DEVELOPMENT PLANNING AND THE ECONOMIC CALCULUS

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The postwar period has brought growing use of professional economists from the industrially advanced countries as advisers on planning development of less developed areas. The consequent accumulation of experience and the renewed interest in development is giving rise to an essentially new branch of economic literature. True, the classical economists, Karl Marx, and a few twentieth century economists have been primarily concerned with economic growth; but their interest has been in explaining or sustaining capitalist economic development where it was already under way. Perhaps for this reason, their writings did not stimulate large numbers of economists to direct their energies towards producing a specialized literature on economic development. It has taken the sudden concern with the appalling problems of launching a process of growth in underdeveloped countries, and the recognition of economic development as a matter of policy in advanced and underdeveloped countries alike, to do that.

Few economists, however, and least of all those with experience in assisting governments of underdeveloped countries in their development planning, would contend that the literature is presently in a satisfactory state. In terms of bulk, most of it is devoted to the development problems, potential, and plans of particular countries. The few efforts at statement of general
principles—including the present writer's—reflect, as much as anything, the frustrated efforts of planners to decide what really should be done, and the self-torture of theorists in trying to decide what are the proper proportions of economics, political science, sociology, social psychology, anthropology, theory of history, and other "ologies," in any attempt to generalize about economic development.

In short, we are not yet at the stage of widespread agreement as to the proper scope and method of research on economic development, nor on the objectives of development planning and the role of the economist in the process. The M.I.T. SSRC Conference on Economic Growth in October 1954, concentrated specifically on "Investment Criteria for Economic Growth." Despite the high level of papers and discussion, and the undoubted progress in thinking on the subject which they represent, this Conference gave abundant evidence of the wide range of opinion on these two questions. The present paper, evoked by the Conference, seeks to contribute to the resolution of these divergences of opinion, by defining more narrowly the goals of economic development and the role of the economist in achieving them. In so doing, I hope also to throw some light on the broader question of the scope and method appropriate to a general theory of economic development.

I. OBJECTIVES OF ECONOMIC DEVELOPMENT

Let us first try to pin down what economic development planning is about. The ultimate goal of any economic and social development
plan is a better life for the people concerned. Expressed in such broad terms, however, such a "goal" provides little guidance as to the form the plan should take. Reduced to its essentials, a development plan has the following main components:

1. A capital budget, comprised of public investment projects of a developmental nature.

2. A budget of government expenditures not usually regarded as capital outlays, but which contribute to economic and social development. These expenditures might be termed a "human investment budget" (education, manpower training, health, etc.).

3. A programme of legislation and regulation governing the activities of private individuals, enterprises, and institutions, so as to redirect, guide, and encourage these activities in a manner contributing to economic and social development, including proposals for new institutions, or for reorganization of old ones, so as to facilitate the execution of measures included in the plan.

Each of these three major components of a plan involves decisions affecting the allocation of resources, human and material. To make wise decisions of this kind, the objective of the plan must be clear, and cast in concrete terms; if possible, in terms which submit to measurement. A development plan is not a static affair, but is subject to constant revision as parts of it are completed and new information
becomes available. In revising a plan, it is of the utmost importance to know whether or not progress is being made towards the ultimate goal; and for this purpose progress should be defined, as much as possible, in measurable terms.

Economic policy in general is concerned with the production of goods and services, including leisure, and is directed towards assuring an allocation of resources that will maximize the flow of these goods and services. Current economic policy is concerned with maximizing the flow at each point of time, with given resources, techniques, and institutions. By analogy, we might say that economic development policy is concerned with maximizing the rate of increase in this flow as time goes by. In other words, economic development policy is directed towards increasing the disposal of the population over goods, services, and leisure as quickly as possible.

It is necessary to distinguish here between production and productivity. Total production can be increased, within limits, by the simple device of lengthening the working week. However, such an increase in total output is not necessarily economic progress. The answer depends upon how the people concerned value the extra flow of goods and services on the one hand and the loss of leisure on the other. There are problems here; in practice, the choice between a higher material standard of living and more leisure cannot be left to each individual as it should be ideally, but must be made to some degree collectively. There are discontinuities in the function relating hours of work to output, and the decisions of various
individuals and groups are interrelated. These problems, however, are not peculiar to underdeveloped countries.

Similarly, production can be increased by increasing the proportion of the active labour force to the total population. Part of the increases in output achieved by the belligerent countries during World War II resulted from drawing into employment young people who would otherwise have been in school, older people who had reached the normal retirement age, and housewives who would normally have been fully occupied in their homes. It is doubtful whether such increases in output can properly be considered "economic development." At least the people themselves should make their own choice between more goods and services, and more leisure in the form of higher school-leaving ages, lower retirement ages, and freedom of housewives from responsibilities outside their homes.

In sum, the choice between higher material standards of living and more leisure is one that the people themselves should make. The planners' role stops with indicating the nature of the choice to be made. However, the choice cannot be made by each individual separately, but must be made collectively, by family units, trade unions, employers' associations, and in some cases, where the whole society is involved in the choice, by the people as a whole through their government.

The choice between a higher level of current consumption and a more rapid rate of economic progress is also one to be made by the people concerned. Here, too, discontinuities appear. Half a
railway is useless; power plants, blast furnaces, or refineries below a certain size are too inefficient to be worth developing; even irrigation projects below a certain scale may not be worthwhile. In other words, a certain minimum volume of saving is necessary before significant economic progress can be made. In large measure, the choice between much or little sacrifice of current consumption for a higher standard of living in the future is the choice between a slow or rapid rate of economic progress. This choice, like the choice between material income or leisure, is one that must be made collectively.

As productivity rises, it may be translated into a higher level of per capita income, or into a larger number of children per member of the labour force. This choice also is for the people themselves to make, and it too cannot be left entirely to individuals, since the wishes of some individuals or groups can be thwarted by the decisions of others. A humanitarian society does not permit children to starve; and if some people have more children than they can support, the rest of the community will take care of them through private or group charity, or through the government. In this manner the income which would otherwise have gone towards swelling the stream of saving and accelerating the rate of economic progress will go instead towards supporting a larger population, in defiance of the wishes of those who prefer smaller families and more rapid progress. Unless income per capita reaches a certain level, the stream of
savings cannot rise to the point where an underdeveloped economy is able to finance the whole of its further economic progress from its own resources, without outside assistance in the form of loans or grants. If the population grows so fast that increases in productivity do not bring the country closer to that level of per capita income, the economy will never get "over the hump" to the point where it can finance its own economic development alone and unaided.

Thus while an economic development plan seeks to raise per capita production as quickly as possible, it is not a matter of indifference how this increased output is attained. The limitations imposed by the people's desire for leisure, by their wish to have large families, and their reluctance to sacrifice current consumption for the sake of a higher standard of living in the future, must be considered. Per capita income can be raised if people work harder and longer, if they save larger shares of their income and so release resources for investment projects, and if they restrict the size of their families; but increases in output achieved in these ways are assuredly "progress" only if the gains outweigh the sacrifices, in the view of the people concerned.

II. MEASURING ECONOMIC DEVELOPMENT

The overall goal of an economic development plan, then, is to maximize the expansion of production, while giving due weight to people's wishes regarding the choice between goods and services or leisure, between more income now and more income later, and between a
higher per capita income and larger families. How can economic development in this sense be measured, as a check on the degree of success of the programme?

A conceptually simple measure would be the trend of gross national income at constant prices. There are, of course, statistical difficulties involved. Measuring national income is itself a complex task in underdeveloped countries, and determining the proper "deflators" to eliminate the effects of price changes is a ticklish operation. The elimination of cyclical fluctuations so as to get a picture of the actual trend is also a statistical operation of some complexity. However, these problems are not insoluble. A more fundamental inadequacy of national income trends, as a measure of economic progress, is that in itself it tells little about the standard of living of the people. A rising national income might reflect rapid population growth, while the standard of living was actually falling. Income or output per capita is accordingly a better measure.

However, as indicated above, changes in per capita income may result from changes in the length of the working week or in the ratio of labour force to total population. To measure increases in productivity, which are the essence of economic development, adjustments must be made for such changes. One way of making these adjustments is to concentrate on the increase in productivity per manhour. Reducing the increases in output to manhour terms automatically eliminates the effects on output of increases in total
population, in the ratio of the labour force to total population, and in the length of the working week.

Strictly speaking, of course, economic development consists not in raising productivity per manhour alone, but in raising productivity per unit of factor of production used. Let total output be \( O \), the size of the total labour force (employed or unemployed) be \( N \), the quantity of natural resources used ("land") be \( L \), the amount of plant and equipment used ("capital") be \( C \). For convenience we can subsume risk-taking under \( C \) and management under \( N \). Then,

\[
O = F(N, L, C), \quad \cdots \quad (1)
\]

where \( F \) is the production function. The factors of production can always be defined so as to make this function linear and homogeneous, so that

\[
O = N \cdot \frac{dO}{dN} + L \cdot \frac{dO}{dL} + C \cdot \frac{dO}{dC}. \quad \cdots \quad (2)
\]

Economic development can then be defined as: an increase in \( F \), or an improvement in the ratio \( N:L:C \) at full employment. With optimal proportions and full employment, the rate of economic progress reduces to \( \frac{dF}{dt} \), where \( t \) is time.\[1\]

Given the data, the time, and the skill, it would be possible

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\[1\] This definition makes the "rate of economic progress" tantamount to "the rate of innovation" in Schumpeter's sense, plus the rate at which the optimal proportion of factors (with "full employment" of all factors) is reached. With "full employment" and an optimal combination of factors, economic development consists only in Schumpeterian innovation.
to make econometric studies to measure both "F" and "dF/dt". In practice, however, especially in underdeveloped countries where data are incomplete and facilities for econometric research limited, so complex a concept and measure of economic development is inconvenient. The rate of increase in productivity per manhour, d/dt(0/N), is the simplest close approximation to the combined effects of dF/dt and improved factor proportions.

Are there no conditions under which an increase in productivity per manhour would not reflect true economic progress? One might conceive of two sets of conditions. First, productivity per manhour might be raised by accelerating the depletion of natural resources; what may appear at first sight as an increase in "F" may really be an increase in "L". But this problem is merely an accounting one; it is only necessary to deduct from total output the value of the resources used up, so as to get a "net" figure for output, or to add to "N" an estimate of the manhours "embodied" in the resources used up. Moreover, while resource conservation should not be ignored by development planners, the resources used up in any period should probably not be valued much above their market price, which is already deducted from net production, as a cost. Given a rapid rate of technological progress, means of replacing depleted resources are usually forthcoming.

Secondly, under a strong dictator, manhour productivity might be made to rise by forcing a rate of domestic capital accumulation
far in excess of the wishes of the people. What looks like an increase in "F\text{"}, or improved factor proportions, may be an excessive increase in "C" through forced saving. While much of what has passed for economic progress in the past has taken precisely this form, it is doubtful whether capital accumulation through enforced sacrifice of current consumption warrants the term "progress." Where saving is voluntary, the problem does not arise. Increased productivity per manhour through voluntary capital accumulation is certainly progress, especially since capital accumulation will nearly always be accompanied by some improvement in technique as well, and so in a rise in "P\text{"}. In any case, the consumers' goods sacrificed through capital accumulation constitute a deduction from total output, which offsets the increased production of capital goods through saving and investment. If one wanted to be strictly accurate in one's measurement of productivity, one could (conceptually) discount the value of capital goods produced at an appropriate rate of interest, reflecting the marginal rate of "time preference" of the community as a whole, whenever there is reason to suppose that the discount rate applied by the purchasers of capital goods (who may be government agencies) in evaluating the goods is too low.

Of course, following standard social accounting practice, depreciation, imports, and the service on foreign debt should be deducted from gross output in calculating output per manhour.

With these adjustments, an increase in productivity per manhour
always reflects either a rise in $F_n$ or improved factor proportions, and can therefore be accepted as a measure of economic progress.

Some development planners have argued that plans should be based on maximizing the productivity of the scarce factor. This argument is based on a double confusion: between average and marginal productivity, and between the selection of the optimal point on an isopod of the production function (optimum combination of factors), and policies to raise the whole function. Certainly, in determining the optimal combination of factors, the relative abundance or scarcity of factors must be considered, and larger proportions of the abundant cheap factor should be used wherever possible. The selection of a maximum rate of increase in productivity per manhour as the objective of economic development, does not mean that the appropriate aim of current policy is to maximize the marginal productivity of labour at each point of time. But economic progress cannot take place without a rise in output per manhour at some point on the cross section of the production function relating total output to manhours worked. Suppose that the society prefers working 100 hours for 1,000 units to working 120 hours for 1,140 units. Now suppose a new technique is

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Even Dr. Tinbergen comes dangerously close to this argument, in suggesting that where capital is very scarce, the "priority figure" for investment projects will "coincide approximately" with the ratio of net returns per unit of capital. Jan Tinbergen, "The Relevance of Theoretical Criteria in the Selection of Investment Plans", paper prepared for the Center for International Studies - SSRC Conference on Economic Growth, October 15-17, 1954, p. 4. (mimeographed)
introduced which permits the production of 1,170 units in 120 hours, and that this situation is preferred to the original one. This change will represent economic progress, even though output per manhour is only 9.75 in the new situation as compared to 10 in the old; productivity per manhour has risen, and also "F", at least for the range of the production function between 100 hours and 120 hours. This possibility (on the whole rather unlikely) means that when hours worked and output rise together (or output and the ratio of gainfully occupied to total population and labour force) but output per manhour fails to rise, we can never be absolutely sure whether or not economic progress has taken place. We would need to know what the product per manhour would have been before, at the new level of hours, or the new ratio of gainfully occupied to labour force. Such cases will, however, be rare, and whenever output rises without a rise in output per manhour as well, a strong suspicion that no progress has taken place is justified.

The argument against maximizing output per unit of scarce factor can be put another way. Assuming that the optimum combination of factors is continuously achieved, it is productivity per unit of the abundant factor that must be maximized. Total output can, of course, be expressed as output-per-unit of any factor, multiplied by the number of units of that factor; that is mere arithmetic. But if we divide total output into one part $O_o$, which is produced by workers ($N_o$) in optimal combination with capital, and
another part $O_b$ which is produced by the remaining labour supply with little or no capital, it is clear that $O_c/N_c + O_b/N_b$ will always exceed $O_c/N_c$, so long as capital is scarce relative to labour. Thus maximizing output per unit of capital alone, in the optimal combination, will not maximize total product; but maximizing the output per unit of labour, with as much labour used in optimal combination with capital as the available capital supply permits, will maximize output.

The question may also be considered in terms of the importance in the development plan of increasing the supply of the factor. We may write $F = N'O_n$. To maximize "$F$", by a variable plan which we may call "$P$" (and which may be quantified in terms of investment, say) we must set

$$\frac{DF}{dP} = 0 = N'dO_n/dP + O_n'dN/dP$$

But $dN/dP$ may be regarded as zero; it is no part of the plan to maximize the size of the labour force as such. The size of the labour force depends on the level of the population, and ratio of gainfully occupied to population. Changing the proportion of the population in the labour force is not one of the accepted goals of economic development, although reducing it (by raising school-learning ages or lowering retirement ages) may be a goal of social development. If the "plan" seeks to affect the level of population or of the labour force, it will do so, not for its own sake, but for its effect on productivity. Thus maximizing "$F$" reduces to maximizing productivity per manhour.

This division of the labour force is a highly realistic one for underdeveloped areas. Cf. a forthcoming paper by Richard Eckaus to appear in the American Economic Review for September 1955; also, Benjamin Higgins, "The 'Dualistic Theory' of Underdeveloped Areas", Ekonomi dan Perusahaan Indonesia, Tahun ke 3, No. 2, February 1955.
In the basic equation, either $O_c$ or $O_s$ may be substituted for $O_n$ and the equation will still hold. But in the maximization equation, the result is different; for the terms $O_s \cdot dL/dP$ or $O_c \cdot dC/dP$ are not insignificant. Increasing the rate of discovery of new natural resources, or accelerating capital accumulation, may very well be part of the plan. Discovery of resources or capital accumulation may be a prerequisite to the improvements in technique (increase in "F") which constitute the core of economic progress. Thus maximizing "F" cannot be reduced to maximizing the productivity per unit of land or per unit of capital. A still simpler way of putting the argument is to say that where land and capital are scarce relative to the existing labour supply, the "plan" should include increasing the supply of land and capital; but increasing the supply of labour, to raise per unit of capital or per acre, would be sheer nonsense.

Unfortunately, measurement of the increase in manhour productivity carries with it a conceptual and statistical difficulty of its own. An important part of development planning is the absorption of unemployment, disguised or overt; it is the increase in output per manhour in the total labour force that must be maximized. But how does one measure the "total labour force" in an underdeveloped country? How does one determine the volume of disguised unemployment that should be considered part of the "labour force", which a good development plan would bring into full employment? Having determined the labour force in numbers of persons, how should it be converted into manhours?
Where statutory regulations exist, governing the length of the working week, paid vacations, and the like, one might accept the statutes as a basis for this conversion. However, labour regulations are themselves a matter of policy, and decisions concerning them might be considered part of the plan.

As a matter of practical procedure, it may therefore be easier in some countries to use per capita income as a measure of economic progress, with suitable adjustments for changes in the working week, ratio of gainfully occupied to labour force, etc., than to use increase in manhour productivity and calculate the size of the total labour force in manhours. In any case, there is no reason why any set of planning authorities should not try both; if both methods give roughly the same result, the authorities can be confident that they have a reasonably good picture of the overall rate of economic progress.

III. TYPES OF DEVELOPMENT PLANNING

This attempt to pin down the overall objective and measure of economic development provides several clues to the source of the present discomfort of economists regarding their role in development planning, and of their disagreement as to scope and method both of development planning and of a general theory of economic development. In the development field one is immediately confronted with problems of choice involving discontinuities rather than marginal changes, which cannot be made individually, in which "external" costs
and benefits may be of paramount importance, and which are "non-economic" in the sense that they relate to fundamental social values rather than to choices among goods, services, and leisure. To some extent the same is true of all welfare economics; but the economics of development is distinguished by the overwhelming importance of the choices which must be made by large groups rather than by individuals; which must be made in terms of "lumps", "jumps", or structural changes rather than marginal adjustment; and which may involve fundamental changes in social organization and perhaps even in social philosophy. Small wonder that the economist, trained to attack policy problems through a "calculus" comprised of marginal choices and marginal adjustments, and to rely heavily on the guidance provided by the market, soon finds himself beyond his depth.

Faced with problems which cannot be solved with the tools provided in the standard kit, economists tend to become defeatist, and to argue that economists should "confine themselves to" one or another aspect of development planning. At the M.I.T. SSRC Conference, several such suggestions were made, with widely varying implications: the economist should limit himself to "trouble-shooting", pointing

\footnote{The problems outlined by Dr. Fellner in his Conference paper are really problems of economic planning in general, rather than special problems of development planning. William Fellner, "General Characteristics of Problems and Comments on Conference Papers", paper prepared for the Center for International Studies - SSRC Conference, October 15-17, 1954 (mimeographed).}

\footnote{Cf. Everett Hagen, "The Allocation of Investment in Underdeveloped Countries: The Case of Burma", paper prepared for the Center for International Studies - SSRC Conference, October 15-17, 1954 (mimeographed).}
out obvious mistakes in policy; he should be content with "project-planning", recommending at each stage a few specific projects of obviously high priority; he should confine himself to broad aggregative questions, including questions of structural change, which can be subsumed under the heading of "sectoral planning"; he should concentrate on "target-planning", selecting a few broad targets (such as the rate of absorption of disguised unemployment or the rate of increase in the ratio of industrial to agricultural employment) and suggesting means of achieving them.

Each of these types of planning has its merits; indeed, it is doubtful whether efficient planning can ignore any of them.

Trouble-shooting

In many underdeveloped countries, growth is hampered by bad monetary, fiscal, and foreign trade policies, by monopolies which have no offsetting advantages in terms of efficiency of large-scale production, ineffective marketing methods, visibly disproportionate development of various related sectors, and the like. A well-trained Western economist with some experience in policy formation at home can sometimes help to remove such barriers to development, and such "trouble-shooting" is certainly part of the economic planner's function. Obviously, however, not all the "trouble" is economic; engineers, training experts, public health experts, and other technicians have their place on a development planning team, even if the team's activities are confined to "trouble-shooting".
Also, one cannot transplant, without modifications, policies and institutions designed for industrially advanced countries; and no more serious mistake could be made than to underestimate the ability of people in underdeveloped countries to do their own trouble-shooting.

**Project Planning**

In the context of a particular underdeveloped country at a particular time, the temptation to "confine oneself" to project planning is certainly a strong one. There are usually a few projects so pressing as to be of very high priority, and the planner feels that at least he will do no harm in recommending that they be carried out, and making suggestions for their financing, timing, and organization. Unfortunately, while the economic development planner may do little harm in limiting himself in this fashion, he also does little good. Ultimately, any plan must be reduced to specific projects; but the really difficult problem is to determine the optimal nature and pace of structural change in an economy. The governments themselves, with their own regular officials, can usually discern a few high-priority projects. Moreover, as was argued by Professor

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\[1/\] Dr. Tinbergen's Conference paper is almost entirely concerned with how to "calculate a 'priority figure' for each of a number of projects of which the execution is under consideration." Jan Tinbergen, *op. cit.*, p. 1.

T. W. Schultz at the Conference, the economist is seldom the most useful technician in the planning of specific projects: the engineer, agriculturalist, manpower training expert, etc., is likely to be more effective. On the other hand, this argument should not be pushed too far. There is something in the economist's training that makes him more prone than other technicians to think simultaneously in terms of alternative means and of alternative ends, a faculty that is very useful even in "project-planning".

**Sectoral Planning**

The concept of "sectoral planning" seems to vary considerably from one economist to another, with accompanying differences in degree of ambitiousness. For some, it seems to mean essentially a forecast, based on a type of input-output analysis or linear programming, given some assumed "target" rate of growth of the entire economy. For others, it means also making recommendations as to the relative rates at which various sectors of the economy should grow, presumably with additional recommendations as to how this growth is to be achieved. Others would suggest a combination of these two things, with projections in sectors where the plan calls only for "steady growth", combined with planned and discontinuous structural change in "development" sectors.¹ This approach to development planning is usually attractive to economists whose interest is in aggregative economics, or in the econometrically derived tableaux économiques.

¹ Dr. Rosenstein-Rodan seems to stress "sectoral planning" in this sense. Paul Rosenstein-Rodan, "Programming in Theory and in Italian Practice", paper prepared for the Center for International Studies - SSRC Conference, October 15-17, 1954 (mimeographed). Dr. Chenery places his emphasis on statistical projections of the structure, given certain targets. Dr. Hirschman would limit the economist to "trouble-shooting" and planning.
involved in input-output analysis. Certainly, sectoral planning involves some of the most basic problems of economic development, such as the desirable rate and form of industrialization.

**Target-planning**

The "five-year plans" associated with Soviet Bloc countries, and some of the postwar reconstruction plans in Western Europe, are not stated only in terms of public investment projects, technical assistance, manpower training, new regulations and institutions and the like, but include quantitative production "targets": so many more tons of coal and steel, so many kilowatts of additional power capacity, so many miles of road or railway, so many tons of cereal, so many dollars worth of additional exports, and so on. While this sort of "multiple target" planning may lose sight of the ultimate goal of raising productivity in the economy as a whole, it may nevertheless provide useful gauges of the success of the development programme, and focal points for public discussion. A development programme may succeed in raising overall manhour productivity and yet be inadequate, because certain strategic sectors of the programme fail to share proportionately in the progress. It is always a bit dangerous to use any single average to measure the effectiveness of economic policy; the average may hide the over concentration in some fields and the neglect of other important sectors.

In order to avoid unwarranted satisfaction with an increase in productivity of the economy as a whole, therefore, it may be worthwhile
to lay down additional sub-targets in quantitative terms.

1. A target for approach to equilibrium in the overall budget and balance of payments position.

Many underdeveloped countries face a combination of budget and balance of payments deficits. No country can go on indefinitely living on foreign exchange reserves; and when imports are restricted in an effort to avoid exhaustion of foreign exchange reserves, the budget deficit must be reduced as well, if dangerous inflationary pressure is to be staved off. Economic policy must be designed to bring about such equilibrium sooner or later, if healthy economic growth is to be possible. At the same time, the scale of the development programme that is feasible is limited by the steps necessary to reach this equilibrium. This "target", therefore, must be taken into account in framing the development plan.

2. A target for achieving self-sufficiency in foodstuffs.

In many development plans increasing production of foodstuffs is a top-priority project. It is desirable to cast this objective quantitatively, in some cases either in terms of expansion of local production or in terms of reduction of imports.

3. A target for industrial production.

It is useful to set forth a "target" in terms of the desired increase in aggregate industrial production over the period covered by the plan, and to break this target down into smaller categories, such as power capacity, transport facilities, manufactured goods, and the like.
4. A target for capital accumulation.

A closely related "target" would be the overall rate of capital accumulation, stated in amounts, or as a percentage of national income.

5. A target for transfer of population from agriculture to industry.

As a rule, economic development requires a net transfer of population from agriculture to industry. It would be helpful to translate this "target" into as precise quantitative terms as possible, the goal being expressed in terms of thousands of persons. In determining this target, account must of course be taken of the rate of net population growth. Thus a "target" with respect to net increase in population is implied.

6. A target for resettlement of population.

In addition to moving people from industry to agriculture, some development programmes also call for movements from overpopulated to unsettled areas. Any such transmigration programme should be defined in terms of the numbers of people to be moved year by year. It is apparent that, this target, too, implies some target with respect to overall population growth.

7. A target for manpower training.

Manpower training should be a major part of any development programme. This "target" should state the numbers of persons to receive training in each major field of industry and agriculture, the numbers at various levels of training, the length of the training programme, etc.
With these individual "targets" as a check on the effectiveness of the development programme, in addition to measurements of changes in per capita income and in manhour productivity as a whole, the planners, the government and the general public should be well informed of the progress of the economy.

IV. TYPES OF PLANNING AND PHASES OF ECONOMIC DEVELOPMENT

All of these aspects of development planning have their proper role. However, the relative importance of the various types of planning varies considerably with the stage of economic development. I believe Professor Adolph Lowe was first to suggest, in discussion at the M.I.T. SSRC Conference, that these types of planning are not rival sets of rules for planners to follow, but aspects of an overall planning process, of varying significance in successive phases of economic growth. The remainder of this section is essentially a systematic elaboration of this germinal idea.

Development Planning in Advanced Countries

The economist's task, in advising on development policy, is simplest in countries that are already industrially advanced. Here the aim is "steady growth", and the maintenance of full employment without inflation is itself an almost sure guarantee of such growth. The economist may also discern possibilities for improving the allocation of resources; but no "lumpy", discontinuous, or rapid structural changes are required. The usual kind of economic calculus
can be applied, comparing marginal (social) costs with marginal (social) benefits. The economist is on familiar ground, dealing with monetary, fiscal, foreign trade, and anti-monopoly policy. He is, in short, primarily a "trouble-shooter". He may also, however, collaborate with engineers, public health experts, architects, town planners, agriculturalists, and the like, in planning specific projects in the public sector, and in devising regulations to direct investment in the private sector. In short, in advanced economies the economist can afford to confine himself to "trouble-shooting" and "project planning". The whole planning process is essentially a matter of "patching the market", leaving the broader policy issues to be decided at the polls. Since the market process and its defects are something the economist understands, he usually feels fairly comfortable doing this kind of planning.

Planning in Underdeveloped But Developing Countries

There are a few countries whose low per capita incomes place them in the "underdeveloped" category, although industrialization and agricultural improvement are taking place at a rate high enough to raise per capita incomes. Argentina, Brazil, Burma, Colombia, Chile, Venezuela, Turkey, Italy and India seem to be in this category. These countries—by definition—have enough domestic savings and taxes, plus assured foreign capital assistance, to finance the capital formation needed to raise incomes. At the same time, all these countries are confronted with bottlenecks—capital supply, skilled labour, managerial and
technical skills—and by laggard sectors of the economy, which limit the rate of growth and make planning necessary.

In these countries, development planning must be more than "patching the market". The market and the polls do not provide sufficient guidance to the required structural adjustments, especially in the laggard sectors. Nor are the required adjustments strictly marginal. "Trouble-shooting" is still useful and indeed necessary; growth can still be hampered by inappropriate monetary, fiscal and foreign trade policies. The economist can still be of assistance in preparing projects in the public sector, and in devising regulations to control and direct private investment projects. But trouble-shooting plus project planning is no longer enough. In such countries growth itself must be "managed", and "sectoral planning" is necessary. The relative rates at which heavy industry, light industry, agricultural improvement, transport and communications, housing, and the like, are to be pushed becomes a matter of conscious policy. It will usually be found helpful to break down overall objectives into specific "targets".

The Italian ten-year plan might be regarded as an example of planning for this phase of development. It postulates a certain "target" rate of absorption of disguised unemployment, in addition to absorption of the current growth of the labour force, through expansion of the economy. The required rate of overall expansion is then "projected" to various sectors; current growth points the way to
future development. However, mere expansion, without structural change, is not enough; in the stagnant South a discontinuous change in structure is a necessary adjunct of development, and must be provided for in the plan. For this purpose, and also to provide the basic stimulus for balanced growth in the private sector, the plan included government development projects in various "impulse sectors", such as transport, communications, land reclamation, irrigation and the like. Thus the public investment aspect of the plan involves both "sectoral planning" and "project planning". In the Italian plan, residential housing is the countercyclical balance wheel.

Other countries in this category may need more rapid structural change than Italy does, judging from Italy's present plan. In that event, the development plan must rely less on statistical projections, based on broad "targets", and must include a larger component of "sectoral planning". But all countries in this category will need all aspects of planning: "trouble-shooting", project planning, sectoral planning, and target planning.

Planning of this kind still involves a calculus, involving cost-benefit comparisons, but it is no longer a purely marginal calculus, at least not for the more rapidly developing sectors of the economy. Questions arise such as "should we concentrate on

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\[\text{The decision to develop the South of Italy by a ten-year $1.6 billion public investment program initiated a structural change which no market decision would ever have reached.} \text{ Paul Rosenstein-Rodan, op. cit., p. 12.}\]
accelerating industrialization in the North, building power plants, roads, etc. there, and transfer population from the South, or should we concentrate on agricultural improvements and small industry in the South, with irrigation and drainage schemes, etc.? Here the usual type of economic calculus is insufficient. The choice involves questions of discontinuous change; and one wants to know not only the direct cost-benefit ratios of the two alternative programmes, but also the relative "demonstration effects", impact on attitudes towards enterprise and technical change, attitudes towards work and leisure, and the like. However, the economist might claim that while this kind of calculus requires knowledge of a sort different from that needed for a marginal cost-benefit calculation, it is not so different as to disqualify him as a member of the planning team concerned with such decisions.

Indeed, since in this phase of development the discontinuities are limited in size and scope, they can usually be reduced to decisions on rates of acceleration of trends already under way. Such planning means only looking at second derivatives instead of first derivatives, and market data can still provide a useful guide to development policy.

Underdeveloped and Stagnant (Declining) Countries

The real problems, both practical and theoretical, arise in countries where per capita income is stationary or falling, or rising so slowly, and from so low a level, that there is no hope of
growth becoming cumulative, without a transformation of the economy. Here the task is not merely to sustain or direct growth already under way, but to launch a process of growth that can become cumulative at some level of per capita income. The barriers to economic progress in these countries are forbidding,1 and nothing but a development programme so big and so bold as to assume the aspect of a "shock treatment" seems likely to succeed. Structural change is the most important aspect of development, and the required changes, if output is to outrun population growth long enough to bring fundamental changes in behaviour patterns, and thus get the economy "over the hump" where cumulative growth becomes possible, are of too discontinuous a nature to be treated as acceleration of existing movements. For such economies, "structural planning" is much the most important aspect of development planning.

For structural planning of the sort needed in these countries, however, the domestic market no longer provides any guidance whatsoever. It is not a matter of estimating the cost-benefit ratios of a 10 per cent or even 50 per cent expansion of an existing industry during a period when per capita incomes rise by, say, 20 per cent. It is a matter of estimating cost-benefit ratios of sudden increases in output ranging from several hundred per cent to infinity, with no previous experience, while national incomes double or treble. The

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very nature of the problem forbids a step-by-step, trial-and-error approach. It is a question of developing that river valley, with its integrated complex of power, aluminum, fertilizer, and irrigation projects, or not; the cost of one such complex of projects may absorb a country’s entire capital budget for several years. Both the scope and the scale of investment must be planned, and decisions on both scope and scale must involve discontinuities.

The other aspects of planning will still be present, of course, but they will be relatively easy. Once the sector plan is made, translation into specific projects, or recasting in terms of targets, will not be too difficult. "Trouble-shooting" will still be necessary, but will not be different in kind from trouble-shooting in the two more advanced phases.

Not only are the crucial "sectoral planning" decisions non-marginal, but they also involve an admixture of economics, engineering, and other social sciences. The required changes in economic structure are so great that they are unattainable without changes in social structure as well. Much depends, too, on what is technically possible. Many of the most crucial decisions present themselves in forms which do not lend themselves to traditional economic analysis at all. Should a direct attack be made on the "undivided family", which so seriously dilutes incentives to work harder or better, to save, to risk capital, or to limit the size of individual families, or will industrialization and urbanization automatically break down the undivided
family? In resettling people in new areas, should young, childless
couples be selected, so as to use the resettlement programme as an
attack on the undivided family, or must the whole undivided family,
or even the whole village, be moved as a unit? Can industrialization
take place within the village structure, so as to avoid the high
cost in social capital and the social disruption involved in
urbanization? Can technological improvements be found that will
raise output per manhour without raising the ratio of capital to
labour? How can the willingness to save, pay taxes, or attract
foreign capital be increased? Will university training in business
administration or industrial management break down the reluctance of
the elite to become entrepreneurs? If so, will emphasis on a com-
bination of engineering and economics training be most effective in
producing the requisite type of manager, or is it better to stress
accounting, which exerts its own discipline on the student and
compels him to manage his business in terms of a rational calculus?

Faced with questions such as these, the Western economist who
finds himself assisting the government of an underdeveloped country with
its development planning finds little in his specialized training to
help him, and is apt to flounder. The market provides little or no
guidance. The direction that might be obtained from periodic elections
is too little and too late. It is doubtful whether any "trigger
projects", or even "trigger sectors", can be isolated. What to do?

One field of recent experience may provide some guidance: the
planning of "total war". Rapid expansion of the defense sector of the
economy from 5 per cent to 50 per cent involved considerable structural change, as well as rapid absorption of unemployment. The process required breaking a succession of critical bottlenecks. Market criteria were thrown to the winds in determining the size of the defense sector, in allocating resources within the defense sector, and to some extent even in allocating resources within the civilian sector. The pace of transformation involved an excess of public and private investment over taxes plus ex ante savings, creating inflationary pressure that had to be offset by loan campaigns, tax increases, price controls and rationing, direct controls over resource allocation—the whole apparatus of the "dis-equilibrium economy". In short, planning "total war", like planning development of poor and stagnant economies, involves marked and discontinuous structural changes, planning without reference to the market, and deliberate creation and subsequent mopping up of inflationary pressure. The present writer was for a short time engaged in wartime planning, and has been struck since by the similarity between the nature of the problem confronting economic planners during the war and in underdeveloped countries now. While the same sense of bewilderment prevailed among wartime economic planners as now prevails among development planners, in retrospect the economics of total war were not too badly handled. It is unfortunate that so few of the economists engaged in wartime planning have recorded their experiences in detail—failures as well as successes. Such records
would be valuable now for the insight they would provide into problems of planning large-scale structural change without reference to the market.

On the other hand, the analogy should not be pushed too far. The objective of wartime planning was more easily understood and more widely accepted than the objective of development planning. The major belligerent powers began their preparations for war with considerable excess industrial capacity as well as unemployment. The unemployed included skilled workers, technicians, and managers as well as common labour. In terms of broad sectors—heavy industry, small industry, agriculture—the structural change was much less drastic than is required for economic development. Wartime economic planning is the closest thing in the recent experience of Western economists to the problem of development planning; it is worth reviewing for what help it may provide; but it will not in itself provide the key.

It seems clear that a new general theory is needed, different in kind from any received economic doctrine, and closer in terms of method to the work of Marx and Veblen than to that of Marshall or Keynes. For it must be a social theory, not a purely economic one, and it must be non-marginal in approach. It will have to analyze behaviour of strategic groups, rather than the behaviour of individual consumers, entrepreneurs, and workers making marginal choices. It should concentrate largely on the causal forces involved in the transition from a stagnant to an expanding economy. A combing of
historical materials from this specific point of view, accumulation of "case studies" of particular countries, anthropological and sociological material, technological research, and theoretical or econometric "models" can all help, particularly if there is continuous cross-fertilization among the scientists using these different techniques. The Center for International Studies at M. I. T. provides one opportunity for such cross-fertilization.

Meanwhile, the underdeveloped countries cannot await the perfection of such a theory. They must proceed as best they can, profiting from each other's mistakes and successes. For this purpose, more complete and uninhibited exchange of information among governments concerning the planning and execution of development programmes, and more continuous exchange of information and ideas between governments and scholars specializing in the development field, would help. New political institutions, such as more frequent use of the referendum, may also help to provide some guidance, in the absence of the direction provided by the market or by a well established general theory of economic and social development. But satisfactory solutions are unlikely to be found until the disease and its cure are well understood, not only by specialists, but by large numbers of the general public directly concerned.

\[1\] Dr. Tinbergen advocates use of public opinion polls, especially for guidance on such questions as "more hospitals or more schools", but would rely ultimately on the judgement of "a group of well-informed objective large-minded people"—not scientifically satisfying. In any case, the polls would be a very unsatisfactory guide to decisions on such questions as, "Should the Indonesian Government embark on the Asahan Valley development programme?", unless the electorate were highly sophisticated on matters of development policy.