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**INTERNATIONAL ECONOMICS
AND DEVELOPMENT**

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REFLECTIONS ON UNLIMITED LABOR

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This paper seeks to clarify and expand two articles which I published on this subject ten and fourteen years ago, respectively [25, 26]. Clarification seems necessary since the large literature to which they have given rise is somewhat confusing.

I. Some Misconceptions

The purpose of the model was to provide a mechanism explaining the rapid growth of the proportion of domestic savings in the national income in the early stages of an economy whose growth is due to the expansion of capitalist forms of production. The chief historical example on which the model was based was that of Great Britain where, as we may deduce from the later figures of Deane and Cole, net saving seems to have risen from about 5 per cent before 1780 to 7 per cent in the early 1800s, to 12 per cent around 1870, at which level it stabilized [8, pp. 265–267]. A similar rise is shown for the United States by Gallman [13, p. 11], starting around the 1840s with gross domestic saving at 14 per cent, and continuing up to 28 per cent in the 1890s, where the figure stabilizes. Similar changes can be found since the second world war for many less-developed countries such as India or Jamaica.

The explanation of capitalist sector growth provided by the model turned on the higher than average propensity to save from profit income, and on the rise of the share of profits in the national income in the initial spurt of economic development. Some such model was needed at the time of writing,

since the dynamic models then in use usually assumed constant savings and profits ratios. Even today our economic journals still publish many articles on savings functions which do not distinguish between profits and other incomes; a notable exception, specially valuable for bringing in less-developed countries, is the article by Houthakker [18].

Given the purpose of the model, the division of the economy into two sectors had to turn on profits. The two sectors are a capitalist and a non-capitalist sector, where "capitalist" is defined in the classical sense as a man who hires labor and resells its output for a profit. So a domestic servant is in the capitalist sector when working in a hotel but not when working in a private home.

This distinction was vital for my purpose. Other writers, with different purposes, have made different divisions. A now popular division is between industry and agriculture, but capitalist production cannot be identified with manufacturing, as anyone familiar with a plantation economy must know. The model is intended to work equally well whether the capitalists are agriculturists or industrialists or anything else, and indeed in its first version (as we shall see in a moment) the model presupposes that the capitalist sector is self-sufficient and contains every kind of economic activity.

This explanation may serve to refute the charge that the model identifies economic growth with industrialization. A further misconception is that it necessarily identifies economic growth with capitalist production. The anti-socialist aspect of this attack is easily beaten off. Since a capitalist is one who hires labor for profit, it makes no difference to the model whether the capitalists are private or public; the model gives a pretty good explanation of the sharp rise in the share of savings in the U.S.S.R. between, say, 1929 and 1939. The accusation that the model disparages peasant production is on a different plane. The model does not deny that peasants can grow rich by producing more, or more valuable output; it does not argue that capitalist production is more valuable; it is not normative. This author is delighted that there are economies where the productivity of peasants increases steadily and that some portion of that increase goes into capital formation. This does not render it useless or dangerous to study models of economies where, in the initial stages, the dynamism of growth is located in capitalist expansion.

In the model, the noncapitalist sector serves for a time as a reservoir from which the capitalist sector draws labor. The original paper makes clear that this labor does not all come from agriculture—a fact which has escaped the attention of many subsequent writers. The paper mentions *inter alia* domestic service and the self-employed (especially in handicrafts and petty retailing). It also points out that the labor force itself expands through the increased participation of women, as well as by natural increase and by immigration. The last of these sources, immigration, played a substantial role in economic

development during the nineteenth century (e.g., U.S.A., Brazil, Malaya, Australia) and, according to Kindleberger [23], is an important explanation of why some European economies have grown faster than others since the second world war.

The existence of such a reservoir is important to the model, since it explains why the capitalist labor force can for a time grow faster than the 3 per cent per annum limit which natural increase would now impose on the less-developed countries, or the 1.5 per cent population limit on Western Europe in the nineteenth century. This is important in explaining why profits can grow much faster than national income. But it receives added significance in these days, since we have observed that in one part of the capitalist sector, namely manufacturing industry, the rate of growth of productivity per head is a positive function of the rate of growth of employment. For this means that productivity can grow faster if there is a labor reservoir than if there is not.

In the model, the capitalist sector is said to have unlimited access to a labor supply, thanks to the existence of this reservoir. The use of the word "unlimited" has caused confusion. It means that if capitalists offer additional employment at the existing wage, there will be far more candidates than they require: the supply curve of labor is infinitely elastic at the ruling wage. One condition for this is that the ruling wage in the capitalist sector exceeds the earnings in the noncapitalist sector of those who are willing to transfer themselves. The other condition is that any tendency which the transfer may set in motion for earnings per head to rise in the noncapitalist sector must initially be offset by the effect of increases in the labor force (natural increase, immigration, or greater female participation). This is discussed more fully later in this paper. The model does not attempt to derive the conventional wage: as in the classical system, this depends not only on productivity but also on social attitudes. The model simply postulates as facts that in the initial stage the supply of labor at the given wage exceeds the demand, and that this condition will continue for some time despite the expansion of the capitalist sector. This postulate is inconsistent neither with history nor with reason.

Since all that the model needs is the fact that supply exceeds demand at the current wage it was not necessary to say anything about the productivity of marginal units of labor in the reservoir, beyond noting that it must be less than the wage offered by capitalists. As the original article said: "Whether marginal productivity is zero or negligible is not however of fundamental importance to our analysis" (p. 142). It was probably a mistake to mention marginal productivity at all, since this has merely led to an irrelevant and intemperate controversy.

This debate has been further confused by the fact that I did not mean by "marginal product is zero" what most of the subsequent writers have meant.

I meant (and said so explicitly) the marginal product of a man, whereas they mean the marginal product of a manhour. For example, in many countries the market stalls (or the handicraft industries) are crowded with people who are not as fully occupied as they would wish to be. If ten per cent of these people were removed, the amount traded would be the same, since those who remained would do more trade. This is the sense in which the marginal product of men in that industry is zero. It is a significant sense, and its significance is not diminished by pointing out that the fact that others have to do more work to keep the total product constant proves that the marginal product of manhours is positive. That an intelligent man like Professor Wellisz [34] believes that my model stands or falls by whether marginal productivity per manhour is zero testifies only to the obscurity of my writing.

Why did I bring in zero marginal productivity (per person)? For two reasons, neither of which is fundamental to the model. Since all the model requires is that the supply of labor exceed the demand, zero marginal productivity was not a necessary condition. My first reason for introducing it was that I was concerned with the relative rates of growth of output in the capitalist and noncapitalist sectors, since this affected the share of profits and thus of savings in national income. Relative rates of growth would depend partly on how the output of the noncapitalist sector would be affected by the loss of labor, so I mentioned zero marginal product as a limiting case. This is clearly a peripheral reference.

The second reason is not even a part of the model. I was concerned, as many others have been, with the possibility that underemployed labor might be put to productive capital formation. This again raises the question by how much the output of the noncapitalist sector would thereby be reduced, and zero is again the limiting case. But it makes no difference whether the loss of noncapitalist output is zero or positive, so long as it is less than the value added by the labor in the sector to which it is transferred.

Egypt is an excellent case, because it illustrates both the kind of labor market which the model fits, and also the misconceptions even of some distinguished writers on this subject. Here is a passage from Hansen and Marzouk [15, p. 16-17] which specifically rejects the model, while actually describing a situation which exactly fits it! After noting the "remarkable" stability of prices in the 1950s, the authors continue:

A basic condition for the price stability is to be found in the labour market. Although the supply of labour is certainly not infinitely elastic in the Arthur Lewis sense (absolute surplus labour in agriculture probably never did exist in Egypt), there is no doubt that the supply has increased so rapidly during the postwar years that the increasing demand has never led to a real shortage, at least in the major categories of labour. Construction is probably the only sector where labour shortage and wage drift has been a real problem. And Government money wage rates have, if anything, been falling for the post-war period as a whole.

Elsewhere they state specifically, referring to agricultural labor, that "during the fifties the wage rate remained unchanged" (p. 78).

The authors' confusion, in using an infinitely elastic labor supply to explain why the price level and money wages remained constant, while at the same time denying that the labor supply was infinitely elastic, derives from their erroneous identification of infinite elasticity with a zero manhour marginal product of labor in agriculture. Elsewhere in their analysis they supply adequate explanations for the elastic labor supply:

(a) Population was growing by about 3 per cent per annum (p. 23);

(b) In spite of this, the agricultural labor force remained constant. There was terrific migration to other occupations, whose potential labor force must thus have been growing by about 6 or 7 per cent per annum (p. 61);

(c) There was considerable underemployment in the service industries, such that between 1952 and 1962 the numbers in commerce increased only by 49 per cent, whereas the volume of goods handled increased by 65 per cent (p. 320). The government service was notoriously overstaffed;

(d) The proportion of women in the labor force was only 10 per cent (p. 37).

These are typical phenomena of an infinitely elastic supply situation.

Though zero marginal productivity (whether per person or per manhour) makes no difference to my model, there is so much confused writing about marginal productivity in the agriculture of overpopulated countries that I will complete this section with a few remarks on this subject.

First as to manhour productivity, it is quite certain that if farmers were willing to work longer hours they would produce more. Agricultural extension officers show the farmers many ways of increasing output per acre (e.g., transplanting instead of broadcasting seed, or weeding their plots more frequently) which the farmers often reject because they involve more work. Moreover most of these require work not at the peak season (usually but not always the harvesting), but in earlier slack seasons when the farmers are undoubtedly underemployed. They do not work because the extra work would not in their view be adequately compensated by the extra output. So here is an example of a situation where the marginal product of persons is zero (in my sense that output would be the same with fewer people) while the marginal product of manhours is positive in the sense that more work would raise output.

So far I am assuming that the time of the farmers is not fully occupied. The proposition that, if one member of the family migrates, the others will do his work has also been attacked (e.g. [2]). The argument runs as follows: The departure of, say, the fifth working member of a family gives each of the others in effect one fourth more land to cultivate. Assuming constant returns to scale, if each works one fourth more hours on one fourth more land he will

get one fourth more product, leaving total output the same as it was before the fifth member left. But the marginal value of output is diminishing in terms of leisure, so if a person was originally in equilibrium he will not work one fourth longer to get only one fourth more output.

One can reply to this in two ways. One can accept the approach through the valuation of leisure, but reject the valuation given to leisure. In particular there is no basis for the assumption that the supply curve of work is upward sloping (in terms of output) throughout the relevant range. A person is trained by his parents or his society that he should work for at least so many hours per day, and until this point is reached he may give no thought to leisure. Indeed, if he can get, say, only 6 hours at his regular job, he may gladly work an extra three hours at half price in some other situation, partly for the money, and partly for self-respect. If in addition he has a fixed idea of what his time is worth, the best representation of his supply curve of work is a horizontal straight line which turns upward sharply when he passes what he considers to be the right number of hours per day.

Figure 1 expresses this situation. Curve I shows the marginal yield of work to the individual worker when the family has five working members on its two acres. Agricultural extension agents want the worker to go beyond the point where this curve cuts the labor supply curve, but he refuses to do so, even though he has much idle time. Curve II shows the situation when the family is reduced to four working members. The farmer now works one fourth more time on one fourth more land with the same marginal product. Without empirical data one cannot assert that the supply curve of labor is horizontal in these circumstances, but this assumption is as reasonable and more likely than the assumption that the supply curve is rising throughout the day.

The other answer is to reject this type of analysis for people in these situations. A farm family with 2 acres wishes to cultivate the farm in accordance with the standards of its community. It will do what needs to be done whether there are 4 or 5 working members of the family. The mistress of the house likes it to be clean. If the opening of a nearby factory reduces the number of her servants from 5 to 4, she will still keep up the standards of her class, even if this means that she and her children must now do a little more for them-

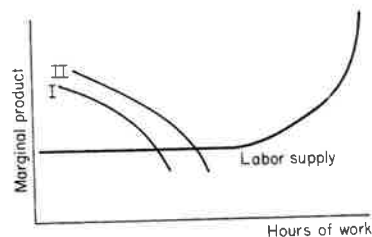


Fig. 1.

selves. Marginal analysis applies to the means by which individuals attain their goals. It is not correct to assume that the goals will be altered just because they become marginally more costly or more easy to attain. Keeping the farm cultivated is amenable to marginal analysis if it is a means, but not if it is a goal.

Let us however move away from these cases, in which the existence of leisure is implicitly accepted, and pass to the attack on underemployment itself. Nobody denies that in the overpopulated countries handicraft workers, petty traders, dock workers, domestic servants, and casual workers have a lot of spare time on their hands, and that most of them (except the domestic servants) would be glad to exchange extra work for extra income at the current rate. Neither does anybody deny that there is much seasonal unemployment in agriculture. The dispute is confined to the situation on small family farms at the peak of the agricultural season, in some parts of Asia and the Middle East.

The argument turns mostly on the labor situation at the time of harvesting, which for most crops (but not, e.g., for manioc) makes the peak demand for labor. The reason for this peak is usually that once the harvest is ready it must be reaped as quickly as possible if it is not to spoil by remaining on the stalk, or to be spoiled by a change in the weather. For this reason, no practicable number of people is too large at this time, since the more hands, the faster the harvesting is completed. It may nevertheless be possible to take off the same harvest with fewer hands if each person works more hours per day, or if the harvesting is spread over a few more days: there is no fixed ratio of number of persons to tons of crop. Harvests vary enormously from one year to another, but somehow or other even the largest harvest gets reaped—although not always the complete 100 per cent. Hansen and Marzouk [15] note that the labor force in Egyptian agriculture was the same in 1960 as in 1950, but was reaping a 25 per cent larger harvest at the later date without any significant increase in machinery. But they fail to deduce the corollary that the farmers could probably have taken off the 1950 harvest with a labor force smaller by (say) 10 per cent. In spite of all they say about labor shortage, one may surmise that if the harvest is 10 per cent larger five years from now, the present labor force will manage to take it off somehow or other.

Even if there were a fixed ratio of men to tons in harvesting, one cannot justify keeping men idle for eleven months so that they may harvest for the twelfth. In the days before harvesting machinery, the standard European solution was for these men to work at nonagricultural occupations during eleven months of the year, and go into the fields for the twelfth. Where this practice is followed, a peak demand for labor at harvest time is quite consistent with transferring men from agriculture into other occupations during the rest of the year.

I do not believe that the productivity of a manhour is zero in agriculture,

domestic service, petty retailing, handicrafts, or any other part of the non-capitalist reservoir. Nevertheless, I have seen nothing in the now vast literature of underemployment to alter my belief that in India or Egypt one could mobilize a group equal to, say, ten per cent of the unskilled noncapitalist labor force without significantly reducing the output of the noncapitalist sectors from which they were withdrawn. (One might not be able to use this group effectively without drawing skilled labor, supervisors, food, raw materials, or capital equipment from the other sectors, but that is a different story.) Professor Schultz's doubtful statistics [32] about India's influenza epidemic in 1918-1919 do not meet the conditions specified, because the labor must come *only* from the small family farms and other underemployed pockets; besides at the time of which he speaks India's population was smaller by 200 million than it is today. Professor Paglin [1, 30] confuses total input with labor input. His figures actually show (though he did not spot this) that the marginal productivity of labor on small farms is zero or negative, but only because bullocks, which are also underemployed on small farms, are treated as a continuously variable input. Most of the other articles relate to the marginal productivity of manhours, or embrace the naive idea that there is a fixed ratio of men to tons harvested, and are therefore not germane.

What our colleagues want to emphasize is that even in very overpopulated countries like India or Java, agricultural output could be increased by additional inputs of labor, if the farmers could be persuaded to spend more time on transplanting, weeding, fertilizing, etc. I agree with this completely, and have always favored heavy expenditure on agricultural extension. But this position is not inconsistent with recognizing that, as things now stand in such countries, labor squads could be recruited for useful works off the farms without significantly reducing agricultural output, since those who were left behind would manage to do what needs to be done.

However, this is all an irrelevant digression, since the model in no way depends on the marginal product in agriculture, whether per person or per manhour. All we need is a situation where the supply of labor exceeds the demand, in the capitalist sector—a situation which may exist either because the capitalist wage significantly exceeds noncapitalist earnings, or because the labor force is increasing (natural increase, immigration, or female participation). We do not even need to know why supply exceeds demand; it is enough for our purposes that it does.

II. The Model's Turning Points

It is important to realize that this model comes in three different versions.

In the first version we have (i) a closed economy and (ii) no trade between the two sectors. The capitalist sector is completely self-contained, except that

it imports labor. The first turning point then comes only when the labor supply ceases to be infinitely elastic and the wage starts rising through pressure from the noncapitalist sector. One can vary this model slightly to take in whole countries developed by immigration, such as Malaya or the U.S.A.; or to consider the effects of immigration on growth in Western Europe during the 1950s.

In the second version (i) we have a closed economy, but (ii) the capitalist sector depends on trade with the noncapitalist sector, e.g., for food or raw materials. Now we have an additional turning point, since the capitalist sector may be choked by adverse terms of trade, even if the labor reservoir is still teeming with people.

The third model is a variant of the second. Here we have (i) an open economy whose capitalist sector (ii) trades either with the labor reservoir or with the outside world. Here the capitalist sector can escape the stagnation of the noncapitalist sector by importing from the outside world, but the resulting import surplus may slow growth or produce structural inflation.

A. Model One

It is useful to begin with a model in which the capitalist sector is self-contained, since this enables us to focus attention upon the labor supply, without considering the terms of trade. Besides there are many economies where the capitalist sector gets labor from the noncapitalist, but neither food nor raw materials.

In this version the supply of labor exceeds the demand at the current wage. One would expect this wage to hold constant for some time as the capitalist sector expands. There are two turning points. The first occurs when the check to the growth of the noncapitalist sector raises average earnings there to the point that the capitalist wage is forced upwards. The second turning point comes when the marginal product is the same in the capitalist and noncapitalist sectors, so that we have reached the neoclassical one-sector economy.¹

The first turning point comes when the changes in the noncapitalist sector begin to react on the wage. We must distinguish between exogenous and endogenous changes. The supply price of labor may rise because something happens to make people richer in the noncapitalist sector, e.g., the farmers may begin to grow a profitable crop for export; or may learn to use fertilizers. Favorable exogenous changes may be expected to raise wages; we must look out for them in any attempts at historical verification, but we cannot take

¹ The second turning point is exactly the same as in Fei and Ranis [10, pp. 201-5]. The definition of the first turning point is also the same, but the mechanism for reaching it is different, since Fei and Ranis are working with Model II, in which the capitalist sector depends on the noncapitalist for agricultural products.

them into the model. (In the same way, as we shall see in a moment, the wage rate may rise exogenously for reasons which have nothing to do with the noncapitalist sector; e.g., because the government enacts minimum wage legislation.) The model incorporates only those endogenous changes in wages which result directly from the transfer of labor from the noncapitalist sector.

This transfer automatically causes consumption per head to be higher than it would otherwise be in the noncapitalist sector. If the people transferred are farmers, farm output will fall by less than their consumption, since land is assumed to be scarce (their consumption equaled average product, which exceeded marginal product). If the people transferred were in petty retailing or handicrafts, those who remain will get more trade.

Several writers (e.g., [7, 14]) have assumed that this increase in noncapitalist consumption per head must immediately force up the capitalist wage, but there are two reasons why this is not so. The first of these is that in my model, as distinct from those used by these and other writers, there is a substantial gap between the capitalist wage and noncapitalist consumption per head, and this gap is not fixed rigidly. If one transfers 5 per cent of the labor force from the noncapitalist sector one is increasing very substantially (perhaps doubling) the capitalist labor force, but the difference this makes to consumption per head in the noncapitalist sector is small and need not be enough to force up the capitalist wage. That wage is determined conventionally, and we know that conventional money wages hold stable even when prices move a few points in one direction or the other.

This is one factor which distinguishes my model from those of some other writers who, desiring to find some reasonable basis for the conventional wage, tie it rigidly to agricultural productivity. This tie seems especially appropriate if one further assumes, as they tend to do, that the reservoir consists exclusively of agriculturists, which of course is not the case. Their rigid assumptions yield precise numbers for wages and earnings, and one can calculate precisely how these numbers alter as labor transfers from one sector to the other. But what is gained in precision is lost in realism.

The second reason why the conventional wage does not necessarily rise as labor is transferred is that in my model the labor force in the noncapitalist sector is still growing in the first stage (though not proportionately as fast as in the capitalist sector). At this stage, therefore, the transfer does not raise consumption per head in the noncapitalist sector in the absolute sense; it merely prevents consumption from falling by as much as it otherwise would. The increase in the labor force may be due to population increase, to greater participation of women, or to migration.² We should also remember Marx's

² Clapham [6, pp. 168–169] remarks that as French peasants migrated to the towns at the end of the nineteenth century, Belgians, Spaniards, Poles, and Italians immigrated into French farming in their place.

point that capitalism creates its own labor force; competition from factories may put the handicraft workers out of business; increasing use of domestic appliances may throw the domestic servants onto the labor market.³ In sum, there are forces at work tending to reduce consumption per head in the noncapitalist sector. These would not necessarily have reduced the capitalist wage, since, as we have just said, the gap between the capitalist wage and noncapitalist consumption is flexible, and the conventional wage may hold constant despite a few percentage points of rise or fall in noncapitalist consumption per head.

Thus, bearing all these factors in mind and, in particular, the population factor, there is no reason to expect the capitalist wage to rise endogenously as soon as the capitalist sector begins to grow. It may rise immediately, or an increase may be long delayed: this is a matter for historical research in each case.

Ultimately the capitalist wage must rise, since a successful transformation implies that the capitalist sector has grown rapidly enough to overtake population growth and reach the second turning point.

Critics of the model make enormous play with the question of how long it takes to reach the first turning point, i.e., the question whether there really is a period during which the wage is constant. But this question is of no consequence. The decisive turning point is not the first but the second, for it is here that we pass the boundary into the neoclassical system. The model would have achieved all that it set out to do even if it could be shown (and it cannot) that historically there never has been a case where the real wage did not begin to grow as soon as the capitalist sector began to expand.

The point becomes even clearer when we investigate what is meant by "the real wage." Everyone recognizes that we are talking about unskilled labor, so this is not the problem; skilled wages will certainly rise as skills increase. We are also talking about capitalist wages and not the wages of domestic servants—this is part of our definition. The problem is not in defining the wage, but in defining "real."

"Real" wage has many meanings. The most common is the money wage rate w divided by the cost of living c :

- (1) w/c denotes cost of living wage.

However, since we are also interested in the relationship between the income of the capitalist worker and the income of the noncapitalist worker a , by which it is ultimately affected, we must also consider the relationship

- (2) w/a denotes factorial wage.

³ There is much less resistance today than there was in 1954 to the idea of an unlimited supply of labor being available to the capitalist sector, since swelling urban unemployment has emerged as the biggest problem of the seventies, as a result of the modernization process itself.

Ultimately, however, what interests us is profit, which depends *inter alia* on the ratio of wages to prices. A crude index of this is given by dividing the wage index by an index of the price p received by capitalists:

(3) w/p denotes wage/price ratio.

This is not a good index of profits, because profits also depend on productivity, i.e., on real output Q divided by the quantity of labor L . Also the price of the product includes the cost of raw materials, which should be deducted to get the value added price of the product v . Profit then depends on the ratio of wages to value added:

(4) wL/vQ denotes product-wage.

If the system does not import raw materials, as in this first version of the model, the product-wage becomes

$$wL/pQ.$$

Given this wide variety of types of real wage, what do we mean when we talk about the real wage being constant, for the purpose of this model? The answer derives from what we are seeking. Our interest is in the share of profits in the national income, which is determined by two factors: the share of the capitalist sector as a whole in the national income, and the share of profits in the capitalist sector (which is unity minus the product wage). The share of the capitalist sector in national income will grow so long as the product-wage is favorable to growth. We can therefore concentrate our attention in the first instance on the product-wage.

We can now formulate more precisely what we are after. The model postulates that the product-wage will fall (the profit ratio rise) during an initial period because capitalists will not have to share with their workers the fruit of technological advance (Q/L). During this initial period the wage-price ratio (w/p) is assumed to be constant, but sooner or later the rise in noncapitalist consumption per head (a) forces up w . This is the first turning point. From here on both w/p and Q/L are rising. Sooner or later w/p will be rising faster than Q/L , which means that the profit ratio will have begun to fall. We enter the neoclassical system at the second turning point, where the marginal product of labor is the same throughout the system. We also believe that at this point the product-wage wL/pQ stabilizes, although we have no theoretical explanation why this should happen. It is sufficient for our purposes that sooner or later we expect the product-wage to start rising, as we move from the first turning point towards the second.

Thus to test the historical validity of the model, the questions to ask for any particular country are (i) was w/p initially constant, and (ii) did wL/pQ ultimately rise?

As to the first question, the data are not easy to find, since even in those cases where we can put together some kind of money wage index it is very hard to make an index of the price of domestic capitalist output (which has, in an open economy, to be not p but v). In a closed economy with a self-contained capitalist sector, if we can assume that the prices of capital goods and consumer goods all move together, we can write

$$p = v = c,$$

and ask ourselves the simpler question—whether the real cost of living wage remained constant initially. This is also difficult to answer, but it is easier to find data for w/c than for w/v . However, even if we get an answer for w/c we have to remember that in the real world p , v , and c are not equal to each other, and that therefore the answer we get for the cost-of-living wage is not conclusive for w/p .

When the first article was being written, the historical wages data uppermost in my mind were those for the cost of living wage in Great Britain in the first half of the nineteenth century, and the U.S.S.R. in the 1930s. Historians still dispute what happened to the real wage rate in the first half of the nineteenth century [16, 17], but it seems a good bet that the rate of increase was slight. Deane and Cole's version [8] of Wood's data on money wage rates shows a rise in Great Britain from 70 in 1790 to 100 in 1840. Phelps Brown and Hopkins's index [4] of the price of consumables rises in that period from 68 to 100, indicating a slight decline in the real wage rate over those 50 years. Indeed the Phelps Brown-Hopkins index of the real wage rate of building craftsmen shows it only 4 per cent higher in 1840–1844 than it had been ninety years earlier in 1750–1754. One can get different results with different figures, but it is safest to conclude that the cost-of-living wage did not rise substantially in Great Britain during the first fifty years of the industrial revolution. (This is not inconsistent with the standard of living rising through a fall in underemployment or movement from worse into better paid jobs; wages per head can rise even if wage rates are constant.)

The British case is not necessarily typical. The wage-price ratio (w/p) will remain constant only if noncapitalist earnings a are not rising, or if the capitalists are not sharing productivity gains with their workers. Both conditions may have been met in Britain 150 years ago, but there are plenty of other cases. Thus, in the U.S.A. productivity on family farms was rising sharply in the middle of the nineteenth century, through the adoption of machinery, so industrial wages could not have been held constant. Similarly, in Japan farm productivity was rising at the end of the century. Okhawa's cost of living data [29] starting only in 1893, show real wages rising by 17 per cent in the 18 years from 1893/95 to 1911/13. They did not rise as fast as industrial productivity; he puts the productivity increase in secondary industry

at 38 per cent, which is rather low for our purpose, since it includes handicrafts. Thus the capitalists conceded part of the increase in productivity to the workers, but they did not concede it proportionately. According to Okhawa the terms of trade between primary and secondary sectors altered little in this period, so profits in the industrial sector must have risen relatively to wages.

Study of the Japanese materials brings out another important phenomenon, which is also found elsewhere, namely, a widening gap between industrial and agricultural wages. The data given in Minami [28] show the real agricultural wage constant in the two decades before the first world war, when the industrial wage was rising, and agricultural productivity rising even faster. How do agricultural wages remain constant while farmers' incomes are rising? The answer is already in our model. The agricultural wage initially exceeds the marginal product of labor. It is established conventionally for the landless (or insufficiently landed) class. Farmers employ laborers for tasks whose productivity exceeds the wage; less productive tasks they do at other times with their own family labor. The agricultural wage of landless laborers is not tied to the farmers' incomes, and may stay constant or rise very slowly for a long time, even though farm income is rising.

In sum, we are now talking about three different kinds of earnings:

- (1) the wages of landless laborers,
- (2) the earnings of small farmers,
- (3) the earnings of unskilled industrial workers.

The crucial test of whether labor is in surplus supply in the countryside will be what happens to the wages of landless agricultural laborers. If, as in Japan, or allegedly in Egypt, these remain constant while the other two are rising, we can be quite sure that a labor surplus exists. What interests our model, however, is the wage that the capitalists have to pay, and there is no doubt that this may rise even in the face of a labor surplus in the countryside.

When we turn to the less-developed countries of our own times and ask what is happening to the industrial wage, the answer, from a very large number, if not from all, is that the cost of living wage w/c is rising, even in situations where there is open mass urban unemployment, not to speak of underemployment. Why is this happening?

In some countries rising a is clearly a contributing factor. The small farmers' output of food per head is more or less constant, but their output of coffee, cocoa, peanuts, rubber, cotton, etc., has been rising swiftly, and in some countries, especially in Africa, the increase in output per head has been greater than the decline in the price received by the farmers. In those countries one would expect the capitalist wage to be forced up.

However, the evidence, even from such favorably placed countries, is that

in most places the gap between w and a has widened; wages have risen much faster than farmers' incomes. This means that the capitalists are sharing productivity gains with the workers to a greater extent than one would expect if the abundance of the labor supply were the only element to be considered. Why they are doing this is not clear,⁴ though explanations have been offered [12, 27, 31].

It seems therefore that what we should expect in overpopulated countries is that the real agricultural wage will remain constant, if the laborers are landless. What happens to the urban wage will depend partly on what is happening to a (the farmers' income) and partly on the extent to which the capitalists share technological gains with their workers. The industrial wage may well be rising faster than industrial prices, but this will not cut into profit unless it is also rising faster than industrial productivity. If we assume that the capitalists share technological gains equally, the product-wage will remain constant. It makes little difference to the model whether one assumes w/p constant or wL/pQ constant. The system expands faster on the first assumption than on the second, but it is still capable of rapid expansion until wages start rising faster than productivity.

Whether the product-wage stays constant or falls somewhat in the initial stages of development, it must ultimately rise when the combination of rising a and diminution of the labor reservoir combine to push up w/p faster than labor productivity. We cannot document this historically, since we do not have profit-wage data for the first three quarters of the nineteenth century for the countries which are now developed, but contemporary cross-country data throw light on the situation.

The United Nations' "The Growth of World Industry 1953-1965" [33] summarizes data from censuses of manufactures taken between 1961 and 1963 (with the exception of Venezuela, which are from 1953). Comparable data for the percentage share of wages and salaries in value added can be computed for several countries, e.g.,

Denmark	59	Venezuela	38	Ghana	26
Sweden	57	Japan	37	Brazil	26
U.K.	53	Jamaica	33	Nigeria	25
Norway	51	Colombia	32	Philippines	24
U.S.A.	49	Peru	29	Ivory Coast	24
Israel	46			Iran	22

The difference between the highly industrialized and the least industrialized countries is striking. Some part of the difference is due to heavier depreciation

⁴ That they will pay a w higher than a to get higher productivity through higher consumption of food, etc., is clear enough. But this does not explain why the gap between w and a should widen continually for unskilled labor.

cost in the least industrialized countries (imported capital costs relatively more, and the life of equipment is relatively shorter), but removing this element would still leave net profits much lower relative to wages in the most-developed countries.

The cross-country data do not, like the historical data, support the notion that the real wage or even the product-wage is constant initially (most of the countries shown here are not overpopulated). They show very high initial profits, and, since the capitalist sector is growing very rapidly (the modal rate of growth of large scale manufacturing in Asian and African countries is about 10 per cent per year), they are consistent with a rapid increase in the share of profits in the national income as a whole, in the countries at the bottom of the list. The generalization which the cross-country data would support for our own times (as distinct from the 19th century) is that the share of profits in national income grows rapidly at the start because both the profit margin and the rate of growth of the capitalist sector (relative to the whole) are high, and that the share of profits declines and eventually stabilizes at a lower level, because both the profit margin and the relative growth rate of the capitalist sector are reduced. For evidence that initially the profit margin increases before beginning to decline and ultimately stabilizing (second turning point), we have to look at historical data from countries known to have had large labor reservoirs (England and Japan).

The cross-country data support the proposition that the profit margin ultimately stabilizes. More appropriate evidence can be derived from the U.S. Censuses of Manufactures. From these one can calculate the following ratios of wages and salaries to value added:

1899	48.6%
1909	50.3%
1929	46.7%
1963	48.6%

Recognizing that 1909 was a relatively depressed and 1929 a relatively prosperous year, one may surmise that changes in the later stages of development are very small in comparison with those which occur in the middle years.

Let us return for a moment to the widening of the gap between w and a which results from capitalists sharing the gains of technology in spite of the abundance of labor. Whatever their reason for doing this, the consequences for unemployment and underemployment are serious. The ratio of w to a is one of the factors determining how many people flock into the capitalist sector looking for work. Apart from full-time jobs this sector offers much casual employment (at the docks, in building, etc.), so everybody who looks for work stands some statistical chance of getting casual employment—

whether for 5, 10, or 20 days per month. Others can become self-employed, in retailing or handicrafts, doing some business, though not much. The higher the wage, the greater the inflow, and the less work for each person, though presumably to each level of w/a there corresponds some degree of underemployment which would be enough to stop further migration. As the ratio of w to a has risen since 1950, there has been a massive exit from the countryside into unemployment and underemployment in the towns. This is now one of the major problems of underdeveloped countries.

Here we tie into another problem, namely, what is the appropriate capital intensity for economies where the wage rate in the capitalist sector exceeds the marginal product outside that sector. This has been investigated by a long line of writers, summarized by Chenery [5], and the debate continues [9, 11, 24]. But the issue is largely political, and our model throws no light on it.

In sum, the model seems to survive the tests of its relevance if one sticks to what is crucial in it, namely, first, the abundance of labor at the current wage, which facilitates the rapid growth of capitalist output and profits; and second, the notion that in due course wages will rise faster than profits until some upper leveling-off is reached. If the model is not destroyed by showing that the marginal product of manhours in agriculture is not zero, neither is it rendered useless by showing that the real (cost of living) wage is not necessarily constant.

B. Model Two

In this version our two sectors produce different commodities and therefore trade with each other. Thus the capitalist sector faces the additional hazard that it may be checked by adverse terms of trade, arising out of the pressure of its own demands, long before any shortage of labor begins to be felt.

This is the version which has been worked out in great detail by Fei and Ranis working with models in which each of the variables is or can be precisely determined. Jorgensen and others also prefer to work with this model. It is a good model for studying the economic history of countries before about 1870, when railways, steamships, and the Suez Canal began the great explosion of world trade. Until then transport costs were so high that countries had virtually to be self-sufficient in basic necessities. But since then the terms of trade are determined by international rather than national forces. If the capitalists were hindered by failure of the noncapitalist sector to produce what was wanted, the capitalists would simply import from other countries whatever they might need (including food for their workers and raw materials for their machines).

This is true for the great majority of countries now underdeveloped, and mainly dependent on foreign trade. It is still not true, however, of huge economies like those of the U.S.S.R. or India, which have been developing with their price levels largely isolated from those of the world market. It is still possible for such economies to grind to a standstill through overemphasis on industry and underemphasis on agriculture, showing up in shortages of food, raw materials, and foreign exchange—contemporary Indian experience illustrates only too vividly the continued relevance of this model. Let us, therefore, pursue it.

For the moment (until we reach model three), we assume a closed economy without international trade. We simplify by assuming that just two commodities are produced, and our interest is in the terms of trade between them. Thus our specifications are altered. The division between the two sectors now turns on commodities rather than on capitalists; it makes no difference to us whether there are capitalists in the slow-growing sector, provided we specify that their profits are not reinvested in the fast-growing sector. What we still need is a substantial initial difference between real wages in the two sectors, so that labor supply is not initially a problem to the fast-growing sector. Following the conventions, we will now divide the economy into an industrial and an agricultural sector, with industry paying significantly higher wages than agriculture.

Thus stated, the problem is an exercise in the study of unbalanced growth in a closed economy. It is normally approached by specifying the conditions under which balance (which here means constant terms of trade) would be maintained. But this balance carries no normative implications. The industrial sector may grow quite rapidly for some time, even if the terms of trade are moving against it. And since industry has no intrinsic merit over agriculture, economic policy does not require that the terms of trade be moved in favor of industry. The only economists who wish to impoverish the peasants are those who have set the creation of a modern industrial state as their target for its own sake.

Since what we are studying is the behavior of the terms of trade between two sectors, ready answers are already available in the corpus of international trade theory; such an answer was given by Johnson [19]. We define the variables as follows:

- e price elasticity of demand,
- z income elasticity of demand,
- r rate of growth of output,
- p price of agricultural products relatively to manufactures,
- a subscript denoting the agricultural sector,
- m subscript denoting the industrial sector.

Then, after various manipulations detailed by Johnson (p. 141), we get the annual change in the terms of trade:

$$\frac{dp}{dt} \times \frac{1}{p} = \frac{z_a r_m - z_m r_a}{e_a + e_m - 1}.$$

From this, it follows that the terms of trade will be constant if

$$z_a r_m = z_m r_a,$$

i.e., if

$$z_m/z_a = r_m/r_a.$$

This equality means that the terms of trade will be constant if the relative growth rates of industry and agriculture are the same as the relative income elasticities. For example, if the income elasticity of demand for manufactures is twice that for agricultural products, then the output of manufactures must grow twice as fast as the output of agricultural products if the terms of trade are to remain constant.

This neat answer reminds us that the terms of trade may move in either direction. If agricultural productivity is rising very fast, the terms of trade will move in favor of industry, which can then pay a lower product-wage and expand faster. (Since labor is available, expansion does not depend on consumption; more capital can be used to hire proportionately more workers [25].) But if agricultural productivity rises too slowly, rapid growth of manufacturing will be checked by a constantly rising product-wage. Several writers (e.g., [3]) have explored the case of "immiserizing growth," which is an extreme form of this proposition.

It should be noted that nothing in the analysis requires the terms of trade to be constant; movement checks or helps the rate of expansion of the industrial sector, by checking or spurring the rate of growth of profits, but since industry and industrial workers are not more valuable than agriculture or farmers, the analysis has no emotional content. Also, even if the terms of trade are rising, industrial expansion will not necessarily cease. Productivity is rising in the industrial sector, so if real wages (w/c) are constant, the profit margin will not fall unless the terms of trade rise faster than industrial productivity. Real wages cannot be constant if agricultural productivity is rising significantly, since this would be moving the factorial terms of trade against industry. So what will happen to profits in any particular case will depend on a race between agricultural productivity, industrial productivity, real wages (which may rise on their own for exogenous reasons), and the commodity terms of trade. If one makes precise assumptions about these magnitudes one can get precise answers, as Fei and Ranis have done. We will not dwell on this model, since it has nothing to add to their work.

C. Model Three

As mentioned, in most of the world since 1870 the terms of trade are determined increasingly, not by the relative growths of the two sectors of the same economy, but by the world market in which it is possible to buy and sell.

In model three, a rapidly growing industrial sector faced by a too slow agricultural sector is forced to import and to pay for its imports by exporting.

However, in order to export more it may have to lower its prices, thus squeezing its profits. Its real wages, in terms of agricultural products, are fixed by definition. If we take as given the propensity to import and the inflexibility of the agricultural sector, we can see that the possible rate of growth of such an economy is determined by its propensity to export.

Alternatively the country may devalue its currency. This raises (in domestic currency) the price of food and raw materials, and therefore by definition raises money wages. This is the well-known case of "structural inflation," in which a spiral of rising wages and prices is set off.

The open economy may run into trouble even if the agricultural sector is not stagnant. As the economy develops, the product-wage rises. This change in the distribution of income will alter the propensity to import—favorably if the economy specializes in consumer goods, but unfavorably if it specializes in producing capital goods.

This gives us a different aspect of "balanced growth." A country must plan its development in such a way as to be sure that its exports will keep pace with needed imports. If it fails to do this, the rate of growth of output will be constrained by the rate of growth of export earnings. All this is now familiar ground [27, pp. 38–55].

Finally, the behavior of capitalists as profit margins diminish relatively to wages cannot be predicted. The original article drew attention to the temptation to export capital, but Kindleberger [23] has pointed out that dynamic capitalists may react rather by speeding up labor-saving innovations. We are still in the dark as to why entrepreneurs act more creatively in some countries than in others, or at one period rather than another in the history of the same country.

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THE CENTER-PERIPHERY SYSTEM

20 YEARS LATER

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I. Introduction: An Idea of the System

From the outset, and particularly in the 1949 Economic Survey [3]—inspired and written by Dr. Raúl Prebisch—the Economic Commission for Latin America (ECLA) paid special attention to the relations between Latin America and the industrialized economies, with particular regard to circumstances prevailing in the 1930s and 1940s.

It is not necessary here to focus on the different aspects of the problem [4], but one is prompted to recall the analytical category that had been coined in examining such relationships, that is, the "Center-Periphery."

The creator of this term remarked some time ago that it was derived from the preoccupation with economic cycles during the immediate postwar periods. From that standpoint, the distinction between Center and Periphery was principally inspired by the unequal role played by the two segments of the world economy in the system's periodic fluctuations: the first playing an active role; the second, a passive or reflexive role.

The approach also stemmed from the difference in the functions assigned to primary exporters and industrial exporters by the international division of labor, whose end result was an unequal distribution of technical progress.

The main hypotheses about the relationships and terms of trade between the Periphery and the Center were established on this basis. They deal with the implications of the substitution of the United States for the United

* The ideas expressed in this paper are those of the authors and do not necessarily reflect the opinions of ECLA.