

## THE CONCEPT OF ECONOMIC GROWTH

The purpose of this paper is to clarify certain issues which are prominent in discussions of the concept of economic growth. The main thesis is that the common practice of basing the definition of growth on an omnibus and pseudo-quantitative concept of aggregate economic welfare is not only untenable but is also unnecessary. The first point is widely accepted, but its implications are repressed behind protestations of "expediency" and "best approximation". Acceptance of the second point lacks a careful exposition of an alternative, i. e., the formulation of an operational but more positive and less value-laden concept. An attempt in that direction is offered here.

### I

Quantitative analysis is widely regarded as the *sine qua non* of scientific social studies. But attempts at the precise measurement of social phenomena are almost invariably frustrated, in part by limitations on the data available, in part by the very intangibility of most social phenomena. The latter introduces an element of arbitrariness into the identification of the phenomena analyzed, and an element of subjectivity into the observations made.

Clear and unambiguous definitions are a necessary preliminary to any precise analysis. The literature of the social sciences is a testimony to the errors, unnecessary confusions, and prolonged debates which can result from ambiguity on the level of basic conceptualization. But even explicit and unambiguous definitions can give rise to methodological debates. Definitions in the social sciences are objected to on any number of grounds, ranging from the broader philosophical legitimacy of their implications to their relevance or operational meaning in some particular context. While often not pertinent such criticism cannot always be conclusively countered. Not unexpectedly, an agnostic attitude toward the merit of debates over definitions has come to prevail, culminating in the common assertion that *any* definition is acceptable providing only that it is "operational" and that it is employed consistently. This assumption

is rejected here. It is argued that the synthesis of the outstanding contributions to the theory of economic growth and hence the resolution of the interminable debate over the appropriate approach to the analysis of the growth phenomenon, is impeded by the lack of a careful and intelligible analysis of the relationships between human behavior in a social context and the process of growth. Such analysis in turn is impeded by the lack of a careful formulation of the concept of economic growth which makes it amenable to analysis from this point of view. It is hoped that the present discussion will help to bridge this gap by setting the concept in a context which does emphasize the connection between behavior and this "economic" phenomenon.

This diagnosis of the ills of growth economics is somewhat difficult to defend. It is essentially an impression derived from considering the conflicting analyses of the problem of artificially stimulating economic growth in the so-called underdeveloped areas of the world. Various eminent authorities argue that for this purpose the analytical categories and the substantive propositions of "traditional" economic theory provide uncertain guides to policy makers and hence make but a minimal (if positive) contribution to the formulation of development policies. Such a statement is subject to various interpretations. At issue is the adequacy of some not too clearly identified body of theory in the context of some not too clearly defined problem. However, there seems to be agreement that the source of the inadequacy of "traditional" economic theory is its failure to give explicit consideration to the dynamics of human behavior, particularly the significance of differences in traditions, personalities, learning aptitudes, and motivations as these manifest themselves in observable differences in economic behavior and economic performance (even in the context of superficially similar "institutional arrangements"). Neglect of the motivational content of economic behavior is alleged to involve a systematic neglect (or grossly simplified analysis) of the processes by which motivations and behavior patterns change or are changed. Thus, it is argued, *the* fundamental problem of economic development is largely ignored. Existing economic processes in underdeveloped areas are, furthermore, allegedly misinterpreted. They are viewed as though they were either direct extensions or substantive counterparts of

“western” behavior patterns and “western” economic institutions. For this reason, such analysis as is carried out on the behavioral and motivational levels is said to suffer from a narrow cultural relativity.

It is not clear whether this general argument is to be interpreted as implying that economic development poses a new range of problems, essentially “non-economic” in character, which economic analysis “properly defined” is inherently unsuited to deal with, or whether it is an economic process, and hence proper subject matter for economic analysis, but that “traditional” economic theory must be much modified and generalized to take account of the different behavior patterns if it is to be adapted for this purpose. The two interpretations reflect different degrees of agnosticism toward received economic theory. While the differences between these two interpretations may be more apparent than real, contrasting them in this way makes it apparent that a number of different issues are actually involved. At a minimum, the complex argument raises questions concerning the nature of the phenomenon being studied, the nature of economic theory, and hence the adequacy of existing theoretical propositions in the context of the problem being studied. Current generalized discussions of economic development are marred by considerable ambiguity concerning each of these issues as well as confusions resulting from a failure to distinguish among them.

The subject matter of the present paper is relevant to the first of these issues, the nature of the phenomenon being studied. Comments on the other issues are made incidentally and mainly by way of indicating the further implications of the conclusions of the paper. The concept of economic development is not considered explicitly. Rather, the discussion is confined to the concept of economic growth. It is frequently argued that these are one and the same concept. One conclusion of the present analysis is that they represent different *types* of concepts. The one, economic growth, has essentially objective content. It relates to phenomena which can be defined and identified in terms of potentially measurable criteria. The other, economic development, has essentially subjective content. It implies an appraisal of economic performance in terms of criteria which reflect personal and social values. While it is possible to define uniquely the concept of economic growth, there can coexist simul-

taneously many definitions of economic development, among which it is not possible to choose without prior selection of a system of values. However, the present discussion does have relevance to the so-called problem of economic development. It is apparent that at the core of all of the concrete proposals for the acceleration of economic development however that may be defined are measures designed to accelerate what we will define as economic growth. This emphasis on the growth phenomenon *per se* implies that at least in the first instance the economist approaches the problem of economic development within the context of a theory of economic growth.

The assumption that there is a uniquely correct or at least a uniquely appropriate definition of economic growth, openly invites a very fundamental type of criticism. Economists and other social scientists jealously guard their right to define concepts as they see fit. Like lexicographers they argue that the meanings of words must be essentially flexible, changing and developing with usage and with the dictates of the problem being studied. While such an operationalist position is attractive because of the emphasis it places on flexibility in research, pushed to the extreme it invites intellectual anarchy. It provides no guide to the delimitation of the various phenomena to be studied in our attempts to develop an integrated body of explanatory theory, nor does it assist in solving the already imposing problem of interpersonal and inter-disciplinary communication. The development of a general theory of economic growth presupposes the existence of some discernible "real" phenomenon or process which we can agree unambiguously to call economic growth. Thus, it presupposes agreement on a "uniquely correct" definition of economic growth. If several inconsistent or overlapping definitions are regarded as equally admissible this must signify the existence of several different (although perhaps related) phenomena, each deserving separate (or joint) study, and each, perhaps, an appropriate subject for theory. In the interests of clarity, however, each should be distinguished by a different label.

## II

Many discussions of the concept of economic growth contain a latent or expressed feeling that in some pure sense the concept of growth

belongs to the vocabulary of the biological sciences<sup>1</sup>. If true, this would suggest that it is used in economics by analogy—a result of considering economic units conceptually as if they were growing vital organisms. Many examples of similar analogies are to be found in the literature of the social sciences. The importance of Social Darwinism in the general development of social theory, and, more directly, the impact of evolutionary concepts on the so-called wholistic critics of traditional economic theory are well known<sup>2</sup>. That similar ideas had an influence on economists more clearly in the mainstream of the development of economic theory is also apparent. How else can one explain the organic overtones of certain passages in the classics of economic theory? For example, we have the explicit statement of ALFRED MARSHALL that:

“Progress” or “evolution”, industrial or social, is not mere increase or decrease. It is organic growth chastened and confined and occasionally reversed by the decay of innumerable factors, each of which influences and is influenced by those around it; and every such mutual influence varies with the stages which the respective factors have already reached in their growth<sup>3</sup>.

Generalizations relating to organicism are hazardous in light of the variety of senses in which the term is employed. Uses of organic-type concepts range from very literal and rigid organic interpretations of society to very superficial almost off-hand analogies with no real content or analytical purpose. It is perhaps the literal organic interpretation which is most at issue: that is, an interpretation which pictures society as a functionally integrated complex entity, in which the strict logic of the organism imposes a discipline on the individual component units (individual = cells), subjecting them to

1. KUZNETS, for example, is on record as having said: “Growth is a concept whose proper domicile is the study of organic units, and the use of the concept in economics is an example of that prevalent employment of analogy...” “Measurement of Economic Growth”, *Tasks of Economic History*, Supplement to the *Journal of Economic History*, VII (1947), pp. 10-34.

2. See, for example, R. HOFSTADER, *Social Darwinism in American Thought* (revised edition; Boston, The Beacon Press, 1955); D. HAMILTON, *Newtonian Classicism and Darwinian Institutionalism* (University of New Mexico Publications in Economics, No. 1; Albuquerque, The University of New Mexico Press, 1953).

3. A. MARSHALL, “Mechanical and Biological Analogies in Economics”, *Memorials of Alfred Marshall*, A. C. Pigou, ed. (New York: Kelley and Millman, 1956), p. 317.

control by the whole but denying them any measure of control over the whole. Such an approach has commonly been associated with a philosophy of social determinism and an attitude of virtual fatalism in human affairs which is largely out of harmony with the melioristic ambitions of the majority of contemporary economists. For this reason, rigid organicism has become philosophically unacceptable to most economists. More significantly, the observable variety and flexibility of economic and social structures, the capacity for disorganization and reorganization which appears to be latent in any social organization, and the many examples of at least partially successful attempts to consciously intervene in and mould the functioning of the economy, seem to provide an *a priori* basis for rejecting at least the most rigid organic interpretation. The usefulness of such an approach to economic and social analysis has been significantly questioned in terms of its broad methodological implications<sup>4</sup> and its possible specific applications<sup>5</sup>.

When the concept of growth is used in an organic context it has reference to physical changes in living organisms which exist as "natural units", i.e., as "...fixed complexes which ordinary experience shows us belong together"<sup>6</sup>. They can be recognized as physical objects possessing mass and describable in terms of measurable dimensions. Organisms can ordinarily be classified into more or less homogeneous groups on the basis of clusters of characteristics. For the members of any group the pattern of physical change which accompanies the growth process, while different in detail as external and internal conditions provide a more or less favorable environment, will be essentially similar in broad contours. Thus, in a general sense, there is much repetitiveness in the pattern of change, making it possible to abstract out of the life histories of a group of related organisms a typical life cycle and growth pattern. Such repetitiveness makes growth, its pattern and pace, statistically predictable. It makes it possible to analyze the growth process into a sequence of

4. Cf. F.A. HAYEK, "Scientism and the Study of Society", *Economica*, New Series, Vol. ix (August 1942), pp. 267-291; Vol. x (February 1943), pp. 34-53; Vol. xi (February 1944), pp. 27-39.

5. Cf. E.T. PENROSE, "Biological Analogies and the Theory of the Firm", *American Economic Review*, Vol. XLII (December 1952), pp. 804-819.

6. HAYEK, *op. cit.*, part III, p. 28.

stages of development and maturity, each stage having certain rather well defined characteristics. Growth in an organism, then, is associated with development into some "mature" form.

The much quoted authority, W. D'ARCY THOMPSON, observes that even in biology, "growth is a somewhat vague word for a very complex matter"<sup>7</sup>. It has been defined "in a strict sense" as "an increase in the amount of the organism's living matter or protoplasm"<sup>8</sup>. Physical expansion is common, but perhaps not essential. BOULDING's example of the butterfly may be a case in point. He notes:

... the growth of the butterfly out of the chrysalis involves an actual decline in overall dimensions such as weight or volume, but certainly seems to come under the general phenomenon of growth or development<sup>9</sup>.

Where physical expansion occurs, however, it is invariably accompanied by structural changes: changes in the form of the organism as defined by its relative magnitude in various directions. According to D'ARCY THOMPSON, at any moment in time an organism, in its physical attributes, can be described by a diagram of forces. The balance of forces accounts for the observed structure. From a static point of view, the structure itself appears to be a mechanism, a device which "checks and controls, and guides into determinate paths the workings of energy (Newtonian forces)<sup>10</sup>". However, it is a mechanism which in itself is subject to systematic change as a result of the dynamics of the development and interaction of those

7. W. D'ARCY THOMPSON, *On Growth and Form* (Second edition; Cambridge, The University Press, 1942), p. 15.

8. "...but it is often associated, as in a cucumber, with great accumulation of water, or, as in the case of bone, with the formation of much in the way of non-living walls around the living cells..." J. ARTHUR THOMPSON and PATRICK GEDDES, *Life: Outlines of Biology* (New York, Harper Bros., 1931) as cited in Harlow Shapely, Samuel Rapport and Helen Wright, ed., *A Treasury of Science* (fourth edition; New York; Harper and Brothers, 1958), p. 285.

9. K. E. BOULDING, "Toward a General Theory of Growth", *Canadian Journal of Economics and Political Science*, Vol. xxxi (August 1953), p. 326. In this context, however, a distinction might be made between growth, "an increase in the amount of the organism's living matter", and development, "the formation of new and complex structures out of the undifferentiated and apparently simple". Cf. THOMPSON and GEDDES, *op. cit.*, pp. 285, 289.

10. THOMPSON, *op. cit.*, p. 291.

forces. The resulting changes in structure are the physical manifestations of the growth process.

The nature of the growth generating forces is difficult to specify. They are clearly an aspect of the process of metabolism of proteins which is invariably associated with life. Thus, they involve the ingestion of food material, salts and water, and a "process of diffusion and chemical activity within the cell" leading normally to a chemical transformation of the material into protoplasm. A situation in which there is an excess of "food-income" over the "everyday expenses of living" results in an accumulation of protoplasm and hence growth as defined. Organic growth, then, would seem to have a chemical aspect and physical manifestations. However, THOMPSON and GEDDES note that "the *power of growth* must be taken as a fundamental characteristic of organisms, for it cannot as yet be described in chemical and physical terms"<sup>11</sup>.

A literal organic growth analogy in economics presupposes the possibility of identifying economic units which correspond to the "natural units" of biological analysis—economic "organisms" or "super-organisms" which possess distinct and observable dimensions statistically predictable lifecycles, and the "power to grow". Clearly, social and economic units can at best only be ascribed as nominal existence. Patterns of organization, subunits, and "boundaries" can be identified and described, but only on the basis of observed regularities in human behavior. Social units have no independent existence. The nature of the "power to grow" in either case is not clear. However, it is difficult to argue, on the basis of available information, that social units (even if they are identifiable) have determinate natural life-cycles which are essentially repetitive and hence predictable. Such an hypothesis requires a level of abstraction and an historical perspective which render empirical testing on the basis of documented history of mankind almost impossible<sup>12</sup>. For this reason, the organic growth analogy can be said to involve an interesting but incompletely formulated and probably unusable hypothesis.

11. THOMPSON and GEDDES, *op. cit.*, p. 284.

12. Cf. J. J. SPENGLER, "Theories of Socio-Economic Growth", Universities-National Bureau Committee, *Problems in the Study of Economic Growth*, S. Kuznets, ed. (New York, National Bureau of Economic Research, 1959), pp. 97-101.



Indeed to pursue an organic analogy as the basis for interpreting the processes by which economic and social units change over time, one would have to go beyond the conception of growth *per se*. It would be necessary to develop analogues to the biological concepts of mutation and selective evolution, introducing the notions of successive generations, of reproduction and of the impact of environmental factors on the inheritance and modification of traits (including the possible influences of experimentation and controlled by hybridization). With this elaboration of concepts the organic analogy loses its simplicity and hence most of its attractiveness. If the assumption of a statistically predictable life-cycle could be defended then growth analysis could be reduced to an analysis of the timing and pattern of structural changes and physical expansion, with due consideration given to the influence of alternative environmental conditions. However, if the possibility of yet unforeseen changes in these patterns is admitted, and the possibility of experimentation to achieve desirable "mutations" and "hybridizations" is allowed for, such a simple reduction is not possible. The deeper roots of the processes of economic and social change must be probed independently of biological studies. A mystical "power to grow" cannot be assumed *a priori*: the processes of economic and social change must be decomposed into their elements. For this purpose, a literal organic analogy seems to serve no useful purpose.

This interpretation of the organic growth analogy can perhaps be criticized as unrepresentative. A part of the apparent intractability of organicism in methodological debates probably derives from its essentially chameleonic character. The meaning of the term continually changes, often without warning. Thus, it might be argued that it is possible to have an "organic point of view" without subscribing to the organic growth analogy as outlined above. What this seems to imply is an opinion that research should be organized around an image of the economic unit in question as an integrated entity composed in a more or less complex fashion of various functionally distinct sub-units. This leads to a definition of growth based on the physical expansion of the larger entity, and the analysis of the functional significance of the various sub-units, the structural relationships among these sub-units, and the structural changes associated with growth. However, there is no formal organicism: no

resort to deterministic causal hypotheses. Any apparent organic analogy is completely superficial, a reflection of the emphasis on the analysis of the expansion of the whole and the internal structural and functional relationships in the expansion process. This is a possibility worthy of further consideration. While not carefully articulated, it can be argued that such a view is implicit in many contemporary analyses of economic growth.

### III

The term growth generally carries a connotation of quantitative increase. Perhaps the most explicit statements that this connotation should be critical in interpreting the concept of economic growth are to be found in the writings of Professor KUZNETS. He argues rather forcefully that "...economic growth is essentially a quantitative concept"<sup>13</sup>, and hence if we are to make substantial progress in the empirical and theoretical analysis of the growth phenomenon, "...we must consider the quantitative aspect as basic"<sup>14</sup>. This point is generally accepted. However, there remains widespread disagreement as to the magnitude which is in fact the relevant measure of growth. Indeed, about the only unifying element in the various "quantitative" definitions of economic growth is agreement that what ideally should be measured is the contribution of economic activity to the achievement of higher states of human welfare. In defining economic growth in this sense, it is argued that economic activity is purposive activity—that economic activity can only be identified and its results measured if there is a prior identification of the underlying purpose of that activity. It is admitted that the concept of purpose is somewhat vague, that a single purpose cannot be objectively established but must be imputed, that empirical verification of any imputed purpose is impossible, and that by consequence any of a variety of purposes might be imputed with equal

13. S. KUZNETS, "Toward a Theory of Economic Growth", *National Policy for Economic Welfare at Home and Abroad*, R. Lekachman, ed. (Garden City, Doubleday and Co., 1955), p. 16.

14. S. KUZNETS, "Suggestions for an Inquiry into the Economic Growth of Nations", *Problems in the Study of Economic Growth*, p. 6.

scientific impunity. However, it is argued that the imputed purpose with the broadest applicability in terms of the long-run ambitions of most people, and the one most commonly assumed in economic analysis, is the satisfaction of the felt-wants of the individual members of society. While the link between output and want satisfaction may be tenuous:

...many practical and important purposes are served by regarding... the flows of the satisfaction yielding commodities and services... (as)... the true objectives counterpart of the subjective state described as welfare. Indeed, the world proceeds very much on the assumption that the flow of goods is an accurate indicator of economic welfare<sup>15</sup>.

Given a broad aggregate welfare concept of economic growth, the measurement of growth and hence the operating definition of growth must involve the evaluation of economic activity in terms of its contributions to the flow of welfare generating want-satisfactions. However, the nature of the link between observable economic activity and economic welfare so defined has not been empirically demonstrated. Any imputed linkage must rest on assumption, and alternative assumptions give rise to alternative operating definitions of economic growth. It is interesting, in light of the firm rooting of modern growth economics in quantitative methodology, that all of the accepted operating definitions of economic growth rest on proposition which cannot be (or at least have not been) subjected to the crucial and convincing quantitative test. The result is a variety of accepted measures.

Among these measures the one most widely employed is per capita national income. It is argued that given inter-temporal constancy in the basic wants of human beings, an increase in per capita income provides a relatively unambiguous indicator of an improvement in economic welfare. In general, changes in the inter-personal distribution of income are neglected. In part, this reflects a feeling that changes in income distribution cannot be relied upon to bring

15. I.B. KRAVIS, "The Scope of Economic Activity in International Income Comparisons", *Problems in the International Comparison of Economic Accounts*, Conference on Research in Income and Wealth, Studies in Income and Wealth, Vol. xx (New York, National Bureau of Economic Research, 1957), p. 350.

about major changes in aggregate welfare in the long-run<sup>16</sup>. In part it may also reflect the interpretation of increases in per capita national income as indicative of increases in potential as opposed to realized economic welfare<sup>17</sup>, and hence an implicit modification of the basis concept of economic growth.

Dissent from this criterion has taken various forms. In some cases its logical and ethical foundations have been questioned. Important debates have occurred over the welfare interpretations which can be placed on statistics of changes in aggregate income, computed from market data, using various systems of price weights. Even under ideal circumstance, doubt is cast on the possibility of unambiguous statements<sup>18</sup>. These issues aside, a problem arises in employing the per capita income criterion in a situation in which the size of the population is changing. Accepting the basic welfare orientation, and making the necessary assumption that all human beings are "basically" alike<sup>19</sup>, one can still ask which situation represents a higher level of welfare: one in which a given population receives a larger per capita income or one in which a larger population receives a constant per capita income<sup>20</sup>.

Allowing for opposite changes in per capita "satisfaction" and the number of persons to be satisfied, it may be necessary (following this approach) to define a broader social welfare function which includes both as variables. This poses a very knotty problem for empirical economics. No method of quantifying such a function has yet been demonstrated which is both feasible and defensible.

It is perhaps in implicit recognition of this dilemma that KUZNETS, in one of his many contributions, has suggested a two-pronged definition of growth:

16. In this connection HLA MYINT's interpretation of the classical view of the welfare problem is interesting. Cf. HLA MYINT, *Theories of Welfare Economics* (Cambridge Harvard University Press, 1948).

17. Cf. J.R. HICKS, "On the Valuation of Social Income", *Economica*, vii (New Series), May 1940, pp. 105-124; P.A. SAMUELSON, "Evaluation of Real National Income", *Oxford Economic Papers*, ii (New Series), January 1950, pp. 1-29.

18. See below, pp. 69-74.

19. S. KUZNETS, "National Income and Economic Welfare", *Economic Change* (New York, W.W. Norton, 1953), p. 204.

20. N.S. BUCHANAN and H. ELLIS, *Approaches to Economic Development* (New York, Twentieth Century Fund, 1955), p. 22.

For purposes of measurement, economic growth of a nation may be defined as a sustained increase in its population *and* product per capita<sup>21</sup>.

This is not simply an alternative to an increase in aggregate output as the criterion of growth. Total output might increase with no change in population. While the rationale for the two-pronged criterion is not made obvious, KUZNETS does argue that "...a definition of economic growth must reflect common experience", and common experience is that a sustained increase in per capita product combined with secular stagnation or decline in population "rarely" occurs<sup>22</sup>. If theory is to provide a basis for prediction and control, it is necessary to sharply distinguish what are effectively separate phenomena, in order to identify the nature of possible causal relationships among them. Many would argue that KUZNETS is effectively combining possible causes with possible effects. Further more, it is difficult to see how this definition facilitates measurement. Unless it can be demonstrated that the two components bear a rigid relationship to one another, a weighting system has to be devised to combine the components into a single aggregate or else the concept of a rate of growth becomes meaningless. Thus, given the general welfare approach, this raises again the problem of defining a more comprehensive social welfare function. While there can be no doubt that KUZNETS interprets the increase in per capita product as indicative of an increase in economic welfare, it is not clear from his writings that he places the same interpretation on the increase in population. By abandoning the relatively simpler per capita income index, KUZNETS, in this instance, renders the growth concept more ambiguous.

Other definitions have been advanced which appear to reject the welfare measure in favor of a "productivity" measure as the criterion of growth. For example, COLIN CLARK has suggested that "the primary measure of economic growth must be real income obtained per hour worked"<sup>23</sup>. It can be argued that a productivity definition

21. S. KUZNETS, "Toward a Theory of Economic Growth", *National Policy for Economic Welfare at Home and Abroad*, R. Lekachman, ed. (Garden City, Doubleday and Co., 1955), p. 16 (*Italics added*).

22. *Ibid.*, p. 99.

23. C. CLARK, "Theory of Economic Growth", *Proceedings of the International Statistical Conferences* (Washington, D.C., Econometric Society, 1947), Vol. v, p. 112.

in this sense is actually derived from a welfare definition inasmuch as some notion of welfare or purpose is necessary to the definition of end product. It is clear from his other works that CLARK does not intend to deny such a welfare connection<sup>24</sup>.

Still other important exceptions to the per capita income criterion can also be noted. Reference has been made to various special indicators of changes in welfare<sup>25</sup>. Objection has also been raised to any general neglect of changes in income distribution, and particularly failure to put explicit emphasis on the reduction of "crushing" mass poverty in the process of rising *average* levels of income<sup>26</sup>. These all involve the use of alternate or supplementary indicators of success in achieving broad welfare purposes. Thus, they represent no real exception to the general welfare orientation of the growth concept. It is this orientation which is of particular interest here. While occasional exceptions are to be noted, a welfare orientation is typical of the economists' approach to the definition and measurement of growth.

#### IV

The particular welfare concept involved in defining the concept of economic growth reflects the impact of the utilitarian philosophical tradition on the development of economic theory. Absolute good is attributed to the individual, his freedom of choice and his wishes or desires. While this is the formula for classical political liberalism, by formalizing individual choices into a conceptual framework of maximizing utility, it also provides the formula for a variety of central planning. If utility can be conceptually identified and an index to its maximization defined, and if the maximization of utility is prescribed as the ultimate objective of economic policy, it would follow that normative judgments could be made on a level of pure objectivity. HICKS makes this explicit:

24. See the introduction to *Conditions of Economic Progress* (Second edition; London, Macmillan and Co., Ltd., 1951).

25. Cf. N.S. BUCHANAN and H.S. ELLIS, *Approaches to Economic Development* (New York, The Twentieth Century Fund, 1955), p. 7.

26. Cf. J. VINER, *International Trade and Economic Development* (Glencoe, Illinois, The Free Press, 1952), pp. 126-128.

If the general aim of the economic system is the satisfaction of consumers' wants, and if the satisfaction of individual wants is to conceive of as a maximizing of Utility, cannot the aim of the system be itself conceived of as a maximizing of Utility, Universal Utility as EDGEWORTH called it? If this could be done, and some measure of universal utility could be found, the economists' function could be widened out, from the understanding of cause and effect to the judgment of the effects—whether from the point of view of want satisfaction they are to be judged as successful or unsuccessful, good or bad<sup>27</sup>.

The aggregate welfare definition of economic growth derives directly from something approximating this concept of "Universal Utility". Aggregate welfare is defined as a quantitative concept; as a phenomenon which "...can be brought under the category of greater or less"<sup>28</sup>. The quantity which changes in the process of growth is precisely this quantity of aggregate economic welfare. Therefore the measurement of economic growth involves the measurement of changes in aggregate economic welfare. This is taken to mean a quantification of the neo-classical concept of real income. The flow of goods and services—the concrete results of economic activity—are significant only as the physical counterparts of psychic want-satisfactions. An assumption must be made concerning the relationship between the quantity of each good or service and the resulting flow of want satisfactions, and, for purposes of aggregation, the goods must be assigned relative weights on this basis. In national income accounting it is usually assumed that relative market prices provide a set of weights suitable for this purpose.

Severe conceptual problems arise in attempting to justify this accounting procedure. If economic growth is to be defined as a realized increase in economic welfare, it is necessary to demonstrate that the resulting statistics are an un-ambiguous indicator of increases in economic welfare. Rejecting JEVONS' hypothesis that it is possible to devise (intuitively or otherwise) an independent measure of the welfare content of a given set of goods, the problem resolves into demonstrating that the required inferences can be made from observed behavior, and particularly from recorded quantities purchased and prices paid at various points in time.

27. J. R. HICKS, *A Revision of Demand Theory* (Oxford, Clarendon Press, 1956), p. 6.

28. A. C. PIGOU, *The Economics of Welfare* (London, Macmillan and Co., Ltd., 1920), p. 10.

Much has been written on the welfare interpretation of price-quantity data<sup>29</sup>. In the case of a single individual (if it is possible to assume that his preferences do not change and that they can be represented by a set of well-behaved indifference surfaces), reasonably unambiguous conclusions relating to levels of welfare can be made from observed price-quantity data, if actual choices have been made<sup>30</sup>. However, these conclusions are not very interesting. This case represents a special limiting case of the more general multi-individual case. In the general case, the inferior and superior situations cannot be as unambiguously identified from price-quantity data, even assuming constant preference maps, well-behaved indifference functions, equilibrium prices and quantities and perfect markets<sup>31</sup>. Unless every individual prefers a particular situation to an earlier one, the problem of inter-personal comparisons arises. The obvious solution—a more generalized social welfare function which permits the netting of gains vs. losses—is a victim of self-denial. The impossibility of quantifying such a function is at the root of the agnosticism which has forced these intellectual exercises with the objective price-quantity data. Nor does the introduction of the possibility of compensation solve the problem. This would define an increase in social income as occurring whenever there is *some* inter-personal distribution of the goods and services produced in a given year which would put every member of the group in a preferred position relative to his actual real income in the earlier period<sup>32</sup>. In other words, there has occurred a potential but not necessarily realized increase in the welfare of every individual,

29. Cf. J. R. HICKS, "On the Valuation of Social Income", *Economica*, vii (New Series), May 1940, pp. 105-124; S. KUZNETS, "On the Valuation of Social Income—Reflections on Professor Hicks' Article", *Economica*, xv (New Series), February 1948, pp. 1-16, May 1948, pp. 116-131; P. A. SAMUELSON, "Evaluation of Real National Income", *Oxford Economic Papers*, ii (New Series), January 1950, pp. 1-29; T. SCITOVSKY, *Welfare and Competition* (Chicago, Richard D. Irwin, Inc., 1951), pp. 70-82; M. ABRAMOVITZ, "The Welfare Interpretation of Secular Trends in National Income and Product", *The Allocation of Economic Resources*, M. Abramovitz, ed. (Stanford, Stanford University Press, 1959), pp. 1-22. Further references are to be found in these works.

30. Cf. J. R. HICKS, *op. cit.*, pp. 108-110.

31. Cf. P. A. SAMUELSON, *loc. cit.*,

32. Cf. J. R. HICKS, *op. cit.*, p. 111.



as measured from the actual size and distribution of income in the base period. It has been demonstrated that cases can be imagined in which actual price-quantity data would not permit an unambiguous statement on this definition<sup>33</sup>. Furthermore, it has been demonstrated that the possibility of the existence of some distribution of income in the later period which is potentially superior to that distribution actually existing in the base period is not inconsistent with the existence of some distribution of the income of the base period which is superior to some distribution of income in the later period<sup>34</sup>. In other words, it is possible that no unambiguous statement can be made regarding the relative superiority of potential welfare in the later period relative to the potential welfare of the base period, because in SAMUELSON's terms, the "utility possibility functions" of one situation may not lie uniformly within that for the other situation. And, what is more important at the moment, it is impossible to tell from market data relating of the actual price and quantities produced if the utility function does behave as required for an unambiguous definition of increase in aggregate welfare.

Theoretical models of the type involved in these discussions of the welfare interpretation of price-quantity data are best interpreted as attempts to specify the conditions necessary for a particular interpretation of the data to be valid<sup>35</sup>. For this reason they are fundamentally different from those involved in what has come to be called positive economics. Having determined what the necessary conditions are, it becomes pertinent to ask whether it can be reasonably assumed that they are or can be in fact realized. In this type of analysis a questioning of assumptions is not only legitimate but necessary.

Various aspects of the assumptions necessary to establish the welfare interpretation are of significance. HICKS has noted that "...comparisons of economic welfare must proceed under the hypothesis of constant wants. It is only under this hypothesis that quantitative comparisons are possible"<sup>36</sup>. Such an assumption has never been

33. Cf. J. R. HICKS, *loc. cit.*; S. KUZNETS, *loc. cit.*

34. Cf. P. A. SAMUELSON, *loc. cit.*

35. Cf. N. KALDOR, "A Classificatory Note on the Determinateness of Equilibrium", *Review of Economic Studies*, 1 (1933/34), pp. 126-129.

36. HICKS, *op. cit.*, p. 107.

empirically demonstrated to be valid. Intuition, buttressed by casual observation, suggests that individuals' wants do change over time, and in a dramatic fashion. It is difficult to defend the assumption that observed changes in consumption patterns simply reflect the reorganization of expenditures in the face of changed production possibilities given constant indifference maps. This is true even if we were willing to accept the dubious convention of assuming that "new" products are not really new—that a preference order for them existed prior to their introduction into the market, but that the price at which they could have been produced was previously too high to permit them to be purchased. Furthermore, it is difficult to know what interpretation is to be placed on the concept of constant wants in the context of maturing individuals, growing and changing populations, and changing cultural patterns.

KUZNETS has offered a somewhat weaker interpretation of the concept of constant wants than that provided by the usual indifference curve analysis. He argues that:

... the wants of men are sufficiently identical over time and similar in space to assume that they all want food, shelter, clothing, transportation, amusement, intellectual fare, and the like; that the specific forms which these wants take differ from time to time and place to place with the technology and complexity of production and social organization, but nevertheless there is essential parallelism residing in the identity of man as a member of the species *homo sapiens*<sup>37</sup>.

The empirical basis for such an assertion is equally dubious. Furthermore, even if it were acceptable as a weak generalization, this would not be sufficient for the definition of an explicit index of improvements in economic welfare.

Other aspects of the assumptions are also open to criticism in terms of their realism. A necessary assumption for the use of price weights in aggregation is that the prices are determined on perfect markets in which the various commodities are effectively choice alternatives to a given body of consumers. If the prices are actually arrived at on different markets, it is difficult to attribute the same significance to them. This problem is alleged to have minor signi-

37. S. KUZNETS, "National Income and Economic Welfare", p. 204. KUZNETS also observes that "This assumption is basic to any concept of economic welfare or progress, or for that matter of any welfare or progress. Unless we are willing to grant this essential identity of man, no comparisons are possible, no results that would relate to comparable identities".

ficance for non-market activities which surround a market economy: prices can be imputed from analogous market activities on the assumption that the market and non-market activities are effective alternatives. However, much output is not directly purchased by consumers, although it may be argued that it indirectly satisfies some consumer want. This is true of goods purchased by governmental bodies. We have no assurance that the prices paid by administrators or imputed by statisticians correspond even closely to those which would have resulted had the consumer the possibility of choice. The argument that these prices reflect rational social choices and in fact correspond rather closely to marginal social rates of substitution which may deviate from marginal private rates of substitution, is far from convincing. It has the appearances of a convenient rationalization.

The problem of accounting for private investment is somewhat the same as the problem of accounting for government purchases of goods and services. However, there is an additional complication is that not only do consumers not make the effective choices that establish market valuations, but also the goods are not destined for the immediate satisfaction of consumer wants. This, of course, was precisely the point being made by IRVING FISHER in his discussion of the income concept<sup>38</sup>. FISHER's solution was to limit the income concept (as a utilitarian welfare concept) to current consumption. KUZNET's solution is to treat as income present contributions to the satisfaction of consumer wants in the future. However, this also involves an assumption of doubtful validity: that the current market price (cost) of investment goods represents an accurate discounting of future consumer satisfactions. Alternatively, it might be assumed that there is some form of want-satisfaction derived now from investment, e.g. satisfaction concerning the provision of well-being for future generations (and perhaps ourselves in the future). However, the analysis still runs afoul of the lack of effective consumer choice with respect to investments. Given effective choice, a different combination of outputs would probably result, indicating that the existing prices do not accurately reflect the underlying preference rates of substitution for the quantities and items produced.

38. I. FISHER, *The Theory of Interest* (New York, Macmillan and Co., 1930), pp. 3-35; *The Nature of Capital and Income* (New York, Macmillan and Co., 1930).

The welfare interpretation of the price-quantity data assumes that the observed prices are equilibrium prices. This assumption is also of dubious acceptability. The recorded prices are averages of changing prices over a finite period of time. They reflect market situations in various stages of adjustment to competitive and non-competitive equilibria. In addition, of course, the statistics available are often estimates rather than measurements. The coverage is incomplete; the data imperfect. This is one of the familiar facts of life with which the economist unfortunately has to live. These problems of statistical practicability aside, a theoretical problem of coverage still exists. A decision must be made as to what constitutes "product" for purposes of analysis. Aside from the (partial) neglect of services which are not customarily a matter of market exchange and price making, problems are posed by sources of satisfactions which are truly free goods in one or both of the periods, and by new goods which are introduced either in addition to or in place of goods existing in the first period. Free goods are typically excluded from the aggregates on the grounds that changes in the quantity purchased (given constant wants) will not occur at a zero price, hence changes in the quantity available to be consumed will not affect welfare (as long as the price remains zero). The limitations of this assumption when the free status of a good changes is obvious<sup>39</sup>.

## V

The difficulties involved in defining an index of changes in aggregate economic welfare on the basis of an individualistic ethic are but symptomatic of the underlying problem. In identifying economic growth as a subject suitable for scientific analysis, we implicitly assume that economic growth is an empirically observable property of observable economic units. In further specifying that economic growth has primarily quantitative manifestations we assume that it is a phenomenon which can be measured. In this sense it is an objec-

39. The appropriate treatment of leisure in an aggregate welfare analysis also poses interesting problems. Cf. S. KUZNETS, "Long-Term Changes in the National Income of the United States of America Since 1870", *Income and Wealth*, Series II (London, Bowes and Bowes, 1952, for the International Association for Research in Income and Wealth), pp. 63-69.

tive process. However, it also has subjective dimensions. That is, inasmuch as growth involves changes in social relationships and in the complex situations of individuals in the society, it will be the object of affective evaluations—it will be judged as “good” or “bad”, as “desirable” or “undesirable”.

Such judgments will normally vary widely from person to person. Each affected individual can be expected to evaluate the changes on the basis of how he is affected, how cognizent he is of the effects on him and of the broader ramifications of the process, how he interprets the significance of these broader ramifications, and hence the weight he gives to the opinions of others (including the economists) and the value system which he employs to evaluate the personal and social consequences which he observes or expects. In addition, apparently disinterested (in the sense of immediately unaffected) persons may provide evaluations of the process based on various criteria which they feel reflect desirable and undesirable situations, i.e., notions as to what is “good for” the economy or the people. There is no reason to expect that the judgments of the disinterested parties will be any more unanimous than those of the directly interested parties. They will reflect divergent concepts of what the objectives of economic activity ought to be. These may range from essentially spiritual notions such as the attainment of the “good life”, to quasi-quantitative criteria such as a given size or distribution of national income.

Such judgments, whether made by interested or disinterested parties, involve a different order of analysis than the discovery, description, and measurement of growth. If economic growth is a real property of real economic units, there would seem to exist a “correct” or “objective” measurement of growth in any particular instance. The same cannot be said of the appraisal of the observed growth. It can be *simultaneously* characterized as “good” and “bad”, depending on the evaluative criteria employed, and on the observer; and without prior reference to some complex, and equally subjective ethical system, there is no *priori* reason for preferring one judgment over another. For this reason, we much consider observation and measurement as conceptually distinct from, and, if policy formation is to be “rational”, logically prior to appraisal.

To imply any welfare criterion as the basis for the definition of

economic growth is to deny the significance of any such distinction. Welfare *is* an evaluative concept. It implies a judgment as to location along a better-worse continuum. It can be debated whether this continuum must be regarded as dependent on the observer and his values, and hence is relative to time and place, or whether there exists in some sense a universally applicable, timeless (i.e., “objective”) scale. While contemporary welfare theory would seem to suggest the former, the writings of the aggregate welfare school of growth analysis imply the latter. Indeed, inasmuch as the former approach denies the possibility of *unambiguous* intertemporal and interspatial welfare comparisons, a contrary assumption is essential to the aggregate welfare approach to growth analysis.

## VI

If we are to consider economic growth to be a real phenomenon in the sense of something which can be observed and measured; and if we are going to deny the possibility of constructing an unambiguous and universally applicable measure of the results of economic activity defined in terms of some imputed welfare purpose, then we must be able to define and identify some entity—an economy—which can be said to grow in the sense of experiencing expansion in its (potentially) measurable dimensions. This again introduces the issue of organism. Indeed, as noted above<sup>40</sup>, if the ubiquitous references to the organic analogy in discussions of the concept of economic growth have any relevance, it is as an oblique statement of this point.

This proposition raises a question which has dominated discussions of the foundations of social science: is it legitimate to say that there “exist” social entities which “...though they are always composed of individuals, are not, strictly speaking, reducible or dividable into individuals<sup>41</sup>. It has been eloquently argued that while “persistent structures of relationships” can be identified and studied, to attribute any independent existence to these is to accept certain

40. Cf. *Supra*, p. 66.

41. S.F. NADEL, *The Theory of Social Structure* (Glencoe, The Free Press, 1957), p. 20.

dubious metaphysical assumptions and to commit the fallacy of misplaced concreteness. In this view, the only "natural unit", and hence the only unit admissible in scientific analysis, is the concrete "natural" person. Social science is properly only an attempt

...to grasp how the independent action of many men can produce coherent wholes, persistent structures of relationships which serve important human purposes without having been designed for that end<sup>42</sup>.

The basic issue is the meaning of the expression "independent existence" as applied to the concept of society. One might argue that in so far as sociologists have been concerned with the development of a systematic general theory of social action, their first problem has been to develop a theoretical framework which makes it possible to attribute existence to social units without resort to anthropomorphic or organic formulations. Indeed, Professor TALCOTT PARSONS has attempted to show that such a theoretical framework (what he calls the "voluntaristic theory of action") emerged inexorably out of theoretical developments in all of the traditional branches of social science<sup>43</sup>. In each area it has been necessary to reconcile HAYEK's observation that only individuals can choose and act with the equally empirical observation that these choices are—indeed must be—constrained within certain limits in any continuous situation involving mutual interdependence. The usual solution is to treat society simply as a mechanism (in the broadest sense of that word)<sup>44</sup> for guiding and harmonizing individual choices and actions. It is, however, a mechanism with only "nominal" existence.

In this sense, the social mechanism is a set of implicit rules of behavior, rules which are mutually understood and mutually respected, and hence which render possible predictions of behavior in particular contexts. This is not to imply perfect predictability, and hence predetermination of every specific action. Rather, it implies a

42. F. A. HAYEK, "Scientism and the Study of Society", part III, p. 27. See also T. PARSONS, *The Social System* (Glencoe, The Free Press, 1951), p. 31.

43. T. PARSONS, *The Structure of Social Action* (Glencoe, The Free Press, 1949).

44. This implies a generalization of THOMPSON's definition, "From a physical point of view, we understand by a 'mechanism' whatsoever check or controls, and guides into determinate paths, the workings of energy..." W. D'ARCY THOMPSON, *op. cit.*, p. 291.

“set of ground rules”<sup>45</sup> within which individual choice can be exercised. Thus the social “whole” is not an organism, nor is it a mere aggregation of human beings. Conceptually it stands between the two extremes. “All societies... involve a certain level of association, a level closer and more intricate than a mere aggregation but looser and more complex than an organism<sup>46</sup>.”

Various discussions of the nature of the economy are extant in the literature of economics. There is no need to review these here. Certain points derived from this discussion should be noted, however. Viewed on a physical level, the economy is a “production unit”. It involves a systematic interrelationship of what can be called in a narrow technical sense productive activities. It is this fact of physical interrelationship, frequently conceptualized as “flows” of goods and services, which makes meaningful techniques of macro-economic analysis of production which are based on the concept of system (e.g. input-output analysis). However, the existence of this physical level of activity presupposes a behavioral level of activity—human decision making and human action. Thus, it is possible to define the economic system in terms of an interconnected pattern of “roles” as well as in terms of an interconnected pattern of physical productive activities. The activities implied in these economic roles do not even potentially exhaust the activities of the occupants of the roles. These concrete individuals must be simultaneously involved in roles which are not directly related to the “economic system”. Thus, from a behavioral point of view, the economy cannot be regarded as an independent system, but rather must be regarded as a subsystem within some broader social system. In PARSON’S terms, it is but one of four functionally distinct (but not necessarily empirically distinguishable)<sup>47</sup> and functionally imperative subsystems within the

45. Cf. H. A. SIMON, “The Role of Expectations in an Adaptive or Behavioristic Model”, in M. J. Bowman, ed., *Expectations, Uncertainty and Business Behavior* (New York, Social Science Research Council, 1958), pp. 53.

46. KINGSLEY DAVIS, *Human Society* (New York, The Macmillan Company, 1949), p. 24.

47. In this regard, note should be made of the problems encountered in attempting to identify empirically what is economic and what is not economic activity. E. E. HAGEN has observed that “...human activity is not divided into such two classes (as economic and non-economic)..., the two classes are not mutually exclusive”. E. E. HAGEN, “Comment”, *Problems in the International Com-*



broader system of social action<sup>48</sup>. The activities involved will be related to the provision of the material requisites of social existence.

This suggests the nature of the problem involved in attempting to define and identify the entity which undergoes physical expansion in the process of economic growth. If it is a dependent part of a social system, identification of an economy presupposes the identification of the broader system. Empirically, however, virtually no social system is truly isolated and hence an obvious, self-contained unit. Invariably some interaction is involved between at least selected members of the different social systems, no matter how the social boundaries are drawn, unless they are inclusive of all human beings. In this instance the concept loses all analytical usefulness. This appears to make the specification of the boundaries of the social system somewhat arbitrary, dependent on an assessment of the degree of interaction. PARSONS' further complicates the problem by defining a "society" as a social system which meets the criterion of "potential independence"<sup>49</sup>. Such a criterion does not, however,

*parison of Economic Accounts*, Conference on Research in Income and Wealth, Vol. xx (New York, National Bureau of Economic Research, 1957), pp. 387-388. Concrete examples are provided A.R. PREST and I.G. STEWART in connection with attempts to measure the national income of Nigeria, where, they observe, "...the distinction between production and living, the distinction between working and not working. ...is often nebulous". A.R. PREST and I.G. STEWART, *The National Income of Nigeria*, Colonial Research Studies, No. 1 (London, Her Majesty's Stationary Office, 1953), p. 4.

48. Cf. T. PARSONS, and N.J. SMELSER, *Economy and Society* (Glencoe, The Free Press, 1956).

49. PARSONS defines ("in the simplest possible terms") the concept of a social system as implying "...a plurality of individual actors interacting with each other in a situation which has at least a physical, or environmental aspect, actors who are motivated in terms of tending to the 'optimization of gratification', and whose relations to their situations including each other, is defined and mediated in terms of a system of culturally structured and shared symbols". T. PARSONS, *The Social System* (Glencoe, The Free Press, 1951), pp. 5/6. Thus there is implied a body of individuals, a physical environment, patterns of motivation and shared cultural norms and symbols. The latter gives coherence to the system by providing a basis for persistent interaction.

He further notes that to be worthy of study the social system must have means of "...duration sufficiently long to transcend the life span of the normal human individual, recruitment by biological reproduction and socialization of the oncoming generation". Any social system "...which meets all of the essential func-

permit the identification of a set of mutually exclusive social systems which are uniquely societies and hence in some sense the fundamental units for our analysis. Furthermore, in PARSONS' terminology, it is not necessary that a social system be uniquely a society for it to be analysed, even from the point of view of economic growth. Thus, the specification of the units for analysis depends simply on the purpose of the investigation. One might find it equally interesting to probe the growth of the economy of a city, a geographic region, a nation state, etc. In each case, however, what is to be analyzed is the expansion of the system of economic activities which is an integral part of the particular social system specified.

Certain implications follow from this discussion. It should be apparent that given interaction with other social systems, the economy of a given system need not be the sole source of the material requisites of existence; indeed, the activities involved in the economy of a given social system (but presumably not a Parsonian society) need not provide directly any of the material items consumed. Production for external trade is common, as are unilateral transfers to and from the outside. Likewise, it follows that economic growth in the sense of an expansion of the economy is not the only source of possible increases in aggregate economic welfare, if we define economic welfare in the traditional sense in terms of some concept of per capita (or total) national income. Given the same physical production activities, income could rise or fall as a result of changes in terms of trade with the outside world. The more narrow the definition of the economy being studied, the more probable that this is going to be an important phenomenon. Indeed, it is possible (given the familiar elasticity conditions) that economic growth could be detrimental to welfare in this sense as a result of the terms of trade effect. This provides added reason for distinguishing between economic welfare and economic growth, even if our ultimate interest is in some variant of the concept of economic welfare.

tional prerequisites of long-term persistence *from within its own resources*, will be called a *society*". "It is not essential to the concept of a society that it should not be in any way empirically interdependent with other societies, but only that it should contain all the structural and functional fundamentals of an independently subsisting system." That is, it should be *potentially* independent. *Op. cit.*, p. 19 (italics added).

This also provides the justification for the observation made above<sup>50</sup> that economic development and economic growth are distinct phenomena, probably but not necessarily related. Economic development presumably implies a movement away from a state of underdevelopment. In almost every context in which this latter concept appears in the literature, it carries the connotation of poor economic performance. In this sense, it can often be interpreted as a term of opprobrium. The specification of poor performance necessarily implies some standard of adequate or good performance. But this implies an evaluation or appraisal. Hence, economic underdevelopment is an appraisal concept, of the same order as the concept of economic welfare, and hence inherently subjective. By implication, the derivative concept, economic development—i.e., improving performance—is also an appraisal concept. Universal agreement on the criteria to be employed in evaluating degrees of economic development, therefore, cannot be expected *a priori*, unless there is some prior agreement on a specific social welfare function. The lack of such agreement is amply reflected in the literature. It is eminently conceivable that economic growth will not be accompanied by economic development according to some of the implicit social welfare functions in common use. For example, the simplest of functions, equating social welfare with some index of per capita income, would yield this result if population were growing fast enough.

## VII

Two aspects of the concept of economic growth remain to be discussed: the methodological problems encountered in the measurement of growth, and the implications of the concept for the nature of growth theory. The first of these will be considered in this section. While not directly pertinent to the problem at hand, some of the theoretical implications will be briefly noted in the concluding section.

Our critical survey of current usage of the concept of economic growth resulted in one important conclusion. Given the theoretical impossibility of specifying an unambiguous and objective measure of the welfare results of economic activity, if economic growth is to

50. Cf. *Supra*, pp. 61/62.

be considered a real, objective, and quantitative phenomenon subject to scientific analysis, then it must be possible to define some entity which has potentially measurable dimensions and which can be said to grow in the sense of experiencing an expansion in these dimensions. This entity is what has commonly been called an economy or an economic system. It can be related to the concept of a social system employed in wider analyses of social phenomena in that any economy is the subsystem of some broader social system. Thus, identification of the scope of the economic system presupposes the identification of the broader social system in which the analyst is interested. This leaves many of the problems of definition in the hands of sociologists, and hence involves a rather weak conclusion in so far as economic analysis is concerned. It amounts to saying that there is no uniquely correct unit in growth analysis. It can be applied to any social unit providing only that the unit meets the minimum requirements of a social system (i.e., it involves association, not mere aggregation).

Just as the identification of the roles which constitute the economic system must involve the abstraction out of the reality of human interaction of certain continuous elements—certain reciprocal “duties” and “rights” or “rules” of the game—so the specification of the dimensions of the economic system in the sense pertinent for growth analysis must involve the abstraction of continuities out of the complex of reality. If we regard the economic system in a general way as a system of activities involving the taking of materials from outside the system (raw materials from the natural environment or semi-process goods from other economic systems) and the processing of them to provide useable goods either for use within the social system or for trade with other systems, then the pertinent abstraction would seem to be that of “normal” aggregate productive capacity. The economic system can be said to grow if its “normal” aggregate physical capacity to produce goods and services expands.

This definition involves no additions to the concepts of traditional economic theory. It simply involves a change in emphasis in growth measurement, from the evaluation of the results of economic activity to the measurement of the limits on the physical manifestations of such activity. Thus it really involves an application of the concept of the production frontier, “... the hypersurface which cor-

responds, in  $n$  dimensions, to the substitution curve between the two commodities in the two commodity world"<sup>51</sup>. Economic growth involves an outward movement in the production frontier, such that it is *possible* to produce more of some items without reducing the output of others (or more of all items simultaneously), and without resorting to abnormal pressures on the productive facilities.

While this definition of economic growth eliminates the conceptual and empirical problems which derive from equivocal assumptions regarding the nature of economic welfare and the relationship between production and welfare, it obviously presents similarly formidable conceptual and empirical problems which it would be unwise to minimize. Indeed, these problems may severely limit the nature of the statements which may be made about economic growth in many specific contexts. They derive from the characteristics of the concept of the production frontier considered in relation to the types of data which it is reasonable to expect to be derived from the real world. In particular two sources of conceptual difficulty should be noted: (1) while the frontier relates to hypothetical production possibilities, the available data relates to realized output; and (2) since productive capacity is to a significant degree determined by the behavior patterns of the active agents in the system (including the natural environment), the frontier is to a significant degree flexible, even under what we might want to call stationary conditions. Even with the elimination of the ambiguities surrounding the welfare based concepts, the measurement of economic growth is neither simple nor free from possible contradictions.

In what follows a few of these problems are discussed, but only in the sketchiest of terms. The arguments and the problems are familiar in other contexts. In general, while they limit the conclusions which can be drawn from empirical analysis, they do not impugn either the "reality" or the analytical usefulness of the concept of economic growth.

At any given point in time, all points on the frontier except one, the existing combination of outputs, must be hypothetical in the sense that while *ceteris paribus* each is a possible combination of outputs, only the existing combination of outputs, is an actuality which

51. J.R. Hicks, "On the Valuation of Social Income—A Comment on Professor Kuznets' Reflections", p. 166.

can be observed. Indeed, under certain circumstances, the common case of general underemployment of resources, *all* points on the frontier will be hypothetical. If the existing combination of outputs can be located within the frontier, the output of many or all commodities could be expanded simultaneously without growth occurring. Thus, in employing available aggregate data on production in order to measure growth, it is necessary to distinguish such observed changes in output as involve an increase in the degree of utilization of existing capacity, changes in the composition of output which involve no change in capacity (i.e., movements along the frontier), and actual expansions in capacity.

This suggests one type of problem which is encountered in employing data relating to the realized output in the study of economic growth, the problem of adjusting the data to levels representing the full utilization of capacity. The production frontier is determined in part by the quantity of human and material resources available and by the engineering requirements for production in the various lines of output; but given such information the frontier could not be specified without also specifying the response patterns of the various active agents in the production process. This is the familiar problem of the difference between supply in a behavioral sense and the physical quantity of some good or service potentially available. Examples could be multiplied as applied to each of the pertinent resources, but the case of labor resources will suffice to confirm the point. On the one hand, one can cite the evidence of the behavior of the labor force and hence capacity output under the unusual strains and psychology of a wartime economy, and on the other hand the observed variability of labor force participation under less severe changes in market conditions as illustrating the flexibility of this partial limit to productive capacity<sup>52</sup>. The labor supply cannot be regarded as a physical constant even with a given population. Any concept which thus relies upon some notion of normal behavior poses these familiar problems for empirical investigators.

52. On this latter point, see the testimony of EWAN CLAGUE before the Joint Economic Committee, Hearings on *Employment, Growth and Price Levels*, Part III (April 25-28, 1959), pp. 468-493; C. D. LONG, *The Labor Force Under Changing Income and Employment* (Princeton, Princeton University Press for the National Bureau for Economic Research, 1958).

For most purposes a refined measure of economic growth is not required. If the problem is simply to identify the existence of economic growth over any period of time, it is sufficient to provide a positive answer to the following question: would it be possible, admitting of some reorganization of productive activities but maintaining normal levels of employment of human and material resources, to produce in the terminal year goods and services in the same kinds and quantities as it was possible to produce in the previous years and still have some productive capacity unused<sup>53</sup>. Generally speaking, the usual aggregate output data<sup>54</sup>, aggregated on the basis of average market prices prevailing in one of the time periods, and adjusted to allow for identifiable underemployment, will provide a useable index for this purpose. The rationale for using price weights in aggregation is the classical hypothesis that in highly competitive markets, price should "in the long run" tend to approximate marginal rates of technical transformation in production<sup>55</sup>. This assumption is of limited validity in a world characterized by frequent and wide changes in the structure of output, variable degrees of monopoly power, fluctuating levels of employment of capacity,

53. Phrasing the question so that we are looking backward in chronological time seems preferable to phrasing it from the opposite point of view. It probably makes no difference in terms of identifying the presence of growth, and it minimizes (but does not eliminate) the conceptual difficulties posed by the introduction of new products.

54. In this context the appropriate statistical concept would be gross domestic product rather than gross national product. The difference, which in most cases may not be great, derives from the existence of incomes accruing to residents which result from productive activities performed outside the nation ("net factor incomes received from abroad"). This again suggests the nature of the difference between this approach and the welfare approach. For the welfare approach, the appropriate concept would be gross national product. On the distinction see United Nations, *A System of National Accounts and Supporting Tables*, Studies in Method, No. 2 (New York, United Nations, 1953), pp. 7/8, 17.

55. It should be noted that this rationale of price weights for aggregation is free of the basic criticism made above, i. e., it is ethically neutral. However, many of the subsidiary criticisms do apply, particularly with respect to the implications of new products and changing degrees of monopoly power. Cf. *Supra*, pp. 72-74. It should also be noted that the use of price weights involves a simple linear approximation; they can only be assumed to reflect marginal transformation rates for small reorganizations of the composition of output, not for large reorganizations. They can at best provide a crude index.

apparent aberrations from maximizing behavior, etc. Furthermore, given different relative price structures in different years, the investigator is forced to choose among these structures in order to derive a consistently weighted index of growth. Clearly, there are situations in which the index will be sensitive to the price weights chosen. This would be particularly true if the changes in capacity were not great relative to the changes in relative prices, i.e. if the observable changes in the structure of prices were not associated with strong economic growth. However, it is doubtful that the discrepancies resulting from the choice of alternative possible sets of price weights, or from the assumption that any selected set of price weights roughly reflect the real marginal rates of transformation, will even approximate the errors introduced by inconsistencies in coverage over time and from gaps and errors in the data. If the growth process was strong and broad based (in the sense of encompassing many sectors of the economy) during the period, almost any set of price weights will disclose the trend<sup>56</sup>.

These observations again lead to a relatively weak conclusion. The concept economic growth does not lend itself to precise unambiguous quantification in the context of drastic changes in the composition of economic activity. In this situation the investigator can only proceed on the basis of estimates of changes in output aggregated on the basis of various sets of price weights and crudely adjusted to full-capacity levels.

## VIII

In this paper an attempt has been made to clarify and resolve certain contradictory themes which have run through discussions of the concept of economic growth. The conclusions are neither radical nor strong. Indeed, the outcome can be regarded simply as a

56. It can be noted parenthetically that a physical production capacity concept of growth necessarily raises certain questions with respect to the meaning of the concept of the "rate of economic growth". The concept of a rate of change implies a single dimension. The production frontier is a multi-dimensional concept, and hence economic growth implies multi-dimensional changes. Only if one is willing to make some assumption with respect to the possibility of specifying a set of constant marginal rates of transformation is it possible to give simple meaning to the concept of a rate of growth in aggregate productive capacity.



systematic statement of points which many economists have already accepted in various contexts. The main achievement is the demonstration of the possibility of *formulating* a concept of economic growth which is free of methodological pitfalls involved in definitions based on either organic or utilitarian welfare propositions: a demonstration of the possibility of divorcing the problems of observation and measurement of the growth process from the much more complex and essentially subjective problem of evaluating the results of the growth process. On the level of empirical application, many of the problems which plague analysis based on the aggregate welfare definitions will also arise because many of the same statistical indicators must be used. These difficulties arise not from conflicting value judgments, however, but from the problems of statistical representation of the growth phenomenon<sup>57</sup>. As a result of these statistical problems, no accurate measure of economic growth is feasible. This is not a new conclusion—the necessity of working with rough indexes is obvious to anyone who has engaged in research in this field.

This discussion also provides support for a particular point of view on the appropriate framework for a theory of economic growth. A tendency has developed to distinguish between economic and non-economic forces in the growth process, and hence to categorize theoretical formulations as either economic or non-economic depending on the forces which are primarily emphasized. The arguments developed here imply that such a dichotomy is not possible. One aspect of the development of growth theory must be the specification of necessary changes in the physical environment of economic activity, i.e., in the industrial structure, in the size and composition of the stock of capital equipment and inventories, in the structure and allocation of the labor force, etc. It is these changes which are often identified by the term “economic” forces. However, they are not in any sense active growth creating forces: they are necessary conditions and physical manifestations of the growth process. If we are interested in the dynamics of causation, the analysis must be on the level of human behavior. It is human behavior which is the active element in the process. This makes

57. In this sense they correspond to the problems involved in the quantitative analysis of growth in the biological sciences, cf. W. D'ARCY THOMPSON, *op. cit.*

relevant to growth economics all the multiplicity of factors—personality, institutions, culture, etc.—which appear to affect human motivations and hence human behavior patterns. The very definition of the concept of economic growth provides obvious justification for the proposition that the analysis of the process of economic growth must draw on all of the traditional social sciences.

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#### SUMMARY

The purpose of this paper is to clarify and resolve certain contradictory themes which have been prominent in discussions of the concept of economic growth. Given this emphasis on clarification, the conclusions are neither strong nor radical. It is demonstrated that it is possible to formulate a concept of economic growth which is free from the methodological pitfalls of definitions based on organic or utilitarian welfare propositions. For this purpose, it is necessary to define and identify some entity—an economy—which can be said to grow in the sense of experiencing an expansion in its potentially measurable dimensions. Under these conditions, the observation and measurement of economic growth become analytically quite distinct from the subjective evaluation of the results of the growth process. Resolution of the basic methodological dilemmas, however, does not solve the basic empirical problem. Given the multidimensional nature of the “boundaries” of an economy, economic growth does not lend itself to simple, unambiguous quantification. The difficulties arise not from conflicting value judgments, but from the statistical problems inherent in the representation of so complex a phenomenon. The necessity of relying on crude indicators is obvious to anyone who has engaged in research in this field.

#### ZUSAMMENFASSUNG

Der Zweck dieses Aufsatzes liegt in der Abklärung und Richtigestellung einiger sich widersprechender Ansichten, wie sie sich bei Diskussionen über das Wirtschaftswachstum eingestellt haben. Der Verfasser kommt weder zu dogmatischen noch radikalen Schlussfolgerungen. Es wird dargelegt, dass es möglich ist, den Begriff Wirtschaftswachstum frei von methodologisch verfänglichen Begriffen zu definieren, die auf organisch- oder nützlichkeitsbestimmten Wohlfahrtstheorien beruhen. Zu diesem Zweck ist es notwendig, eine bestimmte Einheit anzunehmen – eine Wirtschaft, von der gesagt werden kann, dass sie wächst im Sinne einer Ausdehnung ihrer messbaren Dimensionen. Unter diesen Bedingungen werden

Beobachtung und Messung des wirtschaftlichen Wachstums analytisch klar und frei von subjektiven Bewertungen. Die Lösungen des grundsätzlichen, begrifflichen Dilemmas bringt jedoch noch keine Klärung des empirischen Problems. Angesichts der Vielfalt der Grenzgebiete einer Wirtschaft kann das wirtschaftliche Wachstum nicht lediglich quantitativ gemessen werden. Die Schwierigkeiten entstehen nicht aus sich widersprechenden Werturteilen, sondern aus den statistischen Problemen, die mit einem so vielfältigen Begriff verbunden sind. Jedermann, der sich mit dieser Materie befasst hat, ist sich darüber klar, dass er sich nur zu oft auf grobe Schätzungen verlassen muss.

Der Verfasser neigt einer bestimmten Ansicht zu hinsichtlich der Grundlagen einer Theorie des Wirtschaftswachstums. Er deutet an, dass der bekannte Zwiespalt zwischen wirtschaftlichen und nichtwirtschaftlichen Kräften im Wachstumsprozess unbedeutend sei. Ein Aspekt der Wachstumstheorie muss die Bestimmung der notwendigen Veränderungen in der physischen Umgebung der Wirtschaftstätigkeit sein – Veränderungen, die oft als wirtschaftliche Kräfte bezeichnet werden. Doch wenn wir an Kausalzusammenhängen interessiert sind, muss sich die Analyse auf die Ebene des menschlichen Verhaltens verlagern. Durch die Definition des Wirtschaftswachstums selbst, wie sie im Artikel vorgenommen wird, ergibt sich klar, dass sich eine derartige Analyse auf Ergebnisse sämtlicher traditionellen Sozialwissenschaften stützen muss.

#### RÉSUMÉ

Cet article se propose d'éclaircir et d'expliquer certaines contradictions qui se sont manifestées dans les discussions sur la croissance de l'économie. Les conclusions de l'auteur ne sont ni trop dogmatiques ni trop sévères. L'article démontre qu'il est possible de définir la croissance économique sans avoir recours à des termes méthodologiques plus ou moins risqués rappelant les théories utilitaires ou organiques du bien-être économique. Il est nécessaire à cet effet de partir d'une unité connue, d'une économie dont on peut dire qu'elle est en état de croissance, ce terme étant pris dans le sens d'extension des dimensions mesurables. Dans ces conditions, on peut observer et mesurer la croissance économique sans que des évaluations subjectives faussent les résultats de l'analyse. Si l'on peut résoudre ainsi le dilemme méthodologique fondamental, on est cependant bien loin encore d'une solution du problème empirique. Etant donné la grande diversité des domaines qui se rattachent à une économie et en forment le cadre, on ne saurait se borner à une analyse quantitative de la croissance économique. Les difficultés ne naissent pas des jugements contradictoires, mais des problèmes statistiques qui se rattachent à un phénomène si complexe. Quiconque a étudié cette matière sait que l'on doit souvent se contenter de données approximatives et d'évaluations qui manquent d'exactitude.

En ce qui concerne les bases d'une théorie de la croissance de l'économie, l'auteur se rapproche d'un point de vue clairement défini. Les arguments qu'il présente impliquent que l'opposition bien connue des forces «économiques» et

«non-économiques» ne joue pas un grand rôle dans le processus de croissance. L'un des aspects de la théorie de la croissance doit être la détermination des modifications nécessaires du voisinage physique d'une activité économique – modifications qui ont souvent été identifiées aux forces économiques. Si l'on s'intéresse cependant à l'interdépendance des causes et des effets, on exigera que l'analyse se place sur la plan du comportement humain. Il ressort clairement de la définition de la croissance économique que nous donne le présent article qu'une telle analyse doit se baser sur des données englobant toutes les sciences sociales traditionnelles.