Technical Progress, the Production Function and Dualism

1. Introduction

While a great deal has been written in recent years on the problem of economic dualism (*), rather little has been done to connect it with the nature of technical progress. The purpose of this paper is to suggest a view of the production function and its relation to technical progress which may lead to insights into our understanding of the phenomenon of economic dualism.

By economic dualism I have in mind the phenomenon that one segment of a country develops very much more rapidly than another. With respect to Italy, the differential development of the North and South is well known. Clearly it is a phenomenon that is common to a great many underdeveloped countries. The mere

(*) There are now a number of famous articles on this subject of which the following are significant: R. S. Eckhaus, "Factor Proportions in Underdeveloped Areas", *American Economic Review*, September 1955, pp. 539-565; Vera C. Lutz, "The Growth Process in a 'Dual' Economic System", *Banca Nazionale del Lavoro Quarterly Review*, No. 46, September 1958, pp. 279-324; Albert O. Hirschman, "Investment Policies and Dualism in Underdeveloped Countries", *American Economic Review*, September 1957, pp. 550-570; W. Arthur Lewis, "Economic Development with Unlimited Supplies of Labor", *Manchester School*, May 1954, reprinted in Agarwala and Singh ed. *The Economics of Underdevelopment*, Oxford, 1958, pp. 400-449; J. H. Boeke, *Economies and Economic Policy of Dual Societies*, New York, 1953; J. H. Sadie, "Social Anthropology of Economic Underdevelopment", *Economic Journal*, June 1960, pp. 294-303; Hla Myint, "An Interpretation of Economic Backwardness", *Oxford Economic Papers*, June 1954 and "The Classical Theory of International Trade and the Underdeveloped Countries", *Economic Journal*, June 1958, pp. 317-337; W. H. Nicholls, "Accommodating Change in Underdeveloped Countries", *American Economic Review*, Proceedings, May 1960, p. 165; Luigi Spaventa, "Dualism in Economic Growth (Development in a country having both an advanced and an underdeveloped sector in its economy)", charts, *Banca Nazionale del Lavoro Quarterly Review*, December 1959, pp. 386-434.

I am very much indebted to Professor Howard S. Ellis for letting me read an unpublished review paper of his on the question of dualism, and especially for his helpful comments on this paper.

fact of differential rates of development in different sections of a country would not itself be surprising. After all, there is no reason why at any one time all segments of a country should develop at the same rate. What is puzzling is that this differential should persist for very long periods of time. This is especially so if we look at the problem from the viewpoint of neo-classical economic theory, since one of the messages of neo-classical theory is that differentials would tend to disappear. For example, the difference in wage rates between one segment of a country and another should induce entrepreneurs to the areas with lower wage rates, and/or induce workers away from areas of lower wage rates. The end result of such movements would be an equalization of real wages.

I do not wish to suggest that the attempts of others to explain dualism in terms of lack of mobility, socio-cultural elements, or in terms of monopolistic influences are on the wrong track. Most likely, it seems to me, these may very well have been, and continue to be in many cases, contributing factors. Rather, the spirit of this paper is to suggest an additional aspect of the situation that helps to explain why dualism may persist for some time. Now, a consideration of economic dualism must include a discussion of investment. What determines the differential rates of investment in different areas? It is common to divide the analysis of investment into two parts: The propensity to save, and the inducement to invest. A low propensity to save is, in a low income country, a sufficient reason to explain a lack of high investment. But this is not an especially compelling reason in circumstances in which the country-wide rate of investment is often quite high, but the rate of investment in the less developed segment of the country turns out to be quite low. Under such circumstances it may be useful to focus our attention on the inducement to invest. We recognize, of course, that by concentrating on the inducement to invest we are treating only part of the picture. But, of course, it is a very important part. In other words, I am trying to suggest that part of the reason for dualism is not a lack of savings or a lack of capacity of entrepreneurs to obtain investment funds, but rather, a low inducement to invest because of the nature of the underdeveloped sector. The main purpose of this paper is to analyse some possible relations between the production function and innovations in the underdeveloped sectors, and to show how these relations — if they exist — would lead to a low inducement to invest. In addition, I want to show

that while it may be likely for such conditions to exist in the underdeveloped sector of the economy, these same conditions need not exist in the more developed sector. Thus, if it turns out that the over-all savings rate is fairly high, the inducement to invest in the advanced sector may also be fairly high, although the inducement to invest in the backward sector may, nevertheless, be low. In such a case we have reason to expect a differential rate of development. Also, I will want to suggest why this differential rate of development might persist. Clearly, if this possibility could be established, then we will have a possible explanation for non-equalization of sectors, at least for some period of time.

It is of interest to note that on a superficial basis we might expect the existence of technical progress to lead, if anything, to equalization of growth rates rather than to the maintenance of the differential. The backward segment of a country uses more primitive and older methods of production than the more advanced segment. Obviously, the backward sector has more technological " know-how " to borrow than the advanced sector. Such differential opportunities might suggest, on a superficial basis, that the inducement to invest would be greater in the backward area, and hence, that technological progress would work in the direction of equalization. I will want to show why the opposite tendency may persist.

Before setting out the details of the analysis, it is perhaps important to indicate the limited nature of this paper. I shall suggest a *possible* reason for dualism. I do not suggest that it is a necessary one. However, I do believe that what follows is a reasonable, rather than an entirely remote possibility, and that as a consequence, it is a possibility that should be well considered in examining the underdeveloped segment of a given country, and in attempting to work out development policies for such areas.

2. The Production Function

The standard view of the production function is to think of it as a continuous function. In the usual textbook representation of such a function, in terms of two factors, it is usually assumed that the isoquants are continuous and non-kinky (1). This means that

(1) Cf. Alfred W. Stonier & Douglas C. Hague, *A Textbook of Economic Theory*, London, 1953, Chapter X.

any combination of the inputs are possible, and that for each ratio of inputs a production technique exists. In fact, of course, there are many industries in which there are significant discontinuities in factor inputs, and therefore, not every combination of these inputs leads to a new technique. Of course, the possibility of discontinuities is well known. It is usually assumed that the continuity assumption is only made for mathematical convenience. The sort of production function that I wish to present here does not differ so much in the fact that it is discontinuous (2), but in the fact that it is more discontinuous where the capital-labor ratio is low than where it is high. I want to show that, if the production function is of such a nature, this has consequences for the differential inducement to invest between the backward, as against the advanced sector.

Before going into the details of the argument, we might ask the question — why should we care about the nature of the production function in connection with development? If we interpret development as increases in income per man employed, then obviously, we have to examine how such increases are achieved. One usual way of achieving such increases is through the augmentation of the amount of capital that each worker has to work with, *i.e.* via increases in the capital-labor ratio. But increases in the capital-labor ratios imply a movement from some production techniques to other production techniques. It is the shifts along the production function towards higher capital-labor ratios which, in great part, increase output per man. If the production function is assumed to be continuous, then such shifts can be made with relative ease.

But, can shifts along the production function always take place if the latter is highly discontinuous? Consider, for a moment, the extreme case in which there is only one technique. Obviously, under such circumstances, no matter what the inducements are, there is no possibility of shifting to an alternative technique. On a less extreme level we may assume two techniques — one in which the capital used is very cheap and rather primitive, and the other in which capital used is expensive and complicated. Under such circumstances, it is clear that a large discontinuity exists that may inhibit move-

(2) The mere existence of discontinuities in the production function as part of the explanation of dualism is not new. See, for example, the interesting and well known articles by Eckhaus and Hirschman previously cited. It is the differential discontinuities that I stress, which is a somewhat different matter.

ments along the production function. Usually, looking at the matter from the micro-economic viewpoint, we would suppose that a rise in wages relative to capital cost would lead a firm to substitute capital for labor. But, obviously. this need not take place if there are very few productive alternatives available. If the increase in relative wages to capital cost is small, but the alternative technique involves, let us say, a tripling of capital stock, then it may clearly not pay for the typical firm to shift to the alternative technique. Thus, we have a case in which there is an inducement to substitute capital for labor, but the production function does not permit that that be done. This is one of the essential ideas of this essay. Namely, we want to examine circumstances under which there might be inducements to increase capital per man, and hence, inducements to increase output per man, but in which the nature of the production function (and the locus of technological progress) does not permit firms in the backward sector of the economy to respond effectively to such inducements.

Now, for analytical purposes, we want to contrast two possible dynamic sequences. Under one, successful capital accumulation takes place, and capital per man increases, period after period, while under the other, successful shifts towards more intensive techniques are blocked at various points. Consider the former possibility first. Suppose that in a given industry the normal course of events is for output and the wage rate to rise by 5% per year. Clearly, such increases can only continue, in the long run, if output *per man* also increases. Suppose, for the moment, that the labor force is constant. Hence, if the firm can substitute capital for labor (*i.e.* instead of increasing both labor and capital by 5% each period to get the output increase) then it is possible to obtain the requisite output increases. Under such circumstances, we might visualize a smooth adjustment process taking place in which the capital stock per man increases every year, output increases every year, and wages increase every year. No problems arise as long as, period by period, the firm can shift from techniques which are less productive per man to techniques which are more productive per man. However, the possibility of such a sequence taking place obviously breaks down as soon as the firm finds that there is not any technique close by that would permit it to increase output at the requisite rate. If output cannot be increased, the entire wage increase must come out of profits, and in a very short time, the

profitability of such firms would disappear. Obviously, such wage increases would be resisted, and the inducement to substitute capital for labor would also disappear. In any event, we can certainly see that where there are discontinuities, such sequences of improvement cannot take place, or if they do take place, they fairly soon reach a point at which they break down. We assume that in the advanced

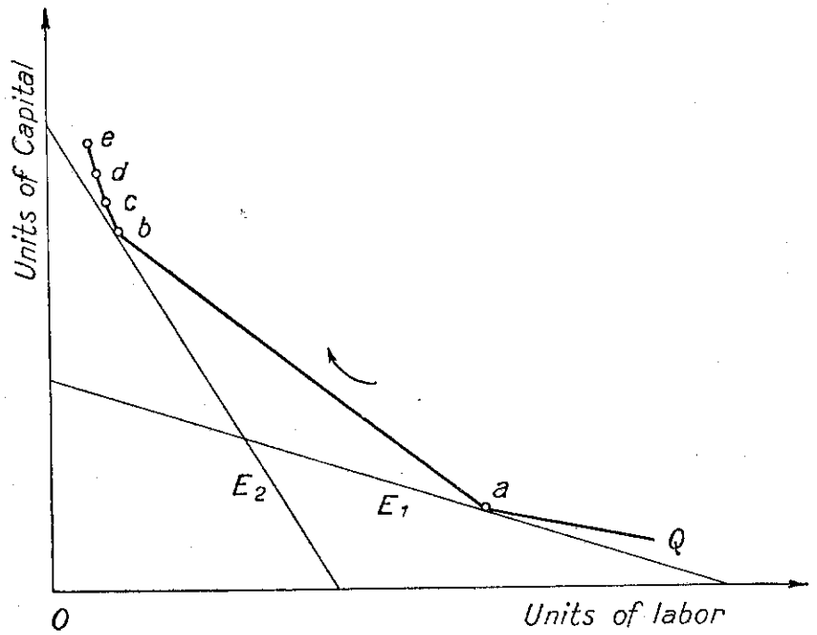

Figure 1

sector the successful (and gradual) growth sequence can take place. Entrepreneurs expect, period by period, a certain expansion of the market, and they expand output in accordance with their expectations. Firms can expand output either with the same technique or with a new technique. Now, if individual firms attempt to expand output, they increase the demand for labor, and we would expect wages to rise. It is this effect that should lead to the substitution of capital for labor (3). The increased output per man

(3) We assume that in both sectors some types of labor will not be in infinitely elastic supply in the short run. This may still be true, even if unemployment exists for many groups in the backward sector.

would then permit an increase in real wages. Thus, the expectations of output growth may be self-fulfilling if it is possible to shift easily to more labor intensive techniques. Clearly, this process would not be self-fulfilling if such shifts are not possible — that is, if there are no neighboring (more capital intensive) techniques that could readily be adopted.

The curve Q in the figure 1 is an illustration of one of the isoquants of the production function in question. The points (*a*), (*b*), (*c*), (*d*) and (*e*) represent alternative distinct techniques. That is to say, we assume that the capital comes in distinct and indivisible units, and that with each different outfit of capital, we associate a given quantity of labor necessary to produce the output Q. The line E_1 is the usual expenditure line, on the basis of given prices for the capital inputs and labor inputs. The slope of the line reflects the ratio of the input prices. E_2 is another such expenditure line which reflects the fact that the relative wage rate is, here, considerably higher than at E_1. Now, the isoquant Q is drawn in such a way that there are relatively few distinct production techniques available when the capital-labor ratio is low and relatively many are available when it is high. The lower part of the isoquant would be relevant for the backward segment of the economy, since in this segment the capital-labor ratio is low, while the upper part of the curve may be relevant for the advanced segment. Now, a small shift in the relative prices of labor to capital will not induce the firm to change its productive technique. This is clear if we compare the line E_1 as against the line E_2. In both cases the tangency of the expenditure line and the isoquant exists. But note that it takes a rather large increase in the relative wage rate in order to induce the firm to shift from technique (*a*) to technique (*b*).

Now, let us look for a moment at the line E_2. Here we find that a relatively small shift in the wage rate would induce such a firm using technique (*b*) to shift out of (*b*) and into (*c*). In other words, if the indivisibilities were as illustrated in the diagram, then a small wage change in the backward sector would not induce firms to substitute capital for labor, but a relatively small wage change in the advanced sector would do so. Hence, under such circumstances, many firms in the backward sector are *not* induced to increase the amount of capital per man, while this would be the case in the advanced sector.

Before closing this section, let me review the main point. Increases in output per man, in the long run, in a sector of an economy necessitate increases in productivity per worker. But this in turn, requires an increase in the capital stock per worker. This increase in the capital stock will come about if there is an inducement to substitute capital for labor. But, even if this inducement may exist — and there would be such inducements for the typical firm if the wage rate relative to capital cost went up — the productivity per man could still not be increased if there are not any more capital-intensive productive techniques that could be attempted and warranted by the input price changes. The existence of significant indivisibilities in the outfits of capital goods that could be used, reflects a situation in which it may often not be possible to shift from one production technique to another. In sum, small stimulants to growth do not induce permanent shifts in technique in the backward sectors, although they may do so in the advanced sector.

Expanding our argument to the economy as a whole, we can see in the existence of indivisibilities, the possibility of differential rates of growth between the two sectors of the economy. If, at the outset, there is a differential in the degree of development in the two sectors of the economy, then the sort of production function that we have depicted should result in an increase of this differential. Where will the investment funds go? By and large, they cannot go to the backward sector because in the backward sector it is impossible, under our assumption, to increase the capital-labor ratio except by making extremely large increases in capital. Clearly, there will not be an inducement for firms to make such large increases. Such increases would occur only if firms anticipate that the wage rate will rise significantly, and if they anticipate that markets will grow significantly (4). But, obviously, there is little reason for such anticipations unless productivity per man rises. In the advanced sector, however, an anticipated increase in wages will lead to an inducement to invest, which in turn, will increase output per man. At the same time, since this results in an increase in wage rate, it also results in an increase in markets for the increased output. Thus, in the advanced sector we can visualize a sequence

(4) This view is also consistent with my "critical minimum effort principle" that I have developed elsewhere. See my *Economic Backwardness and Economic Growth*, New York, 1957, Chapter VIII.

of events in which there is a persistent and gradual increase in the capital-labor ratio. We have already suggested why this cannot take place in many industries in the backward sector. In other words, indivisibilities in the backward sector form a bottleneck for a sustained gradual growth sequence in at least some industries, even if such a sequence could be initiated.

3. Technical Progress and Dualism

Probably the major means through which productivity and income per man have increased, in the long run, has been technical progress — through the creation of new techniques by firms. But, whether or not new techniques are adopted depends on the existing capital-labor ratio, the price of inputs — which determines the cost of alternative techniques — as well as other elements within the firm's purview. We want to show in this section, parallel to the ideas expressed in the last section, the possibility of technical progress which occurs in such a way that it is not adopted in the backward sector of the economy (5).

A common diagrammatical approach is to assume that technical progress leads to a shift of all points on the production function. However, it is quite possible — indeed, it is likely — that specific technique improvements shift only some points on an isoquant, but not all points. This possibility is illustrated in figure 2 below.

The curve Q' results from inventions made after the curve Q in figure 2. If the invention is fairly capital intensive, but the current technique is at a low degree of capital intensity, then it is quite likely that the invention will result in a shift in that portion of the isoquant associated with fairly high capital-labor ratios, but it will not shift that portion of the isoquant associated with low capital-labor ratios. Let us return again to figure 2 and observe the curve Q'', which represents an invention after Q' becomes the production function. Now, if the expenditure slope of the line E_1

(5) The reader should note that although we shall proceed to employ discontinuous isoquants many of the arguments that follow, with respect to technical progress and dualism, would be just as valid if we assumed continuous production functions. For example, in figure 2 a set of continuously non-kinky isoquants of the branched type would yield some of the same results. In other words, the burden of the arguments do not all of them rely entirely on discontinuities.

reflects the existing ratio of labor cost to capital cost, then we see that the shifts in the isoquant noted in the figure have no effect on choice of technique. In other words, we have illustrated the possibility that the locus of technical progress may be such that it would affect the choice of technique in those cases in which the cost of labor to capital is high, but not when it is low. The same inventions, when they take place in the advanced sector of the eco-

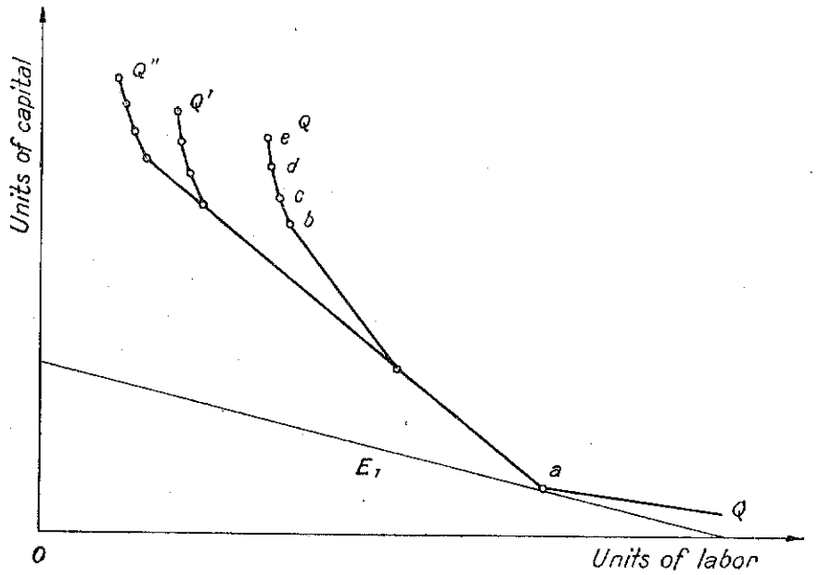

Figure 2

nomy, would be adopted, but they would not be adopted in the backward sector of the economy.

Now, is technical progress likely to be of the kind that we have just illustrated? Here we have to make a major distinction between at least two types of technical progress. The first type we might consider is that of a major over-all invention such as the steam engine or the internal combustion engine or the electric motor. Secondly, there is the gradual type of technical progress which takes place year after year, and in which there are no drastic changes in machines or implements employed, but, through redesign and general improvement, the effectiveness of given types of machines and implements are increased. It is probable that more of the

technical progress that occurs in an economy is of the gradual kind, where through small changes, year after year, the eventual technique that emerges is very much superior to the initial technique. Now, the spectacular innovations may be of the type that may affect all, or at least a great many, points on the production isoquant (6). But, in general, the gradual type of invention and improvement is more likely to affect that portion of the isoquant associated with lower capital-labor ratios. There are at least two reasons why this may be the case. First, gradual technical progress is likely to take place where there is already a sufficient division of labor so that entrepreneurs, inventors, and others, could see the possibility of improving those machines and implements which are sufficiently specialized as to be within their purview. The idea here is that the more specialized the machinery or the implements, the easier it is for someone to understand it sufficiently so that it is possible and likely for improvements to occur to people. In any event, it is likely that inventions will take place in the less traditional and more educated sector of the economy, and such inventions are more likely to be close to those techniques already utilized in the advanced sector.

4. Technical Progress, Knowledge, Scale of Plant, and Complementary Inputs

The previous remarks about gradual inventions and improvements are not intended to suggest that inventions of a spectacular type will have an equal impact on both the advanced and the backward sector. The point made, with respect to spectacular inventions, is that some of them may affect the entire production function — or a great many points on it — so that such inventions may be adopted both in the backward and the advanced sector. It does seem to me, however, that in general, the advanced sector is more likely to be in the position to adopt inventions even of a spectacular kind. This is likely to be true, among other things, if we take into account such considerations as sufficient size of

(6) For example, we often find in some backward sectors, some small scale firms using small electric motors. Obviously, the invention of the electric motor can influence more than just the advanced sector of an economy.

plant and the existence of complementary inputs necessary to adopt some types of new capital goods. In other words, some inventions result in capital goods that are sufficiently large to be adopted more readily in larger rather than smaller plants, and the advanced sector is the more likely to have the larger rather than the smaller plants. A similar argument holds with respect to complementary inputs.

We have already touched on the matter of knowledge. The higher the degree of education that the labor force has, the greater its chances of hitting on inventions, and in addition, the greater its capacity to see the possibility of the useful adoption of inventions in production processes. All of these aspects are likely to be more prevalent in the advanced rather than in the backward sector. It is not only the degree of education that is significant, but also the variety of knowledge available to individuals. Since the advanced sector of the economy is likely to employ a larger variety of productive techniques, hence, the variety of productive knowledge in the sector will accordingly be larger. Therefore, it is more likely that this greater degree of knowledge will yield more inventions and improvements suitable to the advanced sector.

We have already stressed the importance of indivisibilities in potential productive techniques. But, further indivisibilities may be created by the new type of capital goods that come on the market. In other words, there may be a certain minimum size in which new outfits of capital can be produced economically. Certain improved machines or implements may be larger than the existing machines or implements that do a similar type of job less efficiently. The consequence of this possibility is that a large firm of sufficient scale finds that it would pay for it to adopt the new technique, whereas a small firm finds that it could not do so. The variables involved here are the existing size of the firms, the possibilities for expansion, and the size of the market. All of these elements are clearly likely to be greater in the advanced sector than in the backward sector, and hence, to the extent that scale is a consideration in the adoption of an invention, such inventions will more readily be adopted in the advanced, rather than in the backward sector.

For a capital good to be used efficiently, it is often necessary that other capital goods, or other types of labor be employed at the same time. Obviously, to operate a complicated type of capital good such as a linotype machine requires the existence of skilled operators. Similarly, many types of capital goods, for their successful adoption and utilization, require the existence of skilled maintenance people and repair crews who have to be available in time of need. Every type of complicated machinery usually requires the simultaneous existence of a reasonably large spare parts industry. All of these inputs are more likely to exist in the advanced sector. Hence, on this basis, the type of innovations that will take place will, more often than not, be of the kind that could most readily be adopted in the advanced, rather than in the backward sector.

Finally, we might consider that the capital goods that could be adopted do not run the gamut of all *possible* types and sizes of capital goods. Firms are limited in many of their choices to those types of capital goods that are actually produced. To the extent that they utilize industrial machinery and equipment, the backward sector of the economy is likely to be a net importer of such machinery and equipment. But, what types of machines and equipment are in fact being produced? Apart from those traditionally produced for the backward sector, it is likely that the new type of capital goods produced will not be most suitable for that sector where markets are undeveloped and uncertain, but rather, they will be the type of capital goods suitable for the production conditions and the variety of labor available in the advanced sector. Hence, the backward sector faces the additional handicap in that it has to import capital goods, when it wants to do so, of a type not especially designed for its own factor availabilities.

In sum, the locus of inventions is likely to be such that they are more readily adoptable in the sector with the higher capital-labor ratios. In addition, the locus and nature of many inventions helps, in part, to explain the differential degree of indivisibilities in production techniques that are likely to exist in different parts of the production function.

5. Closing the Gap

Thus far our analysis has aimed at explaining the increasing gap between the advanced and backward sector in the dual economy. This has been the main aim of this paper. "The closing of the gap" is a tantalizing problem but it involves many new considerations, and it must be left for another occasion. Nevertheless, I

would like, at this juncture, to offer a few brief remarks in that connection.

I suspect, that in part, the increasing gap and the growth of the advanced sector contain the seeds that eventually lead to the closing of the gap. This happens when more and more markets within the economy become close to being national markets. That is to say, as the economy advances, more and more industries in which there are considerable economies of scale, become important. Also, the average size of firm increases simultaneously. However, the mere existence of economies of scale is not sufficient to create a national market. Economies of scale must become sufficiently large so that their significance is greater than the transportation costs that have to be overcome in supplying national, or almost national, markets. Now, as the advanced sector grows, and as more transportation facilities are built all around (and transportation facilities are themselves subject to economies of scale), a point will be reached at which the economies of scale are more significant than differential transportation costs, and as a consequence, locational advantages other than closeness to markets (or to inputs) gain primacy in determining plant location. When this occurs, the wage differentials between the advanced and the backward sectors come into play, and as a consequence, there is a greater inducement for such industries to locate in the backward sector. At the same time, the wage differential induces more and more workers from the backward sector to move to the advanced sector. All in all, we can readily see that a point will be reached in such a process at which the tendency towards equalization sets in.

6. Summary and Conclusions

Others have used indivisibilities as a means to explain underemployment and the utilization of primitive techniques in backward areas (7). But I suspect that my approach differs somewhat from that of others. In the first place, I am primarily interested in showing that indivisibilities may affect the inducement to invest. Second, a great deal of my emphasis is on technological progress and the fact that the nature of technological progress may *differentially*

(7) See especially the works by Eckhaus and Hirschman, cited previously.

affect the inducement to invest in different sectors. In addition, my analysis is not, strictly speaking, of the comparative static type. Rather, what I have in mind are alternative dynamic process analyses of a kind where in the advanced sector the process, which in this case, not limited by the inducement to invest, succeeds in yielding a certain rate of growth in the long run. In the backward sector, the same process must proceed either at a slower rate, or practically not at all, because of the stifling effect that I have attributed to indivisibilities, to the locus of technical progress, and as a consequence, to the lower inducement to invest. I have tried to suggest that the nature of the production function and of technological progress may serve, in the extreme case, as a bottleneck to the inducement to invest, and in the less extreme case, as a factor that stifles, in some degree, the inducement to invest in the backward sector as compared with the advanced sector. In addition, we have considered other elements which are closely linked to the inducement to invest, and which operate in a differential manner between two sectors. These were, differences in productive knowledge, differences in scale and in the capacity to take advantage of new techniques because of scale limitations, and differences in the availability of complementary inputs.

Finally, let us review briefly some of the initial assumptions and elements in the analysis. First, we assumed that the relative position of the two sectors, at the historical point at which we break into the analysis, is one in which a gap already exists. We suggested reasons for the gap to increase. We emphasized the fact that many more productive alternatives are likely to be available in the advanced sector (where the capital-labor ratio is high) than is the case in the backward sector. In addition, we assumed, what it is also likely to be true historically, that the size-variety of firms is greater in the advanced than in the backward sector. In other words, the backward sector is more likely to be handicapped in its expansion by the size limitations of existing plants.

Before closing, a word should be said about entrepreneurship. It is often argued that entrepreneurship is lacking in the backward sector. Whether or not entrepreneurs are in some sense less readily available in the backward sector I cannot say at present. However, it is of interest to note that our analysis would suggest one conclusion with respect to entrepreneurship. The variety of entrepreneurial opportunities, as well as the number of such opportunities, is clearly

likely to be greater in that sector in which the inducement to invest is greater — namely, in the advanced sector. As a consequence, since there is usually a possibility of entrepreneurial mobility, we would expect that entrepreneurs from the backward sector would migrate to the advanced sector in search of such opportunities. Thus, even if intrinsic entrepreneurial talent were, at the outset, evenly distributed between the two sectors, this talent would cease to be so distributed in view of the inducements established by the dual economy.

Berkeley HARVEY LEIBENSTEIN