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# **The Role of Agriculture in Economic Development**

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## THE CONCEPT OF ECONOMIC GROWTH

### *Economic analysis and growth policy*

A WELL-KNOWN tendency in the history of economic thought is for economic concepts to have been defined in a seemingly objective way, while actually they have reflected subjective value judgments. Moreover, narrow definitions of economic concepts have often been applied to problems of economic policy, where broader concepts correspond to actual political attitudes. It is quite evident that we run the risk of treating the concept of 'growth' in a similar way. The influence of economic analysis on political thinking is today greater than ever before. The risk that this influence will lead to false political conclusions has become more serious, because growth plays a more important role than ever before as a motive for economic policy; one may even say that growth has tended to become a fetish to which most other considerations have tended to be sacrificed. The economists evidently have an obligation to make quite clear to the layman politician the arbitrariness and one-sidedness of their technical definitions, and also to try to guide him towards a conception that corresponds more closely to the prevalent scales of values.

The importance of the concept of growth in political life and the confusion that is often created by technical indices of growth constructed by economists, may be illustrated by reference to some recent political trends. The most spectacular manifestation is the challenge to competition in growth that has been extended to the Western world by the Soviet leaders. The Soviet politicians seem to be even more index-minded, when making their pronouncements about targets for economic policy, than their colleagues in the West. Production indices, they say, will grow by such and such per cent. in the next plan period; this is compared with corresponding rates in the West. It is said that the United States will be overtaken within a given period—and so forth. This attitude to growth has evidently made a deep impression on politicians in the West. They often seem to have accepted uncritically the challenge according to the rules suggested by the Soviet leaders.

*The concept of growth and index numbers*

It is evident that even if we accept production indices as yardsticks for measuring economic growth, there is a wide variety of choice. In the Soviet estimates, most services are not included. This reflects a technocratic attitude to the concept of growth, or a smaller concern for the well-being of the consumer. The importance of this exclusion is indicated by the fact that more than one-half of the national product of the United States is constituted of services. We may try to correct for this difference by including services in Soviet estimates or excluding them from Western estimates. In any case, the arbitrariness of the standard by which we measure growth has become evident. There are also other problems of choice. Should we measure production in terms of national aggregates or per head? The choice will depend on the basis for our valuations: do they refer to the economic strength of the nation or to the productivity and standard of living of its inhabitants? We may also take the view that consumption is the aim of production and define growth not in terms of production but of consumption.

Regardless of which concept best corresponds to the political valuations, it must not be overlooked that index numbers are constructed by using a system of fixed price weights, and that these weights reflect the value attributed to various goods and services. If we choose the prices that have been established in the market, this means that we accept the interplay of the market forces as expressing our political valuations. There may be good reasons for doing this. But the changes in the price relations that result from economic growth lead us into a dilemma which cannot be solved by shifting the base year to which our fixed price weights refer to the end of the period under consideration. We know, for example, that in the course of economic growth labour becomes relatively more expensive, and that consequently the relative prices of labour-intensive goods and services tend to rise. Should this relative rise also be included in our concept of growth? Or should we adjust the price weights from year to year? The result would be that we get a higher rate of growth, if the relative volume of labour-intensive services is rising.

That these questions can be raised indicates the arbitrariness of index numbers and the risk of accepting them without critical evaluation as reflecting the policy concept of growth.

*Inside and outside national accounts*

So far the discussion has been kept within the field of national accounts and corresponding index numbers, where econometricians and politicians may meet on common ground. It is, however, evident that the layman politician's interest in growth extends beyond what is included in national accounts. Such estimates represent an aggregation of the goods and services which flow through the market system; usually, the goods and services that are supplied by government and financed by taxation are included in these estimates. We may, according to the conventions of national accounting, go one step farther by including a part of the auto-consumption, as in the case of the farmer who consumes part of the products of his farm instead of sending them to the market.

This extension, however, is narrowly restricted. Outside the field of national accounts extends the world of 'do-it-yourself' and leisure. If we want to approach a concept of growth that corresponds to attitudes of laymen politicians, we have to take into account the changes in this 'outside' area. We cannot assume that conventional index numbers may be taken to represent these other changes in private and social life; we cannot take a parallelism between 'inside' and 'outside' changes for granted. On the contrary, we have reasons to assume that there are diverging secular trends in the 'outside' area as a country proceeds from a low to a high stage of economic development.

In the agrarian, non-industrialized society there are large-scale activities in the form of 'do-it-yourself' and auto-consumption which are not registered as 'production' or 'consumption' in national accounts. For this reason the national product estimates cannot be used to represent standards of living or productivity. Such activities as small-scale gardening, home handcraft work, hunting and fishing for home consumption must be taken into account if we want to explain how people can keep alive in spite of an impossibly small registered national output per head. The growth of the national product of such countries mainly reflects the progress of commercialization and industrialization. The growth process largely takes the form of separately organized industry and the market taking over what earlier belonged to the 'do-it-yourself' sector. The industrialization of 'do-it-yourself' activities, as we know, does not stop even at a high stage of development. For example, prefabrication of clothes and food makes progress even in the most advanced countries.

The industrialization trend is increasingly balanced, however, by a tendency in the opposite direction. With rising standards of living follows a rising demand for more leisure which is filled with non-commercial activities. In a consumer-centred economy, this side of 'growth' attracts a growing public and private attention, and expenditure is increased for such purposes as education, cultural and artistic institutions and sports. Spending on town and country planning is partly motivated by the desire to create a milieu that enriches life outside the workshop and the office.

The input of materials and services to 'outside' activities is partly registered in national accounts and corresponding index numbers: for example, investment in schools, parks, summer-houses, current expenditure on education, raw materials for hobbies, services for amusement, &c. But most of the services provided by the capital invested in the milieu for leisure, and the 'value added' by private activities in the home, on the beach, in the exercise of athletics, in various group activities, remains 'outside' the national accounts.

This side of growth becomes more important as we approach a society that tends to be 'affluent' in goods and commercial services. It may even be said that the value of what is 'inside' the national accounts depends on the possibility of consumers in their leisure time to develop physical and psychic health, personal interests and culture. If this side of life becomes highly developed, the advent of 'affluence' may even be postponed indefinitely. For a man of highly developed personal tastes and interests, income will always fall short of his 'needs'. He will become less dependent on the pressure from his social surroundings and from commercial media; he will remain an 'economic man' with fairly fixed preferences. This view may be reflected in the political attitude to growth problems. The prevalent scale of political preferences may be characterized by a complementarity between 'outside' and 'inside' changes. The growing demand for more spending on education and town planning that has been noticed in American discussion in later years may illustrate this point.

### *Means, ends, and by-products*

The approach of the economist to the problem of growth is the classical one of using limited resources as means to an end. The preceding discussion points to the fact that, according to prevalent valuations, some of these ends may be expressed by indices derived from national accounts, while others are found outside this area. It is

also a recognized fact, however, that from a political point of view a preference exists between means, quite irrespective of the corresponding costs according to national accounts. If a market economy is regarded as an essential element of a democratic society, we may prefer competition with its wastes, even if, according to national accounting, more regulation and planning would yield a more rapid rate of growth.

The problem is further complicated by the fact that growth through industrialization has an influence on the social milieu and the pattern of life of individuals. Industrialization is accompanied by urbanization. The milieu of urban areas, and especially of large urban centres, forces the individual to accept new patterns of life, new types of housing, new types of social contact, longer distances between home, work place, shopping centres and facilities for using leisure. His cost of living rises with increasing travel and other expenses, and if we follow the national accounts this indicates growth. Such estimates, therefore, may create a false impression of progress.

The same point of view may be applied to the milieu of the workshop or the office, where people spend a large part of their lives. A rise in output, which is interpreted as a rise in productivity, may by itself mean a deterioration in the standard of living of the workers.

Inversely, these by-products of a growth process may have a feedback effect on the efficiency of production itself. The influence of the educational, sociological, psychological and health factors on the performances of labour have increasingly been emphasized and investigated. This is another reason why the growth of production, in a national account sense, cannot be isolated from other social changes.

### *The dimensions of growth*

Growth as reflected in national accounts is no doubt an important element in the development of a society. The relation between input of factors and output, as traditionally defined, is an important relation, well worth investigating. However, the economist must always be aware that he selects one aspect of the social process in order to carry through a partial analysis. His concept of growth forms an abstraction from the general process of development that the politician has to keep in mind. From the point of view of the politician the 'residual' may actually be of dominating importance.

The literature on the problems of less-developed countries shows that it is necessary to break down the conventional limits of economic analysis in order to arrive at more relevant results. The same is

certainly true of an analysis of trends in advanced societies, if we want to probe below the strictly economic surface. The result, however, is that the beauty of simplicity is lost. Growth cannot any longer be measured by one index: we have to realize that it has *many dimensions*. As a consequence, the idea of consecutive 'stages of growth', through which all countries have to pass, becomes impossible to maintain. Such a classification would be easy if growth could be measured by one parameter or if all parameters moved in a given relation to each other. If we approach the problem in a realistic way, we must accept that there are as many combinations of development in various dimensions as there are countries. A country may be 'highly' developed in one direction and 'backward' in others.

The politician may easily overlook the restrictions that the economist has imposed on his analysis. He may mix up the deliberate abstraction of the economic analysis with a selection of the most important factors in the general process of growth; he may, for example, be led to believe that a rise in the resources spent on investment in real capital is the exclusive solution of his growth problem. The trouble is that the economist can warn the politician about the limitations of his analysis, but that he—at least at the present stage of social sciences—can give him very little assistance in posing and solving the more general growth problem in a rational way. The relation between changes inside and outside the accounting system have been only partly studied. The broader growth processes are so complicated and the aspects that can be selected so numerous that only a little ground has been covered by research. Even the problems of measurement are often difficult to solve. Progress can be made only by combining the methods of economics with those of sociology, political science and psychology.

The system of preferences related to various dimensions of growth is also difficult to rationalize. The pattern of preferences may be competitive, like a choice between apples and pears. Alternatively, the various parameters of growth may—as illustrated above with reference to the problem of 'affluence'—have a complementary position in the system of values. A parallel may be drawn with the choice between various complete menus in a restaurant; it is the combination of dishes that decides the choice. This idea has determined the method of presentation that has been used in Swedish long-term planning. Experts have presented to Government and Parliament various internally consistent results which may be reached



in a future period, specifying various types of private and public investment and consumption. If it had been possible to aggregate these results into one growth parameter, the experts might have provided the answer about optimum allocation. The specified 'menus' provide politicians with a more adequate basis for their choice.

Even if the economist cannot solve the politician's problem of optimizing growth, he may assist him by analysing the logical structure of his choice. This task will be exemplified here with reference to the place of education in a process of growth.

### *Consumption and investment aspects of education*

A special characteristic of education is that it can, at the same time, be regarded as both 'consumption' and 'investment'. This distinction, however, according to the general argument in this note, is basically conventional. The investment aspect refers to the effects on the growth of 'production' as registered in national accounts, while the consumption aspects refer to all other sides of social development.

According to this distinction, the *consumption aspect* embraces the following elements:

(a) Studies may be regarded as consumption *per se*, competing with other types of current consumption.

(b) Studies provide a key to *future* consumption, among other things in the form of continued studies. This aspect assumes increasing importance with growing leisure.

(c) Education changes the nature of future work conditions, and this may be regarded as an integral part of the 'standard of living'.

The *production aspect* embraces the following elements:

(a) Education increases the efficiency of labour in the 'production process'. Corresponding to the life-span of individuals and the durability of acquired knowledge, these effects extend over decades after the school years.

(b) Education not only creates a better starting-point at the entry into production, it probably also accelerates the learning process that develops in the course of productive operations. Education also increases the capacity to absorb innovations from the environment, the result being that innovations are more easily transferred from one part to another of the productive system (e.g. between various units within agriculture).

(c) Education increases not only the efficiency of the persons to whom it is applied, but also the efficiency of those with whom they

co-operate in production. With increasing division of labour and the development of higher forms of organization, these 'external economies' assume an increasing importance. More specialized education makes possible a more advanced division of labour which increases the possibilities of exploiting the external economies of education.

The existence of such external economies creates a difference between the social and the private yield of investment in education; the social yield exceeds the remuneration of those who have received a given type of education.

(d) Education forms a starting-point for research and, in this way, promotes technical progress.

(e) There is a 'feed-back' effect of education on the efficiency of education. Technical progress generated by research and better-trained teachers gives education a new content and improves its methods.

(f) Education has an effect on both the professional and local mobility of labour, and this mobility increases the capacity of society to adjust itself to structural changes in a process of growth.

This list is not exhaustive. Education also has an effect on health, birth-rates and so forth. A primary task for social research is to investigate these various relations. Such research is evidently not so advanced that we are able to sum up the overall effects of education. For the sake of the argument, however, we shall assume that this problem has been solved; in order to arrive at a rational formulation of policy, the politician must in any case form a common-sense judgement of the order of magnitude of the various effects.

#### *A decision model for expenditure on education*

The problem of arriving at a rational decision about expenditure on education is complicated by the fact that different results can be reached within the same frame of cost. The optimization problem must therefore be solved in two stages.

*First*, we must determine how to use a given sum of expenditure as regards the school enrolment in different age-groups, the pupil-teacher ratios, the size of other cost elements per pupil, and the content of education. This choice also has an influence on the effects of education; a given change of the educational system may be advantageous from the aspect of 'consumption' but harmful from the aspect of 'production'. This 'qualitative' side of education is mainly a problem for the 'educator', but it also has its economic connotation.

If this step in the optimization process is solved, the *second* remains: to determine the allocation of resources to investment in relation to other types of consumption and investment. The problem has now been reduced to a point where the apparatus of economic analysis can be used.

Let us assume that the resources of society are fully employed, and that they can be reallocated between various uses. These resources can now be distributed between

$E$  = expenditure on education,

$C$  = „ „ other types of consumption,

$I$  = „ „ other types of investment (real capital equipment).

These types of expenditure exhaust the gross national product (GNP). Thus,

$$E + C + I = \text{GNP}. \quad (1)$$

To simplify the exposition, we shall assume that allocation decisions are made for the next period, and that the results of investment mature in a following second period.<sup>1</sup> The rate of growth of production (in the national account sense) can be expressed by a function

$$g(E, I). \quad (2)$$

The partial derivatives  $\delta g / \delta E$  and  $\delta g / \delta I$  express the dependence of the rate of growth,  $g$ , on changes in expenditure on education and other investment. These derivatives may be assumed to decline if we push expenditure beyond a certain point. If we take into account only the 'productive' effects, we should evidently increase expenditure on education at the expense of other types of investment as long as  $\delta g / \delta E > \delta g / \delta I$ . If we also take into account the consumption effects of education, it pays to go beyond the point where  $\delta g / \delta E = \delta g / \delta I$ .

In order to determine how far we should expand education at the expense of other current consumption and investment, we must evidently establish a scale of preferences that is supposed to guide economic policy. The present and durable consumption effects of education may then be represented by a number of parameters. If, however, the use of any given sum of expenditure has been determined, we may simplify by letting the consumption aspect be represented by

<sup>1</sup> In a more realistic model we would have to take into account the fact that investment in education and real capital may influence the growth of production to a different degree in the near and the more distant future. We would thus have to extend the perspective and assume that a functional relation exists between the *time-shape* of  $g$ ,  $E$ , and  $I$ . In the text we also disregard the fact that a reallocation of resources between the various sectors may affect the size of GNP in the same period.

one parameter, the sum of expenditure on education. The scale of preferences may then be represented by a target function:

$$V(E, C, g). \quad (3)$$

This target function indicates the sets of  $E$ ,  $C$  and  $g$  to which we attribute the same 'value'. It also indicates the order in which we prefer different sets. This is all that is needed in order to determine the choice of allocation policy;  $V$  may thus be regarded as a value index, without any meaning being attached to the differences in its value for different sets of  $E$ ,  $C$  and  $g$ .

By combining (1), (2) and (3) we may now formulate the condition for optimum allocation of resources to education in the following way:

$$\frac{\delta V}{\delta E} + \frac{\delta V}{\delta g} \times \frac{\delta g}{\delta E} = \frac{\delta V}{\delta C} = \frac{\delta V}{\delta g} \times \frac{\delta g}{\delta I}. \quad (4)$$

The first link in this equation indicates the 'gain' from increased expenditure on education, taking into account the direct effects on present and future 'consumption' as well as the effects on future growth of 'production'. The second link represents the 'gain' from other types of present consumption. The third link represents the 'gain' from increased investment in the form of future growth of production.

In accordance with the preceding discussion of the problem of 'affluence', we may assume that in the preference system of politicians education (taking into account its nature as a durable asset) is complementary to growth. This relation would be expressed by a tendency of  $\delta V/\delta g$  to increase with growing expenditure on optimum education,  $E$ . If this complementarity is taken into consideration, the allocation of resources will, evidently, be shifted towards higher spending on education as compared with other forms of consumption and investment.

We shall omit here other conclusions that can be drawn from this analysis. The purpose of the exposition has been to indicate how different parameters which are related to growth, conceived in a broad sense, may be included in a decision model. The parameters  $E$  and  $g$  may be replaced in principle by other parameters which reflect various sides of social and economic development. The concept of 'growth' is reflected in the target function, which indicates the changes in these parameters meaning *more or less* 'growth'. If we approach the problem in this way we would not be able to measure growth in terms of market values as is possible when we conceive this concept in the economic accounting sense; but we may approach the broader views on growth that predominate in a society where economic policy is not guided by technocratic ideas alone.