SIMON KUZNETS' CONTRIBUTION TO ECONOMICS

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Introduction

Professor Simon Kuznets, born in Russia in 1901, received his education as an economist in the United States. He took his doctorate at Columbia University in 1926.

I can mention his scientific career quite briefly. Kuznets rendered a large part of his scientific contribution as a member of the research staff at the National Bureau of Economic Research from 1927 to 1960. Since 1931 he has held a number of chairs—the longest period (1936–54) as professor in Economics and Statistics at the University of Pennsylvania, then at John Hopkins University (1954–60) and finally since 1960 at Harvard University.

A bibliography of Kuznets' work lists more than 200 titles. One can therein note around 30 books and major essays of at least 100 pages each, covering about 9 000 pages all told. However, it should be observed that a part of this impressive output embraces reprints and revised editions of previously published essays. The other titles in the bibliography contain, apart from numerous reviews and shorter contributions, a great many major articles and contributions to collections.

In all his scientific inquiries Kuznets has consistently aimed at imparting quantitative precision to those economic magnitudes which seem relevant to an understanding of social development processes. This focus ties in with his critical attitude to purely deductive theory that builds upon abstract hypotheses, in particular if neither these nor the conclusions therefrom lend themselves to empirical testing. The following quotation from Goodwin may be appropriate to give a flavour of his approach (*Economic Journal*, Sept. 1956):

> Kuznets sinks his pile deep into the morass of economic fact, he weaves great rafts to float the massive abutments which he painstakingly builds up bit by bit.

Even so, one point needs to be made clear at the outset: Kuznets does not reject the necessity of theory and theoretical analysis. His empirical research is based on explicitly stated models even if these are not expressed in mathematically stringent form. Kuznets needs models of strategic relationships to select factors that are to be taken into consideration, as well as to define those concepts which underlie the statistical measurement. His critiques of the Kalecki and Schumpeter business cycle theories are illuminating in this respect. Kuznets shows a generous sympathy with generalizing models, but his appreciation of them is limited. He criticizes them for offering so few empirical testing possibilities. Here is what he says in his review of Kalecki's "Essays in the Theory of Economic Fluctuations" (*Economica* 1939):

Under protection of simplifying assumptions and often in cavalier disregard of available evidence that could be utilized in a circumspect advance upon the problem, the author makes a lightning raid and emerges with a striking conclusion. Careful consideration reveals that the empirical generalisations rest upon limited data and somewhat loose criteria as to what constitutes stability or association; and that the final conclusions are, at most, interesting suggestions of uncertain validity.

Kuznets always goes at length in his investigations to discuss definitions of the entities he is studying and to vest them with a precision that corresponds as closely as possible to the method of statistical measurement. Further, he tries to read a broad interpretation of economic and social relationships to his findings. But he denies the feasibility of squeezing economic reality, as this is comprehended in statistical time series, into stringent models. I shall have occasion to refer again to this Kuznetsian approach.

Studies of National Income

One line of inquiry that subsumes nearly all others for Kuznets has to do with measuring the size and development of national income and its components in the United States for different periods. No other scholar comes anywhere near Kuznets in sheer volume of achievement in this field. A serious student of national income cannot avoid taking issue with the contributions, methods and arguments of Kuznets. That is already apparent from the frequency with which Kuznets is quoted in works on this subject; in Paul Studenski's large survey volume, "*The Income of Nations—Theory, Measurement and Analysis: Past and Present*" (New York, 1958), no economist or statistician receives anything like the same number of references. But to acknowledge Kuznets' great achievements in national income research must not be taken to mean that he has been a methodological pioneer on all fronts. In point of fact, national income measurement and research in the United States seems to have lagged at first behind the development in such countries as Great Britain, Germany and Sweden. But once research in these areas became more intensive at the beginning of the 1930's, progress has moved that much faster in the United States than elsewhere—and much of the credit for that undoubtedly goes to Kuznets. On the other hand, it is impossible for me to judge how far and in what respects his researches have had significance on strictly methodological grounds. As will be reported on below, both his methods and results have attracted much attention. But many variants of similar methods had been used earlier. It is of interest in this connection to mention that Kuznets did not take part in developing concepts and methods for the layout of complete national accounting systems and national budgets. The pioneering work in these fields was done in Great Britain (Richard Stone and James Meade) and Norway (Ragnar Frisch, Petter Jakob Bjerve, Odd Aukrust). Kuznets was rather critical of these innovations and took little interest in them.

Kuznets began to devote serious concern to national income studies in the early 1930's and his first results were published in *National Income 1929–32*, put out by the Department of Commerce in 1934. This was followed by a string of publications on the American national income which largely covered the whole period since 1869. His greatest and weightiest contribution appeared in 1941 under the title, *National Income and its Composition, 1919–38*, running for 925 pages. An enormous body of national income data is collected, analyzed and systematized in this volume. In this wealth of material a whole generation of scholars has sought and found the empirical foundations for research into different aspects of the U.S. economy—be it consumption and savings functions, structural changes in production and consumption, the shape of the growth processes, the importance of capital formation, and so on. His more concentrated presentation in the book, *National Income: A Summary of Findings* (1946), has helped and stimulated various generations of economists, hungry for time-series and cross-section data, in applications and critical reconsiderations of Keynesian macro-analysis. Both there and in the earlier volumes they have found not only carefully detailed statistics in time series and cross section results but also what Kuznets calls "analytic description", i.e. compilations of statistical series drawn up with reference to given problem formulations.

The work performed by Kuznets within the broad domains of national income research have produced some special achievements which merit particular attention:

(*a*) Collecting, evaluating and systematizing available statistical data over long periods—spread out in fragmentary form in hundreds of different sources—for tabulations of national income and its principal components.

(*b*) Determining and specifying for these purposes those terms and concepts which underpin the national income calculus.

(*c*) Employing imagination and inventiveness in filling in the "empty boxes" on the basis of incomplete material.

(*d*) Presenting a shapeless and huge statistical material in such categories as to permit summarizing surveys, analyses and comparisons, and in so doing critically test the findings for reliability and validity.

(*e*) Lastly, making fruitful use of national income series (and their different components) for shedding light on essential problems.

It may be argued that Kuznets has rendered major scientific contributions in all the respects enumerated above. The very fact that he has taken so much of the *initiative* towards comprehensive estimations of national income is a merit of the highest order. He has been a driving force (and expert as well) behind efforts to get estimates of national income under way in the United States and in other countries. Kuznets thus inspired similar studies in other countries during the 1940's and 1950's (for an example, see the series called

Studies in Income and Wealth). The relevant documents of various countries make recurring references to the research done by Kuznets on concepts and methods. Cases in point are the arguments and methods Kuznets advances for gross and net estimates with his exhaustive analysis of the concepts of economic life and depreciation; his treatment of intermediate products and discussions of the risk of double-counting, particularly where government services are involved; his treatment of problems of how to deflate capital stock, both as regards the depreciation of older capital goods and quality changes of new ones. In his various investigations of these fields Kuznets has made extensive discourses which have borne upon the international development of concepts and methods.

Kuznets has not confined himself to statistical data from the decades nearest to hand. He has extended his studies as far back as possible, and in so doing pioneered in the application of various methods for making use of extremely defective material. In my opinion the following quotation from Phyllis Deane (*Economic Journal*, 1967) excellently characterizes his eminent ability in this respect:

> ... first is the exhaustive care he takes to define his terms, clarify his concepts and expound an analytical framework before even beginning to manipulate the data ... second is his way with figures. Most of the statistical data which he has to hand are extremely crude and sketchy. Kuznets sifts his rough material with the delicate patience of an archeologist. By a process combining remorseless logic, indefatigable crosschecking and bold judgement he extracts the evidence for a coherent and consistent picture out of what often seems the most unlikely material. All this is done, however, without losing sight either of the inaccuracies of the underlying statistics or of the fact that the statistical results can never yield more than a bare skeleton that requires a political and social covering to give it meaningful shape.

As Kuznets sees it, a positive value attaches to having some quantitative precision in national income categories even if the statistical material is fragile. He is always meticulous in identifying the sources and shortcomings of the statistical data used, critically tries out different methods of using them, warns the reader-consumer against reading too much into his findings and enumerates the reasons explaining why. Hence in spite of all the uncertainty that attaches to statistical information from the earlier decades, Kuznets does not hesitate to present the long time series which are required for the analytical description and for far-reaching conclusions about strategic factors and relationships within the development process. One may hesitate about his boldness in these respects and hold that he sometimes philosophizes too much on secular development processes. However, it is part and parcel of his philosophy that the cause of economic-historical research is better served by careful striving for quantitative measures even where this looks impossible at first, rather than leave the field wide open to superficial generalizations based on unsystematic observations and general qualitative indicators. Kuznets has certainly done the analysis of economic history a great service by presenting his long time series for the United States and by encouraging scholars in other countries to do the same.

Analysis of Economic Growth Processes

As noted above Kuznets has a strongly limited enthusiasm for abstract model-building as a help towards understanding a growth process. His view of what fruitful theory ought to contain is distilled in the following words: "... by a theory we mean a statement of testable relations among empirically identifiable factors, such relations and factors having been found relatively invariant under diverse conditions in time and space" (*Economic Growth and Structure*, p. 4).

Instead of a formal model exhibiting the mechanism of economic growth, Kuznets prefers for the time being to deal with a more modest task: "to draw some suggestions from the empirical record about the identity and relative importance of and interconnections among the determining factors, as guides to the further study of the data and particularly to the directions in which testable theoretical analysis must be pursued" (op. cit., p. 6).

These quotations reveal the attitude to economic research that Kuznets has consistently held throughout his scientific career. For example in explaining an observed growth rate of national product, Kuznets has shown what limited share of this can be attributed to the value of direct inputs of labour and capital. The main problem for Kuznets is to gauge these inputs for their long-term changes in efficiency. Indeed, it is in the long-term perspectives, the wealth of viewpoints, the multiplicity of factors and relations that he puts into the picture that his analytical description gains its strength. In his works he has put special emphasis on the development of the following factors: distribution of the population by size, age and occupation, structural changes, technological advance (with bursts of innovation), quality and proficiency of the labour force, the composition and quality of capital, changes in the social environment and market forms (including attitudes of governments and the general public to economic growth), international trade and capital movements. The special features of Kuznets' analysis are derived from his attempts to combine quantitative precision with total overview, including thought-provoking speculations on different ways and means to identify secular interconnections. A central problem for Kuznets in the long-term perspective, in which he is most interested, is to let factors like population development, changing technology, industrial structure and market forms become *endogenous* variables and not, as model-builders usually do, treat them as exogenously given. As far as the analysis of growth processes is concerned, Kuznets has in my opinion played an original and partly pioneering role with regard to the following topics:

1. Secular variations in the growth rate ("Kuznets cycles") and their connection with population movements and business cycles.
2. Saving and capital formation problems.
3. Relations between structural change and growth of productivity.
4. Growth and income distribution.
5. Comparisons between countries in regard to national income and growth.

Variations in the Growth Rate

As pointed out above, the Kuznets approach to the growth process is characterized by the long historical perspective and the breadth in his vision of conditions, factors and relations. He likes to go back to the era of geographic explorations, to the era of merchant capitalism and to mercantilist policy so as to capture a historical, cumulative process which helped to shape the unique conditions of the "industrial revolution" in England. Kuznets stresses that attention must be paid to extremely complex social and economic processes, such as changes in intellectual and cultural environment, the advent and application of technical know-how, the growing population, transformed institutional conditions and socioeconomic structure, the positions and economic policies adopted by nation-states, forms of business organization and the ground rules of competition, all entering into an interdependent development process. Against the background of this broad perspective Kuznets emphasizes *comparative* studies of different countries, economic systems and epochs; such comparisons widen the scope for assessing the significance of different factors. According to Kuznets, an important ingredient in any study of growth processes is to analyze the diffusion of social and technical innovations from a country of origin to other economies.

It can safely be said that Kuznets was ahead of his time in singling out growth processes as a primary focus for research. In his major volume from 1930, "*Secular Movements in Production and Prices*", Kuznets shows in passing how vaguely the economists of that day usually talked about economic development or growth and how poorly equipped the then dominant school of static theorizing was to tackle the analysis of a dynamic growth process.

On page 2 of "Secular Movements ..." Kuznets says:

> Indeed, questions of industrial development in their general aspects have become suspect to all conscientious economists and statisticians. We find hardly any discussion of the problem in the standard treatises which have appeared since the great days of the English Classical School. In reaction to the too facile generalizations of the latter, economic theory proper has restricted itself largely to static problems.

and further:

> These questions (of growth) can best be answered by an inspection of the historical records of industrial growth, focussed upon the processes that underlie economic development (op. cit., p. 5).

Kuznets attributes the marked lack of interest in growth problems (though there are conspicuous exceptions) and the absence of applicable analytical methods to the fact that no quantitative measurements of the secular trends in production and prices were available. Hence it also became his task to collect and analyze a large body of previously unutilized material from five countries to show how the growth process has undergone continuous structural shifts with reference to the determining factors in the industrial sectors investigated.

For purposes of evaluating this early work one can criticize Kuznets' thesis of secular stagnation tendencies and his use of regression analysis, supported by Gompertz curves and logistic functions, to express these tendencies in a number of commodity sectors. What is of the greatest interest instead is the modern approach to interdependence of the different growth factors: technological advance, development of effective demand, population and employment. In this work heavy weight is put on the interdependence between an ongoing trend and fluctuations of varying length around it. Presented here for the first time is the *Kuznets cycle* (so named by Arthur Lewis) with a duration of some 20 years.

Kuznets ventures upon more or less speculative interpretations as to the nature of these cycles and relates them to corresponding price fluctuations. He also explores different *business cycle theories* in order to see interconnections between the shorter cycles and the longer-run fluctuations in the growth rate of production and prices. The new, essential aspect is that Kuznets searches for a coherent interpretation of growth and cyclical phenomena, where changes in structure and market forms (growth of cartels and monopolies) are brought into the analysis as endogenous events. The conclusion is typical for Kuznets: lack of statistical data and difficulties of obtaining quantitative precision for the phenomenon in question in a sufficient number of cases (countries) make it impossible, at least for the time being, to verify alternative hypotheses.

While skeptical towards the applicability of more comprehensive models at present, Kuznets is in no way averse to using and testing certain hypotheses as to strategic relations. Thus, in his interpretation of the business-cycle as set out in 1926 in *Cyclical Fluctuations: Retail and Wholesale Trade, United States, 1919–1925,* we find a clearly formulated conception of a relatively *stable consumption function,* which is used to interpret income-earning and spending processes during expansions and contractions (with attention paid to lags). Kuznets showed the significance of *inventory variations* for cyclical fluctuations. He tried to use the acceleration principle as an explanatory base in investigating inventory and sales variations within the retail and wholesale trade. In place of earlier theoretical and exemplifying exercises of the acceleration principle, Kuznets sought statistical verification. His critical, empirically oriented research findings rejected a strict application; he came to the result that there were (and for theoretical reasons there should also be) wide variations in the accelerator during the business cycle. Thanks to Kuznets' studies of national income during the 1930's, of the actual size and cyclical variations of total inventory investments became known. These variations were shown to account for about half the amplitude in the cyclical fluctuations of combined gross investments in the United States during the interwar years. Kuznets' measurements and observations were later taken up by Abramovitz as starting points for his detailed study, *Inventories and Business Cycles, with Special Reference to Manufacturers' Inventories* (1950).

In later publications Kuznets has often returned to the theme of possible relations between cyclical variations and the growth process. Thus one finds an exhaustive discussion in *National Income: A Summary of Findings* (1946). It is interesting to note how Kuznets when treating this problem constructed a series for potential secular levels (without cycles) along the same lines as later adopted by the Council of Economic Advisors in its presentation of potential economic growth in the 1960's.

There is every reason to attach weight to Kuznets' discovery and interpretation of the long cyclical swing in the growth rate. He has returned to this observation in several writings and has—contemporaneously with other scholars such as A. F. Burns, Brinley Thomas, W. A. Lewis, C. D. Long and M. Abramovitz—presented more material and deepened the analysis, especially in *Capital in the American Economy* (1961). Kuznets puts crucial emphasis on fluctuations in the rate of population increase in the United States during the period 1870–1955 and treats these in large part as endogenously determined within the framework of the total economic growth process. That holds not only for immigration and internal migration but also for the natural population growth. The increase in population and its internal distribution then have major direct and indirect effects on the volume and allocation of aggregate economic activity (construction of railways and houses plus some other investment categories and capital imports).

In this last-mentioned work Kuznets has presented and analyzed an impressive statistical material, identified turning points and reaction lags, measured amplitudes and figured out the correlation between the fluctuations of the different series. A both original and interesting observation relates to the difference in "population-sensitive" investments (such as residential and railway construction) on the one hand and other parts of the country's gross investments. Kuznets demonstrates that the latter type of investments is also subject to long term fluctuations. However, these tend to be (before 1920) "inverted" in relation to the investment waves influenced by population growth. A negative correlation would make it look as though there were "given" limits (determined by the supply of savings) to aggregate capital formation; when after a lag the growing population and other factors touch off an investment boom in the sectors under study, there arises a relative shortage of savings for other investments, which are held back for this reason (according to Kuznets, the movement of share prices and bond interest rates seem to verify this hypothesis). In his most recent work, *Economic Growth of Nations* (Harvard University Press, 1971), Kuznets has again taken up the problems of long fluctuations and presents new statistical measurements for five countries, among them Sweden. The long cycles are compared by their amplitude and periodicity for population growth, changes in real national income and national income per capita. He finds systematic interrelations but also irregularities and variances (not least in regard to the Swedish development) which pose some interesting problems.

Here I have been able to do no more than adumbrate the nature of the self-perpetuating long cycle mechanism which Kuznets considers applicable. In this connection he himself speaks of "sketch" and "speculation", and suggests that more statistical research will be necessary for more adequate hypothesis-testing. He also points out that these fluctuations seem to have taken on a completely different character after 1920.

Although opinions may be divided as to the value of such a speculative model for these long waves in economic activity, the cited work includes many other observations that fit into the mechanism for these Kuznets cycles but also have merits of their own for the light they shed on the growth problem complex. By way of example I can mention his account of the considerable secular fluctuations in average and marginal capital/output ratios, a variability which ought to cast doubt on simpler models of the Harrod-Domar type. Of great interest, too, is his thorough analysis of secular changes in financing conditions (with reference to degrees of self-financing for different sectors, fluctuations in share prices and returns on capital).

Savings and Capital-Formation Problems

Kuznets' measures in this field have been of central interest, not least for post-Keynesian theorizing and debate. Already in his first book on cyclical fluctuations (1926), he not only speculated at length on the income-formation process—the connection between output and disbursed incomes and the connection between the latter and consumption and saving—but also tried to illustrate these interrelations empirically. He treated the relation between consumption expenditures and incomes in a way that foreshadowed Keynes (and with a "lead time" of 10 years). In so doing he did not confine himself to speculations but also carried out some empirical testing: "... the expenses of consumers in purchasing were assumed to be in perfect correspondence to the amount of income received. But are these assumptions true? Let us test them with the statistical data at our disposal" (op. cit. p. 130). On the strength of the imperfect statistics then available, Kuznets showed how consumption and saving covary with the fluctuations of incomes and how the ratio of consumption to income seems to vary with the business cycle, rising during a depression and falling during a boom. Just consider that Keynes had been aware of Kuznets' research when he "discovered" the consumption function! It is easy to take quotations from this book to show that Kuznets was fully aware that the observed relation between consumption and income, in combination with an investment change, could give rise to a cumulative process in the development of income and employment. A decade later this relation was to constitute one of the cardinal points in Keynes' "General Theory..." under the name, "multiplier".

Kuznets' estimates of national income have conclusively pointed to a secular stability both in the total consumption ratio (with a stable relation between private consumption and net national income of around 88 %) and in the average ratio of saving by households. As we know, this "empirical discovery" became the point of departure for attempts by Smithies, Duesenberry, Modigliani, Friedman et al. to find consumption and saving functions which did not conflict with Kuznets' empirical findings.

It should be noted that Kuznets himself has exhaustively treated the problems of capital formation brought up by his research. That has been done in a number of his works, but especially so in the already cited *Capital in the American Economy* (1961). There we find a series of attempts, proceeding from alternative models for the savings process, to give plausible explanations of the observed long-run stability. Kuznets disaggregates savings with breakdowns for households, corporations, other firms and government. And within the household sector he illustrates how saving is apportioned between the top 5 per cent of income earners and the remainder, and discusses how and why the former group accounts for such a large share of all household saving—but probably with substantial shifts in the distribution over time. We are given a stimulating combination of empirical findings and related speculations on possible relationships. At the same time Kuznets takes care to distinguish between what is borne out by reasonable empirical verification and what is impressionistic and speculative. Also rewarding in this context is his account of the varying importance of corporate saving, how profit margins have developed and are determined, and the factors and relations which appear to play a role in this connection.

In this work Kuznets takes up an old but central problem for lengthy discussion. Over the long term, is investment activity restricted by the total supply of savings (as this is determined by the propensities to save at a given GNP) or is the capital formation ratio rather determined by the demand for capital and investments? Kuznets prefers to regard the savings process (in the terms indicated above) as the controlling restriction, and hence, as the determinant of the size and stability of the total investment ratio over time. But he says that this is not much more than an "impression" and goes on to discuss various modifications. Short-term disequilibrating disturbances are accordingly taken up as a major problem. The interdependence of saving and investment in a development process is discussed, as is the significance of financing conditions (with interesting comments on how the degree of self-financing has evolved over long periods), the movement of interest rates and the creation of credit by the banking system ("forced savings").

I have dwelt at some length on Kuznets' treatment of capital formation problems so as to illustrate what was pointed out by way of introduction, namely that Kuznets is *not* an "ordinary" collector of statistics and pure empiricist who ignores hypotheses and theories (a charge raised against the Mitchell School at the National Bureau). On the contrary, it can be asserted that his empirical research is combined with an unusually rich set of alternative hypotheses that are held up to examination. But as we have already observed, Kuznets is loath to bind his results to more stringent models. If anything, he wants his readers to perceive that a number of different alternatives are available for interpretation and that the empirical material generally does not suffice to permit a definite choice. Sometimes one may well feel that Kuznets digresses a bit too far in imagination-stirring speculations on possible relations and strategic factors, and may even lack the precision that an unrecorded, underlying system of equations ought to give. But Kuznets simply does not function in that way.

Kuznets' studies of capital formation have produced other findings of great interest beyond the ones indicated above. Among these is his observation of a secular decline of the net investment ratio. His various publications abound in close analyses and cogently reasoned discourses about this phenomenon (referring to changes in the structure of investments and capital in various respects, the shortening of the economic life of capital goods etc.). Kuznets also draws upon data to account for the development of capital/output ratios for the whole of the American economy as well as for different industries; the secular (but variable) trend for the whole economy is analyzed with reference to observed tendencies towards convergence of the highly divergent capital coefficients for different industries. We also find bold but stimulating comparisons of average and marginal capital/output ratios and their development between different countries. Kuznets takes pains to discuss the many weaknesses of his statistical material and the vagaries bound up with his method of measurement.

On the basis of available national income statistics Kuznets has been able to generalize a good deal on how the capital formation process has developed over very long periods. The tendencies have been strikingly similar in the 20 or so industrial countries held up to closer examination. Thus a net capital formation ratio is found to have risen from 5–6 per cent at the outset of the modern growth process (say the 1860's) up to 15–20 per cent for a number of countries during the 1960's. He reports a corresponding upward trend for total (reproducible) capital stock which has moved more slowly than for total production volume, so that the capital/output ratio has consistently tended to fall, from 6–7 at the outset to a typical 3–5 during the postwar period. The reader will find daring but stimulating estimates of this kind in many of Kuznets' publications, and they are especially well documented and discussed in the 1971 volume referred to above. The most rewarding aspect of these research findings is not these sweeping generalizations as such, but all the tabulation and analysis of statistical data for different countries that has been performed as well as the critical analysis of the implication of existing tendencies.

It should be pointed out that Kuznets has always felt skeptical towards models which accord the investment ratio and the growth of capital a high weight as factors in the growth process. He has ascribed relatively low importance to the increase in physical capital and instead emphasized—already in his early writing—the significance of technological advance, structural change and improved quality of the labour force, and also included a part of the current supply of consumer goods as a growth factor. The following quotation is illuminative of an attitude that really did not become modern until the 1960's: "For a country's greatest capital asset is its people, with their skill, experience, and drive toward useful economic activity. To keep these at a high level the flow of perishable commodities and of services (as well as the flow of goods to consumers in general) is crucial. The effects of a high standard of living, assured by an adequate flow of perishable and other commodities, and of the skills generated by such a 'perishable' service as education, are, of course, immense." (*National Income: A Summary of Findings* (1946), p. 20.) Kuznets considers it plausible that the productivity-increasing expenditures amount to about half of the national product in a developed country with a net investment ratio of 10–15 per cent.

Relations between Structural Change and Improved Productivity

Kuznets has devoted great attention in much of his writing to productivity, the rate at which it increases and the possible causes. Starting out from the concept of labour productivity, i.e. the amount of product turned out by a worker per hour, Kuznets shows like many others that the growing capital input cannot explain much of the secular increase of labour productivity by around 2–3 per cent per annum. To weigh the importance of capital, Kuznets has made rough calculations in various contexts showing that the capital income share for different countries has been steadily declining. Subtracting the weighted effect of capital input leaves a residual productivity, which for different countries and periods shows greatly varying rates of increase —from 0.80 per cent per annum for Great Britain 1855–1913 to 4.5 per cent for West Germany 1950–1962 (*Economic Growth of Nations*, table on p. 74). But Kuznets takes the productivity analysis further to show how the growth process itself entails social costs (via urbanization, expansion of the public sector etc.), which ought to be deducted in an estimate of net productivity. Kuznets does not flinch from making hypothetical deductions for this class of costs so as to display the magnitude of reasonable corrections. A first practical task to tackle under this head would be to reclassify various items in the existing national accounts in order to draw new distinctions between costs and benefits to consumers.

In many of his works Kuznets has demonstrated the historical association between a high rate of increments to productivity and rapid change in industrial structure. However, the relations are complex and there is no "straight" causality. As in other cases Kuznets puts heavy weight on the effects of innovations or technological advance both on increases in productivity and structural changes in production. But he is anxious to show how such increases and changes also react on research and development, technological advance and the diffusion of innovations.

Structural change in its various aspects in connection with long-run economic growth is a theme to which Kuznets often returns. He has not confined himself (like Schumpeter, for instance) to speculating on the significance of change in the industrial structure, but has also been the first one to embark upon measuring this effect. In *National Income: A Summary of Findings*, published in 1946, Kuznets combined data over a half-century on the growth of national income, number of gainfully employed and their distribution among nine different sectors with the assumption of constant, proportional intersectoral differences in income per employed (according to observations available for the end of the studied period). According to these calculations Kuznets attributed three-fifths of the increase in income per employed during the half-century to the intra-sectoral increase and two-fifths to the *redistributions* of labour from sectors with lower to sectors with higher income per employed. These results tally well with a somewhat later and more detailed analysis over an 80-year period which also takes in the 1930's and 1940's ("Long-Term Changes in the National Income of the United States of America since 1870", in *Income and Wealth*, Series II 1952, p. 124 ff.). Kuznets applies a similar technique to segregate intersectoral from intrasectoral changes as to their quantitative effects on the total ratio between fixed capital and net national product. With a four-sectors classification, almost the whole increase of the total capital/output ratio from the end of the 1870's up to the early 1940's can be assigned to the interindustry redistribution. For the period up to 1929, three-fifths can be assigned to the intersectoral redistribution compared with two-fifths accounted for by the intrasectoral change. Kuznets does not forget to point out that the results depend on how far the disaggregation is taken, and he warns against putting various misinterpretations on estimates of this kind.

Calculations of productivity increases which follow from so-called reallocation gains yielded by structural changes build upon a somewhat superficial approach. Explaining how differences in gains and values added per factor input arise requires a more dynamic analysis, especially of the effects of investment in new manufacturing processes and new products. Kuznets has put more and more importance on these aspects in his later works. Various problems of this kind are especially held up to penetrating discussion in his latest volume (*Economic Growth of Nations*). He attaches special weight to certain growth industries, discusses how innovations are diffused, and shows what a cardinal role has been played in structural change by the relative price fall of products belonging to these sectors plus generally high income elasticity. At the same time, however, Kuznets points out that improved productivity in the more conventional branches of economic activity (such as agriculture and textile manufacturing) becomes important to the release of resources for transfer to these expansive sectors. Limits to growth are analyzed against this background with the aid of a three-sectors model. On the strength of this analysis Kuznets wants to show that the really dominating growth factor is the share of resources in labour, capital etc. allocated to the development of these growth industries—rather than the total investment ratio, which of course is otherwise often pushed into the foreground.

Growth and Income Distribution

In a number of studies that have appeared since the early 1950's, Kuznets has shed light on changes in income distribution from different aspects, and their connection with growth processes and business cycles. The United States remains the primary focus, though comparisons are made with other countries. These findings are often used and quoted in works on growth and cycles. The actual growth analysis—how inputs of capital and labour have changed—provides points of departure for studies of how the distribution between capital and labour incomes has shifted over longer periods. Findings of major interest are reported by Kuznets in *Quantitative Aspects, VII* and especially in one of his most recent works, *Modern Economic Growth* (1966). The trends in the capital/output ratio and in return on capital (according to different measurements) are combined to yield a comparative picture of how the functional distribution of income changes in the longer run to labour's advantage. Within the framework of a simple model of relationships and exploiting rather dubious statistics for all they are worth, Kuznets demonstrates how a redistribution process functions when the price of labour rises in relation to the cost of capital services.

Kuznets' studies of income distribution by size classes would appear to be of even greater interest. In *Quantitative Aspects, VIII*, which deals with numerous distribution concepts and measuring problems (see also his volume, *Shares of Upper Income Groups in Income and Saving*, 1953), Kuznets shows how complicated the redistribution of income seems to be during a growth process. He wants to attach particular attention to the question of mobility of income earners between income classes and how this mobility tends to rise in connection with an acceleration of the growth rate associated with structural change. Kuznets shows (after a detailed presentation of statistics for some

10 countries) how the skewness of personal income distribution generally diminishes with time. A cardinal problem he analyzes at length is how this equalization (before tax) could come about "automatically". Within the framework of a loose model, which elucidates the conflicting forces at work during a growth process, Kuznets explains how a net equalization effect has ensued in spite of the pull towards greater inequality exerted by powerful forces bound up with the growth process. In *Shares of Upper Income Groups in Income and Saving* Kuznets has also investigated cyclical changes in the income distribution and inserted these in a secular perspective. He found a slight tendency towards reduced inequality in the distribution of incomes (between physical persons) during boom periods; however, there were so many exceptions to the rule that no reasonable generalization could be drawn for the cyclical behavior.

Comparison between Countries

No record of Kuznets' achievement would be complete which failed to mention that he has constantly sought to take advantage of opportunities for drawing international comparisons, made considerable efforst to render the results reasonably comparable and then, in his quest for common patterns of growth, offered stimulating viewpoints on similarities and dissimilarities between countries at different levels of development. He has successfully promoted the thesis that the determinants and consequences of economic growth are substantially identical for different countries, and he has devoted a large part of his comparative national income analysis to discovering common patterns of growth.

Kuznets has gone to great pains in various publications to set out and discuss the many disparate *sources of error* that are bound to adhere to international comparisons of national incomes per capita and growth rates. For example, both the level and the growth of output in industrial countries may be overestimated by counting in goods and services whose sole purpose is to offset the drawbacks of industrialization; the level of output in developing countries may be underestimated owing to variations in the extent to which the market mechanism operates; rates of foreign exchange may be misleading indicators of the relative purchasing power with respect to *all* goods and services; the comparison of prices may pose intricate problems. Kuznets discusses and experiments with alternative methods of estimation, which enables him to give some idea as to possible magnitudes of the "errors" (see "National Income and Industrial Structure", *Proceedings of the International Statistical Conferences 1947*, vol. V, 1951, *International Differences in Income Levels* (1950) and *Modern Economic Growth*, chap. 7). According to Kuznets it is far better to take a critical view as to how important such sources of error may be in different kinds of comparisons than to reject comparative national income estimates altogether.

Recently, he presented further material with a thorough discussion of measurement problems at a conference of the International Economic Association ("The Gap: Concept, Measurement, Trend" (1970), in manuscript).

In his comparative studies of countries (as in the periodical, *Economic Development and Cultural Change*) Kuznets has sought to draw some cautious conclusions about development trends in economic structure and the distribution of expenditures and incomes. He has classified countries into groups according to national income per capita and found certain regularities in the stated respects (e.g. how the shares of agriculture, various industries, private consumption and investments in the national income shift with successive increments of national income per capita from under \$100 to over \$1 000). For instance, he finds that the intersectoral disparity of output per employed is much higher for developing than for industrial countries; further, he shows according to very rough but provocative estimates that the share of capital incomes (from produced capital) lies much higher "on average" in developing than in industrial countries, and that the income share accruing to the highest earners is much higher in the developing nations.

Kuznets discusses in considerable detail the conditions under which an economist is justified in drawing conclusions about secular trends with the aid of the "associations" that cross section comparisons of this kind seem to express. He shows how systematic errors can arise when new technology and new tastes impart a different turn to developments than suggested by the expenditure elasticities derived from cross section analysis. Here again one is confronted with typically Kuznetsian speculations based on thought-provoking but extremely rough statistical summaries. And presumably the real object of these speculative suggestions is to provoke reactions in the form of more penetrating research. Kuznets has continued with his comparative studies in recent years. This is especially borne out by the latest volume from 1971, already cited, in which Kuznets has profited from the studies of different countries published in the past few years. Here he draws penetrating comparisons for the broad lines of the development process in different countries and groups of countries. At the same time Kuznets devotes great attention to the processes of growth, capital formation and structural change in the developing countries, with use made both of cross-section and time-series analyses.

In the light of long historical perspectives and with 45 years of experience in development analysis, Kuznets obviously has much of interest to say about the growth problems of developing countries and the widening gap in national income per head (see e.g. *Quantitative Aspects, VII*, *Demographic Aspects of Modern Economic Growth* and *Modern Economic Growth*). The methodological and scientific problems thereby brought to the fore have already been mentioned. Suffice it here to add a provocative question à la Kuznets: "If modern economic growth began in a country that accounted for slightly over 1 per cent of world population, and in a century and three quarters spread and transformed the economies of countries accounting for between a fifth and a quarter of world population, has the rate of spread been low or high? We have no criteria by which to judge such a rate" (Modern Economic Growth, p. 458).

Concluding Viewpoints

There would be no point in the present context to summarize this brief overview of Kuznets' scientific methods and achievements. I shall only call attention to some characteristics of Kuznets' attitude to economic research.

Perhaps the most remarkable fact about Kuznets as a scholar is his almost invariant approach to the long string of research projects. He himself has described how he functions in that capacity (in "Capital ...", pp. 5–15). Having once hit upon a project, he first looks over the existing statistical data; the search for statistical sources and facts already incorporates, fully built in as it were, tentative ideas about suitable time series, tabulations and classifications that should be used—and these in turn build upon vague notions and approximate hypotheses about important factors and relations. In the course of tracking down facts and organizing data, the tentative hypotheses are continuously revised, which keeps up a running need for new facts and new tabulations that were not planned at the outset. Kuznets describes the characteristic steps in a project like this: "from measurement to estimation to classification to explanation to speculation". And he never tires of pointing out how classification into categories such as national income and investments presupposes hypotheses that must be made explicit.

Characteristic of Kuznets, too, is his insistence that all explanations of relations between sets of findings necessitate more exact knowledge of the "mechanism" involved than that which lies at hand. Hence the explanations do not turn out to be much more than "suggestions", e.g. in regard to those factors that have determined observed trends or fluctuations in the development: "The result is, at best, a sketch of a possible but untested association between the findings ..." (op. cit., p. 6). But such kinds of "trial explanations" are necessary as a basis of further speculations à la Kuznets, e.g. on the stability in observed trends, relations with other phenomena, comparisons between countries and eras. Under this head, too, come speculations about the future, in other words the extent to which observations for an elapsed, sufficiently long period can be made to underpin a trend extrapolation, for instance as to future stability in investment and saving ratios etc. Such speculations about future possibilities—with wise and well-substantiated reservations and warnings—are to be found in many of Kuznets' works.

The foregoing remarks—mainly tied in with the statements made in "Capital ..."—can be said to typify the attitude that Kuznets has taken to economic research throughout his long career. To be sure, that can be construed to signify a shortcoming in that there is a lack of renewal in his approach and methods. On the other hand, this stability in Kuznets' approach is highly valuable in its own right. The long series of seminal studies on central subjects have become indispensable and easily accessible sources of economic-statistical documentation of central importance for inquiry into economic history. A minimum of "constraining" models in connection with the presentation of empirical research findings has opened the field to free use and fresh interpretation by other scholars. The intensive use to which the results of Kuznets' studies of national income, investment and saving have been put testifies to the importance of his relatively straightforward approach. At the same time the formation of concepts, the discussion of methods and hypotheses, all the speculation on relations with immense sweeps across long periods and comparisons with other countries have both guided and given meaning to all this tremendous work with empirical data.

It fits in with Kuznets' scientific profile that he does not willingly devote himself to forecasts or to issues of economic policy. Kuznets is a wise man; to my mind, the wisest among now living economists. Even so, he has had quite a bit to say about the purpose and feasibility of forecasts based on the type of trend investigations that have absorbed him. He does not put much stock in the direct applicability of observed trends and of apparently stable relations to the design of forecasts and to decision-making for purposes of economic policy. On the other hand, he is convinced that greater empirical knowledge of the real economic world has indirect importance. Let me conclude with a quotation that neatly illustrates his attitude in this respect (from "Capital ...", p. 13): "The time lag may be long between establishment of empirical findings and their absorption into tested theory of reliably invariant patterns for practical technical use in projections or in estimating calculable effects under alternative policy actions. But the time lag is short between new findings and their use to enrich the background against which broad current problems are considered. Indeed, the danger is not that such findings will not be used for practical purposes, but rather that the results will be eagerly seized upon to yield a spat of hypotheses that claim too much generality... Yet, granting this everpresent danger that new empirical findings may provide a starting point for distorted use or for unwarranted dogmatic generalizations, there is a clear need for more, not less, such empirical knowledge; longer, not shorter historical perspective; for a more detailed, not a more aggregated structuring of empirical evidence; for wider interspatial and intertemporal comparisons rather than concentration on a single country and period." This quotation obviously embodies both the past and future programme for economic research in the Kuznetsian style.