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1. SUMMARY

The results of our exploratory survey of the study of economic growth and structure, presented in rather condensed form in Chapters 2 to 10, have been further compressed into the half dozen pages of this summary in order to help readers who are hard-pressed for time. Needless to say, the results of the survey will seem considerably more definite; the problems discussed will appear less complicated; and the suggestions made for the study of comparative economic growth and structure will sound much more positive in the summary than they do in the body of the report or in the papers, reproduced in Part II, which form one of the main sources of the report. There is no room in such a summary for a statement of the arguments for or against a specific conclusion, position, or recommendation. Readers who limit themselves to perusing the summary must therefore recognize these unavoidable shortcomings of a double condensation.

1. Systematic comparison of the course of economic growth and of the economic structure of different countries at varying stages of their development is needed if we are to understand the process of economic growth; to separate common from individual features; and to assess the importance of the factors which accelerate or retard economic growth. Such a comparative study is therefore required both for analysis of the dynamics of economic development and for formulation of policies designed to facilitate and accelerate economic growth at home and abroad.

2. Although a large amount of work has been and is being done by individual scholars, by research institutions, and by governments on various aspects of economic growth and structure of individual countries, and although considerable progress has been made by international organizations and by a few individual students in assembling materials that permit comparisons among countries, there is a pronounced dearth of systematic thorough studies of comparative economic growth and structure. This is true even for the collection of basic data, but the dearth is still more pronounced in the systematic analysis and interpretation of the entire quantitative and the collateral qualitative evidence.

3. We are still at the beginning of comparative studies of economic growth and structure, on both statistical and analytical levels. Hence, the main task for the immediate future is the establishment of sound foundations on which research on economic development and the comparison

of economic structure can proceed; against which the numerous theories about economic growth which have been proposed and which will continue to be developed can be tested; and which in turn will lead to the reformulation of the theoretical approaches to the problems of economic growth.

4. The comparative study of economic growth and structure should be world-wide. It must free itself from dependence on Western industrialized capitalistic societies and the experience of the last century which, deliberately or unconsciously, have formed the background for much of the economic theory dealing with the problem of growth, and for many of economists' policy recommendations.

5. Economic growth, as every serious student knows, is closely associated with many noneconomic factors. One need mention only physical factors like climate, soil and subsoil resources, and the biological characteristics of population; psychological factors like attitudes toward work, cooperation, authority, change, and reward and punishment in this world and the next; and social factors like class structure, political institutions, land tenure, and the legal system. These noneconomic factors cannot be ignored in studying economic growth. But it is possible, and it would seem necessary for the sake of economy and efficiency in research, to start with the study of two broad subjects: first, the economic aspects — which include the demographic factors — of economic growth and structure; and second, the effects of noneconomic factors on economic life; and to concentrate on these two dimensions of a multidimensional problem until we know much more about them than we do now. Our ignorance of the purely or predominantly economic aspects of economic development is still so great that the problem of integrating economic with noneconomic factors cannot yet be attacked with reasonable expectation of success.

6. Economics is essentially a quantitative science, and economic statistics is exclusively concerned with phenomena that can be measured or ordered. It is therefore advisable to concentrate on the quantitative, measurable aspects of economic growth and structure even though some economic factors relevant to their study are not directly given in quantitative form and sometimes appear to be beyond quantification. For many factors that are not expressed originally in quantitative form, indicators can be found that lend themselves to quantitative measurement. The discovery and development of such indirect methods of measurement, as well as of allowances for differences and changes in quality of superficially identical units of measurement, are among the important functions of the comparative study of economic growth and structure.

7. It is impossible, and inadvisable, to study intensively economic growth and structure in all countries—there are now over a hundred—and for their entire recorded history. Selection of both countries and periods, or at least establishment of some order of attack, is essential to

efficient comparative study. This selection should be guided by two criteria: availability of sufficiently reliable data, and inclusion of countries typical of the main kinds of economic growth and structure and time periods that illustrate crucial phases in their economic development.

8. Economic growth in the sense of a sustained noticeable increase in real income per head—say at a rate of at least one-half per cent per year, which implies a doubling of real income per head in not more than 150 years—is a phenomenon which became general in Western Europe and its white dependencies only in the nineteenth century, and which can be traced back only about one century further even in those countries where the process of sustained growth started—primarily England and France. Comparative study of economic growth and structure may therefore be limited in most countries to the period since industrialization began, but must include a sufficient span of earlier time to lend perspective to the take-off. For those countries that have not yet seriously begun the process of industrialization, the study of structure and development—or lack of it—during the last 50 or 100 years will suffice.

9. In general, the national states that have been the typical form of political organization throughout most of the world for the last few hundred years will have to constitute the units for comparative study. In some cases, however, when parts of the area within national boundaries show great differences in economic growth or structure, it may be advisable to treat each of them as a separate unit.

10. The main contribution which economists, economic statisticians, and economic historians can make is to clarify the character of the process of economic growth and to lay bare the relative importance of the various factors which retard or accelerate it, expressing their findings wherever possible in the form of measurable relations. The emphasis in the comparative study of economic growth and structure should therefore be put, for the time being, on research covering basic statistical and analytical problems. The areas most important for understanding the process of economic growth and differences in economic structure among countries will presumably also be those that are most significant from the point of view of economic policy. Thus, many of the results of research in comparative economic growth and structure should be of immediate use to policymakers. But at this stage of our knowledge, the selection of topics and countries for study should be guided primarily by the contribution they can make to an understanding of the basic problems.

11. The main lessons which the underdeveloped areas of today can learn from the more advanced countries may lie as much in the early as in the contemporary history of the present leaders. A systematic and statistically founded study of the early stages in the economic development of the advanced countries of today is therefore called for. At the moment we have but the vaguest idea how the level of real income per head, or

the sources, uses, and distribution of income at the time the growth process started in the more advanced countries, compare with the current or recent situation in underdeveloped areas. More precise knowledge of these relationships is, however, important in assessing the outlook for the present low-income areas.

12. While economic growth is the primary subject, the study of economic stagnation or decay must not be neglected. Something can be learned from cases in which economic growth failed to occur as well as from those in which it was spectacular. From this point of view, a study of the economic history of India and China between the middle of the eighteenth and the end of the nineteenth centuries is of particular interest. Shorter periods of arrested development also have a claim to special investigation.

13. The study of comparative economic growth and structure is not dependent on or even closely linked to any one statistical or analytical technique. The subject is so broad that advantage should be taken of all approaches and techniques that have been found useful in economic and statistical research and in which individual students have interest and skill. Different problems within the field will naturally call for different methods of investigation.

This general principle of discriminating use of the most appropriate tools from the kit of the economist and statistician does not, however, answer three specific questions likely to be raised. The first concerns the use of formal econometric models. These models have their uses for exploratory, didactic, and analytical purposes, particularly in the study of advanced economies during recent periods, where they provide a very helpful way of clarifying the basic features and interrelations of the growth process. It is as yet uncertain whether these models can be developed in sufficient detail to give much assistance in the study of the "fine structure" of an economy or its growth; or whether they can be easily adapted to the economics of less developed countries, particularly those in which the nonmarket sector is important. The applicability of the input-output technique in its fully developed and detailed form may be similarly circumscribed. On the other hand, national accounting, particularly in its simpler versions, should constitute a powerful method of arranging relevant economic data in the case of most countries and periods, with some guarantee of consistency, if not accuracy, of the figures used. We may therefore expect that the comparative study of economic growth and structure will make extensive use of the national accounting approach, properly adapted when necessary to the conditions prevailing in countries less developed economically and statistically.

14. Statisticians have made considerable progress in devising methods that permit a meaningful comparison, as between countries and over time, of economic data originally expressed in different monetary units and

at different price levels. However, much remains to be done in improving these methods, both conceptually and statistically. To avoid large errors in making these intertemporal and interlocal comparisons—which have occurred when inappropriate or antiquated methods are used—intensive work in this field is an important task.

15. Selection must be made among the many kinds of significant problems in the field of economic growth and structure susceptible to fruitful attack. Indeed, the drawing up of an almost interminable list of questions is so easy that selection and establishment of an order of priorities is essential.

Until this is accomplished, all that can usefully be done in a brief report like this one is to arrange under a few broad headings the problems that have been suggested for study in the papers, at the meetings, or in comments on a preliminary draft of this report, in order to facilitate examination by readers. This is done in Chapter 5. Though limited to those problems regarded as directly relevant and important to the study of economic growth and structure, the list numbers well over 100. Hence each problem had to be restricted to a one paragraph summary. There is obviously no point in further condensing this summary list of problems here.

16. The organization of comparative studies of economic growth and structure depends considerably on the selection of topics. Some subjects, particularly those predominantly theoretical, are probably best left to individual scholars, certainly in those cases where inspiration, insight, and the combination of very diverse materials are needed for success. Other studies can best be done by an organization combining the advantages of continuity of operation, specialization, and ample library, clerical, and calculatory resources. In this group should be included the development of comparable basic statistical data for a substantial number of countries and periods, including the development and application of techniques for reducing the original data to a uniform basis; and the systematic testing of hypotheses about economic development against actual experience in many countries and periods — a task for which the authors of the hypotheses usually have neither the necessary factual data, the technical facility for interpreting them, nor the patience and detachment required.

No such specialized continuous organization concentrating on basic research in comparative economic growth and structure now exists. Yet it could provide a focus for individual research in the field of economic growth and structure, and a training ground for young economists and statisticians anxious to enter this field of economic research and for mature scholars who want to add it to their special skills. Suggestions for such a “Center for Comparative Quantitative Study of Economic Growth” are discussed in Chapter 10.

17. Two other possibilities for advancing our organized knowledge of

comparative economic growth and structure are also mentioned in the final sections of Chapter 10: the organization of a standing conference on the study of economic growth and structure, and the publication of a journal concentrating on these problems.

2. CURRENT EMPIRICAL WORK ON COMPARATIVE ECONOMIC GROWTH AND STRUCTURE

It is impossible to include in this exploratory survey an adequate discussion of all the past and current theoretical and empirical work which has some bearing on the comparative study of economic growth and structure.¹ Limitation to publications and projects in which international comparison plays a central rather than a peripheral role is obviously called for. Further limitation to projects that were actually under way at the time our survey was made (summer of 1958), in the United States or at international agencies, or that were then definitely scheduled for early start seemed advisable, although a brief glance backward at some published empirical work on comparative economic growth and structure helps provide perspective. Projects outside the United States were excluded because of the impossibility of making a sufficiently exhaustive survey. This omission, however, should not result in a misleading view of the work going on throughout the world in the field of systematic comparative study of economic growth and structure.

Even within these limitations, the brief comments that follow should be regarded as illustrative rather than exhaustive.

Past Empirical Work on Comparative Economic Growth and Structure

There are many early studies which in their day constituted considerable steps forward. Though they may not satisfy our standards of accuracy and of disclosure of sources and methods, and though they were necessarily based on limited primary data and a restricted volume of analytical studies, many are still of substantial interest today.² Only a few of these can be mentioned.

¹A bibliography dealing with part of the field is A. Hazlewood, *The Economics of Underdeveloped Areas* (1954). The more recent literature is covered in the July 1958 issue of *Economic Development and Cultural Change* ("A Selected and Annotated Bibliography on Economic Development, 1953-1957" by Frank N. Trager, and Michael Belshaw, Lottie Rausa, Samuel N. Seidman, and S. George Walters).

²The brief discussion in the text is restricted to comparative statistical studies that go well beyond the classified collection on existing statistical data for various countries. Among works that are limited to reprinting official statistics but that

The international comparison of economic structure may claim to be as old as economic statistics. When Gregory King, near the close of the seventeenth century, wrote his *Natural and Political Observations and Conclusions upon the State and Condition of England*—the first serious attempt at an estimate of national income and wealth, an attempt that in many respects compares favorably with any work done in this field until this century—his aim was the comparison of the economic strength of England and her rivals. He therefore specifically supplemented his pioneering estimates for England with comparable figures, though less detailed and presumably less accurate, for Holland and France.

For the nineteenth century, probably the main source of comparative economic statistics is Mulhall's *Dictionary of Statistics*. The many editions of this work, from 1884 to 1903, testify to a considerable public interest in this approach. The Dictionary was international in scope; but unfortunately often omitted sources and explanations of methods, in line with the custom of the time. Modern students therefore hesitate to use the Dictionary even though the estimates—many of them obviously original work—on important economic magnitudes in many countries, which are difficult to derive even under much more favorable circumstances, constitute a continuous temptation to fill statistical voids.

Another level is reached with *Die Welt in Zahlen* by W. S. and E. S. Woytinski, published between 1925 and 1928 in seven volumes, dealing respectively with population and national wealth; labor; agriculture; industry; trade; public finance; and government. Wide geographic scope, coverage of long sweeps of economic history, and discussion of problems of collecting and interpreting different types of statistics and their international comparability characterize the work. When the authors returned to a similar task a generation later in *World Population and Production* (1953) and *World Trade* (1956), they had much richer and more reliable statistics with which to work, particularly the data collected by inter-

often are valuable to the student of comparative economic growth are Hübner's statistical tables (original title: *Otto Hübner's Statistische Tafel aller Länder der Erde*; latest title, *Hübner's Weltstatistik*), covering many aspects of economic statistics, which have been published under different titles and by different editors, irregularly since 1851; Neumann-Spallart's statistical surveys of international trade (*Übersichten über die Weltwirtschaft*), which started in 1878; and Sundbärg's comparative tables (*Statistika Översiktstabeller för olika länder*), published for a number of years beginning in 1895.

It is also well to remember that the statistical yearbooks of a number of countries have included international parts which became sufficiently extensive in a few cases, for instance France and Germany, to constitute a short international statistical compendium. The British government went so far as to issue for a number of years a special annual publication bringing together statistical information on foreign countries; and a similar one for the British Colonies, then covering a substantial part of the globe. After World War I, of course, all these publications were supplemented and partly superseded by the statistical yearbooks of international organizations such as the League of Nations, the International Labor Office, and the International Agricultural Institute.

national organizations; for the same reason, coverage had to be more selective with respect to subjects and to time.

Less ambitious but interesting as one of the first examples of presenting basic statistics of a large number of countries on a uniform plan for a substantial period of time, is *Die Wirtschaft des Auslandes*, published in two volumes by the German Central Statistical Office in 1928 and 1929. Annual figures were presented from 1900 to the mid-twenties for more than sixty countries, and discussed in a fairly standardized pattern, more descriptive than analytical.³

The most recent era of comparative statistics of economic growth and structure is reached with Colin Clark's *The Conditions of Economic Progress*, first published in 1940 and reissued in considerably enlarged and modified form in 1951 and 1957. This work is characterized by its analytical orientation; by the volume of material on a large number of countries during the twentieth and much of the nineteenth century—necessarily of very differing quality—which is used primarily to illustrate the author's hypotheses about economic growth; and by concentration on trends in real income per manhour and the factors determining them.⁴

Current Empirical Work by International Agencies

The main contribution which international agencies have been making to the comparative study of economic growth and structure has been through providing easy access to relatively simple data for a large number of countries, sometimes for virtually all countries in the world for which figures are available. Typical examples of this type of service are publications like the *Statistical Yearbook* and the *Demographic Yearbook* of the United Nations, the *Yearbook* of the Food and Agriculture Organization, and the balance of payments and financial statistics of the International Monetary Fund. Without these compendia of international statistical data and a few similar publications, it would be practically impossible for individual scholars, and difficult even for sizable research organizations, to study comparative economic growth and structure on a broad scale.

The second and probably even more important service rendered by international statistical agencies is the continuous pressure they have exerted—albeit with varying success—toward improvement of the quality of statistics in many countries; toward expansion of the scope of statistics in less developed countries; and toward making the statistics of different countries more nearly comparable, in form and in substance. This movement has been particularly important and successful, from the point of

³Another publication of the same organization, *Statistisches Handbuch der Weltwirtschaft* (1936), presented similar data for the period 1920 to 1934.

⁴Extensive data on comparative economic growth as reflected in national income statistics are contained in P. Studenski's *The Income of Nations* (1958).

view of the comparative study of economic growth, in the field of national income statistics.

International statistical agencies have sometimes taken another step forward by making analytic comparative studies of economic growth and structure. Such studies have been quite common in the annual *World Economic Survey* of the United Nations; and in the reports of the United Nation's regional economic commissions for Europe, Latin America, and Southeast Asia, of the Food and Agriculture Organization, of the Organization for European Economic Cooperation, and of the Bank for International Settlements, although most of these studies have been limited to current and recent years. Scholarly long-term studies primarily comparative in nature have not, however, been entirely lacking. It may suffice to cite two examples, Svennilson's *Growth and Stagnation in the European Economy* published in 1954 by the Economic Commission for Europe, and the investigations of comparative production and purchasing power of member countries, made by Gilbert and associates for the OEEC.⁵

The value of the work currently being done by international agencies will be considerably increased from the point of view of the scientific study of comparative economic growth and structure if instead of dealing with individual countries, primary emphasis will be put on the systematic comparison of structural and functional problems of several or all countries within a region. Some movement in this direction has been visible during recent years.⁶

Although international statistical and economic organizations thus have made substantial contributions to the study of economic growth and structure, and though their reports are essential as starting points for rapid reference for anybody working seriously in this field, they have not been able to do much for the systematic comparative study of economic development, nor are they likely to do so, because of the nature of their operations.⁷

Current Empirical Work in the United States

It was not possible within the scope of our survey to make a systematic firsthand survey of empirical research work on comparative economic growth and structure that had been done or was then in progress in the United States and abroad; nor was it felt necessary to do so. We tried to make sure, by a review of the printed literature and by consultation with

⁵E.g. *Comparative National Products and Price Levels* (1957); *Statistics of National Product and Expenditure, 1938 and 1947 to 1955* (1957).

⁶Examples are the comparative study of postwar economic developments in OEEC countries in that agency's *A Decade of Cooperation* (1958), and the comparative study of the problems of development in the Mediterranean area in an FAO project now in progress.

⁷Cf. Chapter 10, first section.

specialists, that no large-scale project devoted primarily to the comparative study of economic growth and structure was overlooked. This section, however, is not intended as a report on even all those projects, whether completed and published or still in progress, of which we acquired knowledge; its purpose is only to indicate by examples the nature and the approaches of current research in this country on comparative economic growth and structure, giving preference to projects discussed at the Princeton and Washington meetings. Reference to a specific study or project, therefore, does not mean that it is outstanding in its field, nor does omission of a publication or of work in progress mean the opposite.

In the absence of an established theoretical framework for a comparative study of economic growth and structure, it is not surprising to find wide differences in approach, in part themselves attempts to establish and test such a framework.

One path of inquiry is represented by comparative studies of selected sectors of the economy.

At the University of Chicago, for example, a study of the agricultural sectors of a number of countries in Latin America, the United States, and some other areas is in progress under the direction of Professor Schultz; it aims to explain output trends by an examination of changes in composition and quality of inputs, leading to a study of optimum scales of output and the degree of conformity to the optimum achieved in different countries.

Another research project in comparative agricultural economics is being undertaken by Professor Jones and his associates at the Stanford University Food Research Institute. This study covers the native economies of Africa south of the Sahara, and is basically concerned with the question of nutritional adequacy of food production for present requirements and for a potential rise in the standard of living and increasing urbanization: an approach dictated by the paucity of available data and the limited usefulness of traditional income accounting concepts for economies in which economic behavior is strongly influenced by tribal custom. Under examination are the relative advantages of small-holder and plantation methods of production, and the contribution made by export crops to the growth of agriculture. From these analyses arise questions of economic responses and of differential growth in terms of access to markets, resources, and education.

Several projects deal with special problems rather than with individual sectors. At the University of Chicago, Professor Schultz is directing a study of education in various countries, relating levels of education to achieved levels of income. At the Harvard Law School, a research program under Professor Surrey has produced descriptions of the tax systems of some forty countries and is proceeding to analyze their effect on economic development. At the Harvard Business School, a study is planned, under the direction of Professor Gordon, of the relationship of foreign private investment and economic development in a number of countries.

Professor Reynolds of Yale University has made a study of the effects of market forces, collective bargaining, and government regulation on the structure of wages in five industrial countries; this is being supplemented by a study of labor force and industrialization in Puerto Rico.

A study of the relationships of industrialization, management, and labor in more than a dozen countries, including developed and underdeveloped areas and planned-economy as well as free-enterprise countries, is being conducted by the Inter-University Study of Labor Problems in Economic Development, in which faculty members of Harvard, Massachusetts Institute of Technology, Princeton, California, and Chicago Universities, and several foreign academic institutions participate. Individual studies, some already published, deal mostly with problems in one country. The project apparently does not include a summary report on a comparative basis.

Possibly the broadest project in the field now in progress is a study of the growth of national product and income in a number of countries during the past century, or as far back as reliable estimates can be made. This study is directed by Professor Kuznets under the auspices of the Committee on Economic Growth of the Social Science Research Council. The countries for which estimates are being prepared—following a common basic plan—include Great Britain, France, Germany, Italy, the Netherlands, Sweden, Norway, Denmark, Australia, and Japan; and it is intended to cover Mexico and some other Latin American countries.

The Research Center in Economic Development and Cultural Change at the University of Chicago is sponsoring a series of projects, with the chief aim of providing data on significant magnitudes of interest for the study of economic growth. An effort is made to search out areas in which the collection of data has been inhibited in the past because of theoretical or methodological difficulties. One project centers on capital formation in Japan since the 1880's; one on the determination of total agricultural production in India since 1895; one on estimating regional gross product of certain areas of India; and one on long-range shifts in the labor force of countries with a large section of subsistence farming. It is contemplated to expand this program and to engage in research on such topics as the determination of long-range changes in the terms of trade between primary and final goods; and on some indicators of urban growth as well as the quantitative measurement of the urbanization process in underdeveloped countries.

As part of the research project on the Economics of Co-existence at the National Planning Association under Henry G. Aubrey, questions of comparative growth are treated in studies of a number of Soviet Bloc countries, including the Soviet Union and China, advanced Western countries, and underdeveloped countries, with particular emphasis on possible rates of growth at different economic levels and in different economic systems.

Two projects dealing with wider questions of the causes and the process of economic growth are under way at the Center for International Studies

of the Massachusetts Institute of Technology and at the Department of Economics of Stanford University.

The M.I.T. project is proceeding along several lines. The phenomena of the growth process are studied in detail in three countries representing different types of development: Italy, which is interesting because of the differing degrees of development in the northern and in the southern parts of the country; India, basically an agricultural economy still using largely traditional methods of production but in the process of industrialization; and Indonesia, a tropical, thickly populated economy that has stagnated in recent times.

A different approach, emphasizing noneconomic factors, is pursued in another study of the M.I.T. Center headed by Professor Hagen. On the assumption that economic factors alone do not account for growth, a rough model of the interactions of economic and sociological factors is being constructed. The salient feature of this inquiry is a study of the psychological make-up of persons who have been economic innovators. Psychological tests were made on some innovators in Colombia and Mexico to ascertain how these people differ from persons of the same background who have not introduced economic innovations. Historical-sociological studies are also being made of innovators in England and Japan at the relevant periods, and use is being made of experience gained in similar field work in Burma and Indonesia.

A third study at the Center attempts to define and analyze the central factors involved in the rapid economic development of Africa south of the Sahara, excluding the Union of South Africa. Research has begun with an economic survey of the region, which brings together available quantitative data on such topics as rates and patterns of investment and growth, agriculture, trade flows, and relationships between African economies and those of developed countries. Further research will include field work in selected African territories, probably Nigeria, the Belgian Congo, French West Africa, and the Federation of Rhodesia and Nyasaland. This project will try to find interrelationships between the political and social evolution of sub-Saharan Africa and its economic growth.

The project at Stanford University, headed by Professor Chenery, focuses on three elements which are quantitatively measurable and which fit into models, on the assumption that their interactions are of primary importance, viz. consumption, production, and international trade. These elements are analyzed and compared separately, and their similarities or dissimilarities between countries observed. Then their interactions are studied. The comparative studies make use of the available—and comparable—data of a large number of countries for the aggregates, although only a smaller number of countries can be used for some of the analyses of production. Changes in consumption and production in the various sectors at different levels of income are observed. Production is being studied in greater detail, by comparing capital-output ratios by industries for a number of countries; by an international comparison of labor-output

proportions for a number of sectors; and by a comparison of input-output tables to determine similarities of intersectoral relations between countries. To determine the effects of time and of nonspecifiable factors, studies of actual growth patterns for a few countries are planned. Throughout the work, the usefulness of more sophisticated theoretical formulations as against simpler models is being tested in a few cases of each phase, by measuring the improvement in the results when more complex models are used.

A research program planned in the Graduate Economics Department of Columbia University, interesting from the point of view of research organization, is the "Industrial Countries Workshop" intended as supervised research by graduate students on the economic development of the more highly developed industrial countries. The underlying assumption is that the processes that led to the present state of development of the advanced countries should be of interest to the policymakers of the underdeveloped countries in their current efforts toward industrialization.

Mention must be made of comparisons between free-enterprise and planned economies, which usually reduce to comparisons between the Union of Soviet Socialist Republics and the United States. This comparison is in a class by itself with respect to the frequency with which it has been undertaken and the amount of resources which have been devoted to it in the United States by the federal government and private research organizations, probably exceeding the combined resources devoted to all other work on comparative economic growth and structure.

Most of the work in this field is not strictly comparative in nature, but is a prerequisite to comparisons, e.g. the laborious construction of detailed national income accounts of the U.S.S.R. by Professor Bergson and associates for the years 1928, 1937, 1940, and 1948;⁸ the calculation of indexes of industrial production;⁹ the derivation of measures of productivity;¹⁰ the large-scale comparison of dollar and ruble prices;¹¹ and the attempt to develop an input-output table for the Soviet economy;¹² — to disregard entirely the numerous detailed studies dealing with individual sectors of the U.S.S.R. economy.¹³ The unusual feature of all this work is

⁸A. Bergson, *Soviet National Income and Product in 1937* (1953); A. Bergson and H. Heymann, Jr., *Soviet National Income and Product, 1940-1948* (1954); O. Hoeffding, *Soviet National Income and Product in 1928* (1954).

⁹The most detailed attempts in this field have been made by D. R. Hodgman, *Soviet Industrial Production, 1928-1951* (1954); and by G. W. Nutter (NBER study, as yet unpublished in full, but summarized in *American Economic Review*, May 1957 and May 1958).

¹⁰W. Galenson, *Labor Productivity in Soviet and American Industry* (1955).

¹¹Stanford Research Institute and Rand Corporation (unpublished).

¹²The Council for Economic and Industry Research (unpublished).

¹³Examples of published work are G. Clark, *The Economics of Soviet Steel* (1956); H. Hunter, *Soviet Transportation Policy* (1957); N. Jasny, *The Socialized Agriculture of the USSR* (1949); and E. W. Williams, Jr., *Freight Transportation in the Soviet Union: A Comparison with the United States* (NBER Occasional Paper 65, 1959).

that it is done outside the country with which it deals; however, it uses mostly a selection and adaptation of that country's official data because of the obvious shortcomings of the official Soviet estimates for aggregates like national income, industrial production, and consumer prices for serious research and for comparison with the figures available for Western countries. Another characteristic of work in the field is that much of the research done by and for the United States government remains unpublished, even in cases where it is difficult to detect a connection with national security.

These painstaking and often voluminous studies have served as the basis for several reports that are essentially comparative in nature. Two of the most detailed are the publications of the Joint Economic Committee of the United States Congress on *Trends in Economic Growth, a Comparison of the Western Powers and the Soviet Bloc* (1955) and *Soviet Economic Growth: A Comparison with the United States* (1957).

3. CONCEPT AND IMPORTANCE OF COMPARATIVE STUDY OF ECONOMIC GROWTH AND STRUCTURE

Concept and Measurement of Economic Growth and Structure

A reasonable degree of agreement has by now been established among economists and statisticians that economic growth may be usefully defined as the sustained noticeable increase in real income per head.

Acceptance of this working definition does not mean, of course, that all other changes in the economy accompanying such an increase in real income per head are unimportant or are uniquely correlated with the rate of growth of real income per head. Nor does it imply that increase in a country's real income in step with its population growth — extensive growth as distinguished from the intensive growth involved in an increase in real output per head—does not present significant problems, problems that are similar in many respects to those with which this report deals. However, no measure of economic growth has been advanced whose advantages outweigh the relevance and simplicity, in concept and in actual measurement, of real income per head.

Any simple definition of a complex phenomenon such as economic growth obviously can be used only as a desperate condensation or abbreviation. In this case the definition of economic growth by the concept of real income per head is only an abbreviation for the whole complex of measurable changes in economic structure which accompany economic growth. Complex changes in structure must still be studied in detail by supplementary measures.

All of the six components in this definition of economic growth—"sustained noticeable increase in real income per head"—except possibly the word "increase," require comment. Most of these components can be understood in slightly different ways without impairing the applicability of the definition.

The requirement of sustained growth calls for two characteristics: first, the presence of a positive noticeable rate of change for an average period of more than, say, two or three decades; and second, a reasonably regular pattern of growth that can include cyclical ups and downs but generally shows increases from one peak to the next and from one trough to the next. Situations in which the rate of change in real income per head

over longer periods is zero or negative are not outside the field of study—they even have particular interest for certain problems—but they are classified as periods of stagnation or of decline.

How large the average rate of increase in real income per head must be to be noticeable or nontrivial, and thus to qualify a period as one of growth rather than of stagnation, is essentially an arbitrary decision. Even seemingly negligible rates—say, 0.1 per cent per year—build up to large absolute increases if they continue over millennia. In practice, however, where we deal at best with a few centuries, an average rate of increase in income per head of less than 0.5 per cent per year can be regarded as almost equivalent to stagnation; it would mean an increase by only about 25 per cent over a man's lifetime. An increase in real income per head, even if it were regular, which lifted the level of average real income by only 10 per cent during a generation, i.e. by less than 0.25 per cent per year, could not be called a noticeable rate of growth at all.

Real income, then, is the key element in the definition. However, income may be defined, in the language of national accounting, as either gross national product, net national product, or national income, depending on the purpose of the investigation. And either a broad or a narrow definition of output may be used, including or excluding items like military output, use value of consumer and government civilian durables, and unpaid family services. Again, purpose and data availability will decide.

Abandonment of nominal values, i.e. of changing or differing current prices, is essential. Reduction to a constant price basis leads immediately into the most difficult questions of index number and value theory. If income is regarded as the measure of economic growth, it can be so treated only in the sense of a bundle of physically identifiable goods and services. Only then can it reasonably be said that, if the average person at one time or place has twice as many goods and services at his disposal year after year than at another time or place, income has risen by 100 per cent in the time interval, or a difference of 100 per cent exists in the level of income over a space interval.

The per head element in the definition again is open to varying interpretations without impairing its applicability. The common practice is to interpret "per head" as the result of the division of aggregate income by the number of a country's inhabitants irrespective of age, sex, or labor force status. However, it may be preferable to use as the denominator only the actual labor force, if the emphasis is on productive relations; or the number of adult male equivalents, possibly in the form of the poundage of body weight of the population, if the study is directed primarily toward consumption.¹

¹Some students prefer real income per manhour as the basic statistical measure of economic growth, e.g. Colin Clark in his *The Conditions of Economic Progress*. Real income per manhour may be preferable when the analysis is directed specifically toward productivity—though in that case allowance must be made for other inputs—but seems less desirable as the most general measure of economic

To agree on the characteristics of economic structure is much more difficult. But such an agreement is less necessary than in the case of the definition of economic growth because the most appropriate characteristics of economic structure will vary among countries and over time. In other words, any set of structural characteristics will apply only to a limited number of space-time situations.

We may define economic structure as the totality of economically relevant interrelationships, at a point of time or during a period of time, within a national economy and between it and other economies. Which of the innumerable economic relationships are relevant is to some extent a matter of judgment. The better the selection—which naturally depends on the available quantitative data—the more completely do the structural coefficients and their changes characterize the economy and capture the essentials of its development.

A number of characteristics are, however, applicable to virtually all economies, though they vary in importance in different cases; they may be regarded as constituting the minimum for an adequate analysis of the structure and development of an economy. The list below includes the more important structural features, but ignores the often difficult problems of measurement involved. Most of the characteristics may be used as absolute figures, though usually they are more relevant when related to population or a similar denominator.

1. Characteristics of resources endowment
 - a. Land area, classified as to fertility and accessibility
 - b. Subsoil mineral deposits
 - c. Water resources
2. Characteristics of human capital
 - a. Age and sex distribution of population
 - b. Age specific birth and death rates — the latter classified by cause
 - c. Health and morbidity
 - d. Physical characteristics of population
 - e. Psychological characteristics of population
 - f. Educational level of population
 - g. Spatial distribution and concentration of population, particularly extent of urbanization
 - h. Labor force participation
 - i. Working and leisure time
 - j. Length of training, working, and retirement life
3. Characteristics of reproducible capital
 - a. Size and form of capital stock
 - b. Sectoral distribution of capital stock

development than real income per head, which can serve as an indicator — albeit a rough one — of both the production and consumption aspects of economic growth.

- c. Regional distribution of capital stock
 - d. Durability and age distribution of capital stock and its components
 - e. Amount and distribution of use of energy
4. Characteristics of income and wealth
- a. Level of income, in the aggregate, for different sectors of the economy, for different groups in the population, and for different regions
 - b. Share of market and nonmarket activities in income
 - c. Sectoral distribution of income and wealth
 - d. Functional distribution of income
 - e. Distribution of income between consumption, and gross and net investment
 - f. Size distribution of income
 - g. Size distribution of ownership of wealth
 - h. Concentration of control over tangible and intangible assets
 - i. Share of government in income and wealth; sources and uses of government income
 - j. Extent and character of cyclical fluctuations in income and wealth
 - k. Effect of price level changes of long duration on level and distribution of income and wealth
5. Characteristics of productive organization
- a. Size of markets
 - b. Size of establishments
 - c. Factor combination in different sectors; capital-output ratios; production functions
 - d. Efficiency of production (productivity)
 - e. Location of productive activities, particularly their local concentration
 - f. Extent of monopoly and similar forms of market domination
 - g. Extent and character of governmental direction of and influence on productive activity
6. Characteristics of financial organization
- a. Size of financial superstructure and of different types of financial institutions
 - b. Degree of separation of ownership and control
 - c. Sources of saving; saving-income ratios for different sectors and groups
 - d. Uses of saving; sources of financing of different sectors
 - e. Asset-debt relationships
 - f. Level and structure of interest and yield rates
 - g. Relation of money holdings to income

- h. Price level and price relations, and long-term changes in them
 - i. Cost-price relations
 - j. Changes in financial structure accompanying long-term price-level movements
 - k. Changes in financial structure accompanying long-term changes in the level of interest and yield rates
 - l. Regional differences in financial organization and structure
7. Characteristics of international economic relations
- a. Size and importance of merchandise and service imports and exports
 - b. Size and importance of capital imports and exports
 - c. Extent and nature of foreign ownership of natural and capital resources
 - d. Extent and character of obstacles to international movement of commodities, capital, and men
 - e. Susceptibility to developments abroad

The Comparative Approach to the Problems of Economic Growth and Structure

It is rather strange that an argument or a plea should be needed for the systematic comparative study of economic growth and structure. In most other humanistic disciplines outside the social sciences and in not a few of the natural sciences, the comparative approach has long been accepted as a separate branch of the discipline. Thus we have in the humanistic field, to cite only a few familiar examples, comparative law, comparative linguistics, comparative literature, and comparative religion; and among the sciences comparative anatomy, comparative anthropology, comparative physiology, comparative chemistry.

In all these cases the object of the "comparative" branch of the discipline is the systematic comparison of different "cases" (or "space-time situations") falling within the subject matter of the discipline. In the humanistic disciplines, the space dimension of these "cases" is usually but not always circumscribed by national or other territorial boundaries. Thus, comparative linguistics centers on the systematic comparison of different languages with regard to the structure and development of those characteristics — such as sound, grammar, word form, and word order — which have been found to be important in linguistic theory. In natural sciences, such manmade divisions are usually ignored and cases are constituted by divisions appropriate to the science; comparative anatomy, for instance, compares the anatomically important characteristics of bone structure and bone development over time of animal genera, species, varieties, etc. In all such cases, the comparison can be conducted on several levels depending on the definition of a "case." In comparative linguistics, for instance, the basis of comparison may be either national languages; or on a more

detailed level, the dialects of one language; or on a broader canvas, language families.²

In both the humanistic disciplines and the natural sciences the comparative method is used for two reasons mainly: first, because it has been found to lead to insights about the structure and development of a single case which cannot usually be obtained from a study of that case alone; second — and more important — because comparison permits separation of what is specific to a case and what is only a reflection of the common characteristics of the class of phenomena to which the case belongs. Comparative linguistics, for instance, tells us which of the characteristics of the Latin language are specific to it as against those which are common to all Romance languages or to all so-called Indo-Germanic languages or to all human languages.

The situation in economics is basically similar. Here, too, several levels of units exist which can form the subject of comparisons. The first is the individual household, voluntary association, enterprise, or public body. Systematic comparison of structure and growth among units in each group — or subgroups within each group — is quite possible and often fruitful. On the second level of comparison, units are combined either on a spatial basis — cities, counties, and regions are examples — or on a nongeographic basis, yielding groups such as industries or social classes. In economics, however, it is the third level which provides the main field for the comparative approach — the national state, or more correctly, the totality of economic units of the first level located within national boundaries.

There are many economic problems for which national boundaries are not the best basis of classification. For a study of the effects of the introduction of a new type of tractor or of a famine in India, for instance, a wheat farmer in North Dakota and a wheat farmer in Manitoba, or even a wheat farmer in New South Wales, are much closer to each other — in the sense of belonging to an economically homogeneous group of units — than the North Dakota wheat farmer is to a New York garment worker.

In analyzing economic growth and structure, however, there is little doubt that national states are the natural units of comparison. First, from a practical point of view, national states are the only units for which the statistical data required for the study of economic growth and structure are available on a fairly broad basis and for substantial periods of time. Secondly — and this is more important substantively — economic growth seems to be closely associated with the national state in at least two respects. Many of the conditions of economic growth, stagnation, or decay result from direct government action. Mention of the vicissitudes of war on the noneconomic plane, and in the economic sphere of the legal system,

²Interestingly, there is no established academic subject called comparative history. What takes its place often goes by the name of philosophy of history, and is not in favor among historians who pride themselves on using the scientific approach.

taxation, currency, and tariffs — to keep to subjects of government action even in the night watchman state — may suffice. Also — and this is more relevant for economic analysis — a considerable degree of economic similarity exists among the units situated within a national state, partly as the result of direct government action, but partly for other reasons. In statistical language, the intra-country variation among economic units belonging to one national state is smaller with respect to many important economic structural and dynamic variables than the inter-country differences in the same variables. To take an obvious though rather extreme example, the average difference in level and character of consumption among American households today is much smaller than the difference between the average American and the average Indian household.

Occasional comparisons between the economic situations and development of two or more countries abound in economic literature from its earliest beginnings. There also have been a few detailed studies comparing either the economic structure or the economic development of two or a small group of countries, chiefly during the postwar period, and usually limited to comparisons over fairly short periods. Finally, several compilations of statistical data on economic structure and growth of a large number of countries have been published, sometimes without comment as in the case of most statistical publications of international organizations; a few of these have stressed comparisons of economic development in different countries.³

Giving full credit to these studies, it yet seems fair to conclude that the systematic comparison of economic growth and structure on a world-wide scale and over long periods of time is still in its infancy, particularly if emphasis is put, as it should be put in scientific studies, on the systematic character of the comparisons.

There are at least four reasons for the dearth of systematic comparative studies of economic growth and structure. The first although possibly not the decisive reason is the lack of a generally accepted theoretical framework that is sufficiently specific and realistic. The classical economists and Marx, of course, had a general theory about the course of economic development, which is expressed rather clearly in their published works. At that time, however, economists had neither the inclination to test their theories against statistics, nor the statistics themselves. Neither did they have a real possibility of confronting their theories with facts since their theories were essentially prophecies of the future — Ricardo's gloomy expectation of a decline in the profit rate leading to the slowing down of the process of accumulation, and of the consequent stagnation of the economy; the population crisis foreseen by Malthus; and Marx's vision of the progressive immiserization of the workers — how weak a rendering of the original "Verelendung"; the concentration of production in the

³References to individual publications are omitted here, as a brief survey of the literature is given in Chapter 2.

hands of a few monopolists; the proletarian revolution; and the communist millennium. For at least two generations from the mid-nineteenth century on, it became unfashionable for a professional economic theorist to concern himself more than casually with long-term movements in the economy of his own country, let alone with the problems of economic development in nonindustrial nonwhite economies. As a result, a theory of comparative economic growth is missing from the systems of the English-speaking neoclassicists and of the Austrian marginalists, the two main bodies of economic theory flourishing during this period.

The complaint that economic theorists have neglected the problem of economic growth certainly does not apply to the last ten to twenty years except possibly with respect to the systematic comparison of economic structure. Indeed, the stampede into this field after World War II has been such — there are fashions in economic theory as in any other human activity — that the proliferation of theories of economic growth of vastly differing form and content has made it impossible for empirical research workers to discern areas of agreement among theorists; or even to be sure which approach theorists had selected as most fruitful from their point of view. This situation is not likely to change basically in the near future, if only because too many theorists have not yet come forth with their personal theory of economic growth and, more importantly, because the interaction between the formulation of hypotheses by theoreticians and their testing by empirical research, which is always essential for an advance in both fields, has hardly started.

The flowering of the “stage theories” of economic development during the second half of the nineteenth century might be regarded as an exception to the neglect of economic growth by theoreticians. These theories,⁴ however, were usually not much more than descriptions of different types of economic organization which were supposed to follow one another in time, although it was hardly ever shown how one stage evolved from the preceding one and developed into the next phase. And, what was more damaging to the comparative study of economic growth, virtually all of these schemes postulated one line of unidirectional development, extending usually from the primitive food-gatherers to the economy of the then leading country — Great Britain — which was regarded as the natural endpoint of all economic development. As these hypotheses had no close connection to the economic theory of the day, which was essentially static, they were by and large neglected by the theorists. Nor did the stage schemes lead to what might have been regarded as their logical consequence, the development of self-contained economic theories applicable to one of the various stages of economic development. Such theories were repeatedly advocated, called for, and sketched, but none was ever developed to a point where it could be taken seriously by economic analysts.

⁴Cf. B. Hoselitz, “Theories of Stages of Economic Growth” (unpublished).

The second reason for the absence of systematic comparative studies of economic growth and structure is that only very recently has agreement been reached among research workers — and it is not yet unanimous — on the use of the national income approach as the best way of organizing the basic statistical material on economic growth and structure. Hence, national accounting data, in particular national income statements and national balance sheets, that meet modern standards are available for only very few countries before the postwar decade. Even for these few countries, the figures rarely extend into the nineteenth century and practically never reach back to the period of the industrial revolution.

The third reason for the lack is simply the magnitude of the task. When reviewing the main requirements of a systematic comparative study of economic growth and structure, it will become evident that until much of the basic statistical work is done it will be quite difficult for individual scholars to make progress on as broad a basis as many of the problems of economic growth and structure require. The result has been that much of the work of individual students has necessarily been limited to comparisons covering only a very few countries or a narrow subject; or have had to be conducted in the broadest of terms. Private economic research organizations have not yet entered the field on any substantial scale. Governmental and international statistical and economic agencies have limited themselves to relatively simple and uncontroversial compilations, and have concentrated on figures for the present and recent past.

The fourth reason for the dearth of systematic work in this field is a lack of integration in the work done in the field, which in turn is due partly to the lack of a theoretical framework. Even with limited personnel and financial resources, considerably more progress might have been made if there had been less duplication and more coordination in the efforts of individual researchers in different countries. In a field as new and unsettled as the study of economic growth and so much affected by diverging national interests and pressures for immediate action, it would be too much to expect international cooperation based on long-range programs directed primarily toward basic research.

What, then, are the tasks and the uses of a systematic comparative study of economic growth and structure? The basic objective is easy to formulate: to understand the process of economic growth and of changes in economic structure by means of comparing different countries and different periods, a comparison that permits separation of the specific characteristics of individual geographic and historical situations from the common traits of economic development.

It may well be found that no combination of significant traits is applicable to economic development in all areas and periods, and that it is necessary to distinguish several types and phases of economic growth, each with its own characteristic common traits. Such a multiplicity of economic growth and structure patterns in no way invalidates the comparative approach with its characteristic recognition of the varieties of

actual economic experience and their reduction to an analytical model which may or may not be expressed in algebraic or quantitative terms.

What would invalidate the comparative approach, as here understood, is a situation in which every case of economic growth and every economic structure constituted a law unto itself, understandable — if at all — only as a unique combination of features and forces. Some historians have maintained that this is the situation which they are facing in their craft: that since they deal with unique cases, they must use the idiographic (describing-the-singular) method; and that there are no regularities or laws in history. Economic historians sometimes take the same position with respect to their field — and the study of economic growth certainly is, if not an integral part of, then closely related to economic history. This position economists cannot share. To accept it would mean that the methods of economic analysis — which are nomothetic and not idiographic, to use the famous methodological distinction first made by Rickert,⁵ though much modified in later discussion — are inapplicable to problems of economic growth.

To determine the specific characteristics of an individual economic growth situation or an economic structure, we must first collect information as reliable, as complete, and as comparable as possible, on a substantial number of growth situations or structures. We must then study the characteristics — both economic and noneconomic — of each static (structure) or dynamic (growth) situation, and classify the situations in accordance with the presence or absence of common characteristics. Next, we must take the situations that have certain common characteristics and investigate to what extent the economic growth process reflected or involved in them has been similar. Finally, we must try to discover the factors responsible for dissimilarities in development within a group of situations having the same basic characteristics.

This process can be carried out on different levels of detail, depending on the number of situations for which information is available and on the fineness of classification used. For certain purposes it may suffice to distinguish two groups only, such as industrial and nonindustrial countries or periods; Western and non-Western countries; or free-enterprise and planned economies. We may try to find characteristics of structure and growth that are common to all countries in one group, but not present in any country of the other group. It is unlikely that we shall be able to establish close relations between structural characteristics and patterns of growth using only such broad groupings; but we may expect that such relationships will emerge when finer groupings appropriate to the specific problem under investigation are employed.

Up to this point structure and growth have been given equal attention as two parallel objects of comparative study. Due to limitations of time and resources, the rest of this report concentrates on problems en-

⁵ *Die Grenzen der Naturwissenschaftlichen Begriffsbildung* (1902).

countered in the comparative study of economic growth. It must therefore be stressed here that the comparative method is applicable to the study of economic structure as well as to the analysis of economic growth. Some of the problems encountered are identical in both cases; the basic approach is the same, and so are its basic advantages. This conviction is reflected in possibly the most pronounced form in Professor Reynolds' plea for conducting *all* economic teaching and research on a comparative basis, and not only when economic development, growth, and stagnation are involved,⁶ an attitude which is probably shared to some extent by most participants in our conferences. The relative neglect in the remainder of this report of the specific problems of the comparative study of economic structure in no way implies that this is a subject less worthy or less in need of systematic quantitative study.

⁶Cf. Part II, memorandum 9.

4. THE BASIC APPROACH TO THE COMPARATIVE STUDY OF ECONOMIC GROWTH AND STRUCTURE

Concentration on Economic Factors

All empirical research on economic growth and structure, if at all ambitious, is torn between two influences: one is the desire to take account of as many different economic and noneconomic aspects and factors as possible, because the serious student knows that all human factors and not a few physical ones are interrelated and that none can be fully understood if any is disregarded; the other is the need of limiting the field of inquiry and the range of factors if a research project is ever to terminate and to lead to communicable results. Economists should be the last to forget this web of interrelations, as they are brought up on a general equilibrium model in which everything depends on everything else in the system, if ever so remotely. In the analysis of economic growth as in economic theory, one must find the best compromise between universal scope and isolated treatment of one element.

Economists and statisticians working on the problems of economic development cannot help realizing that the set of measurable economic facts, which they call growth, is intimately bound up with and influenced by noneconomic factors, some of which look quantifiable, while others are not easily and possibly not at all amenable to measurement. It was an economist (Kuznets) who said that there is no economic theory of economic growth. One need enumerate only a few of the more important noneconomic factors to realize how essential these factors must be for many aspects of economic development — and for the character of economic structure as well.

There are, first, the physical factors, such as climate, water, vegetation, and subsoil resources. In the early phases of economic development, these factors probably dominate the local distribution and the forms of economic activity. Even at a later stage, they have much to do with the relative importance of different industries and continue to have an influence, though a diminishing one, on the level of real income per head. These factors are not likely to be neglected by economists. The danger rather is that their economic importance will be exaggerated; the numerous theories which explain history — and not only or primarily economic history — in terms of climate and basic physical resources testify to this.

Secondly, there are biological factors — simple ones like body size and weight, metabolism rates and blood groups, and complicated ones like capacity for sustained muscular or cerebral exertion. At the present stage of our ignorance of the interrelations between such biological traits of the population and economic needs and performance, and because of the obvious dangers of crude biological or racial explanations of economic history, it seems best to limit ourselves to the bare mention of this group of problems.

Third are psychological factors like basic attitudes toward work, cooperation, authority, change, and reward and punishment in this and the next world. We know very little about how these attitudes are distributed among different populations; to what extent they are inherited in accordance with Mendelian rules or how they are acquired; and — for our purposes probably the most important point — how they are influenced by economic factors and in turn influence economic activity. It is not rare, however, to hear that these psychological factors are the real determinants of the moment at which economic growth starts, the speed at which it proceeds, and the direction which it takes. Since these psychological factors usually resist quantitative measurement, their role in economic development is much debated.

Finally come social factors like class structure, political institutions, land tenure, and the legal system. These factors lend themselves somewhat more easily to quantitative measurement, and hence more is probably known about their relation to purely economic aspects of growth and structure. Many students, however, would say that these factors, in turn, are only reflections of more basic psychological or physical determinants.

These four types of noneconomic factors obviously cannot be ignored in the study of economic growth and structure. However, they need not be treated on the same level as the economic factors themselves. First, noneconomic factors may be treated as data at least in first approximation; it is then outside the economist's competence to trace them back to possible final causes. Secondly, all that the economist needs do is try to establish a factual, and wherever possible quantitatively measurable, connection between the noneconomic factor and the economic effects which appear to be traceable to it. In other words, insofar as the influence of noneconomic factors on the structure or operation of the economy is concerned, the economist cannot go very far in trying to understand the relationship, but generally must be content to establish the existence and beyond that the strength and regularity of the connection. The why of the relation will generally be beyond him. Within the economic sphere, on the other hand, the economist does not stop with establishing statistically the existence of a relationship, but must attempt to explain its nature and causes on the basis of the more general assumptions and theories of economic analysis.

The possibility of separating economic and noneconomic factors and the advisability of doing so is at this moment really more a theoretical than a practical problem. As yet we know so little about the purely economic

aspects of economic growth and about the interrelationships among the various economic aspects of the process that there is a wide field for research before running seriously into problems that cannot be solved except by close joint consideration of the economic and noneconomic factors involved.¹

Concentration on Measurable Aspects of Economic Growth and Structure

Economics is basically a discipline dealing with measurable phenomena, and economic statistics is concerned exclusively with them. It is therefore natural to suggest that the study of the economic aspects of comparative economic growth and structure concentrate on, and possibly be restricted to, those aspects of economic growth and structure which can be measured directly or indirectly.

The advantages of such a limitation are obvious. It permits the use of the methods of statistics throughout the field that will be covered by comparative study. It prevents much unnecessary argument. It facilitates presentation.

This limitation does not seriously narrow the field of inquiry. There are few economic aspects of economic growth and structure which are not susceptible to measurement, if we remember that we are not limited to what is obviously and directly measurable by count or by similar operations but that we may include anything that is indirectly measurable by means of indicators or surrogate measures, whose possibilities will be explored briefly in the second section of Chapter 9.

There is only one important facet of economic growth which may be seriously affected by the limitation to measurable phenomena: the welfare aspect that has been brought to the fore since Pigou's basic treatment.²

¹The exact nature of the relationship between economic and noneconomic factors in economic growth, and in particular the best method of studying this interrelationship, turned out to be possibly the most controversial point in our conferences and in the comments on a preliminary draft of this report. As usual in questions of this type, no unanimity was achieved. If the point of view taken in the preliminary draft and maintained here appears as too "separatist" to some participants or readers, they are asked to consider that nothing of what is said is intended as a prejudgment of the nature of the relationship that will emerge — many years hence — from an adequate study of this set of problems. We may then know how economic and noneconomic factors mutually influence each other and which of the noneconomic factors have significant economic effects. All that is suggested here is that in the near future — say, in one or two decades — economists and statisticians will be better off, and may contribute more to the ultimate answers if they provide reliable comparable data on economic growth and structure on as broad a scale as possible and analyze them with the tools of economic theory, than if they become amateur political scientists, sociologists, and psychologists. We should by all means test the economic implications of as many as possible of the theories about economic growth that are developed by or in conjunction with other disciplines. To be ready to do so, we should concentrate on getting our economic and statistical test material ready.

Despite great efforts on the part of economic theorists, it has not yet been possible to give a quantitative measurable meaning to the concept of economic welfare, a concept as important for economic policy and analysis in the field of economic growth as elsewhere. The more intensively the problem has been attacked, the more elusive has the concept of economic welfare become and the more difficult if not impossible to measure.³ The old hope of discovering an objective measure of economic welfare seems to have receded farther and farther into the distance. The impossibility of finding a way of comparing the utilities of different individuals and then combining them into group, national, or world aggregates is still the main obstacle. In some special cases, roundabout ways have been shown leading to conclusions based on welfare considerations that can be used as the basis of economic policy without resorting to direct interpersonal comparisons of utility. Even if these cases stand up — and most of them are still controversial among specialists — they do not seem to provide a basis for casting welfare considerations into a statistical mold as a matter of general practice, and thus combining them with the body of quantitatively expressed economic relations.

Such strict standards, however, are quite possibly a luxury that theorists with a methodological bent can afford, but which is neither required nor possible for economists who are dealing with problems of actual development, where some assumptions may be admitted and may prove helpful even if they cannot be proven within the framework of a rigorous economic theory. The main example is the assumption of equal marginal utility of income for all participants in the economic process. A further step in the same direction is the acceptance of welfare judgments prevailing in one situation, in practice that of the observer. This implies use of the value and valuation system of a modern mechanized economy in developing quantitative measures of economic growth and structure for different areas and different periods; in technical language it means using a weighting system appropriate to a modern economy in developing price deflators, and accepting the modern economy's — or the modern national accountant's — delimitation of the scope of economic activity.

Such a latitudinarian approach undoubtedly simplifies the task, as many quantitative indicators of economic growth and structure can then be given welfare significance. What may be persuasive to students interested more in the substance than in the shadow is that the basic value system of advanced Western countries, with its emphasis on the economic aspects of life and on physical growth within the economic sphere, seems to be on the way to becoming as universal among underdeveloped and planned-economy countries as it is among developed, free-enterprise

²A. C. Pigou, *Wealth and Welfare* (1912); revised as *The Economics of Welfare* (1920).

³On these problems, see for example the review article by A. Bergson in *A Survey of Contemporary Economics* (1948), and K. Arrow, *Social Choice and Individual Values* (1951).

countries. Acceptance of the valuation standards of the economically most advanced areas may therefore be one way out of the dilemma created by the nonmeasurability and noncomparability of economic welfare. If we take this position as a preliminary solution and retain other valuation systems only as subsidiary variants for special analysis, we must always remain fully aware of its limitations; not the least of these are the difficulty of exactly defining the valuation system of the most advanced economy and the unavoidability of continuous change in the system, requiring periodic recalculation of all measures of economic growth.

If we are not willing to accept this approach when studying economic growth and structure on an international comparative basis, we must be content to deal with the measurable evidence, and abandon the hope—at least for the time being—of also measuring the subjective welfare aspects of the situation. It will be difficult enough to find out how the size and composition of the product of different national economies have changed and how they differ among countries, and to identify the factors responsible for the rate of growth of aggregate product and for changes in its composition and distribution, without trying to ascertain how people at different times and in different places have felt about the product available to them; without considering whether aggregate welfare would have been greater if the product had been of different composition and had been differently distributed; without guessing whether people would have been more satisfied with a different organization of the production process, with all that this implies regarding the location of the population and the conditions of work; and without speculating whether they would have preferred to devote more of their time and energy to noneconomic pursuits at the cost of reducing the total product available to them. These noneconomic pursuits include leisure. Leisure may indeed be the most important among many noneconomic activities that may not call for material resources, but—like even pure thought—require time and surcease from physical exhaustion. Comparison of welfare, over time or space, is incomplete without considering the amount and quality of leisure permitted by alternative economic systems and situations, and without analysis of the reactions by different groups of people to the choice between leisure and income. It is not astonishing that a detailed study of the problem concludes that “the competitive, self-defeating, and irrational aspects of peoples’ wants and their changes over time make it impossible to interpret the trend of national product” [and, we may add, of any other measurable indicator of economic growth] “as an index of secular trends in economic welfare.”⁴

An important additional reason exists, however, for concentrating at this stage of our endeavors on the measurable aspects of comparative

⁴M. Abramovitz, “The Meaning of Economic Growth as Measured by Secular Estimates of National Product” (paper mimeographed for the Conference on Research in Income and Wealth, National Bureau of Economic Research, September 1957).

economic growth and structure. Quantitative data on economic growth and structure in individual countries are rapidly accumulating, not only in the form of current statistics of growing detail and reliability, but also as historical series of increasing scope, growing length, and improving quality. These data are not yet being used to a significant extent for systematic comparative study of economic growth and structure. Thus we are not only losing an opportunity to advance our knowledge of the process of economic growth on a comparative basis, but we may well be retarding progress in the study of economic development of individual areas since the systematic comparison of the results for different countries is bound to lead to improvements in methods of approach and in analytic techniques applicable to academic studies and to policy recommendations dealing with individual countries. There is opportunity and need for a systematic attack at the earliest possible moment on the ever-increasing accumulation of quantitative data. Non-quantitative materials certainly are of importance for the thorough study of economic growth and will be needed in later phases; but they are much more difficult for economists to obtain and to handle than the type of basic statistical data which is so rapidly accumulating.

Research or Policy Orientation

The choice between research and policy orientation, between ascertaining facts and explaining them on the one hand, and providing a foundation for economic policy on the other, is by no means specific to the study of economic growth; it exists in one form or another in most fields of theoretical and applied economics. Nor is it more pronounced in the study of economic growth than in other fields where policies are controversial and where large pecuniary or power interests are at stake, e.g. in the controversies about labor policies and public finance.

This choice, as became evident in our discussions, is hardly ever an absolute one, involving complete concentration either on research or on policy orientation and complete abandonment of the other approach. Few research men entirely suppress the hope that their findings may be used to influence policy. Few serious workers on problems of economic policy are unwilling to be influenced in their recommendations by facts—as they see them, naturally—or to add by their own work to the store of tested factual knowledge.

There is, thus, no complete dichotomy between research orientation and policy orientation in the worker's mind; still less on the objective level. The findings of research-oriented study are used by policy makers. The question is what facts, originally established by the research man, the policy maker uses and how he uses them—whether all the facts available or only the facts he happens to remember or those that suit his purpose. On the other hand, policies change facts and these changed facts lead to further alterations in policy, and this process of mutual interplay is itself one which the research man must follow.

All these considerations nevertheless do not eliminate the difference between research and policy orientation. There remains in virtually every field of economic study the choice between primary emphasis on ascertaining facts and explaining them because they are relevant for understanding the economic process; and the primary emphasis on finding economic means of attaining objectives of economic character—which is what economic policy aims at. This choice must also be faced in the study of economic growth and structure. Shall we direct our efforts primarily toward ascertaining the facts of economic growth as an historical process and understanding them with the tools of economic analysis? Or shall we concentrate on finding economic means that will accelerate economic growth; will reduce the economic inequality among countries; will abolish poverty in one generation; or will prevent the Soviet bloc from catching up economically with the free world or the United States—or whatever may be the economic policy goal that we set ourselves or are given? It cannot be denied that we shall study different situations, concentrate on different problems, and use different methods of research, depending on our objective. It cannot even be denied that we shall attract and use different men, depending upon the choice of orientation.

To the extent that a decision must be made at the present time, when we really know so little about the facts of economic growth and its relation to economic structure, it is felt that research orientation should dominate the approach to the study of economic growth and structure. This does not mean that we want to isolate ourselves from policy problems or are unaware of the needs of policy makers. Let us by all means ascertain the relevant facts as rapidly as we can. Let us try hard to understand them, although realizing that it is easier to speed up the collection of data than their intellectual absorption. Let us communicate the results of our research rapidly and plainly to policy makers—when we think we know what the facts are and what they mean. Let us even give preference to cases involving policy interest when we are in doubt about the order in which to attack problems. Let us always keep in mind, however, that our primary aim is the understanding of economic growth and its relation to economic structure as a basic economic process; and let us therefore concentrate on those situations which promise to lead us most fully and rapidly to that understanding. If conducted in this spirit, the study of economic growth and structure should in the end be more useful not only to the economist and historian, but also to the policy maker.

The Need for Further Work on Comparative Economic Growth and Structure

If we compare the basic requirements of the comparative study of economic growth and structure as they have been outlined in section two of Chapter 3 with the results of the rapid survey in Chapter 2 of the actual work in the field now going on or completed within the last decade or two,

we see that within the field of our survey, as it has been delimited above, there are at least three important areas needing additional or intensified research. They are, first, the systematic study of the measurable aspects of economic growth and structure instead of the case approach without much connection among situations studied; secondly, the comprehensive coverage, both in space and time, of the process of economic growth instead of the concern with individual growth situations; and thirdly, the need for continuous research in the field, if possible by a permanent though rotating group of researchers supplementing sporadic work of individuals or groups independent of each other.

1. The systematic element in the comparative study of economic growth and structure refers to the choice of countries and periods on which to concentrate as well as to the systematic selection of data to be collected and of problems to be attacked; and to the methods of processing the raw data so as to make them as self-consistent and comparable over time and between countries as possible. The systematic element applies also to the testing of hypotheses about economic growth by confrontation with the relevant measurable data.

Something has already been said in the first section of Chapter 3 about the selection of data characteristic of economic structure and growth. The problems that suggest themselves for systematic study in many countries will be reviewed in Chapter 5, and the selection of countries and periods for immediate attention in systematic research will be discussed in some detail in Chapters 6 and 7. In Chapter 8 there is some discussion of the possibilities and the advisability of systematization of research methods. Finally, some problems to be solved in approaching comparability of basic data on economic growth and structure will be reviewed in Chapter 9.

Anticipating the conclusions of these discussions, the essential point is that in all cases substantial scope is found for application of systematic procedures. Adoption of these procedures would have the advantage of introducing a considerably greater degree of intertemporal and intercountry comparability among the products of quantitative research in economic growth and structure, and—what is equally important—would facilitate or even make possible the joint use of the products of research dealing with different countries and different periods.

2. The emphasis on comprehensive coverage does not mean that no progress can be made in the study of economic growth and structure until data are collected and analyzed for all countries and for their entire recorded history. What is wanted is selective comprehensiveness. The comparative study of economic growth and structure need be comprehensive only in the sense that it should cover situations (structure or development of a given country during a given period) representative of all main types of economic growth and structure. There is no need to go on studying one situation after another if they are essentially similar. If it

required exhaustive study to decide whether two or more situations are essentially similar, we would, of course, be frustrated in any selection; fortunately, however, we should be able to make the decision in most cases on the basis of less detailed studies already available or of a preliminary survey, although we may occasionally have to reconsider our initial classification of situations as similar or dissimilar.

The answer to the question how similar is similar depends, of course, on the purpose of the study. For research oriented toward the basic aspects of economic growth and structure, but treating them on a world-wide basis and studying them for as long as two to three centuries, which is the point of view taken in this exploratory survey, situations may be regarded as similar that would be dissimilar—and hence would require separate treatment—in a study concentrating on one part of the world and on a shorter period of time. For a general survey of economic growth and structure, for instance, the six Central American republics may be regarded as essentially similar, so that the study of one might be sufficient. The specialist, however, may be interested in just the relatively minor differences in economic development which can be associated with differences in the main product of each of the six republics; or in the character of the population; or in the participation of foreign capital; or in any of a large number of other factors which may influence differentials in their economic structure and development, differentials which may not matter from a world-wide point of view.

3. The need for continuity in research on economic growth and structure on a comparative basis hardly needs elaboration. Like most comparative aspects of different disciplines, this is a field where the continuous accumulation of material that fits in with data already at hand is essential. This approach to knowledge and understanding requires considerable continuity of personnel specializing in the field and in the organizations working in it. While every economist will be better off if he occasionally makes comparisons between countries on a more than casual basis, progress in the field will probably depend to a good extent on the ability of a small number of economists and statisticians to specialize in it. This is not a field in which pure intuition is likely to get us very far, although occasionally the outsider may see connections, similarities, and dissimilarities which escape the specialist immersed in the subject.

5. A CATALOG OF PROBLEMS

General Considerations

The effectiveness of the comparative quantitative study of economic growth and structure, both in fostering an understanding of the process of economic development and in helping policy makers in their tasks, will depend to a considerable if not decisive extent on the choice of problems studied and, since time is not a free good, also on the sequence in which they are attacked. One cannot therefore avoid discussing the selection of problems for study even in a preliminary survey such as this. This selection is made particularly difficult by the large variety of problems claiming attention, which have been championed more or less enthusiastically by scholars and research organizations working in the field.

Among the problems to be faced when a concrete research program is worked out must be mentioned: the relative importance of problems suggested for study; their relationship as to subject matter and type of data needed; method of approach; type of research worker best fitted for the studies; and of course, means of coordinating the work. In choosing the problems for study, consideration must be given to the needs of builders of theoretical models, of applied economists, of economic historians, and of policy makers. The most difficult decisions, which ought to be made quite explicitly, will be to select the problems whose study will contribute most to our understanding of the basic character of the process of economic development, and to rank them in order of importance.

Anything as ambitious as this is obviously out of the question in this initial survey. All that is attempted in this section is a listing of the problems which were mentioned in the papers (memoranda 1-11, Part II), were discussed at the Princeton and Washington meetings, or were raised in comments on a preliminary draft of this report—with the addition of some problems found in the literature or which occurred to the author; and the arrangement of this plethora of questions under a few broad headings to facilitate discussion. No systematic attempt was made to search the literature for additional suggestions. Even a casual perusal of this literature—rapidly growing to outwardly immense proportions—indicates that such a search would have produced more material relevant to our problems. It is hoped, however, that the most important problems are included in the catalog, incomplete and overcondensed as it is.

Because of limitations of time and space, the presentation is restricted to a brief characterization of each problem without explanation of its importance and position in the study of economic growth; without discussion of the best approach, the type of factual data needed, the extent of resources required, the chance of success, or other operational considerations; and without even an explanation of some of the shorthand terms used. Presented in such condensed form, some of the questions unfortunately sound simpler and more obvious than they are.¹

Even in this limited task, judgment had to be exercised in two directions. First, it was not possible to list all the hundreds of suggestions for study which were made. The listing had to be restricted to those problems which appeared to be reasonably closely connected with the growth process and which were not too specialized. Secondly, because similar suggestions were made in different terms by several participants, it was often necessary to consolidate related suggestions. So the problems set forth in the list are not identical in content or wording with those formulated in the papers or at the meetings; and overlapping could not be entirely eliminated. No participant is charged with the responsibility for an individual suggestion although the careful reader of the papers in Part II will often be able to trace a problem listed in this section to an individual author.

The classification of the hundred or so problems under half a dozen headings is a very rough one, and in some cases, arbitrary. Related problems are grouped under one heading so far as possible; beyond that, the sequence of problems follows no definite principle. Numerical sequence among or within headings definitely does not indicate relative importance. (Indeed, in a few cases the supposedly most important problems have purposely been left to the end.) Nor is it to be inferred that the number of separate questions allotted to a problem reflects its importance. On the contrary, the list contains several brief and sometimes vague questions which may be as significant for the understanding of economic growth as a whole section of others. There is no implication, finally, that statistics alone will be able to answer all or most of these questions. Quantitative testable data should help in the attack on virtually all of the problems listed, but their contribution will vary greatly from one problem to another.

The problems and questions are as a rule stated as if the chain of causation ran only in one direction: from the economic or noneconomic factor under consideration, which is regarded as the independent variable or cause, to economic growth and structure, which are treated as the dependent variables or effects. It is hardly necessary to point out that this form of presentation has been used largely for convenience. In the real world, the relationships between the factors mentioned under a given heading and economic growth and structure are in many if not most cases

¹To avoid repetition, the phrase "economic growth" or "economic development" is used as shorthand for "rate and character of economic growth and its effect on economic structure."

two-sided. Economic growth and changes in economic structure influence the independent variables sometimes more, sometimes less, but only rarely not at all. To restate the existence of this other side of the relationship in every relevant case would be intolerably boring; and also valueless if limited to an assertion of a feedback relation without indication of character and intensity—information which in most cases is simply not available. It might, finally, have been misleading since apparently the effect of the independent variables on economic growth and structure is in most cases more pronounced and prompter than the opposite effect of economic development on the so-called independent variables. The shocks and impulses seem to originate in the independent variables, while the counter-effects and the second and later rounds of mutual interrelations are likely to behave—in the absence of new impulses—like dampened oscillations. Whether and when this actually is the character of the interrelationship between the independent variables and economic growth and structure are subjects for fruitful factual research.

The lack of ordering, or even of a systematic grouping of problems that may seem closely related, will no doubt disappoint both theorists and policy makers. Theoreticians will miss it because it seems to negate the validity of their search for one or a small number of decisive factors in economic growth. Policy makers will feel dissatisfied because the catalog may not help in their search for effective ways to accelerate economic growth. This disappointment, however, is unavoidable: if we did know with certainty what determines economic growth, we would not need to embark on the comparative studies suggested here. Every student of the subject, including the author of this report, naturally has his own ideas, derived intuitively or founded upon firsthand research, about a rough ordering of the multitude of problems. It might even turn out that the ranking by many students would show a clear central tendency—which still would not guarantee that results of such a poll would ultimately prove correct. The papers prepared for the two conferences, the debates, and the comments on the preliminary draft of this report lacked sufficient agreement to justify a grouping of the superabundance of questions into a few alternative but unified theories of economic growth, let alone a ranking among the several theories that might thus be established.

General Problems

1. Is there a typical economic growth curve? If so, what are its shape and its main determinants?
2. Can economic growth be a smooth process, or does it necessarily involve at least one sharp break in the tempo of development, a “take-off” into sustained growth?
3. Is there a “threshold” rate of increase in aggregate real income below which sustained economic growth does not take place?

4. Is sustained economic growth impossible until a minimum level of real income per head is reached? If so, how high is that level, and does it vary at different periods of history and in different cultural settings?
5. Is there a minimum length for the different phases of the economic growth process? In particular, is there a minimum distance between the start of sustained growth and the achievement of economic maturity in the sense of independence from foreign capital and foreign technology?
6. What have been the common factors in economic growth? To what extent do the basic characteristics of the industrial system and the basic similarities in human behavior constitute such common factors?
7. Is it possible to assess the relative importance of economic, technological, and noneconomic factors in initiating and sustaining economic growth?
8. What are the relative roles of resources endowment, thrift, and labor productivity—or of natural, manmade, and human capital—in economic growth?
9. What are the roles of “hidden reserves”—disguised unemployment of labor, latent entrepreneurial talent, and unutilized natural resources—and their catalysis through institutional change in setting off a sustained process of economic growth?
10. Which factors in economic growth are cumulative? Of the noncumulative factors, which have permanent and which only transitory effects on growth?
11. Can definite types of economic growth be distinguished? What elements are involved? How can countries and periods be classified accordingly?
12. What is the identity and relative importance of factors common to the economic growth of all countries; factors peculiar to one country; factors operating by interaction between countries?
13. Are there factors (and what is their relative importance) common to all phases of economic growth in a country; factors peculiar to one phase only; and factors that work only by cumulative transmission from period to period?
14. Do significant differences exist between the early stages of economic growth (occurring several generations or centuries ago) of the currently advanced countries, and the recent (early) growth of more backward countries? Could any such differences be ascribed to co-existence and communication between countries of very different levels of economic development?

15. To what extent are the long-term average rate of economic growth and the character of the long-term changes in economic structure affected by the amplitude and impact of cyclical movements of shorter or longer duration? This question will have to be answered separately for the so-called business cycle of less than decadal length and for the construction cycle, the bidecadal swings claimed by Kuznets and Kondratief's semisecular cycles (provided they survive closer scrutiny on an international basis). Is observed growth only a residual of cyclical fluctuation, or is it due to basic forces, cyclical fluctuation acting only as a secondary modification of the trend?
16. What is the relationship between extensive and intensive economic growth: the first characterized by an increase in the absolute volume of national income without a rise in average income per head, which is the distinguishing feature of the latter?
17. Are there regular sequences in industrial structure during the process of economic growth, the various sectors or subsectors of the economy waxing and waning in relative importance in accordance with a uniform pattern, or a group of patterns? (Examples are the postulated sequences of primary, secondary, and tertiary industries, or of consumer and capital goods industries.)
18. Does the sequence of industries being developed make a significant difference in the speed of industrialization and economic growth? In particular, is growth more rapid and regular if industrialization starts with the heavy capital goods industries rather than with light consumer goods industries?
19. Does an industrial revolution require a precedent agricultural revolution?
20. How much similarity and regularity has existed in the patterns of inter-industry relations (input-output coefficients) and in their relation to economic growth?
21. What is the relation between the size of a country—measured by population, area, or aggregate income—and economic growth?
22. To what extent is economic growth in small countries dependent on their position as economic satellites to large countries, and on their participation — through common or similar language, educational system, and migration of men and ideas—in the advantages of a larger market?
23. Is balance among economic sectors (i.e. no sudden, violent changes in the relative importance of different sectors or sharp differences in their rates of growth) a necessary requirement or even a help in economic growth?

24. Has economic growth tended to mitigate or to accentuate differences in the levels of economic performance and welfare within and between countries? Have areas differed significantly in this respect and at different phases of growth? For instance, has the discrepancy between countries central and peripheral in the world economy grown?
25. How and why does the economic growth process start? What are the typical "growing points," if any?
26. Are the factors determining the "take-off into sustained growth" primarily economic, technological, or ideological?
27. What were the effects on economic growth of large-scale wars, the preparation for them, and their aftermath? Have they, on balance, accelerated or retarded economic development in the countries directly involved and in third countries? Have they been responsible for permanent changes in economic organization?
28. How are the speed and form of the process of economic growth affected by the character of the economy before sustained economic growth starts? Are such differences related to type of pre-growth economy—whether tribal, feudal, semi-feudal, absolutistic, or democratic in organization; parochial, regional, or continental in size; this or other worldly in orientation; intellectually stagnant or progressive?
29. Are there regular alternations between periods of expansionist (capital extensive) and intrinsic (capital intensive) development in economic growth?
30. Does the significance of a given rate of growth change in the process of economic development—both objectively and in the eyes of the population affected? (In other words, how do the objective and subjective urgencies of economic growth vary?)
31. How do regional differences—particularly in resources endowment, capital, and productivity—influence a country's economic growth?
32. How has the center of economic gravity shifted within countries or larger areas, and for what reasons?
33. To what extent is it necessary for underdeveloped countries to retrace the path of the older, now developed countries in order to reach similar levels of average real income?
34. Do countries with dual economies—a modern and a traditional sector, each of substantial size—show specific problems and patterns of growth?
35. What are the reasons for long interruptions in development after apparently self-sustaining growth has started, for instance, Argentina, Uruguay, and Chile since the 1930's?

36. What is the influence of differences in factor proportions on economic growth, particularly the relations of labor force, capital stock, and natural resources endowment? How far do these differences explain techniques actually used, factor prices, and factor shares?
37. Are underdeveloped countries handicapped by the absence of advanced but labor-intensive techniques?
38. What difference does the use of different concepts of national product make for the measurement and analysis of economic growth; particularly the Marxist limitation to material production, the use of the Western concept of marketable production, and the acceptance of a broader concept of all economic activities?
39. To what extent are the measured increases in real income per head that characterize economic growth offset by increased disutilities not reflected in the usual measures of real income? (Examples of such disutilities are: cost of travel to work; social overhead costs of urbanization.)
40. How can adequate comparisons be made between the rate of economic growth and levels of economic achievement among countries and over time, particularly over long periods and among countries differing greatly in economic structure and levels?
41. How can "technical progress" be isolated and measured so that it can be used as an explanatory variable in intertemporal and international comparison of economic growth?
42. How can quantitative indicators be developed for institutional and other not immediately quantifiable factors in economic growth?

Natural Resources

1. How have differences in resources endowment influenced the speed and character of economic growth and the level of economic performance? (This question will have to be studied separately for minerals, soil fertility, water resources, climate and geographical configuration, etc., and related to demographic developments.)
2. How can natural resources endowment be measured? Can measures for different resources be combined?
3. To what extent have diminishing returns characterized the increasing output of the several natural resources as economic growth increases the demand for them?
4. How have the relative prices of natural resource products behaved during different phases of economic growth?
5. What role have natural resource products, particularly those produced for export, played in initiating economic growth?

6. What is the relation between increasing use of energy and economic growth? In particular, is there a close relation between use of energy per manhour and productivity?
7. Is atomic energy a factor comparable to other important technological innovations — particularly steampower and electricity — in its effects on economic growth; or is it a development *sui generis*?

Human Resources and Attitudes

1. Has a rapid increase in population been a boon or a hindrance to economic growth? The problem will have to be studied separately for cases in which rapid increase in population was due mainly to a high or increasing birth rate and those in which it is mainly traceable to low or declining death rates. The question whether absence of population growth, or very slow growth, has retarded economic growth is the reverse of the problem.
2. Is sustained economic growth of substantial proportion compatible with a wide range of forms of social organization and of attitudes toward pecuniary gain?
3. What effects do the value system (including character and intensity of religious attitudes) and the class structure of a society have on economic growth, particularly on the beginning of the process of sustained growth?
4. What are the roles of social differentiation, social mobility, and social tensions in economic growth? Is the existence of either a social elite or social rebels who can improve their status through innovation and change an important factor in starting or sustaining economic growth?
5. Is sustained economic growth under free enterprise possible in bipolar societies lacking a substantial middle class not dependent upon the government? Is it possible in societies dominated by the extended family system; in rural societies?
6. What is the relation of nationalism to economic development? Which aspects of nationalism help and which hinder economic growth?
7. To what extent is economic growth dependent on the existence of a group endowed with special "entrepreneurial" or "innovating" abilities that are not present or latent in *any* sizable population?
8. Do innovators and innovations appear in waves, and do they typically require enterprises of larger than average size?
9. What determines the prevalence and effectiveness in a society of economic innovators and of imitators, as contrasted to stay-putters? Are their number and scope closely connected with the existence of specific economic incentives?

10. What are the factors in the “spirit of enterprise”? To what extent and by what means can this spirit be developed exogenously?
11. Has entrepreneurship typically been generic (freely shiftable between sectors and industries) or specific (limited to one industry)? In particular, has substitutability existed among merchandising, financial, and industrial entrepreneurship? To what extent has the specificity of entrepreneurship retarded economic growth?
12. How essential to sustained economic growth are Western methods of management, labor relations, and business ethics?
13. Is economic growth necessarily connected with urbanization; or does a connection exist only for certain phases of growth and for countries of a specific cultural type?
14. How has the structure of the labor force, particularly with respect to skills and education, changed with economic growth?
15. What have been the effects on economic growth of investment in human resources—particularly the quantity and quality of nutrition, education, preventive and curative medicine? Are these relationships amenable to quantification and statistical demonstration?
16. Has labor force participation followed a regular trend during economic growth?
17. How do the lengths of pre-working life, working life, and retirement life change with economic development?
18. What is the extent of underemployment in different sectors of underdeveloped countries? In the earlier stages of now developed countries?
19. Is economic growth dependent on the stability of or on trends in labor’s share in total national income?
20. How regular, over time and among countries, is the increase in the share of white-collar workers in the labor force, particularly of managerial and professional employees (cadres) that seems to accompany economic growth?
21. Is economic growth accompanied by a narrowing of wage differentials among different occupations, between skilled and unskilled work, male and female workers, and urban and rural workers?
22. Do money and real wages become less flexible with economic growth? Is this tendency steady, or subject to long swings, depending on the phase of economic development?
23. What are the effects of autonomous or induced changes in consumption on economic growth? How far are they influenced by extraneous

forces like advertising, subsidies, excises, and direct government controls? How far by changes in the value system, or by intranational and international emulation (“demonstration effect”)?

24. What are the relationships between economic growth and the intensity and character of progress in pure science, in technological knowledge, and in the application of both in production? In particular, are there significant differences in the rate and character of economic growth depending on whether science, technology, and innovation are or are not organized and routinized? Is there statistical evidence of a relation between expenditures on research in science and technology, and economic growth?

Capital

1. Which factors determine the ratio of gross or net investment (in the sense of the output of reproducible durable tangible assets, i.e. capital formation) to national product? How is the ratio, as well as the composition of capital formation, related to the rate and character of growth of population?
2. Does the ratio of gross and net investment to national product show definite trends or swings during economic growth?
3. Does the process of sustained economic growth need a one-time massive investment effort to get started, or can it get under way with a continuous though moderate increase in the volume of investment?
4. Does the ratio of capital to output change in a systematic fashion during economic growth, for individual sectors and for the economy as a whole?
5. Can we identify the initial sources of capital formation setting in motion the process of sustained economic growth? Are they similar in all or most countries and in all or most periods; or do they vary widely from case to case?
6. Is a certain minimum stock of capital goods necessary to permit sustained economic growth? To what extent does this minimum depend on the size and structure of the economy? How is it altered by technological changes affecting the optimum or minimum size of basic facilities in the fields of transportation and power supply?
7. What influence does the structure of capital formation have on economic growth? Which types of capital investment have proven to be particularly effective in starting, continuing, or accelerating economic growth?
8. What is the role of social overhead capital in economic growth? Does this capital have to reach a certain absolute—aggregate or per head—level before sustained economic growth can start?

9. Does the relative importance of consumer durables and government durables necessarily increase in the process of economic growth?

Economic Organization

1. What have been the scope and effect of resource allocation through the price mechanism and through administration in different phases of economic growth?
2. Which of the factors of economic growth are subject to effective administrative and legislative action, and which are not?
3. What is the role of government fiscal policies in economic growth? In particular, is there a maximum share of the government in national income beyond which taxation will inhibit economic growth?
4. Have government economic budgets and plans had a demonstrable effect on economic growth, especially in countries retaining a free-enterprise system?
5. What influence does the tax system have on economic growth, distinguishing both the total burden of taxation and its distribution among economic groups? What is the effect on economic growth of the relation between direct and indirect taxes, and of features such as capital gains taxation and free depreciation?
6. What are the relations between protectionism and economic growth, both in advanced and in less developed countries?
7. To what extent has economic development of basically free-enterprise countries been influenced by direct intervention of the government (other than through monetary, fiscal, and tariff policy)? Which types of positive or negative direct intervention have on balance accelerated economic growth, and which have impeded it?
8. How has the role of the state changed during economic development? What determines these changes, and how have they affected rate and character of growth?
9. Is the role of the government in economic growth positively correlated with the level of economic performance or welfare sought; the rapidity with which this level is desired; the poverty of natural resources endowment; the height of the barriers to economic change; and the relative backwardness of the country?
10. What are the main differences in the allocation of resources and the rate and character of economic growth between otherwise comparable free-enterprise and planned economies?
11. What influence do patterns of land tenure and land use have on

economic growth, particularly its early stages? How far can economic development go while the agrarian regime remains feudal or tribal?

12. What differences of the same character exist between countries in which the international movement of commodities, capital, and labor is free, and those in which it is subject to obstacles of different height, nature, duration, and arbitrariness?
13. What is the importance to economic growth of the size of the market?
14. Specifically, what has been the impact upon economic growth of the development of markets for luxury and mass consumption commodities, for labor, and for capital?
15. Has economic growth been significantly affected by changes in the size of the market due to the creation of supranational trading areas through customs unions, international "communities," commodity agreements, and international cartels?
16. What is the role of improvements in transport and the reduction of transportation costs in economic development, particularly its early stages?
17. What is the relation between minimum size of plant in different industries—in a technological or economic sense—and economic growth? Has the introduction of devices reducing minimum plant size (e.g. the fractional horsepower electric motor) had a significant effect on the character of economic development?
18. What is the role of indivisibilities in the process of economic growth?
19. What is the importance of external economies in economic growth, particularly in relation to internal (intra-firm) economies? (The problem will have to be treated separately for different phases of economic development and may be of particular importance in the early stages.)
20. What is the relation between the degree and character of competition and monopoly, and economic growth?
21. Are differences in the degree of competitiveness associated with different phases of economic growth? With economic growth in the different countries and different sectors? With the rate of technical progress?
22. What is the relationship between economic growth and the concentration of production and financing, in the sense of an increasing inequality (as measured, e.g., by the Lorenz curve) of producing, distributing, and financial enterprises?

23. Does sustained economic growth require a minimum degree of monetization of the economy? What is it?
24. Is economic growth accompanied by systematic changes in the distribution of wealth and income, particularly a tendency toward less concentration of income and wealth but more concentration of control and management? How do different distributions of income and wealth, and changes in them affect economic growth?
25. In the allocation of resources during economic growth, what is the role of the price mechanism as compared to other methods of resource allocation? Is this role different in different phases of economic growth?
26. What is the effect of the usually much lower value of output per head in agriculture compared to other sectors on tempo and character of economic growth; and what is the explanation of this persistent difference?
27. What are the effects on economic growth of underdeveloped countries devoting comparable amounts of domestic and foreign resources—particularly capital and labor—on the development of agriculture rather than of manufacturing?
28. Is partial unemployment of the labor force a necessary or at least common stage in economic growth in situations where the labor supply is ample compared to the availability of capital, but where efficient labor-intensive methods of production have not been developed locally and are not available from more developed countries (which do not need them) or from other countries in similar situation?

Saving and Finance

1. Does sustained economic growth call for a minimum saving ratio? Is sustained growth impossible unless the ratio of net saving to national income reaches approximately one-tenth?
2. Is the saving ratio, and particularly the ratio that may be necessary to permit a process of sustained economic growth to start, dependent on a minimum absolute level of real income per head (a level which may vary among different cultural situations); or are other factors more important in determining the saving ratio?
3. How do average and marginal propensity to save act during the process of economic growth? Does their behavior show systematic differences among countries?
4. How far is economic growth affected by the distribution of total saving among different sources, in particular the share of different groups in the population in total savings; by the concentration of

saving within groups; and by the relative importance of endogenous, direct and indirect, saving?

5. How is the saving ratio affected by differences in class structure; by the size and distribution of income and wealth; by the sectoral distribution of income; and by cultural factors?
6. What is the influence of interest and yield rates—both gross and net of allowances for losses—on economic growth? What influence do yield differentials have on economic structure?
7. Are there systematic differences in the level and order of yields in different phases of economic development? In particular, does the yield fan narrow as economic growth proceeds?
8. What degree and type of inflation (in the sense of a rise in the average level of prices) is compatible with sustained economic growth?
9. How does inflation influence economic structure?
10. Is sustained economic growth dependent on, and how is it influenced by the direction and speed of changes in the general price level; or by certain relationships among prices, and between costs and prices?
11. What influence does the nature of financial intermediaries and the organization of the capital markets have on the volume and use of saving, and on economic growth and structure?
12. Is there a regular relationship between economic growth and the relative role of internal financing, direct financing of business and government by ultimate investors, and indirect financing through financial institutions?
13. Does the relative importance of financial institutions necessarily increase with economic growth, or during certain phases of it?
14. Is economic growth, at least in free-enterprise countries, regularly accompanied by an increase in the size of the financial superstructure relative to tangible wealth? Is there an upper limit to the ratio of intangible to tangible assets in the national balance sheet which reflects this relationship?
15. Does sustained economic growth depend on the existence of certain types of financial institutions and instruments; or on a certain level of financial morality and discipline in business and government? In other words, is there a definite correlation between financial structure and the start and speed of economic growth?
16. Does the character of the banking system—particularly its policy toward long-term commitments involving substantial risk—make a significant difference for economic growth?

International Economic Relations

1. How dependent is economic growth in its various phases on access to foreign commodity, capital, and labor markets as sources of supply or as outlets? To what extent has foreign demand for commodities been a starting and a decisive factor in the economic development of individual countries?
2. Do countries in the process of economic growth go through a uniform or at least similar sequence in the structure of their foreign trade, in the terms of trade, and in the international debtor-creditor position?
3. Are changes in terms of trade an important factor in promoting or retarding economic growth? Do they induce offsetting movements in industrial structure? (These questions can be asked with respect to both international and interregional trade.)
4. How effective is the mechanism of international transmission of economic growth? (This question will have to be studied separately for transmission through commodity trade, through capital exports and imports, international migrations, international risk sharing and bearing, and through the international spread of business and scientific know-how.)
5. How does pronounced dependence on foreign trade—particularly on foreign demand for home-produced commodities— influence economic growth?
6. How do marked deviations in a country's long-term price level movements from those of its main trading partners influence its international economic relations, and through them its own economic development?
7. What has been the role of foreign economic enclaves—with or without substantial foreign immigration—in the economic development of the host country?
8. Have there been significant differences in the development of colonies vs. independent countries that are otherwise economically comparable? If so, what are these differences and what effects have they had on economic growth?

6. SELECTION OF COUNTRIES FOR COMPARATIVE STUDY

To the common man, to the practicing economist, the politician, and the the historian, each country is something special and each situation unique. If we followed their diverse preferences, a study of comparative economic development would have to cover every country in the world and extend over all recorded history of each. This is neither feasible nor necessary for an entirely adequate analysis of economic growth.

Our aim in the comparative study of economic growth and structure, as in any scientific investigation, is to discover common basic traits beneath surface variety. Their discovery and their distinction from surface features may be helped by enlarging the number of cases (countries or periods) studied, but the law of diminishing returns operates here as everywhere. Our understanding is not likely to be increased nearly as much by adding a 60th case to 59 cases previously investigated as it was by adding a sixth to the previous five cases. What matters is not the number of cases studied but how they were selected. Each of the major types of countries and each major stage of development should be adequately represented. The development of a typology of countries and phases of development, and a classification of countries thereunder, must therefore precede the actual process of selection of countries. One thing, however, is clear. The goal is definitely not coverage of as high as possible a proportion of the number of nominally sovereign entities which constitute the formally equal units in international organizations or statistical tabulations.

If the practical need and the theoretical justification for concentrating on a limited number of countries are accepted, three qualifications are required. First, no selection of countries and periods will satisfy all the specialists, nor, what is more important, will it be adequate for all types of comparative analysis of economic growth and structure that may be required even where only a world-wide rather than a regional point of view is taken. Secondly, such a selection is not intended to preclude or discourage work on other countries or periods. Thirdly, our present state of knowledge is such that any selection can be only preliminary. The choice of countries presented in the following pages has been made primarily to stimulate discussion about the principles which should be applied to the selection of what might be called "core" countries for the

comparative study of economic growth and structure. It is not claimed that the specific selection made would meet with the approval of all or even most participants at the two meetings. In the tentative selection of countries discussed in the following pages, it was assumed that the primary interest is in over-all economic growth, more precisely in identifying the factors which have promoted growth and have shaped economic structure, and in understanding their mode of operation. At times we may also be interested in putting the problem differently or in concentrating on specific aspects of growth. We may, for instance, want to study causes of economic stagnation or of particularly rapid growth; the influence of government policy on growth; the effect of different systems of agriculture; or the special problems of dual economies with very different traditional and modern sectors. In each of these cases we probably will select different groups of countries or different periods for intensive study; in each case diminishing returns will set in as the number of countries or periods covered is increased. However, it is not certain whether or at what rate the law of diminishing returns will operate so far as understanding the general problems of economic growth and development is concerned, when the number of special aspects of growth studied is increased. The selection of countries in this section was intended for the study of the broad aspects of economic growth; it is a minimum list, to be expanded by additional countries when special aspects of economic growth and structure are to be studied intensively.

In most of the research work on economic growth and structure, nations form the units of measurement and analysis.¹ The same convention is followed in this report. For most aspects of economic growth—though less so for problems of economic structure—the national state is the logical unit of study by virtue of the decisive importance of economic and non-economic factors like the monetary regime, the credit system, tariffs, commercial law, taxation, and political stability, which are tied to national boundaries. As the study of economic growth develops, however, there will be more and more occasion to distinguish regions or other subdivisions within national states, and to study separately their growth and economic structures. Studies which compare regions within one country have not been rare, but they have not yet been made on an international comparative scale.

The need for a regional breakdown will differ very much from country to country, depending on the degree of differences among a country's regions in structure and rate of growth. Larger and more populous countries are apt to have greater regional differences. A regional breakdown would be needed in countries consisting of two or more geographically

¹ Apart from colonial dependencies, which are usually treated as separate "countries," the exceptions are trivial. In the case of the United States, for instance, the statistics have often been limited to the forty-eight continental states, thus omitting Alaska and Hawaii although they are within the national boundaries.

separated pieces of territory—Pakistan and the United Arab Republic are the outstanding examples; or which are made up of two or more parts that, although contiguous, differ greatly in the level of economic performance, as in Italy, Spain, and France, where the northern part of the national territory is much farther advanced than the central and southern parts. In the United States a similar distinction might well have been made until World War I.²

The addition of regions as units of study, on the one hand, enlarges the number of cases of economic growth available for analysis and creates units which are more homogeneous. From this point of view, the regional approach helps considerably in the study of comparative economic growth and structure. On the other hand, the recognition of regions as units of study greatly increases the amount of work to be done; especially since statistics on economic growth and structure are usually more difficult to obtain for regions than for countries. The scarcity or absence of estimates of regional gross or net product even in countries with highly developed national income statistics like the United States is only one example of these difficulties.

Returning to the problem of selecting countries when the broad aspects of economic growth and structure are the object of inquiry—which is the limit of this chapter—there are two simple and obvious measures of the economic size of a country: the number of its inhabitants, and the size of its aggregate real income. Hence we need to cover as much as possible of the world's population or the world's income. This principle of selection is modified only by the desire to have adequate representation of all types of economies, large and small. Both objectives can be attained by proceeding in a way similar to the statisticians' stratified sample, i.e. by including most or all very large economies as well as a fraction, declining with size, of medium-sized and small countries.³

If population is used as the measure of economic weight, there are only four countries having more than 5 per cent of the world's total population each—in order of number of heads, China, India, Soviet Union, and United States. Together they account for a little over one-half of the world's population. There follow a dozen countries having between 1 and

²This type of "region" is not identical with the distinction between industrial and agricultural areas which is encountered in virtually all developed countries and which is generally regarded as evidence of sectoral rather than geographical diversity.

³This approach would be invalid if large, medium-sized, and small countries differed basically in their economic structure or development: for instance, if all large countries were industrial and all small countries agricultural; or if there was a positive or negative correlation between a country's economic size and the level or rate of change of real income per head. This is apparently not the case with respect to any important economic characteristic except the intensity of international economic relations. There is obviously a tendency for the share of imports and exports in national income, and similar measures, to be inversely correlated with the economic size of a country.

5 per cent each of the world's population (Japan, Indonesia, Pakistan, Brazil, United Kingdom, West Germany, Italy, France, Nigeria, Mexico, Spain, and Poland), together representing almost one-fourth of it. The remaining fourth of the world's population is divided among about 100 countries (the exact number depending upon the treatment of some colonial dependencies), each of which harbors less than 1 per cent of the world's population. Using the stratified sampling approach, one might include in the sample all four countries with more than 5 per cent of the world's population each; possibly one out of four of those with 1 to 5 per cent; and one out of ten of the small countries with less than 1 per cent. In that way one would cover well over two-thirds of the world's population by limiting oneself to about twenty countries, or one out of six of those now in existence.

Use of aggregate real income, which probably is a better test of economic weight, does not make much difference at the top. The United States, the U.S.S.R., China, and India remain in the top group of countries with more than 5 per cent of the world's total—although India is precariously close to the lower level—and the United Kingdom would join them, though again at the margin. These five countries together account for fully 60 per cent of the world's real national income, a concentration somewhat more pronounced than if population alone is used. The group of countries with between 1 and 5 per cent of the world's total, however, changes considerably if real income instead of population is used as the criterion. The group then is rather small, including West Germany, France, Italy, Japan, Brazil, and Canada—the latter the only member not also qualified by number of inhabitants—and their aggregate weight comes to only about 15 per cent of the world's total income. These 11 top countries (according to the income test) thus account for about three-fourths of total world output.

Any comparative study of economic growth and structure would probably include the 11 countries now having the largest real aggregate income, both because of their present economic weight and because of their role in developing the industrial system inside and outside Europe; or because of their decisive importance in the second half of the twentieth century. It may, however, be possible to eliminate France and Italy from the list because they are not sufficiently different from West Germany and the United Kingdom to represent another type of economic structure and development, and thus to justify separate treatment. Similarly, Canada might be omitted because of its general similarity to the United States.

The 11 leading countries (eight after eliminating France, Italy, and Canada), measured by aggregate real income at the present time, provide a reasonably good representation of the different continents, five (three) of them being situated in Europe (if the U.S.S.R. is regarded as European), three in Asia, and three (two) in the Americas. They include both the most developed industrial countries (United States, United Kingdom,

West Germany); some definitely underdeveloped, predominantly agricultural areas (India and China); and some countries of an intermediate character (U.S.S.R., Japan, and Brazil). They allocate to planned economies approximately the correct representation based on these countries' share in aggregate world income.

The remaining problem is therefore to choose another 10 countries—or as many as advisable—from among the approximately 100 countries not included in the top group. Here the choice is necessarily somewhat arbitrary, and determined partly by availability of data. With an eye to the desirability of adequate representation of countries situated in different parts of the world, and of countries having different levels of real income per head, different dominant branches of the economy, and different economic systems, the list of 20 countries given in Table 1 below was developed.

Table 1
SUGGESTED LIST OF COUNTRIES FOR COMPARATIVE STUDY
OF ECONOMIC GROWTH AND STRUCTURE

Country	FIRST CHOICE Share in:			Country	SUBSTITUTE Share in:		
	Avg. Income Class ^a	World Population ^b	World Income ^c		Avg. Income Class ^a	World Population ^b	World Income ^c
Australia	A	0.003	0.011	Argentina	B	0.007	0.011
Bolivia	C	0.001	0.000	Peru	C	0.004	0.001
Brazil	B	0.022	0.017				
Burma	C	0.007	0.001	Thailand	C	0.008	0.002
China	C	0.226	0.040				
Egypt	C	0.009	0.004				
France	A	0.015	0.042	Italy	B	0.019	0.020
German F. R.	A	0.018	0.033				
India	C	0.141	0.030				
Indonesia	C	0.031	0.006	Malaya	B	0.003	0.002
Japan	B	0.033	0.022				
Mexico	B	0.011	0.008	Puerto Rico	B	0.001	0.001
Nigeria	C	0.012	0.002	Ghana	C	0.002	0.001
Sweden	A	0.003	0.009	Norway	A	0.001	0.003
U. South Africa	B	0.005	0.005				
United Kingdom	A	0.019	0.053				
United States	A	0.061	0.398				
U.S.S.R.	A	0.073	0.133				
Venezuela	A	0.002	0.004	Iraq	C	0.002	0.001
Yugoslavia	B	0.007	0.005	Poland	B	0.012	0.010
Total		0.702	0.823				

Notes to Table I

- ^aCountries in Class A had an average income (net national product) per head of over \$500 in 1952-54; those in Class B, \$150 to \$500; and those in Class C, less than \$150. The figures for most countries are taken from United Nations Statistical Papers, Series E-4 (*Per Capita National Product of Fifty-Five Countries 1952-54*). For the U.S.S.R., estimates of \$535 per head (Joint Economic Committee, *Trends in Economic Growth*, p. 61) and for China, \$50 (Eckstein, *World Politics*, 1955, p. 258) have been used. Classification of a few of the smaller countries is based on very rough estimates. Since the estimates of the United Nations were derived by translating average net national product in national currency into U. S. dollars at the rate of exchange, they understate the income of most countries relative to the United States from the point of view of purchasing power. It is unlikely, however, that adjustment for the difference between purchasing power and foreign exchange value of currencies would change the classification of any of the countries in the list, except that Egypt might move from C to B, and Puerto Rico from B to A.
- ^bBased on population figures for 1956, as given in *Demographic Year Book*, 1957, of United Nations.
- ^cBased for most countries on aggregate net national product in 1952-54 as given in United Nations Statistical Papers Series E-4; for sources of U.S.S.R. and Chinese estimates see *a*. Total world net national product in 1952-54 is assumed to have approximated \$750 billion. For the reasons mentioned under *a*, from the viewpoint of purchasing power, the share of most countries (other than U.S.S.R.) is understated compared to that of the United States.

Drawing up such a list does not mean that systematic comparative study of economic growth and structure should henceforth be limited to these countries. Still less does it mean that economic research on other foreign countries should be curtailed or suspended. There are many reasons why individual scholars and research organizations will and should continue to study the economic development of countries not on any master list, either for their intrinsic interest or for regional or even international comparisons. The preparation of a master list has only two purposes. First, it might be used as a guide for the initial group of countries to be covered if a systematic comparative study of economic growth and structure is undertaken and if it is not possible—which is a realistic assumption—to cover all 100-odd countries in the world. Secondly, the list may be taken as a suggestion to researchers who are interested in problems of economic growth as such but have no reasons for selecting specific countries or areas, to work on these countries rather than on others so that an increasing amount of information is accumulated on the listed countries, and their structure and growth is studied more intensively and in more and more aspects.

The somewhat arbitrary bases for choosing the 11 countries outside of the nine leading ones (United States, United Kingdom, U.S.S.R., France, Germany, India, Japan, China, and Brazil)⁴ should be sum-

⁴The exclusion of Italy and Canada, which by the test of aggregate income alone would belong in the list, has been explained in the preceding paragraph. The inclusion of France, although it could have been omitted for the same reasons, is to some extent arbitrary. One could as well omit France and include Italy, particularly because Italy represents a better example of a country with sharp regional differences in economic level.

marized. These comments will be arranged alphabetically by names of the countries.

Australia has been selected as the representative of the high-income countries of recent white settlement for which agriculture is the basic source of growth and economic weight. This group is small, the only other members being Argentina, Uruguay, and New Zealand.

Bolivia is one of the underdeveloped countries depending primarily on mining. This is now a small group also, including among others Northern Rhodesia and less definitely Chile and New Caledonia. (Formerly this group also included Mexico and Peru.)

Burma has been included as one of the Oriental countries living on tropical peasant agriculture and eliciting from it only a below-average income. Similar are Thailand, Indo-China, and, of course, large parts of India and China.

Egypt is the only Mideastern country for which statistics are available well into the nineteenth century (not to speak of the possibility of comparing these modern figures with relatively good data from the Ptolemaic and Roman periods); while most of the other countries in this area acquired independent existence only after World War I or II and hence cannot easily be followed back statistically before those dates. In economic structure—the predominance of subtropical agriculture, low level of income, and heavy population pressure—Egypt is representative of most of the area from Morocco to Iraq.

Indonesia is one of the main representatives of Oriental low-income countries depending upon tropical agriculture, but with considerable emphasis on plantation agriculture. Malaya and Ceylon are other examples.

Mexico has been included as representative of countries which, while still largely dependent on subtropical agriculture, have made considerable progress toward diversification, and in the process are moving from the low into the middle average income bracket of the international scale, aided by the proximity of the great United States market for commodities and tourist services. Other examples are Cuba and Puerto Rico.

Nigeria is probably the most important example of countries of African tropical peasant agriculture, just emerging from tribalism and with very low average real income. This group includes Ghana and several British and French West African dependencies, and, less unequivocally, the Congo. Nigeria, however, appears to be the best representative of the type, partly because there is less admixture of white plantation economy.

Sweden is one of the small European countries with high average real income, a large international trade, and the advantages of close cultural and technological relations with the much larger centers in Germany and Great Britain. The three other Scandinavian countries, as well as Belgium, the Netherlands, Luxembourg, and Switzerland, share these basic characteristics. The choice among these countries is fairly arbitrary; Sweden

was selected partly because of the availability of data for a large part of the nineteenth century.

The appearance of the *Union of South Africa* on the list is probably its least defensible feature. Each of the countries included is supposed to represent several others of the same or a similar type. There is, however, no other country in the world similar to the Union of South Africa; but its basic characteristic, the coexistence of a fairly advanced European economy and an African economy which is almost entirely agricultural and as backward as that in tribal areas, is of particular interest.

Venezuela represents the best example so far of an otherwise poor country which has floated into the top class of relatively high real income—though it is still near the bottom of that group—exclusively on a sea of oil. Kuwait, Iraq, and possibly even Saudi Arabia may later move into this group, although the shift seems to be still a good while off.

Yugoslavia has been included in the list for two reasons. First, it is representative of the half dozen Southeast European economies which are characterized by a very low level of average real income and by a predominance of agriculture unusual for that continent. Secondly, Yugoslavia now has an economic regime between East and West, though closer to the former. The main reason why it was given preference over Poland is its easier accessibility to foreign students, which provides a chance for research independent of the government.⁵

⁵At the Princeton meeting, Professor Reynolds improvised a list of 20 countries that might be the initial subject of comparative study. His list and the one presented here, although independently developed, have 12 countries in common (United Kingdom, United States, Germany, France, U.S.S.R., China, India, Japan, Brazil, Mexico, Sweden, and Australia). Three more countries on Professor Reynolds' list appear in our list among the substitutes (Argentina, Ghana, and Poland). There are five countries on Reynolds' list which are not on ours (Canada, Chile, Congo, Pakistan, and Rhodesia). On the other hand, eight countries on our main list do not appear in Reynolds' list (Bolivia, Burma, Egypt, Indonesia, Nigeria, Union of South Africa, Venezuela, and Yugoslavia).

Some readers of the preliminary draft of this report have made suggestions for changes in the list, usually affecting the selection of smaller countries. A few have been accepted, but most of them could not be used, as they were predicated on different principles of selection from those applied in this report.

7. SELECTION OF PERIODS

Whether or not the comparative study of economic growth and structure is restricted to or concentrated on a limited number of countries, it is necessary to limit the period studied in two ways. First, we generally cannot push our statistical data back to the beginning of human settlement of the areas with which we are dealing; or even to the beginning of non-aboriginal settlement in cases where later significant waves of immigration have produced sharp breaks in economic as well as social and political history.¹ Secondly, even within the period for which we have quantitative materials we usually lack continuous (usually annual) data, but have information only for selected benchmarks, often at irregular intervals and for different points of time for different characteristics of economic growth and structure.

Thus, two questions arise: First, how far back can we or need we go in the comparative study of economic growth and structure; second, to what extent can we use benchmark data instead of continuous series?

How Far Back Can We Go?

This question is in many cases answered, at least as a practical problem, by the rapid, progressive attenuation of data once we proceed beyond the middle of the nineteenth century, even in countries now statistically well developed. There are only a few countries in which more than fragmentary reliable materials are available on a continuous basis before the middle of the eighteenth century—Great Britain and France probably being the most important examples. Even in these countries, statistically usable data on a scale broad enough for the study of economic growth and structure run out at some time during the seventeenth century. There are, of course, considerable bodies of quantitative economic data for other countries and for earlier periods, but they usually refer only to one or to a few aspects of economic development or structure, such as the price statistics which have now been carried back through most of the Middle Ages for several

¹Australia and large parts of the Americas are exceptions, as it is not impossible to develop figures for the entire period of white settlement, which (apart from limited areas like the Aztec, Maya, and Inca empires) constitutes all the significant economic history of the two continents.

European countries;² statistics of government income and expenditure; and on an international scale, the detailed statistics of maritime traffic through the Danish Sound from the fifteenth century to 1783,³ and between Seville and America in the sixteenth to eighteenth centuries;⁴ or they are sporadic like the fairly common enumerations or estimates of population, the occasional censuses of real estate holdings — of which Domesday Book is the most famous example — and censuses of personal income and wealth. These bodies of data, however, are for the economic historian rather than the economist and statistician.⁵

Fortunately the virtual impossibility of pushing a statistically founded systematic inquiry into comparative economic growth and structure back beyond the mid-eighteenth century is not too serious a handicap, as this date coincides — not entirely fortuitously — with the beginning of the industrial revolution.⁶ Even if the shortage of comprehensive data were not so compelling, it is thus doubtful whether our study should go back in the developed countries beyond the seventeenth century. A starting point as early as 1700 would give us a sufficient interval before the onset of the industrial revolution to provide a fairly adequate background for observing and evaluating this crucial “take-off into sustained growth.”

The possibility and advisability of developing data for a century or so prior to 1850 is limited to Western Europe, the United States, and a few other countries such as Sweden, where the data happen to be relatively

²Cf. the publications sponsored by the International Scientific Committee on Price History, which deal with England (Beveridge and associates), Germany (Elsas), France (Hauser), the Netherlands (Posthumus), and the United States (Cole). Similar long series have also become available for some other countries, e.g. Spain and Italy.

³Nina E. Bang, *Tabeller over skibsfart og varetransport gennem Øresund fra 1497-1660* (2 vols., 1906-1922); Nina E. Bang and K. Korst, *Tabeller over skibsfart og varetransport gennem Øresund, 1661-1783* (4 vols., 1930-1953).

⁴H. and P. Chaunu, *Seville et l'Atlantique* (9 vols., 1953-56).

⁵How rich a statistical material exists even for classical antiquity—though it is often difficult to put in modern form—can be seen from books like Heichelheim's *An Economic History of the Ancient World* (1958) and from the famous studies of Rostovtseff (*The Social and Economic History of the Roman Empire*, 1st ed. 1926, 2nd ed. 1957, and *The Social and Economic History of the Hellenistic World*, 1941). For a statistician's use of this material cf. Clark, *Conditions of Economic Progress*, 3rd ed. (1957), Excursus.

⁶This is not the place to take sides in the issue about the dating of the industrial revolution in various European countries. Many historians have a tendency to push that date farther and farther back, and they can always find some evidence for an earlier appearance of some features of what later became the capitalist system. To the economist it looks as if little that is characteristic of a real “industrial revolution” took place before the eighteenth century, though its intellectual origins may well lie in the seventeenth and even in the second half of the sixteenth centuries. The slowness of increase in population and real income, to cite only two important quantitative pieces of evidence, would seem to point definitely toward a later rather than an earlier dating of the industrial revolution as a development that is significant from the standpoint of long-term economic growth.

plentiful. For the rest of the world, it is hardly possible to go back that far, even though we should like to study the impact of the industrial revolution on the nonindustrial areas from the time of the revolution in Western Europe. This impact became significant as early as the eighteenth century in only a few countries outside of Europe. In most cases, the clear effects of the industrial revolution in Europe and North America became apparent only during the first half of the nineteenth century; in some parts of the world, particularly in Africa, the effect was delayed until the second half of the century. In these countries, therefore, we should try to push the data back until they cover a sufficient period before the effects of Western industrialization became evident. In the few cases where this is possible, it will enable us to observe the indigenous economy while it was still basically unaffected by these alien elements. But where we cannot go back that far, it is not too serious a drawback.

What is essential is to have figures for one or two generations prior to the start of industrialization in these countries themselves. This happened probably in the third or the fourth quarter of the nineteenth century in Latin America, the Near East, and the Far East; and in the first quarter of the twentieth century in tropical Africa. Our figures therefore should go back if possible to the first or second quarter of the nineteenth century in the first group, and to the third or fourth quarter in the second group of countries. Even this goal is often beyond reach; our ability to go back to the period we want was one of the considerations in selecting the countries for inclusion in the list presented in Chapter 6. Indeed, unless figures are available for a period of at least half a century without a major break, it is inadvisable to consider a country for comparative study of economic growth. Unfortunately much recent work on economic growth has been limited to the postwar decade, or to a comparison of the postwar years with the 1930's, or at best to the interwar period, thus covering just about one generation.

The situation is different in the comparative study of economic structure. These comparisons aim at international cross-sections for a smaller or larger number of countries at the same point of time. The phrase "same point of time" can, however, be interpreted in two ways. The obvious and simple way is to interpret it as meaning the same calendar date. But there are situations and research problems in which sameness is not that of calendar time, but that of the stage of economic development however defined for the problem under investigation—for instance, the time when real income per head is the same, or when the proportion of industrial to agricultural labor force is the same, or when the saving ratio is the same.

For such cross-sections, whether calendar time or equivalent stage cross-sections, data are usually available covering a much larger number of countries than for long-time comparisons of economic growth. Even countries for which reasonably accurate and comparable statistical data have become available only recently can be included for the calendar year

to which the cross-section refers, or for the development stage for which it is drawn up. For instance, in a cross-section for an early stage of development, countries can be included that are still in that stage (provided they meet the criteria for the cross-section), even if no data are available in that country for previous calendar periods.

Continuous Series vs. Benchmark Data

Another problem arising in connection with the time aspect of the comparative study of economic growth and structure is the choice among (a) continuous annual data (or continuous data for a shorter period), (b) averages of such data for a period of years, and (c) benchmark data at shorter or longer intervals.

Except in the study of the interrelations between cyclical fluctuations and growth, data for periods shorter than one calendar year are obviously not needed for the study of economic growth and structure. The question remains what combination, if any, of annual data should be used, whether selected benchmark years, straight period averages, overlapping averages, moving averages, or fitted trends.

To some extent, availability of data will decide the question. Detailed information on subjects like population, housing, and manufactures collected through census-type enumerations is almost always limited to benchmark years. Decision among the choices just enumerated must be made mainly for the data which are available in more or less the same detail year after year. Statistics of prices, wages, unemployment, foreign trade, public finance, and the production of basic commodities are examples. In these cases the purpose should decide, but in practice the resources available to work up the data often are determining.

There is no need to discuss here advantages or disadvantages of different straight or moving averages, and of fitted trends following one of the several forms usually applied in the analysis of economic time series (algebraic straight line; logarithmic straight line; growth curve—Gompertz or other). The purpose of averages in the study of economic growth is the elimination of fluctuations that have no direct relation to the growth process (again ignoring the possibility of an intimate connection between short-term fluctuations and growth), and this can be achieved by the selection of benchmark periods, by the use of averages, or by fitted trends. In the first case, the benchmark dates selected should be in the same position in the business cycle, usually at the top of every business cycle or at the top of every second or third cycle if longer intervals between benchmarks are wanted. If averages are used, the period should at least be equal to a full cycle, but it may cover two or more full cycles. The choice of five- or ten-year averages, although common, is not very satisfactory. It is not likely that such fixed periods will always include the same number of full cycles or the same proportion of years in the same cyclical positions. Fitted trends are usually employed only for periods of

at least two and more decades, but are often preferable when comparable data are available for long periods.

If swings of about 20 years' duration, which have recently been made plausible for the United States,⁷ should be found to exist in many countries, the appropriate choice of time periods for international comparisons would be somewhat complicated. Averages for such long cycles, or benchmark years at the top of long cycles, will then be preferable (as measures of long-term growth) to the usual cycle averages or to benchmarks at cyclical top years, let alone to mechanical five- or ten-year averages. Fitted trends will then have to include several long cycles, i.e. cover periods of 40, 60, or more years.

These considerations apply mostly to the study of growth. In the comparative analysis of economic structure, the use of single-year values for any given country is more common and also more justified. However, since cycles and other short-term movements do not occur in the same calendar time in all countries, there is an argument for either using years in the same cyclical position (even if they are not exactly the same calendar years) or cycle averages if comparisons between countries are made.

⁷Cf. S. Kuznets, "Capital in the American Economy: Its Formation and Financing," National Bureau of Economic Research, mimeograph, 1959.

8. THE METHODS OF COMPARATIVE STUDY OF ECONOMIC GROWTH AND STRUCTURE

The study of comparative economic growth and structure is not dependent on, or even closely linked to, any one statistical or analytical technique. The subject is so broad that advantage should be taken of all approaches and techniques that have been found useful in economic and statistical research.

The earlier the period and the less developed the country to be studied, the greater usually is the reliance on typically historical and (particularly in sub-Saharan Africa and other very primitive areas) ethnological methods, with their emphasis on case studies of individuals and single enterprises based on field work and scrutiny of written, manuscript, and archeological sources. It is not, however, true that the more advanced methods of statistical analysis are applicable only to modern developed countries; some are even more needed when the available material is scattered in nature and of unknown quality. Similarly, different types of problems call for different methods. For example, a technique like input-output analysis has little place in the study of monetary and financial aspects of economic growth; contrariwise, the sources and uses of funds approach can hardly contribute much to the study of production in industry or agriculture.

There is no need and no room here for discussing which methods are most appropriate for the study of the different facets of economic growth and structure even within the field of this report, which is essentially restricted to the usual methods of economic and statistical analysis. All methods are admissible which increase our understanding of the problems of economic growth and which yield testable results. One may, however, legitimately ask that methods which achieve approximately the same result at lower cost be preferred to those requiring more of scarce research resources. One may even suggest that the idiosyncrasies of individual scholars or old established institutional habits of operation should not be permitted to override large advantages of alternative methods.

There are, nevertheless, three specific methods which deserve discussion, if only because of the wide interest they have aroused among academic students of the problem as well as among policy makers, and because of the apparent success they have had when applied to the problems of a

number of economically advanced countries. These are the national accounting approach; the input-output (inter-industry relations) technique; and the construction of formal economic models.

A large technical literature exists on each of these three subjects.¹ It is neither necessary nor possible to discuss here the general problems which these three methods raise. The few remarks below are limited to use of the three methods in the international comparison of economic growth and structure.

The National Income Approach

This is the most general of the three approaches, particularly in its simpler versions. Essentially, it is a systematic arrangement of economically relevant flows and stocks, all expressed in the same unit of account—usually the currency of the time and place—on the basis of the rules of double entry business accounting. Particularly important for economic analysis is the fact that this approach involves systematic separation of current transactions from those on capital account, i.e. from investment and saving. The national accounting approach is quite flexible with respect to the number and the character of the flows and stocks distinguished, and the number and arrangement of the sectors into which all economic units within the country are grouped. It is common practice, however, to separate at least the government from the private sector and to subdivide the private sector into a household and a business sector.

The national accounts are not limited to actual transactions expressed in money or involving actual monetary consideration. Economically relevant events can be brought into the system by imputation even if they do not involve market or barter transactions. Examples are the imputation of rent on owner-occupied houses, of the use value of consumer durables and government tangible assets, of farm consumption of home grown food and of unpaid family labor. This use of imputations is particularly important in international comparisons. It makes possible the equalization of the scope of the national accounts as between situations which are institutionally very different; and thus permits us to compare level and composition of important national accounting totals, such as national income or national product, in cases where limitation to actual transactions for monetary consideration would distort the comparison. For instance, unless imputations were used, the national income of under-

¹Most of the relevant publications on national accounting are listed in the successive volumes of the *Bibliography on Income and Wealth*, published by the International Association for Research in Income and Wealth for the period since 1937. Specialized bibliographies are also available in the input-output field (e.g. V. Riley, and R. L. Allen, *Interindustry Economic Studies*, 1955). The literature on econometric models, on the other hand, is spread over many books and articles in periodicals, and no comprehensive and up-to-date critical summarization appears to be available at this moment.

developed countries would generally be understated in comparison with that of more advanced countries because, in backward countries, non-market transactions among neighbors, unpaid family labor, and the consumption of commodities produced in the household are relatively more important.

Nor is the national accounting approach limited to cases where contemporary estimates have been prepared. National accounts can be reconstructed, obviously in different degrees of detail and with different degrees of reliability, from scattered data. A good example of such historical "reconstruction" of the national accounts is that made for England in 1688 on the basis of Gregory King's original estimates.²

Use of the national accounting approach in comparisons over time and between countries has several important advantages.

First, because of its nature, the national accounting approach forces complete coverage of the relevant flows and stocks and shows clearly where gaps in the information exist.

Second, arrangement of the data in the form of a national income and product account or a national balance sheet provides a considerable degree of internal checks, particularly if a number of sectors are distinguished.

Third, comparison over time and between countries is facilitated because uniform terminology is used and the treatment of the different types of transactions follows general and uniform rules.

Fourth, the national accounting approach is flexible enough to be applied both to simple and to complex economies, to agricultural and to industrial countries, and to free-enterprise and to planned economies. The more complicated an economy, the more detailed and complex the account framework necessary to provide adequate understanding of its operations

Fifth, it is not necessary to have a continuous annual set of national accounts in order to benefit from this approach. Estimates for benchmark periods and dates, even at fairly widely spaced intervals, will usually be quite satisfactory.

Sixth, a fairly close connection has been established during the past decade between the national accounting approach and macro-economic dynamic theory which attacks the problems of economic growth with the tools of economic analysis. As in all successful marriages, there has been considerable mutual adaptation between the two partners. The estimators of national accounts have paid increasing attention to those magnitudes which the builders of economic models have regarded as important. On the other hand, some though by no means all of the model builders have chosen their variables and formulated their equations with some regard to

²See Phyllis Deane, in *Economic Development and Cultural Change*, November 1955.

the possibility of obtaining numerical values for the variables from the system of national accounts. This mutual adaptation has been facilitated by the fact that the basic concepts and aggregates of a system of national accounts and of most versions of macro-economic dynamic theory are very similar. This is true primarily of concepts like national output and income, the functional distribution of income, the distribution of expenditures between consumption and investment, and relations like the saving ratio and the capital-output ratio.

In using the national accounting approach in the comparative study of economic growth and structure, two main problems arise. The first stems from the fact that the national accounts are originally expressed in the currency of the time and place; hence all the problems of deflation (taking account of price changes over time) and of translation (eliminating differences in prices between countries) that will be discussed in Chapter 9 arise here too. But this is true primarily if we want to use the national accounting data for the measurement of economic growth or to make comparisons of the absolute levels of income and of similar magnitudes between countries. A large part of the value of the national accounting data, however, resides in the aid they give to the study of economic structure. Here, relationships existing in one country at one point of time are often the subject of interest, and comparisons can be made without having to resort to deflation or to translation between the relationships derived from data in current prices; examples of such relationships are the shares of different groups in national income, the ratio of investment to national product, and the distribution of personal expenditures among classes of commodities and services.

The second problem is probably less obvious and more difficult to handle. Some of the concepts used in the national accounting approach—as in all economic analysis—have different meanings at different places and times. Price, for instance, may mean a market price resulting from free competition on both sides; an administered or monopoly price in a free-enterprise economy; the customary price in a tribal economy; and a price fixed by a government within or without a comprehensive economic plan. The relationship between price and private and social cost thus may vary greatly; and the national accounting approach usually is not able to allow for these differences. This is only another way of saying that this approach cannot of itself reduce actual or virtual market relationships to welfare relationships, the exact definition of which would be necessarily imprecise if not arbitrary. Other methods of economic analysis, however, cannot effect this translation either. In some cases where the extent of the discrepancy justifies it, *ad hoc* corrections may be attempted. Indeed, the use of factor cost in addition to or in lieu of market price in the national accounts is one form of taking notice of some of these discrepancies between different economic situations, particularly differences in the use of indirect taxes.

Since World War II, most countries have developed a system of national accounts, although such systems differ in detail and in reliability. Considerable variations still exist in these systems, but the trend toward uniformity has been very pronounced, particularly under the influence of international organizations such as the United Nations and its regional commissions and the OEEC. Serious difficulties in using national accounting data, apart from the shortage of systematically deflated figures, will therefore be encountered, mainly prior to the 1930's. Progress has been made, however, both in pushing back estimates of the main aggregates from the national accounts—gross national product, net national product, national income, labor and property income, output of producer and consumer goods—on an annual basis; and, though less successfully, in developing fuller national accounting statements for selected benchmark years.

As a result, we now have or expect to have in the near future estimates of at least the main national accounting aggregates, both in current and in constant prices, back to the middle of the nineteenth century and sometimes to its beginning, for the main industrial countries of Europe and North America, specifically the United States,³ Canada, the United Kingdom, France, Germany, Italy, Sweden, Norway, Denmark, Belgium, and the Netherlands. Lacking in this group are only Luxembourg and Switzerland. There is, however, only one country—England—in which we can follow developments on the basis of national accounting statements back to a time before the industrial revolution, even if at widely spaced benchmarks.

The situation changes radically once we leave Western Europe and North America. There is an almost complete lack of national accounting statements for the nineteenth century for agricultural and non-Western countries. Apparently in no case is it possible to go back before the impact of the Western industrial revolution, or even before these countries' own industrialization started. The case where we can come nearest to this stage probably is Japan. In some of the countries of white settlement, for instance in Australia, it is possible to go back to a very early stage of their

³While it is true that we now have annual estimates of gross and net national product of the United States back to 1869 and considerable fragmentary material is available to 1840 and even before, it must be stressed that a set of estimates of satisfactory quality covering both the product and the income side throughout the nineteenth century, providing a reasonable amount of sectoring, and supplementing the income accounts by balance sheets at at least decadal intervals, does not yet exist. Until they produce these figures, American economists and statisticians have little reason to complain about unavailability and poor quality of data for other countries which have fewer primary data and less funds available for economic research. The 1957 Joint Meeting of the Conference on Research in Income and Wealth and the Economic History Association made a considerable contribution by providing estimates for some sectors and periods which will be published in Volume 24 of *Studies in Income and Wealth*. The main job of building up a complete integrated set of figures, however, remains to be done.

own development, although by calendar time only to the mid-nineteenth century.

Because of the many advantages of basing international comparisons of economic growth and particularly of economic structure on a set of national accounts, the development and improvement of these data is one of the most important tasks for the study of economic development. The efforts should be aimed in three directions.

First, the uniformity of accounts for the postwar period should be improved, and as many of these accounts as possible should be shifted to a comparable price basis. This would make possible a considerable advance in the comparative study of contemporary economic structure and of economic growth since World War II or since the 1930's.

Second, national accounts — both national income and product accounts, and national balance sheets—should be developed for selected dates and selected countries throughout the century prior to World War II. As most countries have been strongly though not uniformly affected by the same economic and noneconomic forces at least during the twentieth century, it is advisable to select a few common dates, although the available material will sometimes force deviation by a few years in either direction. Obvious dates are: a year around 1890, when a long depression reached its trough; 1913, before World War I shattered the Victorian universe for good; 1929, just before the greatest cyclical depression in history; and 1937, chosen to avoid any undue influence of the preparations for World War II in several countries. In the nineteenth century, the availability of basic material and the specific characteristics of the development of different countries will determine the choice of benchmark dates; one would hope for estimates for a year shortly before the Railroad Age started in the different countries, and for a year in the early 1870's at the top of the strong boom.

Third, the development of information of this type for at least a few countries outside of Europe and North America is particularly important. The best chance for developing such national accounts probably exists in Japan, Australia, and Argentina. A special effort should be made to include India and some countries in Africa, the Near East and tropical Latin America, possibly the Union of South Africa, Egypt, and Mexico.

The Input-Output Approach

The input-output approach, also known as the study of inter-industry relations, is basically a part of a complete national accounting system. While transactions among business firms are netted out and thus not separately shown in the usual form of the national income and product account, it is just these inter-industry transactions that form the core of input-output analysis. The formal characteristic of this approach is the preparation of a table—usually in the form of a square matrix—which shows the purchases and sales of each of a number of “industries” (sec-

tors) from and to each other. While the earliest input-output table distinguished only 10 separate industries,⁴ the tendency, particularly in the United States, has been for a finer and finer subdivision, until one table showed transactions between each of more than 400 industries and thus had about 200,000 cells, although many of them were, of course, empty.⁵

Input-output tables have two purposes, both of which are relevant to the study of economic growth and structure. The first is the detailed presentation of the aggregate flows of commodities and services among the different sectors of business or of the entire economy during one period, usually a year. The second purpose is the use of this detailed from-whom-to-whom cross tabulation in the derivation by mathematical manipulation—the solution of a system of simultaneous equations by matrix inversion—of production or demand functions for the different industries, functions which at present are limited to linear form.

The usefulness of input-output tables as a method of systematically organizing information on commodity and service flows among sectors of the economy is evident. By its very nature, an input-output table, like all national accounting statements, insures completeness of coverage; provides internal checks of consistency; and quantifies and classifies relations which otherwise might remain ill-defined or hazy. For the comparative study of economic structure, input-output tables have the special attraction that they facilitate comparison of complicated relationships by providing a uniform framework. Without an input-output table, it is rather difficult to come to conclusions about the degree of similarity of inter-industry relations and production coefficients between countries and over time except in a vague and usually less useful way.

The problems which arise in connection with the use of input-output tables in the comparative study of economic structure and growth, and which were the subject of lively discussion particularly at the Princeton meeting, concern two points chiefly—the applicability of the input-output approach to underdeveloped countries, and the high cost of input-output studies if done in the American style, at least compared to other forms of economic and statistical research on economic growth and structure.

By their very nature, particularly because of the fine sectoring demanded (the number of flows for which data are required increases with the square of the number of sectors distinguished), input-output studies require a great deal of material on the structure of cost and the distribution of sales in different industries. This material is often not available in organized form in less developed countries, and is almost never available,

⁴See W. W. Leontief, *The Structure of American Economy, 1919-1929* (1941).

⁵For a brief description of this study, see W. D. Evans and M. Hoffenberg, "The Interindustry Relations Study of 1947" in *The Review of Economics and Statistics*, May 1952. Vol. XVIII of *Studies in Income and Wealth* (1955) and the *Technical Supplement* to it (1954) contain a set of articles describing and discussing the 1947 study in more detail. No full official report on the study has ever been published.

even in developed countries, in exactly the form needed for input-output tables. This disadvantage may be partly offset by the relatively small number of businesses involved in these countries, which sometimes makes it possible to collect the necessary material by direct informal inquiry. More serious is the fact that the construction of an input-output table absorbs large amounts of time of economists and statisticians of a type scarce in most underdeveloped countries; it is, therefore, often a question whether these resources could not contribute more if used on other aspects of economic statistics. In such countries the input-output approach—particularly on anything like the American scale—may be an unnecessarily powerful and expensive tool of economic and statistical study.

Yet the spread of the input-output approach in recent years has been altogether remarkable, particularly as it has not at all been limited to advanced industrial countries. Input-output tables now exist for the United States, the United Kingdom, Germany, France, the Netherlands, Norway, Denmark, Italy, Spain, Yugoslavia, Canada, Australia, New Zealand, Japan, India, Argentina, Chile, Colombia, Mexico, and Peru, and possibly in a few other countries, particularly in Eastern Europe.⁶ As the economists and statisticians working on input-output tables constitute a closely knit international fraternity, the methods employed in their construction have been quite similar throughout the world.

Much of the rapid spread of input-output tables, particularly to less developed countries, may be attributed to their attraction to policy makers who use them in economic planning. This predilection may be influenced by the fact that input-output tables permit the user to follow the effects of alternative investment programs throughout the entire economy in a way probably superior to other approaches.

Apparently the contribution which the input-output approach can make to the study of economic growth is limited, as compared to its possibilities for the study of economic structure. Because of its detailed nature, it is hardly ever possible to construct an input-output table long after the event. There is thus not much hope that input-output tables can be obtained for any country for the period prior to World War II.⁷ They therefore cannot help us in studying the early phases of economic growth except in a few of the countries still underdeveloped. Another limitation is that so far very few countries have prepared an input-output table for more than one date. Where such tables are available for several dates—as in the United States—their comparability over time is quite limited.

⁶Most of these tables, it is true, distinguish a much smaller number of sectors—often only 20 to 40—than the postwar United States matrixes. The smaller the number of sectors, the less pronounced the difference between an input-output table and a sectored national income and product account.

⁷The only exceptions are the summary tables for the United States in 1919 and 1929, and a similar summary table for the United Kingdom (cf. T. Barna, "The Interdependence of the British Economy," *Journal of the Royal Statistical Society*, 1952, Series A, Vol. 115, pp. 29-77).

But input-output tables may still develop into an important tool in the academic study of economic growth provided the one-shot investigations which have prevailed hitherto are replaced by the repeated preparation of input-output tables, even at irregular substantial intervals, so that changes in coefficients over time can be studied; provided it proves possible to separate and cross-tabulate investment expenditures and thus to make the matrixes dynamic; and provided a way can be found to use more flexible (non-linear) forms for production functions. In view of the recent developments in this field it would be imprudent to deny the possibility that all these conditions will be met, but it is unlikely that they can be met for the next five to ten years. The intensive use of the input-output approach in the comparative study of economic growth is therefore not likely to become a pressing problem in the immediate future.⁸

These difficulties are much less serious when the objective is the comparison of economic structure of different countries, rather than the study of the growth process. For the latter purpose, comparable input-output tables are needed for the same country at several dates extending over a substantial period of time. For structural comparison, on the other hand, one table for each country is sufficient and the reference dates for the various countries may differ considerably. In making structural comparisons, input-output tables may therefore be of very great value provided that, as is often the case, sectoring and other statistical features are basically comparable. Since countries for which input-output tables are available represent different stages of economic development, one may even draw some inferences about changes in inter-industrial and production coefficients during economic growth from a comparison of input-output tables for different countries and dates. This, however, should be done only with great care and considerable hesitation because of the

⁸The status of input-output analysis in the countries having a planned economy, or more specifically those behind the iron curtain, is interesting. As a form of national accounting, the input-output technique is politically neutral, and the charge sometimes heard in the United States that the preparation of input-output tables is a step toward a planned economy is unfounded. Nevertheless, it would seem that the input-output approach would be particularly valuable for countries in which elaborate economic plans are used as guides for economic action; and also that countries operating a planned and generally government-owned economic system would have easily at hand more of the information needed for input-output tables than is usually available in free-enterprise countries. It is therefore astonishing that public or printed discussion of the input-output approach in the form developed in the last two decades in the United States and Western Europe has until recently been banned behind the iron curtain as bourgeois economics. Tabulations and calculations very similar to those used in Western input-output technique do actually exist in the Soviet Union even though virtually nothing has been published about them. (The system of "material balances" can, of course, be regarded as a rudimentary and partial input-output technique, a relationship now being recognized by Soviet economists.) It is quite in line with developments in other fields that the first serious publication on the input-output approach from the planned economy area should have come from Poland, namely in Professor Oscar Lange's article in *Sankhya* (February 1957).

difficulty of separating changes likely to accompany the process of economic growth as such—insofar as there is any typical pattern of economic growth—from changes that reflect peculiarities in the inter-industrial structure of the countries used in the comparison.⁹

Economic and Econometric Growth Models

A growth model, for purposes of this discussion, is a system of equations designed to explain the long-term development of an economy. A model may be called economic if the equations consist only of non-numerical symbols, econometric if they include both symbols for certain variables and numerical values for constants, the latter derived from fitting the system of equations to a body of actual statistical data.

It has been claimed that anyone who discusses problems of economic growth uses a model, although it may not be cast in algebraic terms; in that sense the classical economists and Marx worked with economic models. The construction of economic or econometric models of economic growth set forth in print and not existing only in the author's mind or notes, however, is essentially a development of the last twenty years, reaching its intensive and accelerating stage only in the postwar decade.

Probably the simplest economic model of long-term growth is that developed by Harrod.¹⁰ It requires only three variables (output, change in output, and investment) and two constants (the saving ratio and the capital-output ratio). In its simplest form it can be expressed in three equations:

$$(1) \text{ Saving Ratio} \times \text{Output} = \text{Investment}$$

$$(2) \text{ Capital-Output Ratio} \times \text{Change in Output} = \text{Investment}$$

$$(3) \frac{\text{Change in Output}}{\text{Output}} = \frac{\text{Saving Ratio}}{\text{Capital-Output Ratio}} = \text{Rate of Growth of Output}$$

The model has been given concrete form by Tinbergen,¹¹ who combined it with a Cobb-Douglas type of production function to add a fourth equation, viz.

$$(4) Y = e(t)L^{3/4}K^{1/4}$$

where Y is the rate of output, L the labor supply, K the stock of repro-

⁹For the comparison of some characteristics of input-output matrixes for selected countries, cf. H. Chenery and T. Watanabe in *Econometrica*, October 1958.

¹⁰*Towards a Dynamic Economics*, 1948. The basic features of the model are already contained in Harrod's 1938 article, "An Essay in Dynamic Theory," *The Economic Journal*, March 1939.

¹¹Cf. memorandum 11 in Part II.

ducible capital, and $e(t)$ a term dependent upon time which is introduced to take account of shifts in the production function such as may follow changes in the scale of output.

Some models contain only a few equations and have less than 10 variables and constants; others run to several dozen equations and use half a hundred variables and constants.¹²

Most models include among the variables certain basic economic magnitudes, although in different forms, such as output, share of labor in total income, the saving ratio, the capital-output ratio, and the profit rate.

Another common characteristic of most models is that the variables are expressed in physical units or in constant prices rather than in current values, and on a per head rather than on an aggregate basis. Hence, the models do not try to explain the course of observed income, wages, prices, etc., but only the "real" phenomena behind these.

From the point of view of use in the comparative study of economic growth and structure, most models have certain common characteristics.

1. Most of the models refer only to the economy as a whole, i.e. they do not distinguish among sectors. Even those which make some distinction deal with only two sectors, usually wage earners and the rest of the population, or agriculture and all other sectors combined.

2. The models generally do not specify the country (countries) or period(s) to which they are to be regarded as applicable. Few authors would claim that their models are applicable to all countries and all times,

¹²The following alphabetically arranged list of a dozen growth models published since the war is not exhaustive, although it is hoped that all the models which were at the center of professional discussion and which have been the fountain-head of most further work have been included.

1. D. G. Champernowne, "Capital Accumulation and the Maintenance of Full Employment," in *The Economic Journal*, June 1958.
2. E. Domar, *Essays in the Theory of Economic Growth*, 1957 (particularly item III, originally published in 1946).
3. R. Goodwin, "A Model of Cyclical Growth," in *The Business Cycle in the Post-War World* (ed. E. Lundberg), 1955.
4. T. Haavelmo, *A Study in the Theory of Economic Evolution*, 1954.
5. R. Harrod, *Towards a Dynamic Economics*, 1948.
6. N. Kaldor, "A Model of Economic Growth," in *The Economic Journal*, December 1957.
7. M. Kalecki, *Studies in Economic Dynamics*, 1943, and *The Theory of Economic Dynamics*, 1954.
8. L. Klein & A. Goldberger, *An Econometric Model of the United States, 1929 to 1952*, 1955.
9. H. Leibenstein, *A Theory of Economic Demographic Development*, 1954.
10. A. Smithies, "Economic Fluctuations and Growth," in *Econometrica*, January 1957.
11. J. Tinbergen, "Comparative Studies of Economic Growth" (memorandum 11, Part II).
12. S. Valavanis-Vail, "An Econometric Model of Growth, U.S.A., 1869-1953," in *American Economic Review*, May 1955.

but they probably intend them to cover all free-enterprise (capitalist) economies since the industrial revolution. Within this very wide compass the models do not allow for possible differences or changes in relationships and constants over time.¹⁸

3. With one exception, the models make no allowance for non-economic variables other than (in some cases) demographic variables which are anyhow better regarded as belonging to the economic category.

4. The two econometric models, i.e. those expressed in quantitative terms, both refer to the United States; one for the period since World War I and the other for the period since 1869.

5. No economic model seems to have been tested systematically against the experience in any economy, although some authors try to satisfy themselves that the tendencies which their models imply are not in obvious disagreement with the generally known facts about economic growth in the Western world.

The formulation of these characteristics already implies the problems which the models raise. The basic question, of course, is how the models fit the growth of one actual economy or, as would be necessary to satisfy their claim to generality, the growth of any of a large number of countries since the industrial revolution. Until this basic question is decided, it may be regarded as unnecessary to raise additional queries, since no definite answer can be suggested. For instance, can the actual growth process be approximated without allowance for noneconomic variables; without distinction of several sectors; without allowance for the changing importance of the nonmarket sector; without changes in the form of relationships and constants over time although a period of 100 to 200 years is involved; with practical exclusion of monetary and financial factors; and with abstraction from price movements and relationships?

The test of an economic or econometric model is not whether it explains in detail all aspects of observed growth over a wide range of countries and of periods; such a close correspondence between theory and observed reality is not the function of models. By their very nature models must radically simplify reality. What can be asked is only that the model reproduce correctly the essential features of observed development. What the "essential features" are remains a matter of judgment though one on which broad agreement among students might not be beyond reach. Similarly, it is not easy to set up limits to the tolerable discrepancy between the observed values of certain economic magnitudes and the values they assume in accordance with the model, particularly for years outside the period for which the original model was fitted.

¹⁸ An exception is Kaldor's model, which distinguishes two stages of development of capitalist economies — essentially the period before and after real wages start to rise — and assumes different relationships among variables to hold in the two periods.

The importance of economic and econometric models for the study of comparative economic growth lies not so much in the possibility that they may provide definitive answers about the causes and course of economic growth, but in their ability to raise questions and to formulate hypotheses more clearly and comprehensively than is possible by literary means alone. By constructing models and by drawing conclusions from them through logical inference, theoreticians provide the empirical research workers with a target. Empirical researchers then may test the models offered them by the theoreticians against observed reality in as many countries and for as many periods as possible; they certainly should do so if a model withstands preliminary scrutiny as to completeness and realism. This indeed is the only means of testing models, since they cannot be proven, but can only be disproved by not fitting situations to which they ought to apply, according to their own terms.¹⁴ In this process of testing empirical research, research workers will often have to develop estimates for magnitudes for which no figures have been available before, possibly because it never occurred to them that just these data might be important in explaining economic growth. Some variables and constants in some models may, however, prove resistant to quantification so that the model cannot be effectively tested. Such nonoperational models would seem to be of no concern to the quantitative study of economic growth and structure.

¹⁴ In K. Popper's methodological language, economic models can only be "falsified" but not "verified" (*The Logic of Scientific Discovery*, 1958).

9. NEEDED IMPROVEMENTS IN THE TECHNIQUES OF COMPARISON

Comparison over Time and between Countries

Statistically, the comparison of economic growth and structure among countries must proceed in two stages. The first is the collection of relevant time series, cross-section data, or other statistics for countries included in the comparison, and the examination of these materials for internal consistency and reliability. This scrutiny requires no specific techniques and no qualifications other than those called for in the statistical analysis of data for a single country, but it is nevertheless of the greatest importance. The second stage is the comparison of time series, cross-section data, and other statistics for two or more countries. This is the specific field of the comparative statistician, and often calls for special techniques.

The international comparison of economic growth and structure presents two particular problems. The first results from the need to use estimates of national income and product and related magnitudes that are similar with respect to the scope of economic activities covered, the degree of grossness in transactions adopted, and the method of valuation of entries used. The second problem arises primarily from the fact that a large proportion of all statistics that are relevant to the analysis of economic growth and structure are originally expressed in monetary units of the place and time of occurrence. We may call the first the invariance problem, and the second the deflation (adjustment over time) or translation (comparison between countries) problem.

Invariance of measures of economic growth and structure. In this report a brief mention of this type of problem may suffice, as it has been discussed at some length in the literature, particularly by Professor Kuznets,¹ and as yet relatively little has been done to translate the results of the theoretical discussion into practice.

The invariance of the scope of estimates concerns primarily imputed (noncash) transactions. Examples are the treatment of household production of goods and services consumed within the household (farmers'

¹See, e.g., "National Income and Industrial Structure" (*Proceedings of the International Statistical Conference 1947*, Vol. V).

use of home grown food is the main case in present United States national accounts); the treatment of the use value of durable goods owned by households, nonprofit institutions, and governments; and the treatment of capital consumption allowances. There would be no problem if the relative importance of these types of transactions remained the same over time or in different countries. Since this condition fails conspicuously to be met (the decrease in the production within households and the increase in the holdings of durables by households and governments are important characteristics of economic growth), it is necessary to develop methods of measuring economic growth that are invariant to shifts of activities between households and businesses, or more generally between any two economic structures.

The problem of invariance is not limited to the scope of imputed transactions that are to be included in gross national product or national income, or excluded from it. It also arises with respect to problems of actual transactions such as government interest, and in connection with techniques like the standardization of average income for age and sex structure of the population.

Comparisons of levels of economic activity or rates of growth and of the character and changes of economic structure can be validly made only if the measures on which they are based are invariant to institutional changes of the types just mentioned. Development of such invariant measures is largely a practical problem, but one of great difficulty. It has not yet been solved satisfactorily.

The decisions about the definition of income that will be used as the basis of invariant estimates, on the other hand, raise conceptual problems because the rate of growth differs depending upon the scope of activities included. There is a case for the use of the broadest definition of economic activity—including household production of goods and services—when the purpose is the measurement of economic growth in general. This argument is particularly strong when primitive economies are involved. For the study of certain problems of economic development, however, a narrower scope may be preferable and may call for the development of alternative subsidiary measures, particularly if even rough estimates are difficult to make for the broader concept. The differences in the actual measures of levels of economic performance or of economic growth seem by no means negligible or secondary. For some undeveloped countries, real national income per head probably is much higher absolutely and in comparison to more developed countries when the broader concept is used rather than the narrow scope to which we are accustomed in the national accounts of industrialized Western countries.

The problems summarized under the heading of the degree of grossness concern primarily the scope of cost of production in the national income and product accounts; or more specifically, the location of the borderline between household consumption and business cost. The problem arises even though we do not regard the cost of raising and maintaining

the labor force—i.e. the expenditures on persons not yet, no longer, or temporarily not in the labor force—as costs of production; but treat them as consumption, as is now common, and thus retain them in national income or product. Examples are the expenditures on equipment owned by households but used in their productive activities (such as tools and work clothes supplied by employees), and transportation costs to and from work. As in the case of the scope of economic activities, the position of the boundary between household consumption and business costs differs from country to country, and has shifted over time. Here, too, measures invariant to such shifts are essential for a valid comparison of economic growth and structure.

In the case of valuation of flows and stocks, the need for uniformity has always been recognized. The most important case in the field of national income and product accounts is the alternative between factor costs and market value, the two differing mainly by indirect taxes and subsidies, which are included in the latter but not in the former. The comparison of economic performance should not be influenced, most students would probably agree, by a mere shift in the method by which the government finances a given amount of expenditures, particularly a shift between direct and indirect taxes, which would affect national income at market value but would leave national income at factor cost unchanged. Much more difficult problems are raised by the existence of monopoly prices, difficulties which lead us into welfare problems. These difficulties are only mentioned here, without discussion of whether and how a treatment more invariant to the institutional differences reflected in the existence and scope of monopoly prices can be devised and applied in practice.

Deflation and translation. The particular problem of international comparisons of economic growth and structure, which stems from the fact that the statistics are originally expressed in monetary units of the place and time of occurrence, arises not only for estimates of national product, national income, and all other national accounting aggregates, but also for all wage, profit, and price data, all monetary and financial statistics, and even for a considerable proportion of production statistics. The influence of the price level and the price relationships of the time and place of occurrence, however, goes deeper. Some series that seem to be expressed in physical units, and hence unaffected by varying prices and incomes, such as indexes of the volume of production or of productivity, are actually influenced—sometimes decisively—by interlocal and intertemporal price differences which are reflected in the weights assigned to the series combined in the index.

International comparison, therefore, calls for deflation of the original time series, i.e. adjustment for price changes, even where comparison is limited to rates and pattern of growth of several countries. It calls for translation of the original data expressed in different currencies into a common unit when a direct comparison is to be made of the levels of any characteristic of economic structure in different countries. This common

unit may be either one of the currencies involved in the comparison, or that of a country and time other than those being compared. The use of the so-called "international unit," i.e. the purchasing power equivalent of a United States dollar in 1925-1934 throughout Colin Clark's *The Conditions of Economic Progress*, is an example of an extraneous unit.²

The conceptual and practical problems are similar for intertemporal comparison (deflation) and interlocal comparison (translation). In both cases the difficulties increase with the distance between the situations to be compared. The number of calendar years or miles involved is, of course, not the only or the best measure of this distance. The test rather is the degree of economic similarity and dissimilarity between the situations under comparison.

The conceptual problem centers on the difficulty of defining equivalent situations, i.e. the collection of identifiable economic elements, usually goods and services, which can be regarded as equivalent for a specific comparison; so that the relationships between the current prices of these collections yield the deflation or translation ratios which are the goal of the operation. Once we are able to calculate or estimate the deflation ratio between two situations at different points of time, or the translation ratio between two situations at different points of space, the reduction of the original data expressed in current prices of the time and place of occurrence to a common unit of measurement becomes a purely arithmetical operation.

If the average real income of textile workers (of comparable position on the scale of relative skills) in Boston and Calcutta—or textile workers in colonial Boston and in Boston today—are to be compared, the problem obviously is not solved by ascertaining the prices prevailing today in Boston and Calcutta (or in Boston in 1759 and 1959) for any one collection of goods and services, whether it be the collection usually consumed by the contemporary American or Indian worker or by the Boston worker of 1759 or 1959. Some decision must also be made about the "bundle" of commodities and services to be priced—and this is generally a much more difficult problem. Comparisons of this type are even more difficult if they are aimed at the average real income of populations whose patterns of consumption are not homogeneous even within each of the groups to be compared, or toward the comparison of the volume of investment or the stock of capital of two countries or at two dates, because the definition of identical commodities to serve as the basis of comparison is much more difficult here than in the case of relatively uniform and simple consumption goods.

²A similar problem exists even within some countries in which modern and traditional, or foreign and native, sectors coexist but have little intimate economic contact, with the result that the valuation systems and price levels differ radically. In such cases the two sectors may have to be treated as two separate economies, the data for which can be combined only after translation into a common unit of measurement.

Another problem, both on conceptual and practical levels, and one which logically precedes the problem just discussed of selecting the commodities to be compared, is the difficulty of finding commodities in the two situations that are sufficiently similar so that users may be regarded as indifferent between them. This difficulty again exists both in inter-temporal and interlocal comparisons. One aspect is the problem of taking adequate account of quality changes over time or, possibly less important, quality differences between markets. In a world in which the character of commodities changes rapidly, even though they may continue to be designated by the same name, it is almost impossible to overcome this difficulty entirely. It becomes more serious the larger the interval between the situations compared. It is presented in its extreme form by the comparison between two situations in which none of the commodities and services used are exactly the same. Such a situation will rarely be encountered in practice; but it is approximated by the differences in the character of the commodities and services used at widely different times in the same place, or used at the same time in places with wide cultural differences.

The calculation of deflation and translation indexes also encounters serious practical difficulties. The shortage of price quotations for commodities and services that are identical or at least very similar; the inadequacy of descriptions of the commodities and services to which available prices refer; the scarcity of budget and other data on which to base the weights for the combination of the individual price quotations; and insufficient knowledge about quality changes and differences are probably among the most obvious and important difficulties.

It is not astonishing, therefore, that no satisfactory method has as yet been found, either on the conceptual or the practical level, of translating figures for income, wages, prices, and other magnitudes expressed in different currencies, or occurring at different times and places, into a common unit (unless all prices are the same in the situations to be compared and there is no difference in tastes—but this never happens). Some first steps toward more adequate comparisons (in particular between countries) have, however, been taken in recent years. Possibly the most important example of these more refined procedures is the comparison of national product and price levels for the OEEC countries and the United States.³

For any systematic comparison of economic growth and structure it is essential that these beginnings be extended to more countries and longer periods, and improved both conceptually and statistically. The development of measures of relative purchasing power—as the deflation and

³Milton Gilbert and Irving B. Kravis, *An International Comparison of National Products and the Purchasing Power of Currencies*, 1954; Milton Gilbert and Associates, *Comparative National Products and Price Levels*, 1957. Reference should also be made to the pioneering effort, covering many more countries but naturally much more summary in character, in Colin Clark's *The Conditions of Economic Progress*, 1st ed., 1939.

translation indexes may be called—is one of the most important tasks in the field of comparative study of economic growth and structure. It is certain to be difficult and laborious, because the number of countries and periods involved is large and because the indexes must be tailored to meet different purposes—not only the comparison of purchasing power over consumption goods but also other investment goods and other groupings of commodities and services.

The practice which is still all too common—and unfortunately still condoned by the United Nations⁴—of translating aggregate or average national income figures at the exchange rates (whether official or market rates) of the currencies involved has no place in a serious global comparison of economic growth and structure. It can be quite misleading even among industrialized Western countries. The OEEC study, for instance, indicated that the gross national product per head of eight European countries in 1950, expressed in U.S. dollars, was almost 45 per cent higher on the basis of a purchasing power index than when calculated at official exchange rates, and that as recently as 1955 the difference was still above 30 per cent.⁵ Thus, not only did the use of the official exchange rates (in this case there were no large differences between market and official rates) seriously understate the real national income of the European countries in comparison with the United States, but it also distorted the change in the relation of average real income in the United States and Europe over as short a period as the five years between 1950 and 1955.

Translation at the exchange rates leads to almost absurd results when extended to comparisons between countries differing considerably in economic structure and development. Simon Kuznets, for instance, found that the average real income in China in the 1930's was twice as high, compared with the United States, when translation was made by means of an index of purchasing power instead of foreign exchange rates.⁶

Development of Indicators of Economic Growth

Many of the factors that are likely to influence economic growth and structure, and most of the evidences and effects of economic development are open to direct measurement; even though serious conceptual and technical problems are often encountered in devising adequate methods

⁴Cf. for instance, *Per Capita National Product of Fifty-five Countries, 1952-1954* (1957).

⁵Gilbert and Associates, *op. cit.*, p. 21.

⁶Simon Kuznets, *Economic Change, Selected Essays in Business Cycles, National Income and Economic Growth*, 1953, p. 189. The discrepancy actually was due not only to differences between foreign exchange rates and purchasing power index, but also to the omission in the usual estimates of China's national income of items which need to be included for an adequate comparison with the United States.

of measurement. The discussion in the preceding section has dealt with a field in which these problems are particularly pronounced.⁷

However, there are other important aspects of economic development and structure which do not lend themselves so obviously to quantitative measurement. Some of these factors may, nevertheless, have a very great influence on the rate and form of economic growth, and on the character of economic structure; examples are subsoil resources, climate, the physical characteristics of the population, the education system, the political and legal structure, social relations and basic psychological attitudes—to proceed from the more to the less tangible and measurable.

Not a few students assert that these factors are ultimately more important for the start and course of economic growth than are the common easily measurable economic aspects. Indeed, it has become a commonplace for students of these subjects to stress that a purely economic explanation of economic growth is impossible. Whether or not they are correct, there is little doubt that ways must be found in international comparative study to allow for the interrelations between these non-economic factors and economic growth and structure. This can be done effectively only if these primarily noneconomic factors are quantified, or at least arranged in a uniquely ordered sequence. Only then is it possible to apply the familiar methods of statistical analysis to an investigation of the character and closeness of the interrelation between the non-economic and the economic factors; and to include the noneconomic factors in formal econometric models. Even if we do not want to go that far, quantification of the not directly measurable economic and noneconomic aspects of economic growth and structure is regarded by many students as almost essential for clarification of the relationships.

Fortunately, the fact that a phenomenon cannot be directly measured—by count, by the application of rod or clock, or by similar devices—does not mean that ways cannot be found to quantify it or to measure it indirectly; in the physical sciences, indirect measurement has come to be as important as direct measurement. We cannot measure the age of rocks, fossils, or bones directly, but we can measure it rather accurately by observing the extent to which they show radioactive decay. There are no ways of directly measuring distances or velocities of stars, but indirect methods such as the observation of the red shift in a star's spectrum provide usable answers.

Ingenuity and experimentation with alternative indirect methods of measurement are required to find an acceptable way to measure factors which do not lend themselves to direct measurement. Enough work has been done to encourage the hope that it will be possible in most cases to find indirect measures that satisfy the requirements of practical research in comparative economic growth and structure, even if at times they may

⁷Subject to somewhat easier measurement are magnitudes like population, labor force, hours of work, output, consumption, productivity, wages, and prices.

not pass muster with conceptual rigorists. A few examples may be in order, starting with indirect measures of economic factors and continuing with those of noneconomic factors.⁸

Probably the outstanding examples of indirect measurement in economics are the attempts to quantify the welfare concept, which has played such a basic role in economic theory and in the theoretical foundation of economic policy in the last generation, beginning with Pigou's *Economics of Welfare* of 1912.⁹ This problem has not yet been satisfactorily solved, as already indicated in Chapter 4. However, at least one promising approach has been developed, typical of what may have to be done in other cases of indirect measurement of factors relevant to economic growth: this is the selection of a number of indicators of welfare—such as the consumption per head of certain commodities, and certain characteristics of health and education of the population—and their combination into one over-all measure of the level of living or of welfare.¹⁰ Even if such indicators do not measure the theorist's welfare, they may enable us to investigate how levels or differences in the movement of various synthetic measures of welfare compare with similar movements of simpler measures sometimes used (possibly too naively) to reflect welfare: e.g. income per head adjusted for changes (or differences) in the level of consumption goods prices.

Another example of the use of a quantitative indicator of an important economic characteristic not directly measurable is the role of government in the economy. Some aspects of this relation are directly measurable, such as the government's share in the labor force, in national product, in the output of selected industries, in personal and business income, in investment and saving, and in the capital stock. What is needed is a combination of these and other measures to provide an adequate quantitative characteristic of the government's role in the economy. A measure of this type would reflect not only the differences over time and between countries in obvious relations like the government's share in income, etc., but also the less easily quantifiable but nevertheless important differences in the government's degree of control over the economy. Such an indicator could then be correlated with various measures of economic growth and structure.

The problem of indirect measurement by indicators or surrogate vari-

⁸For particular emphasis on the need for indirect measurement, together with a few examples of the possibilities, see "Quality into Quantity? The Need for New Indicators in Comparing Economic Growth" by Henry G. Aubrey, memorandum 1 in Part II.

⁹Abramovitz's paper on "The Meaning of Economic Growth as Measured by Secular Estimates of National Product" (mimeographed for Conference on Research in Income and Wealth, National Bureau of Economic Research, September 1957) deals specifically with the welfare approach.

¹⁰Cf. Bennett, "International Disparities in Consumption Levels," *American Economic Review*, September 1951, pp. 632 ff.

ables naturally presents more difficulties in the case of noneconomic factors. We might, however, remember how far sociologists have gone in quantifying the seemingly immeasurable—witness, e.g., Sorokin's efforts¹¹—even if we do not want to accept and emulate all they have done.¹²

Few will doubt, for instance, that education and the accumulation of knowledge are an important factor in economic growth, and some may even regard it as the most important single factor. No satisfactory way of quantifying this factor has yet been developed, though a few simple measures easily suggest themselves, such as the proportion of the population of certain ages actually in school; the proportion of the labor force engaged in education; the proportion of national income spent on education; the proportion of total educational effort devoted to certain subjects; the proportion of the population possessing certain educational qualifications; the degree of literacy at various levels; and the sale and use of educational materials of certain types. It may therefore be worthwhile to experiment with correlating various combinations of these elements with simultaneous and, more likely, lagged effects on economic growth and structure.

The difficulties are less forbidding in the case of physical variables. Climate, for example, has often been regarded as an important factor in economic development. While the economically relevant aspects of climate probably cannot be measured unequivocally by a single indicator, it might be assumed that a judicious combination of several indicators (such as average temperature, annual or secular range of temperature, aggregate annual rainfall, distribution of rainfall over the year and the area, regularity of rainfall, incidence of droughts, and similar variables) could produce a synthetic indicator, or sets of them, that will provide an adequate measure of the economically relevant characteristics of climate. Such a measure could then be used to represent climate in an econometric model or in a more limited correlation between climate and single economic variables or groups of them. The problem of finding adequate indicators may well be more complicated for subsoil resources, and for the physical characteristics of the population, whether inherited or acquired; but the task does not seem to be hopeless.

The measurement of sociological variables is probably more difficult, although sociologists themselves have done a considerable amount of spade work. It should not be impossible to develop quantitative indicators for social characteristics like class structure, class conflict, social coherence, intensity of interpersonal contacts at different levels, and forms

¹¹ *Social and Cultural Dynamics*, 4 vols. (1937-1941).

¹² A good recent example of successful quantification of the superficially nonquantitative and nonquantifiable is G. Becker's analysis of the economic aspects of racial discrimination in the United States (*The Economics of Discrimination*, 1957).

of legal and governmental organization. The relative size and cost of the police and of similar organizations may, for instance, constitute a helpful indicator of the degree of freedom and order existing in a society; and measures derived from the statistics of crime and punishment may cast some light on attitudes toward authority.

The most serious difficulties undoubtedly will be encountered in an attempt to quantify psychological variables that reflect deep-seated basic attitudes of the population, variables that go beyond the psychological attitudes reflected in econometric measures like the elasticities of demand for commodities and supply of factor services. These attempts, however, are of particular importance since it may be the variables of just this type that have a decisive influence on whether, when, and how economic growth starts; and on how rapidly, how regularly, how smoothly, and how long it continues. Here indirect measurement is still in its infancy. The prevalence of the spirit of enterprise, innovation, and competition, and the inclination to take risks are often regarded as among the most important factors in economic development; but no successful attempt seems to have been made to devise quantitative indicators for these attitudes. It may be that such indicators can be derived only from systematic sampling of the population and application to the sample of various psychological and personality tests.¹³ But the possibility cannot be ruled out that ways may be found to derive essentially the same information without the need of special, costly inquiries, by the ingenious use of existing or more easily procurable data.

¹³ Cf. the attempts described toward the end of Chapter 2.

10. ORGANIZATION OF RESEARCH IN COMPARATIVE ECONOMIC GROWTH AND STRUCTURE

The survey made in the preceding chapters of the work now being done on the comparative study of economic growth and structure and of the possibilities and demands of the field suggests that the primary needs are for: (1) more comprehensive coverage of countries and of phases of their development; (2) a more systematic approach with respect to both the conceptual framework and the statistical evidence; and (3) continuity of research. The question is how these objectives can best be obtained. Can they be attained by continuing to work as before, though on a somewhat larger scale; or is something more needed—new methods or new organization of research?

The first of these questions can be answered briefly. So many methods have actually been applied that most students agree there is need for sifting and pruning, and for concentration on those methods which after careful review will be found most productive of results and also reasonably economical in use of resources; rather than for the development and application of entirely new methods, whether worked out *ad hoc* or taken over from other disciplines. This is particularly true if interest is concentrated, as it is throughout this report, on the measurable and testable economic aspects of economic growth and structure. Experimentation with new methods should by no means be discouraged; but this does not seem to be the most urgent task for the next few years, when there is so much scope still for using established methods that have proven their worth in more limited application.

In the matter of organization of research on economic growth and structure, on the other hand, many students see an opportunity for some innovation in the period immediately ahead, partly just because the need is for consolidation and systematization rather than for a new start.

Occasional work in the field of comparative economic growth and structure is now going on in a large number of organizations here and abroad, in many universities, and on the part of many individual scholars. Examples of such activities have been given in Chapter 2. In some cases work on economic growth and structure represents a substantial part of the activities of these organizations, and centers on economic rather than

political or other aspects of economic growth. There is more than enough scope for this essentially individualistic work on single countries and selected periods. But there is also felt to be a need for a more systematic approach, and an organization for that purpose is as yet lacking.

A Center for Comparative Quantitative Study of Economic Growth

To fill this gap and to provide a focal point for research in this field, the organization of a center for comparative quantitative study of economic growth and structure has been suggested—most specifically in Professor Kuznets' paper (memorandum 8 in Part II). What follows embodies the discussions at the recent exploratory meetings, as well as our own initial thinking about the scope and method of operating such a Center.

The advocacy of this Center does not imply that work by individual scholars, academic research institutions, and government organizations now being done in this field of economic growth and structure should be curtailed, or even expanded more slowly. The Center visualized here would be a help in providing them, as well as more casual students of economic growth, with some of the statistical foundations for their research and in testing some of their ideas; it would not be their competitor nor try to act as their coordinator.

The two distinctive features of the proposed Center are the concentration on the quantitative measurable aspects of economic growth and structure; and the systematic and world-wide coverage of this circumscribed field. The Center would have about half a dozen main functions: the systematic collection of data on economic growth and structure; the scrutiny, appraisal, and supplementation of these materials; the development and construction of over-all measures of economic growth and of characteristics of economic structure; the systematic comparative analysis of the comprehensive data so developed; the testing of hypotheses about economic growth developed inside and outside the Center; the training of specialists in the study of economic growth and structure on an international scale; and the clearing of information about quantitative work on economic growth and structure throughout the world. Each of these possible fields of activity will be discussed briefly. (It is hardly necessary to add that the few ideas sketched here are preliminary suggestions, not worked out operational plans. It will be up to the staff of the Center, if it comes into being, to make these plans.)

1. Systematic collection of data on economic growth and structure will probably be the first statistical activity of the Center, and is likely to continue as an important operation as long as the Center exists. The collection, on as comprehensive a basis as possible, of long-time series of data relevant to the analysis of economic growth and of cross-section and other data pertinent to the study of economic structure are obviously prerequisites for a successful operation of the Center. The collection may

well start with a limited number of countries—probably those on which the research will be concentrated in the beginning—and will expand as resources become available and experience grows. In this branch of activity, world-wide coverage is the goal.

This aspect of the Center's activities is by no means a mechanical one, since for most countries the number of series available, at least in fields like foreign trade, public finance, and prices, is so large that selection is essential. Considerable experimentation and careful consideration of the needs of hypothesis-testing will be necessary before settling on a fairly standardized set of series and a form of presentation that can be applied to the material available for a number of countries. The construction, and possibly the publication, of an annotated, classified list of available long series for a large number of countries may be one of the valuable results of this preparatory work.

2. Equally important are the scrutiny and appraisal of the series that will be admitted to the Center's collection, and the supplementation (including unpublished material) necessary to close gaps and to obtain series that are reasonably consistent and comparable over time.

Before being accepted, each series would be examined for continuity and internal consistency; described with respect to source, method of collection, and availability; and assessed as to its reliability on the basis of both origin and of consistency with related series.

In principle, annual data will be the goal. In many cases, however, data will be available only for benchmark dates, but these will generally suffice if the dates are not too widely spaced and if enough of them refer to normal years (excluding deep depressions, wars, and similar extraordinary events) to permit the establishment of long-term trends.

This work may be limited initially to the countries selected for intensive study of comparative economic growth; it should probably be expanded later to include all countries for which a sufficient number of series is available. The result will be similar to a *Historical Statistics of the United States* for a number of key countries, although the number of series per country will be much smaller.

In general, the Center will have to base its work on generally available printed statistical material, issued by national governments or international organizations, or on statistical series prepared by research organizations or individual scholars. This primary reliance on existing data, however, does not preclude field trips by staff members to obtain a first-hand view of the methods of collection and processing of relevant statistical data in countries where particular problems seem to exist. Nor does it rule out the occasional building up of required statistics from primary data. Indeed, both of these types of contact with the statistical raw material and the economic realities underlying it are necessary, at least when

countries are being studied which differ greatly from those with which the staff has firsthand familiarity.¹

The contribution of the Center may be even more important in this field than in the systematic collection of already published basic data. Collections of time series are not rare and include a number on a fairly broad international scale. These publications, however, rarely appraise critically the data they make available. The reason is twofold. First, the international organizations issuing these publications lack time and personnel for this rather laborious task. Second—and in practice the decisive factor—it is not possible for an international organization to criticize figures submitted by its members. The organization may indirectly express its appraisal of the quality of some of the statistics by omitting them from its own publications or by disregarding them in its work, but that is about as far as international civil servants can go. The need for critical appraisal of the rapidly accumulating mass of statistics on economic growth and structure increases, however, as the number grows of organizations and individual scholars utilizing these statistics, either occasionally or as a main part of their activities, without being in a position themselves to make critical evaluations of them. It is therefore just in this field that the Center may be of greatest use to outside researchers who do not have the possibility of carefully examining each series they find in primary or secondary sources. For this reason, the Center's collection of annotated series should be made available to individual scholars and other research organizations as soon as possible. If the means can be found, this should be done in the form of a publication including the original data, a description of the sources, a discussion of the reliability of the data, and an indication of the adjustments necessary for their consistency and comparability.

3. With the development and construction of over-all measures of economic growth and of the characteristics of economic structure, fields are reached where not only are great practical difficulties encountered, as in the collection and scrutiny of long-term series, but where one has to deal also with important conceptual problems. If the Center's staff is not to be mired in the mass of available unorganized material, even after statistically sifting and purifying it, they will have to develop a set of integrated measures of economic growth and of characteristics of economic structure applicable to different types of economies.

Work in this field is of two types. First, there is again the task of collecting and evaluating the estimates of national income and similar aggregates which have appeared in considerable profusion over recent years. This is a task of substantial magnitude if done with the required care and

¹P. T. Bauer's emphasis on direct observation (*Economic Analysis and Policy in Underdeveloped Countries*, 1957) is relevant here. Acceptance of this point, however, does not mean sharing Bauer's apparent underestimation of the usability of the standard statistical data—naturally properly qualified and interpreted—as the main source of information on economic growth and structure even in underdeveloped countries.

if it includes a thorough evaluation of the reliability of the different estimates. In the present state of affairs, however, similar over-all measures of economic growth are missing for a number of countries which may become essential in the Center's general plan of studies, and particularly for periods—primarily in the eighteenth and nineteenth centuries—which may be of crucial importance for studying the early phases of economic growth in the now advanced countries. The examination of the existing data may indicate that some of those hitherto accepted also have to be reworked. When the need for such new estimates for specific countries and periods becomes evident—the second of the tasks under this heading—the Center's own staff may prepare the required figures, or the Center may find it more expedient to farm this task out to scholars working in the countries or specializing in the periods for which the estimates are needed.

4. The systematic comparative analysis of the entire complex of data that will have been accumulated by the operations described under (1) to (3) is likely to constitute the core of the Center's activities. It is here that the ingenuity of the staff, their grasp of all the relevant economic and noneconomic factors, and their ability to organize the immense mass of data under comprehensible headings and in a way to illuminate important aspects, will be put to the crucial test. There is no point in speculating how this task may best be accomplished. The development of a typology of countries and of phases of their development will probably form one of the aspects of such a systematic comparative analysis, but even this should not be regarded as a foregone conclusion.

5. The testing of hypotheses about economic development that originate either within the Center or have been proposed by other scholars will constitute another important activity. Here too the Center should be able to perform a service not otherwise easily available. The authors of hypotheses about economic growth generally have neither the facility nor the inclination to subject their own theories to an exhaustive confrontation with the facts. Such hypotheses are usually put forward by economists with a predominantly theoretical bent who are commonly not too interested in or qualified for the laborious figure work which is required to test theories. What is more important, hardly any individual scholar can have at his disposal the mass of figures necessary for such a test, or the time needed for it. The requirements for such a test are more stringent and time-consuming than is generally realized. It is not enough to find one or two countries for which the data seem to be in general agreement with the hypothesis—that is as far as the more realistically minded theorists sometimes are willing to go before they publish their hypotheses—but it is necessary to proceed until such a correspondence has been established for a large number of situations, or until one or more situations have been found where the data are clearly in contrast to the hypothesis. Indeed,

all that such statistical tests can do is to refute certain hypotheses, while they can hardly ever be sufficient to prove them conclusively; they may, however, endow some theories with such a degree of probability, on the basis of correspondence to the experience of a sufficiently large number of countries and situations, as to make them acceptable to most economists.

6. In the longer run, one of the most important contributions of the Center may well be the training of U.S. and foreign economists who will become specialists in the comparative study of economic growth and structure. The development of such a group is essential, first, for the Center itself because only if such a group exists—particularly at the levels of the younger professional ranks—will the Center have a chance of making substantial and sustained progress. It is to be expected and indeed desired that part of the personnel trained at the Center will leave it, and will continue their studies in the field of comparative economic growth and structure at other institutions of research or universities here and abroad. The ensuing diffusion of ideas and techniques, both on a national and international basis, is one of the most valuable contributions to economic research which the Center could make.

7. Finally, the Center may perform the useful function of acting as clearing house for quantitative work on comparative economic growth and structure, keeping in touch with organizations and individual scholars working in this field and possibly making the assembled information available through periodic progress reports. This activity should help prevent duplication of effort and should direct attention to countries and periods on which insufficient specialized research is being done.

This function suggests the establishment of fairly regular and close contact with institutions in the United States and abroad which work on economic growth and structure, particularly on a comparative basis, as either their main or secondary activity. Examples of such institutions, apart from the obvious cases of the United Nations and its regional commissions, the International Monetary Fund, and the International Bank, are: the Center for International Studies at the Massachusetts Institute of Technology; certain sections of the Food Research Institute and the Department of Economics of Stanford University; the Center for Economic Development and Cultural Change at the University of Chicago; the National Institute of Economic and Social Research in London; and the Institut für Weltwirtschaft in Kiel.

The scope of the Center envisaged here also determines to a considerable extent its size and its location.

As it is essential that the collection of basic data cover a wide range of countries and long periods of time, and that even the more detailed analysis extend to at least two dozen countries, a substantial staff of junior and intermediate grade will be needed. The number of senior staff members may be kept relatively small. Indeed, in that category, the limitation will not be the size of funds which can be secured for the Center, or the

number of scholars who could profitably be employed on studies within the Center's scope, but the availability of qualified economists and statisticians who are willing to devote a number of years to the task of directing and training junior and intermediate grade personnel, including foreign trainees and guests; or of concentrating their own analytic work in the field, making use of data accumulated by the Center. Wide familiarity with the statistics of countries of varying degrees of economic and statistical development, and the ability to handle these data constructively are the main prerequisites for the senior and intermediate staff. There also will be need for a few staff members whose main strength is in economic history proper, and in advanced statistical and economic methods. It will bear repetition that the creation of a staff of specialists, some for permanent employment and some for a period of a few years, including Americans as well as foreigners, is one of the main functions and contributions which such a Center can make.

The location of the Center is influenced by two considerations. On one hand, it is desirable for the Center to be close to the main storehouses of information on economic growth and structure on a world-wide scale which are provided by international organizations, the United States government and its agencies, and by large libraries. From this point of view, the New York and Washington areas are the obvious locations, and it is difficult to think of alternatives anywhere. On the other hand, proximity to an academic institution with a considerable body of good graduate students and junior faculty in economics and statistics is desirable, as these are likely to furnish many of the junior and intermediate staff. By this test, the New York and Washington areas are not the only or even the best locations, but they do not seem to be eliminated either, in comparison with other places whose main attraction is the presence of a large university.

One question remains, the advisability of organizing the Center as an independent entity or setting it up as part of or as an affiliate of an already existing research organization or academic institution. There are arguments for both forms of organization. Affiliation with an existing institution affords the advantages of some sharing of overhead costs (administration, personnel, library, secretarial staff), of reducing starting expenses, of minimizing delays in getting to work, and, more important, of offering a combination of research and teaching activities. On the other hand, operation as an independent entity permits selection of a governing board or trustees who are specifically interested in and familiar with the type of work the Center is to do, and who will be willing to give the Center's affairs more of their attention than similar bodies of a large university or a general economic research institution might. A relatively small independent institution also would have more flexibility and less of the bureaucracy of large organizations; this might offset some of the disadvantages of small size and the consequent necessity for senior staff members to do some of the administrative work. Most importantly, however, independent operation may permit the Center to secure as research direc-

tor or senior staff members scholars of leading rank who would be less inclined to join a larger and more diversified institution in less responsible capacities. More freedom in the level and gradation of salaries may also be an important advantage of independent operation. Operation as a semi-autonomous research organization affiliated with an academic institution may combine most of the advantages of both possibilities.

The Center is supposed to operate in the United States. But in outlook and scope it must be thoroughly world-wide if it is to be useful. This aspect should be stressed from the beginning, first, by having foreign economists, particularly from non-Western countries, on the permanent staff, both in senior and junior positions; secondly, by making systematic provision for foreign trainees and for temporary visitors of senior grade; and thirdly, by sending American staff members abroad not only for short visits, but also for one or two years' work in foreign institutions. These foreign tours of duty of Center staff members have a double purpose—developing specialists in the handling of statistical data available for key foreign countries and areas, and giving them that intimate firsthand feeling for the economic reality and its reflection in quantitative data in areas other than their home country, without which a comparative study of economic growth and structure is not likely to be really fruitful.

The organization of such a Center, though probably the most important single step to advance the systematic study of comparative economic growth and structure, is not the only means and possibly not one that can be realized most rapidly. At least two other possibilities were considered in connection with our explorations and discussed at the two meetings—the organization of regular conferences among specialists in the field of economic development, and the publication of a journal devoted to the problems of economic growth on a comparative international basis.

A Standing Conference on Comparative Economic Growth and Structure

A conference on the problems of economic growth on an international scale would have a precedent in the annual Conferences on Research in Income and Wealth, which have been held since 1936, and which have contributed greatly to the extensive and intensive development of research in this field in the United States and Canada, the area to which the Conference is limited. Not the least of the effects of the Conference has been the opportunity for personal contact afforded specialists in the field, and the chance of publication of valuable studies which otherwise would hardly have found an outlet because of length or specialized character. Similar effects can be claimed for the biennial meetings of the International Association for Research in Income and Wealth, which have been held since 1947. While all its meetings so far have been located in Europe and have been attended mostly by members from Europe and North

America, the Association has now been enabled by a grant from the Rockefeller Foundation to conduct three regional meetings in Latin America, Africa, and Asia during 1959 and 1960.

The following are proposed as the main functions of such a standing Conference:

1. Establishment of regular personal contacts among economists and statisticians working on economic growth in different countries. To judge from the experience of the International Association for Research in Income and Wealth, this may be expected to be one of the first, and by no means least important, effects of the Conference. While attendance will change from meeting to meeting, there is likely to develop a core of regular participants who will come to know each other well and who will give continuity to the conferences. It is through these personal contacts, more than through any other means, that students begin to understand and to develop an intimate appreciation of the possibilities and limitations of work for given areas and periods. This type of personal contact is particularly important for younger men and for people not in a position to do much foreign travel.

2. Coordination of research projects. This is an obvious necessity if duplication of effort is to be avoided; and there is no better way to do it than by person to person discussion of work under way and being planned. Only thus can it be determined whether seemingly overlapping projects would actually constitute duplication of effort or whether they are sufficiently different in approach, methods, and sources to promise mutual stimulation rather than waste of scarce resources.

3. Stimulation of research in less developed countries. One of the main effects of the meetings of the International Association for Research in Income and Wealth and of similar international conferences has been to acquaint economists and statisticians in the less developed areas with the work in the more advanced countries, and quite naturally to stimulate them to attempt to do similar work at home. A Conference on the study of economic growth would facilitate cooperative arrangements between individuals and research institutions in more and in less advanced countries.

4. Inauguration of research projects of international scope. It may be expected that each Conference will center on one or a few subjects, with the same problem being treated in a number of papers, each devoted to one country or area. If a problem is sufficiently important and the selection of contributors judicious, such Conference sessions may develop into full-fledged international cooperative research projects.

5. Filling gaps. The preparation of the programs for a Conference will usually show that certain problems which it is desired to include have never been adequately treated or have not been covered for some impor-

tant areas. The organizers of the Conference will then search for authors qualified by background to fill the gap and who may be induced actually to do some part of the job. An example is the work on national income in the United States during the nineteenth century that was started in connection with the 1957 meeting of the Conference on Research in Income and Wealth devoted to this subject, research that promises to continue well beyond the papers prepared for the meetings.

These are the functions that a Conference could fulfill. Whether it actually would do so will depend mainly on two conditions. The first is to find a strong board of organizers for the first meeting who are willing to devote considerable time to this task. As the Conference will represent a fresh start, it is particularly important to have a good secretary who can devote a substantial part of his time, at least during the first few years, to the task of getting the Conference under way.

The second condition is the availability of a sufficient number of papers of high quality that fit into a coherent program on problems of comparative economic growth and structure. This again will depend both on a sufficient volume of work being done on these problems, and on the willingness of people active in the field to direct their work into channels which can be used by the Conference.

Experience with similar organizations has indicated that between 50 and 100 participants are most conducive to a Conference which permits real personal contacts and general participation in discussions. Since members seldom can attend all meetings, it is advisable to plan on an ultimate membership of between 100 and 150. It may, however, be possible and even preferable to start with a smaller number although something like 50 is probably the minimum. Attention should be given to including both government and academic economists, particularly from less developed countries where it is sometimes difficult to find competent economists without governmental ties.

Once an organization of this type is in operation, there is no problem about selecting new members. It is more difficult to get started. One possibility is for a small group of outstanding experts in comparative economic growth and structure from various countries to draft the statutes of the new organization and to draw up a careful list of persons to be invited as original members. This list probably should include not more than 30 or 40 names. If enough of the designees accept, then a nominating committee from the original members could make up a list of 30 or 40 additional people to be asked to join, partly on the specific recommendation of original members. The supplementary list could then be submitted to the ballot of the original members. Thus a group of 60 to 80 members would be formed, sufficient for the first meeting. Although perhaps not all of these could attend the first Conference, invited nonmembers would easily bring up actual attendance to a workable minimum. Future expansion of the membership could then be left to the first Conference.

There was some discussion at the meetings on whether a standing

Conference should be limited to students of comparative economic growth and structure residing in the United States, or whether it should be organized on an international basis. The possibility was suggested of starting with a domestic organization and, if successful, expanding it to an international body. The example of the Conference on Research in Income and Wealth, limited to North American scholars, and the International Association for Research in Income and Wealth indicates that the coexistence of national and international Conferences in the field of economic growth should not be ruled out either.

The advantages of limiting the Conference to students residing in the United States include the greater ease of getting the organization started; the smaller expense; and the easier rapport among participants. These advantages, however, seem to be more than balanced by the fact that in this field, more than in most other branches of economics, the participation of scholars living in the different countries included in the comparative study is almost essential once the Conference leaves the field of discussion of primarily theoretical and methodological aspects—and that means almost immediately. American scholars have done remarkable work, sometimes of pioneering nature, on the economic growth of several foreign countries, particularly countries having few qualified native scholars. The continuation of intensive firsthand work on the development of foreign economies by American economists, statisticians, and historians is greatly to be desired, and is even indispensable if the study of comparative economic growth in this country is to develop as expected in this survey. Nevertheless, the bulk of the work on economic growth and structure in individual foreign countries, and particularly work of a detailed quantitative type, obviously will be done by foreign, and primarily native, scholars, except possibly in the most underdeveloped areas. It would therefore seem preferable to organize the Conference in a way that brings together scholars who are familiar from protracted, firsthand experience with the different aspects of the problems, irrespective of where they reside. Indeed, unless it were agreed that for virtually every area and period as competent experts could be found within the United States as in the entire world outside, an international basis for membership of the standing Conference would seem necessary if it is contemplated as a meeting ground for the leading scholars in the field. The discussion in the preceding pages has therefore assumed that a standing Conference on economic growth and structure would be international in membership.

A Journal of Economic Growth Studies

Opinion at the meetings was divided about the need for a new journal specializing in problems of economic growth and structure on a comparative basis. While some called for such a journal and saw considerable advantages in it, others felt that existing journals give enough room to articles on this subject and doubted that sufficient original material of

high quality is now being produced on comparative economic growth and structure to justify a special publication. It would therefore seem that the decision about the organization of a journal concentrating on problems of economic growth should be postponed, at least until it is clear to what extent *Economic Development and Cultural Change* may fulfill this function, and whether *Comparative Studies in Society and History*, a recently founded international quarterly, will concern itself with predominantly economic and quantitative problems of comparative growth and structure. If the Conference became a regular feature, particularly on an annual basis, and published volumes of its proceedings, there would be even less need for a separate journal.

There are, however, two features of a specialized journal which might be considered separately, and which might be added by one of the existing journals to their program: the publication of regular reports on work in progress or under consideration, and the publication of a current, specialized, annotated bibliography.

The advantages of progress reports, at quarterly or semiannual intervals, could be obtained by a rather simple, short publication of entirely informational character. The problem of sponsorship and of the not inconsiderable correspondence and editorial work involved remains. If the Center is set up, dissemination of such information might be one of its functions, as indicated earlier. Alternatively, this task might be taken over by the Conference.

Similarly, the compilation and publication, on a current basis, of a specialized annotated bibliography—somewhat in the style of the Bibliography on Income and Wealth, issued by the International Association for Research in Income and Wealth—could be undertaken by either the Center or the Conference. In this case the amount of work and expense involved in doing the job adequately should certainly not be minimized. One solution might be to find a competent person on a full-time basis who would combine the editorship of the Bibliography with the function of secretary of the Conference.