing in addition to producing public services.

Second, the economy is at an early stage of development, with "modern" business enterprises producing perhaps ten percent of national output. It is neither Malawi nor Mexico, but more nearly like Thailand, Pakistan, or Colombia.

Third, the economy is growing, i. e. per capita output is rising. In a stagnant economy, the phenomena analyzed below would not appear.

Fourth, population and labor force are growing rapidly--say, at 2.5 to 3.0 percent per year. There is surplus labor, or perhaps better "labor slack" in the economy, consisting partly in unutilized labor time and partly in wide sectoral differences in output per worker. There is an ample supply of (untrained) labor to the growth points of the economy.

The occupational groups to be analyzed are: self-employed workers in agriculture; self-employed workers in traditional urban occupations; low-skilled workers in "modern" private enterprises and in government; and white-collar workers requiring some period of

formal education. We shall examine how the earnings of these workers are determined at a point of time, and offer hypotheses about the probable movement of relative earnings during the first few decades of development. The discussion is necessarily speculative and hypothetical, because reliable earnings data are rare in the less developed world, and are usually limited to short periods of time.

## II. Earnings in Agriculture

We begin with agricultural workers, whose earnings are often regarded as constituting a base for the urban earnings structure. Agriculture is a diversified industry, including many products and numerous forms of production organization. It may include large plantations, producing for export and hiring wage labor. It includes landless laborers on other farms, hired on a daily or weekly basis. It includes peasant farmers, who own or rent the land they cultivate. So we must first decide whose incomes we are talking about and what kind of agricultural organization we are assuming.

We limit the discussion to peasant farmers, who may be either owners or tenants. We assume that all farm work is performed by household members, and ignore the possibility of hired labor. We assume also a clear separation of people and incomes between country and city. People who move to the city settle there permanently. There are no informal income transfers--farm people do not ship food to relatives in town, nor do town dwellers help to support rural relatives. This is meant to exclude the African migratory labor situation, in which it becomes difficult to segregate and compare "rural incomes" with "urban incomes."

It is necessary next to select an appropriate income measure. Should this be earnings per man-hour of labor, or per farm worker, or per farm household? All adult household members commonly do some work on the farm, and children begin to contribute at an early

age. Farm employment is thus difficult to measure, and it is probably best to take income per household as the most useful figure.

At an early stage of development, farm income consists largely of production for home use. This is not merely food production, but includes almost everything the family consumes--clothing, housing, furniture, personal services. Salt, tea, shoes or sandals, cloth, and a few metal tools and cooking utensils may be the only purchased items. The valuation of household production is thus of critical importance. In GNP calculations, foodstuffs for home consumption are usually valued at farm prices, so as not to include "fictitious" transport and marketing charges. But if the purpose is rural--urban welfare comparisons, or appraisal of inducements to migration, it would seem that farm production should be valued at "city prices." To the extent that this is not done, and to the extent that all items of household production are not counted, the relative level of rural earnings is understated.

Where the peasant is an owner-cultivator, there should be a deduction for imputed rent and interest in order to arrive at labor income proper. But such adjustments are notoriously imprecise and often yield the result that farm labor income is very low or even negative. In any event, gross earnings including rent and interest may be more pertinent to analysis of rural-urban migration and labor supply to the modern sector.

Having made these distinctions, what can one say about the probable behavior of peasant incomes? These incomes are certainly "low" though perhaps not as low as may appear, because of a bias toward undervaluation of household output in existing measurements. It is not certain either that real incomes of rural households are below those of urban households engaged in "traditional" trade, service, and handicraft activities.

More interesting, however, is the question of movement over time. We have assumed that per capita output in the economy is rising. It would seem, then, that per capita

agricultural output must also be rising in the economy is not to run into the Ricardian food bottleneck. While there are some possible lines of escape from this proposition, none appears very promising. First, a strong government might follow an austerity program under which per capita consumption does not rise despite a continuing increase in per capita output, which would then be channeled entirely into capital formation. It is doubtful, however, that many governments in the less developed world could actually enforce such a program. Second, domestic food production per capita might be increased without any increase in agricultural output per capita by diversion of acreage from export crops and non-food crops. But this does not look like a viable development path over any extended period. Third, if the country is able to increase non-agricultural exports rapidly, it can import food to close a growing agricultural deficit. But this would be feasible for only a few oil or mineral exporters.

One could argue, indeed, that farm income per household must rise in any event. For suppose that agricultural output rises only as fast as population, or even at some lower rate. Rising per capita incomes in other sectors, pressing against this limited food supply, will shift the rural-urban terms of trade in favor of agriculture. Real income per farm household will then rise because of the terms of trade effect. It is unwise to rely on this as more than a short-term argument, however, because such a growth path would come to an end rather quickly as the classical economists foresaw.

In the general case of successful development along a balanced agricultural-industrial path, agricultural output per head of national population will be rising. Assuming for the moment that the distribution of population between agriculture and non-agriculture remains unchanged, agricultural output per head of farm population will be rising. (If there is a redistribution of population toward urban areas, as is sometimes assumed in growth models, the argument holds a fortiori.)

If output and income per farm household are rising, it seems likely that consumption per household will also be rising. All of the increased income (in the case of owner-cultivators), or a certain proportion of it (in the case of tenants), accrues to the farmer in the first instance. While he may save some of the increment, he will normally consume part of it. Government may recapture part of the increase through taxation; but a 100 percent marginal rate of taxation is scarcely feasible. Increased output requires that the household supply increased labor inputs, learn new techniques, and assume new risks. It seems unlikely that they would be willing to do this for zero return.

We conclude that growth models in which the "rural wage rate" remain constant as output rises are not plausible. Instead, income and consumption per household will move upward over time.

The rate of increase depends on: (1) the rate of increase in physical output, which depends partly on what government does to discover and disseminate new techniques, and to make available physical inputs, credit, and marketing facilities; (2) land tenure arrangements, which determine the share of increments in output accruing to the cultivator, and which can be altered by government through "land reform" measures; (3) the behavior of farm prices, which is often regulated through price supports, marketing boards, or other government purchase schemes; (4) the marginal rate of taxation on farm incomes. There is thus nothing inevitable about the rate of increase in agricultural incomes. It is normally regulated--more or less systematically, more or less wisely--by what government does or fails to do.

Do decisions in this sphere affect only the operation of the agricultural sector, or do they react also on the urban wage level? In models of the Lewis or Fei-Ranis type, there would be a direct reaction. The supply curve of labor to the modern sector of the economy

is drawn horizontal at a level sufficiently above earnings in agriculture to induce rural-urban migration. If, then, the level of farm earnings were to rise, the urban labor supply curve would shift upward correspondingly. The wage of low-skilled urban labor would move upward over time at the same rate as agricultural earnings.

But while things might possibly work in this way, they do not seem actually to work in this way. It seems in fact reasonable to draw the supply curve of labor to the modern sector (SS in Figure 1) as sloping upward in the usual way. Although we have spoken for convenience of an average level of earnings in agriculture, actual earnings vary widely because of variations in soil, climate, water availability, cropping patterns, and the farmer's own capacity. The wage at which individuals find it worthwhile to transfer from country to city will vary correspondingly. Moreover, the modern sector draws only part of its recruits from agriculture. Some come from other urban activities, and some are new entrants to the labor force.<sup>1</sup> For these people, too, it is reasonable to suppose that the higher the industrial wage, the larger will be the number of job applicants.

The truth behind the Lewis-type diagrams is that, at the wage-level prevailing in the modern sector (OW in Figure 1), the number of workers desiring employment (ON) exceeds the number demanded (OE). There is a disequilibrium situation. The interesting question is how the wage OW was established, and why it does not fall in the face of a labor surplus. Explanation of this phenomenon belongs to a later section.

An increase in agricultural earnings would shift the supply-curve leftward, say to  $S_1$ ,  $S_1$ . But this would still leave a labor surplus, and would not directly affect wages or employment in the modern sector.

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<sup>1</sup> In a sample of 1000 new factory workers in Puerto Rico, the writer found that about one-fifth had transferred from agriculture, two-fifths were drawn from other sectors of the economy, and another two-fifths were new entrants to the labor force. See Lloyd G. Reynolds and Peter Gregory, Wages, Productivity, and Industrialization in Puerto Rico (Homewood, Ill.: Richard D. Irwin, Inc., 1965), p. 209. It would be useful to have comparable evidence from other industrializing countries.

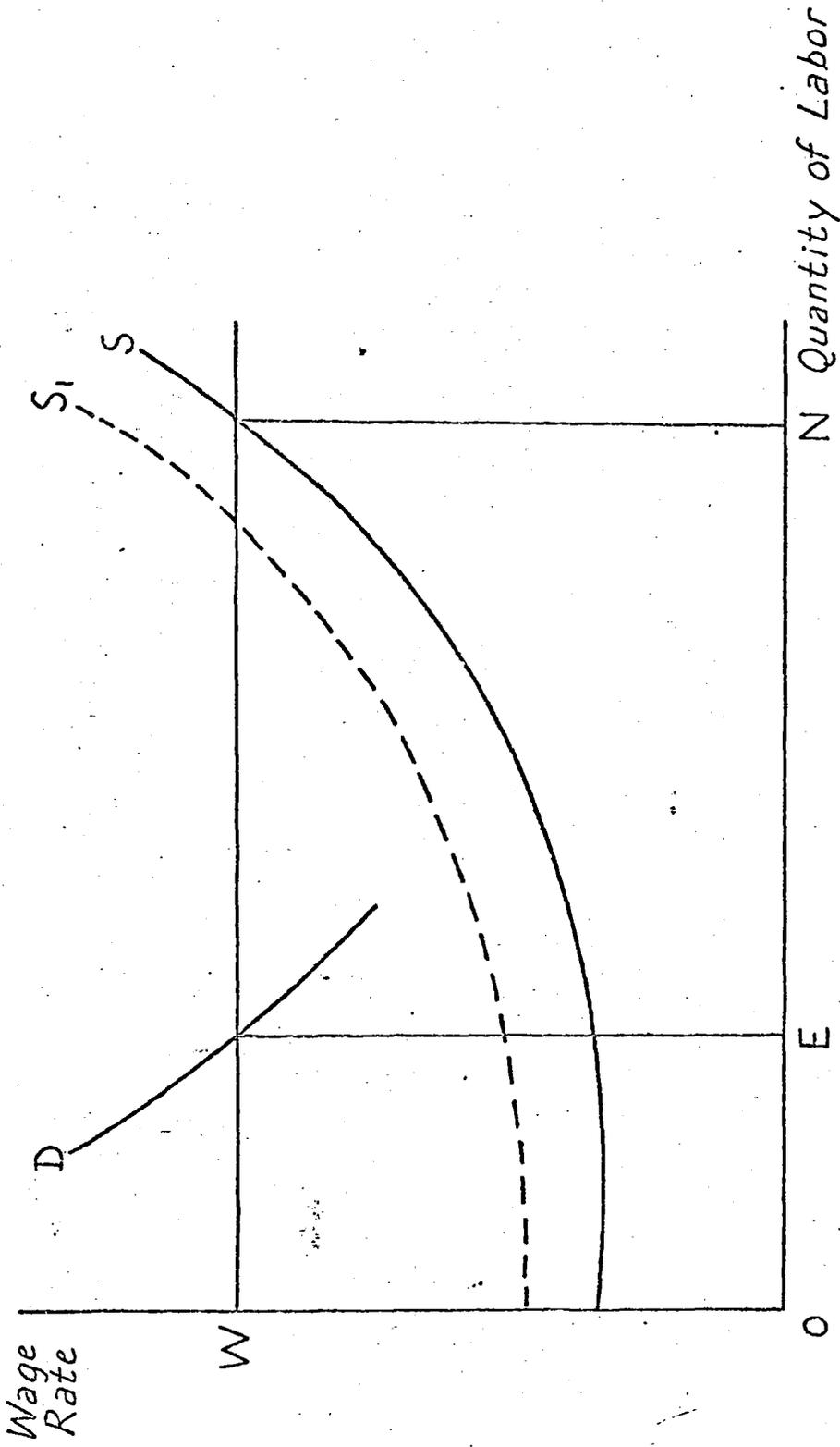


Figure 1

### III. The Low-Productivity Urban Sector

Simplified models of development sometimes assume that all non-agriculturalists are employed in the modern sector<sup>1</sup>. But this is actually not true. The urban population comprises two distinct areas of employment. These may be termed the traditional and modern areas, or the small enterprise and large enterprise areas, or the low productivity and high productivity areas.

In the early stages of development, most of the urban labor force is in the low productivity area. This includes handicraft manufacturing, retailing, labor-intensive transport of goods and people, domestic and personal service, and a variety of other service activities. Most of these people are self-employed, resembling in this respect the agricultural population. Entrance to the occupations in question is open. Most of them require little or no skill, and also little or no capital. They thus provide a natural entry point for migrants from the country, who win a precarious foothold in the urban economy by crowding into petty trade, services, and other small-scale activities. Overmanning of these activities contributes to low output and income per worker. While most people manage to work a little and earn a little, some remain wholly unemployed. They presumably subsist by being attached to a household which has some source of income; but their presence reduces real income per household member.

Very little is known about incomes in this sector. Statistical effort tends to be concentrated on wages and salaries in the modern sector, and to a lesser extent on agricultural earnings. Even if one had good measures of money income, it would be difficult to compare real income levels in city and country. There are well-known pitfalls in such comparisons,

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<sup>1</sup> The original Lewis article, however, was careful not to make this assumption. Lewis includes among his sources of surplus labor what we here term the low-productivity urban sector.

including the fact that some items consumed in the city are not available in the country. One is in the end comparing two different styles of life.

Suppose, however, that these difficulties could be overcome. What would one expect to be the relation, in equilibrium, between real earnings in agriculture and in traditional urban activities? The equilibrating factor would be rural-urban migration. So the question may be put in this form: what assumptions about migration would lead one to expect income parity between agricultural and (traditional) urban occupations?

One would have to assume that everyone growing up in the countryside has the option of remaining in agriculture (no one is literally pushed out by land scarcity); that the only alternative to agricultural employment is employment in the low-productivity urban sector (which ignores the chance to secure employment in the high-wage modern sector); that differences in real household income are the only determinant of migration (the "bright lights" and other presumed attractions of city life are not relevant); that whole households migrate; that accurate information is available, and that migration costs are zero. Under these conditions one might expect real incomes to tend toward the same level in both sectors. Any disruption of equilibrium resulting from differing rates of population growth in country and city, or from differing rates of increase in labor demand, would be speedily corrected by net migration.

Migration is clearly more complex than this, and we do not know much about it. Labor market information is poor, and the costs and risks of migration are substantial. On these counts it is often argued that the equilibrium level of real income will be somewhat higher in the city. But there are also forces working in the opposite direction. If rural population growth is rapid and land scarce, people may be forced out of agriculture willy-nilly. City life also has considerable non-monetary attractions: enlarged opportunities

for social contact, including a broader marriage market for young people; greater variety of recreational opportunities; the possibility of learning new skills and moving up the economic ladder; better educational opportunities for one's children. Moreover, there is in the city a modern high-wage sector alongside the traditional sector. The actuarial likelihood of getting employment in this sector has a value which must be added to the other attractions of city life. This consideration is especially important for young people with above-average education. Much of the country-city migration consists of such people rather than of whole families.

One can readily argue, then, that the equilibrium level of real income in traditional urban activities may be below that in agriculture. Or to put the point differently, income parity in the two sectors will lead to substantial country-city migration. This hypothesis can be tested, however, only through country-by-country investigation.

Whatever the equilibrium income relation may be--and supposing that equilibrium is once established--changes in the earnings level in traditional urban activities should thenceforth parallel those in agriculture. If real income per farm household rises gradually over time, as we argued earlier it should do in a growing economy, one would expect a similar movement of earnings in traditional urban activities.

A word may be added on urban unemployment. In many of the less developed countries, the number of rural-urban migrates has recently exceeded the increase in urban labor demand, leading to growing unemployment and underemployment in the cities. While this is indeed a serious problem, one may speculate that unemployment will not increase indefinitely. It tends to reduce real income per household member in the cities relative to

that in agriculture; and it reduces the probability<sup>1</sup> of new migrants being able to find jobs in the modern sector. Both effects are unfavorable to migration. At some level of unemployment, therefore, net migration will fall to the rate at which new urban jobs are being created. Unemployment will then have reached an equilibrium level, and will not increase further.

There are important policy problems in this area. Assuming that many LDC's will have substantial under-employment for some decades to come, is it better for people to be under-employed in the country or the city? Should cityward migration be encouraged or discouraged? What policy instruments are available? Further investigation of migration behavior and relative income levels might contribute to resolving such questions.

#### IV. The Modern Sector: Low-Skilled Labor

The modern (or high-productivity) sector embraces government service, factory industry, commercial construction, mechanized transportation, import and export trade, banking and finance, electric power and other public utilities. In some economies it includes also large mining or petroleum industries.

The wage rate of primary concern is the hiring rate for unskilled labor; but we use the broader term "low-skilled labor" to include semi-skilled operatives in manufacturing and comparable groups in other industries. These jobs require only a short training period, and are usually paid at not much more than unskilled labor rate.

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<sup>1</sup>Calculation of this probability requires assumptions about the working of the urban labor market. One might assume, for example, that new migrants take their place at the tail of a queue and are hired only after the existing unemployed have been absorbed. Alternatively, it could be assumed that a new migrant has precisely the same chance of employment this month as do the existing unemployed, i. e., that selection by employers is random as regards date of migration. Under either assumption, a higher level of unemployment will reduce the prospects of the new migrant.

The limited statistical evidence suggests two observations concerning these rates. First, they seem to vary considerably more among establishments than is true in more developed countries, suggesting greater imperfection of the labor market (including the widespread prevalence of underemployment and surplus labor). This variation is observable, for example in data on wage rates by size of manufacturing establishment. It is normal everywhere for smaller enterprises to pay less than larger ones; but in the more developed countries the differential is moderate. Taira found that in the U.S., Britain, and five West European countries, manufacturing plants with 50-99 employees typically paid 80-90 percent as much as establishments with 1,000 employees and over. But the smaller enterprises pay only 55 percent as much in India and 65 percent as much in the United Arab Republic.<sup>1</sup>

The second striking fact is that wage levels in the modern sector seem very high relative to earnings in traditional activities. Instead of the modest 30 or 40 percent premium hypothesized in some growth models, they are often 2 to 3 times as high. Foreign-owned oil and mineral companies seem particularly prone to pay wages much above traditional levels. Evidence is available from areas as diverse as Jamaica, Puerto Rico, Zambia, Uganda, Lebanon, Iraq, and Iran.<sup>2</sup> While more evidence is needed, it is a

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<sup>1</sup> Koji Taira, "Wage differentials in developing countries: a survey of findings." International Labour Review, March 1966, pp. 281-301. The data for most countries are from the era 1955-60. In some countries, though not all, they represent comparison of different enterprises in the same industry, which is of course much to be desired.

<sup>2</sup> In addition to Taira and Reynolds and Gregory, see Elliott J. Berg, "Major Issues of Wage Policy in Africa," - Arthur M. Ross (ed.), Industrial Relations and Economic Development (London: Macmillan, 1966); Elliott J. Berg, "Wage Structure in Less-Developed Countries," forthcoming in a symposium volume on Wage Policy Issues in Economic Development, to be published for the International Institute for Labor Studies; and J. B. Knight, "The determination of wages and salaries in Uganda," in Bulletin of the Oxford Institute of Economics and Statistics, Vol. 29, No. 3, 1967.

plausible hypothesis that industrial employers throughout the less developed world typically pay more than the supply price of low-skilled labor, i. e., that the labor market situation is as sketched in Figure 1.

Why should employers behave in this way? There are several possible reasons. First, a high-wage policy often costs very little. In capital-intensive manufacturing and extractive industries, labor cost is a small percentage of value added. Moreover, if the company's profits are taxed at, say, 50 percent, half of any wage premium is paid by government.

Second, a high-wage policy has productivity advantages, and so again costs less than it may appear to cost. It enables the employer to skim the cream of the local labor force, to secure workers of relatively low age, superior physique and intelligence, above-average education, stable work habits, good scores on tests of manual aptitude. It helps to reduce turnover and absenteeism. It enables supervisors to demand a good pace of work plus attention to quality of product and care of machines. Higher wages may also add to workers' strength and efficiency by permitting better nutrition and health care.

Third, there are less tangible but important advantages in the company's public relations. In the ideological atmosphere of most LDC's, high profits are viewed with suspicion and may lead to demands for nationalization or heavier taxation. Foreign-owned enterprises are especially vulnerable to political attack. Profit-sharing through an obviously generous wage level may seem good long-range strategy.

Once a sizeable wage differential has appeared, for whatever reasons, it tends to harden into custom. There develops, in a sense, a dual labor market. To the extent that employers are competing, not for labor in general, but for workers already accustomed to employment in the modern sector, they may be expected to offer what other modern-sector

employers are paying. This can be rationalized partly by arguing that the productivity of experienced industrial workers is higher than that of new, untrained workers, they contain more efficiency units per man. Perhaps more significant, however, is that their wage expectations are decidedly higher as a result of their past earnings experience.

Wage levels are not determined simply by market pressures and employer policies. Trade unions are typically not very consequential in the LDC's, operating mainly as political pressure groups rather than as bargaining organizations. Government wage regulation, however, is quite important. In most LDC's the political climate is welfarist and egalitarian. The urban employees, including government employees, the university students, the writers and intellectuals are a force to be reckoned with if a (frequently) insecure government is to remain in power. Given the obviously high wage-paying ability of modern industry, it is entirely natural for governments to pursue a high-wage policy (high, that is, relative to earnings in traditional activities, though still low on an absolute basis or relative to more developed countries).

Government policy operates, first, through the wage level it sets for its own employees. Government departments and state enterprises employ a considerable share, often 20 to 40 percent, of the workers in the modern sector. So it can, and frequently does, act as a wage leader for this sector.

The other main device is minimum wage legislation, which is widespread in the LDC's and usually exerts substantial pressure on the wage structure. Even if the initial minimum is reasonably in line with traditional earnings, there is a strong tendency toward frequent and large increases. One can always show that existing wages are too low to support a "decent" standard of life, and it can be argued plausibly that employers will somehow absorb the higher labor costs. In Uganda, for example, the minimum wage in government

employment was tripled between 1954 and 1964, a period during which the average incomes of peasant proprietors rose very little. In Puerto Rico, too, minimum wages in manufacturing almost tripled between 1950 and 1963.<sup>1</sup> Increases of 10 percent a year are not uncommon in other countries.

The effect of the minimum wage system is thus quite different from its effect in more developed countries. In the United States, for example, the federal minimum wage lags the upward movement of wage rates. When the minimum is raised every five years or so, this affects only a few percent of the labor force, and serves mainly to tidy up the ragged lower fringe of the wage structure. In the LDC's, on the other hand, the minimum actually determines the earnings of low-skilled labor, and forces them increasingly above the supply-price of such labor.

Given this kind of split-level wage structure, it seems likely that the earnings gap between the modern and traditional sectors will widen over the early decades of development. An important consideration here is that value added per worker in the modern sector is likely to rise quite rapidly over time--partly through "learning" by both workers and managers which is normal in new enterprises, partly through other types of technical progress.

The fact that output per worker is rising does not per se provide any reason for wage increases, since wages are already above the supply price of labor. But if wage rates were actually held stable, or at least held stable relative to product prices, profit margins would widen continuously. This is politically unacceptable for reasons suggested earlier, and there will be strong pressure to keep wages moving upward.

Earnings in traditional activities will also be rising, because of our basic assumption of agricultural progress; but they are likely to be rising quite gradually. It is thus a

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<sup>1</sup> See the Knight and Reynolds-Gregory studies cited previously.

a reasonable hypothesis that the wage level in the modern sector will diverge farther and farther above earnings in traditional activities.

A rough test of this hypothesis may be had by comparing the movement of real wages in each country with that of real product per capita. This indicates whether employees are improving their position relative to the population in general. The data are very unsatisfactory. A study by A. D. Smith suggests, however, that in tropical Africa the rate of wage increase has everywhere outpaced that of GNP increase. This has also been true generally in Central and South America, though Brazil and Peru may constitute exceptions. In Asia, the picture is mixed. Wages have advanced materially faster than output per capita in Ceylon, but at about the same rate in Pakistan, and less rapidly in India and the Philippines.<sup>1</sup>

It is interesting to speculate on the main consequences of this kind of wage behavior. First, how is continual forcing up of the unskilled labor rate likely to affect the earnings of higher grades of manual labor? As regards semi-skilled workers, there is a tendency toward compression of skill differentials. When the minimum wage is raised, workers who are only a short distance above the minimum usually receive increases as well. But these are often not equal in absolute terms, and still less in percentage terms, to the increase in the minimum wage. If, however, the shrinkage of differentials reaches the point of interfering with incentive to learn and perform semi-skilled jobs, the employer has the option of widening them once more. These rates are market-determined in that the premium over the common labor rate must be sufficient to call forth the required supplies. From another standpoint, since the common labor rate itself is artificial, the structure of rates above it may also be considered artificial.

<sup>1</sup>A. D. Smith, "A Conspectus of Wage Trends in Developing Countries," to be published in the International Institute of Labor Studies symposium previously cited. Data for most countries cover the years 1956-64.

The wages of skilled manual workers are also market determined, and their premium over unskilled labor is considerably larger than in more developed countries. In Britain and Western Europe, skilled men typically earn 20 to 30 percent more than the unskilled. In the LDC's, however, they almost invariably<sup>1</sup> earn at least 50 percent more, and quite often earn two to three times the laborers' wage.<sup>2</sup> The movement of skilled rates over time depends mainly on the relative rates of increase in demand and supply. In a growing economy, with considerable investment in infrastructure and industry, demand for skilled tradesmen will be rising quite rapidly. The response of supply is lagged because of the length of the training period. In some newly-independent countries, where skilled work was formerly done by expatriates or by ethnic groups regarded as "foreign," nationalization of these jobs may also restrict supply for the time being.

On balance, skilled rates seem likely to advance rapidly in economies which are really progressing. The minimum rate for the unskilled is being pushed up meanwhile by the non-market pressures noted earlier. Whether the skilled-unskilled differential widens or narrows over time depends on the arithmetic balance of these two sets of forces, which have nothing directly to do with each other. The evidence assembled by Berg suggests that there has been some tendency toward compression of skill differentials in the post-World II period;

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<sup>1</sup>In Chilean manufacturing, Gregory found that skilled workers earned on average only 42 percent more than the unskilled in 1963. (Peter Gregory, Industrial Wages in Chile, Ithaca: New York State School of Labor and Industrial Relations, 1967), p. 88. Argentina seems also to have only moderate skill differentials. These two countries, of course, are semi-industrialized and not really typical of LDC's in general.

<sup>2</sup>See a summary of the available evidence by Berg, in the I. I. L. S. paper previously cited. As Berg points out, however, it is not easy to identify the rate for a certain category of skilled labor. There is usually a wide variety of rates for any job title. One reason is that the classification itself is heterogeneous, comprising some people who are truly all-round craftsmen along with a larger number with less skill and training. The gap between the laborer and the true craftsmen is considerably wider than is suggested by studies which use median earnings of all those classified as skilled.

but that this tendency is not as strong or as uniform among countries as one might have expected a priori. Of 13 LDC's for which data were available in the early 'fifties and in the early 'sixties, skill differentials seemed to have fallen in 8 and risen in 5; but in several cases the degree of change was too small to be significant in view of the crudeness of the data.

The fact that the modern sector wage level is abnormally high, in part because of non-market pressures, has other consequences which can be mentioned only briefly. The tendency for the profit share of national income to rise sharply during early development is retarded, through the transfer of potential profits to wage-earners. Investment in the modern sector may be reduced, both by a reduction of reinvestible earnings and of the profit margins which are the incentive to investment.

Rising wages may have favorable productivity effects. In addition to the possible effects already noted on workers' physical capacity there is something to the "shock effect" on management. New enterprises setting up in a country where manual labor seems very cheap are likely to use it wastefully. Wage pressure forces them to economize labor in an effort to maintain profit margins. To the extent that these efforts are successful, the impact on industrial profits is reduced; but the negative impact on industrial employment becomes more severe.

Wage pressure in the modern sector increases the inequality of labor income in the economy. It creates a high-wage island in a sea of agriculturalists and self-employed or unemployed urban workers living at much lower income levels. This must make it harder for government to apply any general policy of restraining consumption for the sake of investment. Farmers or others who are squeezed by such a policy can point to the rapid rise of industrial wages and demand similar treatment.

Not unimportant is the squeeze on the government budget. A rapid rise of wages in the public sector means large built-in increases in the current budget, of which two-thirds or so is payment for labor services.

Suppose GNP is rising at 5 percent per year, and that the tax system has unit income elasticity, so that revenues are also rising 5 percent per year. Then if the government wage level is also rising 5 percent per year, it is clear first, that the numbers employed in providing current government services cannot be increased; and second, that there can be no increase in the proportion of the budget devoted to investment. The investment proportion can be increased only through some combination of: a tax structure which yields a revenue elasticity greater than one; frequent imposition of new taxes so that, even if the elasticity of existing taxes is less than one, revenues will still rise faster than GNP; a rate of increase in government salary scales below the rate of GNP increase; or a reduction of current services. The less the success on the wage front, the greater the pressure on other fronts. In some countries wage pressure has contributed to a growing encroachment of the current budget on the capital budget, contrary to the requirement for successful development.

This leads to the employment effect of rapid wage increases. If we assume that the amount which government can budget for labor services is independent of the wage level, the elasticity of demand for labor in the public sector is  $-1$ . Elasticity in the modern business sector is harder to estimate, but must also be negative and substantial. Wage pressure leads to efforts to economize labor, both through better management and through capital-labor substitution. This is certainly one reason, though not the only reason, why manufacturing employment in Puerto Rico rose only 65 percent between 1950 and 1962,

although value added in manufacturing increased more than fourfold.<sup>1</sup> A similar slow growth of industrial employment, despite large increases in industrial output, is reported from many LDC's.<sup>2</sup>

A final effect of rapid wage increases in the modern sector is to stimulate rural-urban migration. The higher the wage level in the modern sector the greater, other things equal, will be the volume of migration; and the higher also will be the equilibrium level of urban unemployment.

These surmises about wage-employment behavior in the modern sector are summarized in Figure 2. The subscript 1 denotes an initial situation while subscript 2 indicates the situation, say, five years later. Because of the assumption that earnings in agriculture and other traditional occupations are rising, the labor supply curve  $S_2$  starts out at a higher level than  $S_1$ . But it bends outward to the right because of the growth of population and labor force. The demand curve for labor is shifting rightward because of expansion in both the business and government sectors. The wage-level is assumed to have shifted upward to  $W_2$  for reasons suggested earlier.

In the new equilibrium, employment in the modern sector has increased, but by considerably less than the rightward shift of demand. Unemployment and underemployment, shown by the distance  $E_2 N_2$ , have also increased.<sup>3</sup> This may be a rather typical situation for high-population-growth countries during the early decades of development.

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<sup>1</sup> Greater detail is presented in Reynolds and Gregory, *op. cit.*, Chs. 1-3. Strictly manufacturing output should be valued in constant dollars. The Puerto Rican price level rose moderately from 1950-62, in line with that of the U.S. mainland. Even on this basis, however, there would remain a gross discrepancy between output and employment trends.

<sup>2</sup> See on this point Werner Baer and Michel Hervé, "Employment and industrialization in developing countries," *Quarterly Journal of Economics*, February 1966, pp. 88-107.

<sup>3</sup> Figure 2 does not show directly the number of unemployed. Some of those arrayed along the distance  $E_2 N_2$  are wholly unemployed; some are partially unemployed who work a short week; most are disguisedly unemployed, i.e., working normal hours but producing and earning below what they could earn in "modern" activities. It seems plausible that, as the distance  $E_2 N_2$  lengthens, its three components increase more or less proportionately. But this hypothesis would require an empirical test.

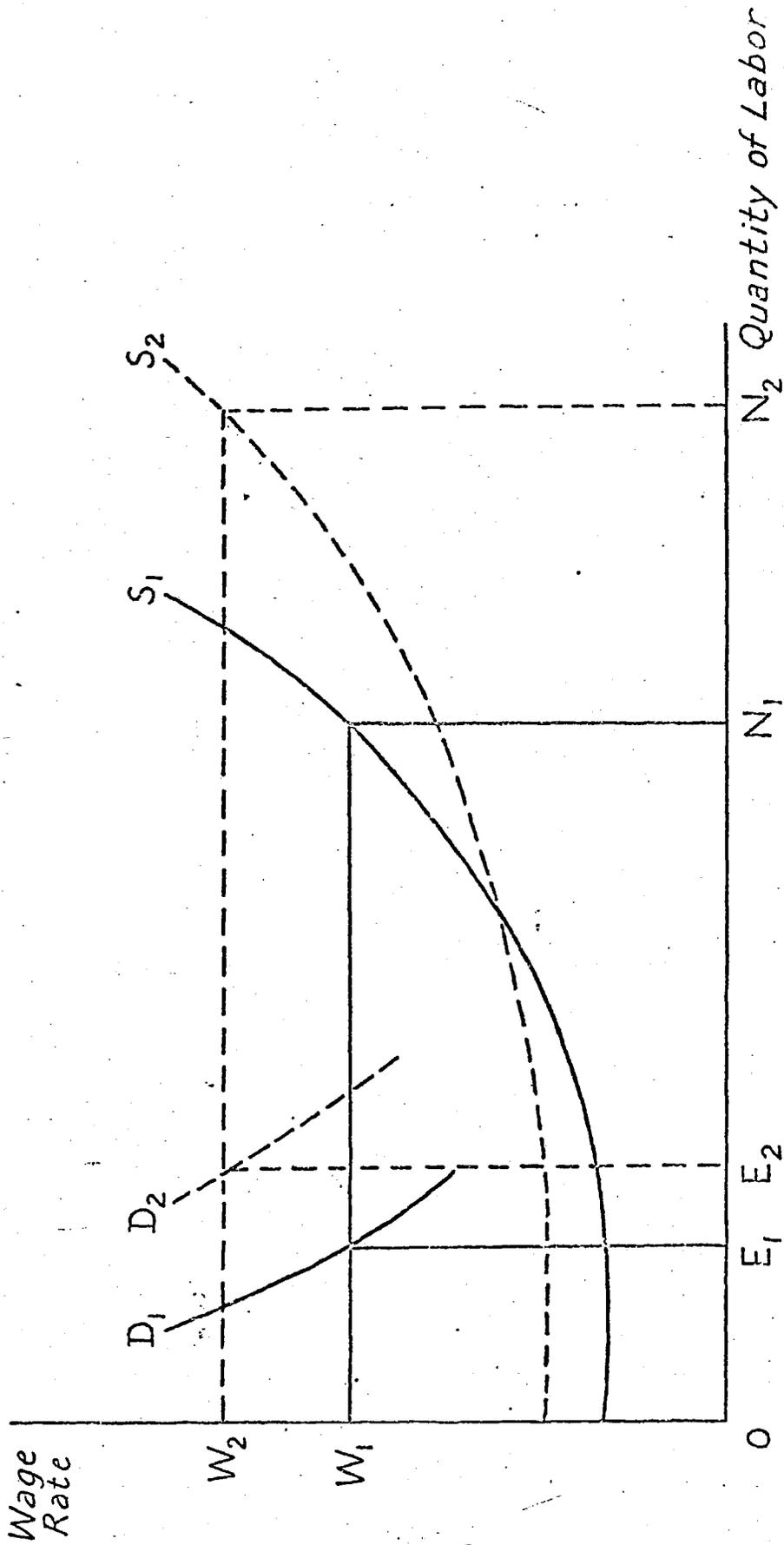


Figure 2

### V. The Modern Sector: Educated Labor

Our explorations in this area must necessarily be brief. We consider only white-collar occupations, and we assume that some degree of education is required for unemployment in these occupations. Initially, we shall assume that there is only one grade of "educated labor," characterized by secondary-school graduation. We assume also that educated labor is produced and employed wholly within the country, i. e., we ignore the possibility of hiring expatriates, and the reverse possibility of "brain drain" losses to more advanced countries.<sup>1</sup>

Figure 3 illustrates wage determination for the single category of secondary-school graduates. The stock of such people is fixed in the short-run at OE. The demand curve D, in conjunction with the fixed supply, determines a wage OW. The potential supply curve, S, may be presumed to start near the unskilled wage level in the modern sector,<sup>2</sup> and to slope upward in the usual way. This curve does not affect the wage level because of the supply bottleneck imposed by the educational system. Educated labor earns a rent equal to the area between the wage line and the supply curve.

Rental incomes are apt to be viewed with suspicion. What would happen if efforts were made to eliminate this type of rent? One might reason that the proper wage is  $OW_1$ , at the intersection of the D and S curves, and might try to impose a ceiling at this level. The first effect of this, however, would be to create excess demand of  $EE_1$ . There would be competition for educated labor among government departments, public enterprises, and private industry. Unless workers could be allocated among employers, the wage line  $OW_1$  could not be held.

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<sup>1</sup> The complications arising from expatriate labor are explored in an interesting unpublished paper by Dharum Ghai, "Some Notes on Labour Markets in East Africa" (Nairobi: Institute for Development Studies, University College, Nairobi 1967 (mimeo))

<sup>2</sup> Not at the unskilled level, if decisions are rational, because of foregone income and educational expenses during the training period.

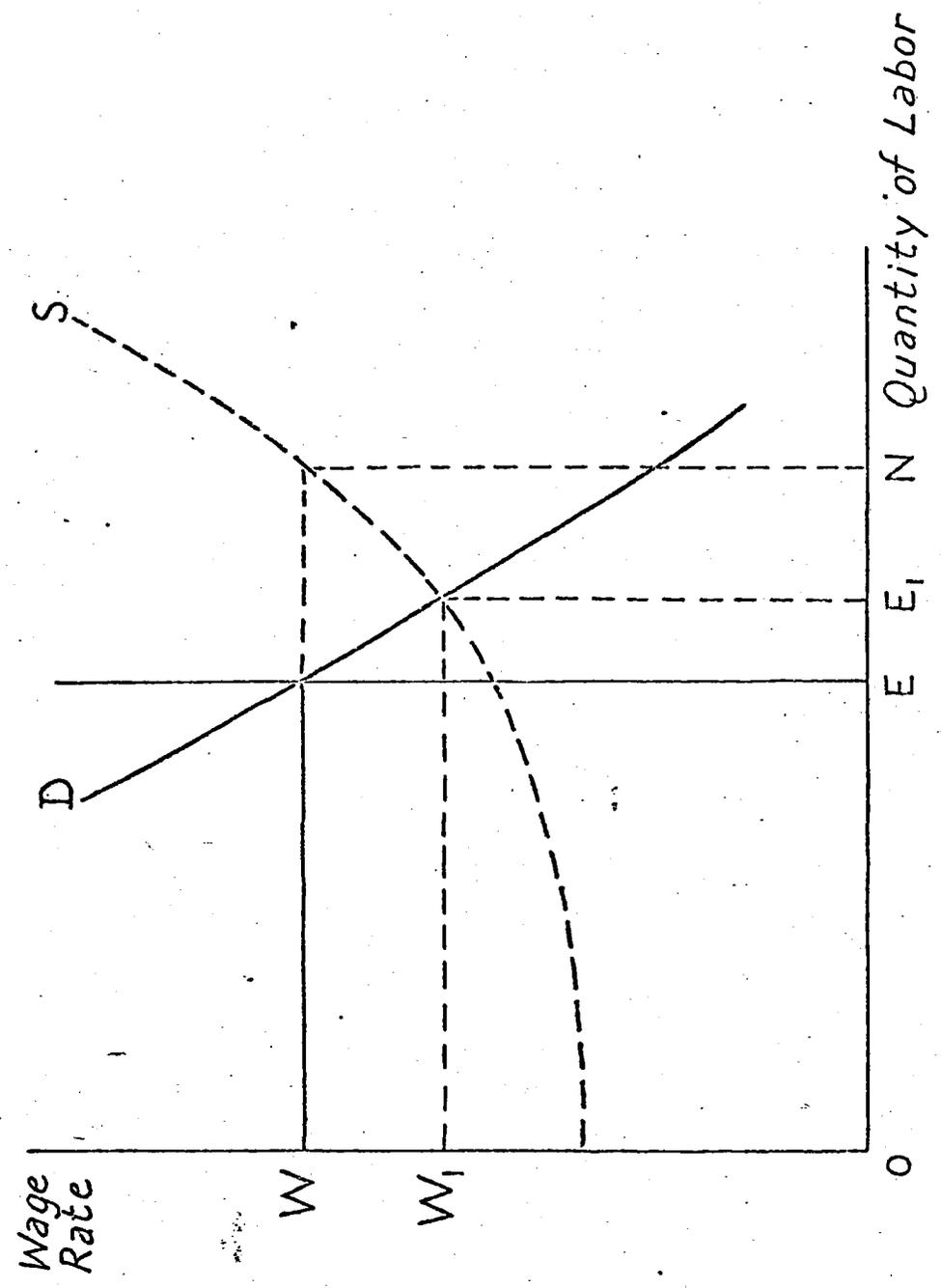


Figure 3

The basic remedy, clearly, is to increase educational capacity. But by how much? Should one aim at a target on ON, which would take care of all those willing to apply for education at the prevailing wage? This would overshoot the mark. A supply of ON, in conjunction with the demand curve D, would in a competitive market cause earnings of educated people to fall substantially, and many of those who had chosen education would be disappointed. Or, if the wage OW is rigid downward for institutional reasons, there would be "educated unemployment" of EN.

Because of the time required to expand educational capacity, such overshooting is unlikely in practice. But setting educational targets is clearly a complex problem, and any target which may be selected has wage implications which are not always recognized.<sup>1</sup>

Figure 3 assumes, that at the outset of development, educational facilities are likely to be so restricted as to produce substantial rents for school graduates. The actual situation will of course differ from country to country. There are indications, however, that large wage differentials for educated white-collar workers are common in the LDC's. In Chile in 1960, the monthly earnings of manual workers in manufacturing averaged about 65 escudos, while office workers averaged 163 escudos.<sup>2</sup> In Uganda, in 1965, when the rate for unskilled government employees of whom no education is required was £90 per year, holders of a Junior Leavers' Certificate (8 years of education) were averaging £204

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<sup>1</sup> The complexities, indeed, are not fully revealed by Figure 3. Labor quantities such as OE and ON are stocks at a moment of time. The output of the educational system, however, is a flow per unit of time. The time needed to raise the stock OE to ON will depend on the annual output capacity of the educational system and on attrition rates. Since time is required, the demand curve (and probably the wage rate) will meanwhile have shifted to a new position. The problem of educational target-setting must thus be set up algebraically with a time dimension.

<sup>2</sup> Gregory, op. cit., pp. 37 and 81. The figures for both groups include wage supplements as well as basic rates.

per year in the civil service, while holders of School Certificates (12 years of education) earned an average of £556 per year.<sup>1</sup> Taira presents data on relative earnings of unskilled labor and bank tellers in 9 more developed countries and 15 less developed countries.<sup>2</sup> In the MDC's the ratio of tellers to laborers' earnings in 1963 varied from 0.8 in New Zealand to 1.7 in Australia. In the LDC's, however, tellers typically earned 2 to 4 times as much as laborers, the ratio rising as high as 5.9 in Chile, 6.1 in Kenya, 6.5 in Nigeria, and 6.9 in Guatemala. While such large differentials may contain a conventional element, they seem to be mainly market-determined, with educational supply restrictions playing a key role.

How will the premium for educated manpower behave over time? This clearly depends on the relative rates of increase in demand and supply. Even without expansion of educational facilities, E will move rightward if the annual output of graduates exceeds attrition through death and retirement. But the higher the rate of expansion in school capacity, the more rapidly the stock of educated manpower will rise. The rate at which the demand curve shifts to the right depends on the rate at which output is rising in the modern sector, and on their inputs of educated labor per unit of output. The input coefficient is no doubt adjustable, but not indefinitely; and in the public sector custom may enforce educational qualifications for each civil service grade regardless of job content.

There is a distinct possibility that the differential for educated manpower will widen for quite some time. This is especially likely in countries which entered a phase of accelerated growth with a small educational base.

Matters become more complicated when one recognizes that there are several levels of educated manpower. There are primary graduates, secondary graduates, and university

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<sup>1</sup> Knight, *op. cit.*, p. 255

<sup>2</sup> Taira, *op. cit.* pp. 288-289

graduates (even overlooking dropouts at intermediate levels.) The behavior of supply at these various levels, and the consequent behavior of earnings differentials, will depend on the strategy of educational expansion.

The allocation of secondary school graduates is particularly crucial. They are demanded from three sides: as teachers for primary schools, as employees in other public and private sector activities, and as inputs (students) to the university system. Different allocations imply a different development of the earnings structure. Suppose, for example, that there is a massive push to enlarge primary education with a view to early achievement of universal literacy. A high proportion of secondary graduates is ploughed back into primary teaching by squeezing the members entering other employments and going on to university. The consequence may be a rise in relative earnings of secondary and university graduates, possibly accompanied by a decline in relative earnings of primary graduates.

Suppose, on the other hand, that without much enlargement of secondary education the proportion going on to universities is increased sharply. This will again raise the earnings premium for secondary graduates, since it reduces the supply available for immediate employment. But if the rise in university outputs outpaces the rise of demand at that level, the relative earnings of university graduates will fall. Thus it is quite possible that differentials for some educational levels may be widening while others are declining.

A further complication is that university education comprises numerous specialties. Depending on training capacity for each specialty relative to demand movements, the prices of different skills may move in different directions. Relative earnings of engineers may rise while those of philosophers fall.

These complex issues cannot be pursued here, but several things should be clear. First, future requirements for different levels of educated manpower cannot be calculated

independently of market prices. Second, strategy should be guided, not by the present structure of relative earnings, but by the structure as it may appear ten or twenty years hence, on the basis of explicit assumptions about demand elasticities and demand shifts. Third, the actual movement of earnings for different levels of educated manpower will be heavily influenced by educational decisions. Earnings structure, manpower allocation, and educational expansion are aspects of a single interdependent problem.

#### VI. Some Implications for Policy and Research

It is not the purpose of this paper to explore wage policy. We may note, however, several policy issues which stand out clearly from the discussion.

(1) What is the primary function of the earnings structure in early economic growth? This structure serves a variety of purposes. It distributes income between capital and labor, and within the working population. It provides an indicator of relative skill scarcities. It influences the allocation of labor to industries, occupations, and regions. It affects workers' effort and productivity. Which of these functions should be given heaviest weight in judging whether a particular earnings structure is optimal?

(2) At what rate should real income per farm household increase over time? This is mainly a matter which concerns the agricultural sector; but it also influences rural-urban migration and the earnings level in traditional urban activities.

(3) Given that there will be considerable underemployment of labor during the early decades of development, what is the best distribution of this under-employment between town and country? Should rural-urban migration be discouraged, and if so by what means?

(4) How far should wages of low-skilled workers in the modern sector be permitted to rise above earnings in agriculture and other traditional activities? It may well be impossible to avoid undesirably wide differentials; but it is still worthwhile to define what wage behavior would be optimal if it could be achieved.

(5) What is the optimal size of the educational budget, and the optimal allocation of this budget among levels of education and specialized training courses? This is basically a problem in manpower economics, involving relative earnings as well as physical manpower flows?

(6) To what extent can large market differentials be eroded by progressive income taxation? Can one assume that, the higher the wage or salary level, the larger the rental element which can be recaptured without affecting supply? Can one assume also that the groups involved will not seek to restore their post-tax position by a further widening of pre-tax differentials?

It should be clear also that no LDC, even if it could define objectives and had effective policy instruments, presently has enough knowledge to devise optimal policies. The following may be suggested as high-priority research problems for any developing country:

i. Measurement of the main dimensions of earnings structure, and of how it has changed over time. This will usually require major improvements in the statistics on wages and income.

ii. Farmers' production and consumption responses to increases in real household income.

iii. The volume, incidence, and determinants of rural-urban migration.

iv. The rate and sources of productivity increase in the modern sector, including the role of wages and the implications for employment.

v. Elasticity of demand for labor in modern employment, private and public.

vi. The interaction between earnings differentials for "high-level manpower" and the structure of the educational system.

vii. Projection of supplies, requirements, and prospective earnings in occupations requiring extended education.

viii. Optimal educational strategy, viewed in the light of such projections.

