SOCIAL INDICATORS AND A FRAMEWORK FOR SOCIAL AND ECONOMIC ACCOUNTS

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The need for social indicators as a basis for government policy

In recent years governments have become increasingly concerned with improving the economic and social performance of society. Beyond providing for law and order and national defense, governments are recognizing that they must bear responsibility for a wide variety of social and economic conditions. They must concern themselves with the health of the population, the equality of educational opportunity, the eradication of poverty, and income security for the aged. They have become increasingly aware of environmental problems such as the need to control waste disposal and reduce the amount of air pollution. In brief there is much greater concern with a variety of dimensions of the quality of life.

The social indicator movement has been a response to these needs for information. Specific social indicators have been developed to monitor various aspects of society and to give some guidance to policy makers. The publication of Social Indicators by the Office of Management and Budget represents a first effort in this direction by the Federal government. It follows closely the sort of information contained in Social Trends, published by the Central Statistical Office of the United Kingdom. Provided systematically over time, social indicators can not only monitor social conditions, but can also be used to evaluate the effectiveness of government policy in specific areas. This characteristic is very important since, unlike the enterprise sector of the economy, the government cannot rely on profitability to judge the efficiency of its performance.

As the name implies, social indicators are generally oriented to non-monetary aspects of society, including demographic and regional information. Discrimination, for example, needs to be considered in terms of age, sex, race, and ethnic origin. Air and water pollution by their very nature must have a regional dimension. Much of the interest in social indicators focuses on differences in the quality of life in different localities or among different social and demographic groups.

There is, nevertheless, considerable dissatisfaction with social indicators as they are presently conceived, deriving from the fact that they are a miscellaneous collection of tables on social statistics, with no clear guidelines as to what precisely should be included or excluded. Ideally, the social statistics should be so designed that they would fit into a common framework, and could be aggregated for the nation as a whole, and different types of social statistics could be related to one another.

The national economic accounts and the measurement of economic performance

In contrast with the apparent chaos of the existing social indicators, monetary transactions data have been systematically developed within a national economic accounting framework, where they are used to monitor the behavior of the economic system and to evaluate the performance of different sectors of the economy. The public eagerly awaits the release of the quarterly estimates of the gross national product and the measures of the amounts by which output and prices in the economy have changed. Business behavior, consumer buying intentions, government monetary and fiscal policy, and forecasts about the future of the economy are all highly sensitive to this information.

But the national economic accounts do more than provide current summary measures. The detailed disaggregations by sector and by industry show how change is taking place. Sales of new automobiles, farm output, the housing industry, and government spending on defense or social programs all feed into the aggregate figures, making it possible to assess their relative importance. The impact of changes also appears in the wages and salaries of individuals, the profits of corporations, and the revenues received by state and local governments. Together, the interrelated set of data facilitates an understanding of how the economy functions, and an assessment of the importance of different parts of the economic system in relation to the whole.

The national economic accounts have achieved this integrated, comprehensive framework by restricting their focus to the network of monetary transactions and excluding, for the most part, social and demographic content. Some limited information in terms of the distribution of income by size and for specific regions is provided, but it is recognized that inclusion of such information in any detail would cause the system to become unmanageable. There does not appear to be any simple way to link the social indicator statistics to the national economic accounts at the aggregative level.

Despite their omission of the kind of information needed for social indicators, the national economic accounts do have the considerable advantage that they provide a systematic and integrated reporting system for the economy as a whole. Because of the national accounts, the economist can speak about "the economy" and its behavior, and the definition and measurement of the economy and its performance are quite widely accepted. In contrast, the social scientist who wishes to talk in terms of "the society", has no corresponding system of social statistics to define or measure the concept which he has in mind.

The relation of national economic accounts to social indicators

The national economic accounts have been an evolutionary development. Adam Smith conceived of the wealth of nations as the income which those nations could generate. Pareto's preoccupation with the size distribution of income was based upon his feeling that the size distribution of income was the most important descriptor of the structure of a society. Pigou, examining

the economics of welfare, came to the conclusion that the national dividend does in some utilitarian sense reflect the welfare of a nation. In the early work of the National Bureau of Economic Research on the national income of the United States, the major concern was to show how the national income changed over time, and how it was distributed among the people. In all of these endeavors, the focus of concern was on the measurement of how well off people were, in a nation as a whole and in relation to one another. The elaboration of the national economic accounts into a comprehensive economic accounting system developed much more recently, after the publication of Keynes' General Theory, and the wartime experience of the usefulness of a full-fledged economic accounting system for mobilization for war and for monetary and fiscal policy.

Although monetary transactions that include the receipt and spending of income by individuals are obviously highly related to welfare, focusing solely on monetary transactions does omit important aspects of welfare. It has long been recognized that the exclusion of non-market activities of households such as housewives' services, education, and leisure activity leads to an understatement of both total output and welfare. Similarly, failing to take into account the deterioration of the environment and other costs related to maintaining the existing way of life leads to overstatement of output and welfare. If we are to take the total seriously as a welfare measure, both additions to and subtractions from the existing constructs are needed. Such extensions are being worked on at the present time by economists both in and out of government.

This extension of coverage to include certain kinds of non-market activity will make the national economic accounts more valid for many purposes, but it is not as easy to handle at the aggregate level the kind of social and demographic information which can neither be assigned an imputed monetary value nor be aggregated for different social and demographic groups. As already suggested, the national economic accounting framework cannot easily accommodate highly disaggregated information relating to distributions by social group, by region, or by social and demographic characteristics. Nevertheless, it is extremely important to be able to relate social indicators and social statistics directly to the national economic accounts. If this is not done, there can be no correspondence between the social statistics and the economic transactions data, and the linkage between the economic and social information will be lost. It must be recognized that for public policy the heart of the problem is the interrelation between economic transactions and social measurements. If, for instance, a satisfactory health level is to be achieved for specific regions or social and demographic groups, there will be certain costs, and it is essential to relate the expenditures to the social conditions to which they are addressed. Improvement in the quality of education will also have costs, and models need to be developed to determine these costs. Poverty is by definition both a social and an economic reality. Thus, although economic transactions constitute merely a portion of the relevant information, they are a highly significant portion, and they are central to questions of policy relating to the quality of life.

The development of a framework for economic and social measurement

The current NSF/NBER pilot project on the measurement of economic and social performance and its proposed extension have been designed to develop a coherent, integrated conceptual and statistical framework for the measurement of social performance with both aggregative and distributional dimensions. It is based on the further development of the national economic accounting framework in the direction of including non-market activity, improving the measurement of intermediate goods and services, and evaluating the impact of environmental factors. Microdata sets for specific sectors--households, enterprises, and governments--will be developed to provide information on the social and demographic characteristics of the population, regional and locational information, and the interrelation among the revenues and expenditure programs of the different levels of government. Such microdata sets are designed to provide representative samples of individual observations containing both transactions and non-transactions information. The transactions information in the microdata sets would when aggregated yield the economic constructs of the national economic accounts. Thus for example the income of individual households in the household microdata set would add up to personal income, and the value added by individual enterprises in the enterprise microdata set would add up to gross national product. The revenue and expenditures of the various units of government in the government microdata set would add up to total government revenues and outlays. The national economic accounts thus would provide the integrating framework and the control totals. The individual observations would, however, carry with them such social, demographic, and locational information as was needed for the construction of social indicators and the measurement of social performance. Thus for example, in the household microdata set, information on work-leisure, education, health, age, sex, and race for each individual would be the building blocks from which social measurements could be made.

This strategy of utilizing the national economic accounts in an extended form as the framework for a system of economic and social data rests upon the belief that we should take advantage of the progress which has been made to date in national economic accounting, and that systematic extension of the accounts is fully consistent with the past evolution of national economic accounting. Since the days of Wesley Clair Mitchell, the National Bureau of Economic Research has made significant contributions to the development of national economic accounting, and it is logical that the NBER should continue its efforts in this field.

There is, however, a more compelling reason why the national economic accounts should be used in developing the framework for economic

and social measurement. As already indicated, although the transaction flows are not satisfactory by themselves as a measure of social welfare, the social and economic dimensions of our lives are so completely intertwined that a common framework is needed to embrace them both. Since considerable progress has been made in developing an integrated economic framework, it seems logical to extend what already exists in the direction of a more complete system of economic and social data.

Enlargement of the national income accounting framework

Three of the principal investigators associated with the project (John Kendrick, Robert Eisner, and Henry Peskin) will concentrate their efforts on enlarging the national income accounting framework to make it more comprehensive. While it is not thought possible to construct a unitary welfare measure, various welfare-oriented adjustments and additions can provide much additional quantitative information that will make the economic accounts more relevant and useful for appraising changes and differences in material welfare.

John Kendrick will focus primarily on imputing values of non-market activities by sector. He will build on his recent work on the formation and stocks of total capital to provide information on the flows of services from durable consumer goods not now included in national income. Additional imputations will be made for unpaid household and volunteer services, the opportunity costs of schoolwork by persons of working age, and of the frictionally unemployed, and the personal consumption of employees and the public financed by business through charges to current expense. In addition, there are other categories of non-market activities, such as time spent in commuting and in personal business which should and can be added to the body of the estimates.

Robert Eisner will be working along these same lines, but will in addition concern himself with problems relating to the valuation and revaluation of assets which give rise to capital gains and losses. The role of capital gains and losses in the generation and distribution of income and as a determinant of behavior has been neglected in conventional national income accounting. Special emphasis will be placed on estimating both depreciation and revaluations. The work done to date on revaluations of existing stocks has relied heavily on price indices relating to the cost of a current supply of similar assets. A major part of the further work, however, will entail the development of systematic and internally consistent revaluation and depreciation accounts for all capital assets. Eisner will endeavor to apply this approach to all forms of capital, tangible and intangible, in governments and households as well as enterprises.

Henry Peskin is involved in integrating into the conventional national income accounting structure measures of the flow of services from non-marketed environmental assets such as air and water. The principal problem is that the sources of data on such items as the watershed service of wooded land or ecological service of estuaries are widely scattered. Furthermore, rarely are such data so comprehensive as to provide a readily available national estimate suitable for national income accounting use. An attempt will be made to provide time series of such data using extrapolation methods already adopted by EPA for their long term projections. Additional sector detail will be provided, especially in those cases where the present 2-digit classification hides significant intra-sector distinctions in the use of environmental assets. The stock of environmental capital will be measured for the base year of 1968, and possibly estimates can be made of the levels of these stocks for one or two future periods as well. Regional breakdowns of environmental factors will be made, utilizing microdata sets for households, enterprises, and government. Finally, an effort will be made to improve the existing estimates of the social damages associated with air and water pollution. Using microdata sets to study the pollution impacts on individual households can be expected to improve the estimates.

The development of microdata sets for various sectors

The remaining members of the project are working on the development and use of microdata sets for specific sectors of the economy. Each of these microdata sets will be aligned with the macroeconomic accounts for the sector, and each will contain the relevant social, demographic, and regional information needed for social measurement.

The development of a microdata set for the household sector is the primary responsibility of Richard and Nancy Ruggles, assisted by Edward Wolff. The function of a microdata set for households is to provide a set of observations which contain social, demographic, and locational information in sample form, and at the same time are fully integrated with the national economic accounts in that the income and outlay transactions for the individual households, when aggregated, will yield the totals for households in the personal income account of the national economic accounts. Such a microdata set will achieve the desired linkage between micro and macro data, making possible distributions of the aggregates, e.g., size distributions of income for different social and demographic groups, or for different regions.

In developing an appropriate microdata set for the household sector, two problems arise. First, appropriate economic, social, and demographic data must be obtained, and it is unfortunately true that no single data source contains all of the needed kinds of information. Second, the microdata set needs to be aligned so that it actually does generate the control totals in the comprehensive national economic accounts. The pilot project has devoted considerable attention to these problems. Techniques for combining microdata from a number of different sources into a synthetically matched microdata set have been developed. At the present time work is under way on linking the 1970 Public Use Sample, the 1960 Public Use Sample, the Longitudinal Employer-Employee Data File (LEED) of the Social Security Administration, and the IRS Tax Model files to form a single synthetically matched microdata set.

The alignment problem arises due to biases

in reporting or sampling of the different microdata sets, and adjustment factors must be introduced to make the information in the microdata sets consistent with what is known about the totals for the economy as a whole. Thus for example, transfer payments received by individuals from the government are notoriously underreported in any survey relying on individual respondents. From government sources, however, the total number of people receiving transfer payments and the total amount paid out is known. Corrections can be introduced into a microdata file to compensate for some of this underreporting. To the extent that additional information is available from yet other sources on the characteristics of those receiving transfer payments, furthermore, such information can be utilized in the adjustment process.

Milton Moss is carrying out a closely related projection of the distribution of lifetime income for different groups of persons and households over the span of their adult lives, to show how these patterns have been changing for successive birth cohorts. This project involves putting together both macro and micro data to provide a better understanding of the changes taking place in the life patterns of the American population.

A closely related collaborative study is being carried out by Thomas Juster at the Institute of Social Research of the University of Michigan. This project is involved in collecting time use patterns of U.S. families for a set of analytically relevant functional categories. It is hoped that it will be possible to introduce such time use information into the microdata sets for households, to generate information on non-market activity required for the macro studies of Kendrick and Eisner, and to facilitate micro studies relating to the distribution of real income.

For the enterprise sector, Robert E. Lipsey and Michael Gort are developing micro data for individual corporations and establishments. In these data, individual plants and offices and their characteristics, such as location, size, industry, and type of employee, would be linked to the enterprises that control and finance them and often provide technology or markets for them. With such a dataset one could trace the distribution by locality, region, and type of employee of any event that has affected a corporation. One can study the aggregate impact on a locality of an economic change affecting companies by aggregating the effects on different establishments within the locality. For several studies already under way at the National Bureau, financial data have been assembled for approximately 2000 corporations, and for about 1000 of them data exist on the employment in each establishment classified by detailed industry. A large variety of microdata sets on firms and establishments are available from private sources, and exact matching of data by firm and establishment is possible for larger firms and establishments. For smaller firms, sample data based upon published statistics may have to be developed in order to complete the microdata set and align it with the macro control totals.

Finally, a microdata set is being planned for the government sector. In addition to the Federal government, there are, of course, 50 state governments and approximately 78,000 units of local government, including counties, municipalities, townships, school districts, and special districts. Much of the needed information for a microdata set of governments is already gathered and available at the micro level. For example, the census of governments collects data on government organizations, property values, effective property taxes, other sources of revenue, local finance, and public employment. In contrast to the problems of data collection in the household and enterprise sectors, a complete census exists and the information is in the public domain. Thus there are neither problems of sampling nor problems of the disclosure of privileged information. There are, however, serious problems of designing the structure of the data set so that it will be consistent for the analysis at the micro level (i.e., so that the interactions among firms, households, and the local public sector can be modeled), and so that the accounts can be aggregated to the national level.

Interrelation of the micro and macro information

In a fully articulated national economic accounting system, the flows among the different sectors are consistent. Thus for example, the sum of wages paid by enterprises and governments is equal to the wage income received by individuals. Similarly, taxes paid by individuals and enterprises precisely correspond to the tax revenue received by the government. It has already been noted that aggregation of the microdata set for each sector will yield the macroeconomic constructs for that sector. In the same way, the microdata sets will of necessity be linked with one another. At this more detailed level, alignment will have to be even more precise. Wages paid by a given industry in the enterprise microdata set will have to correspond to the wages received by individuals in the household sector employed in that industry. Similarly, in locational terms, wages paid in a given locality must correspond to the wages received in that locality. Although this task of aligning data and providing a consistent articulated set of information is quite difficult, the large variety of statistical sources available makes it feasible. In a great many instances, the problem resolves itself into one of developing appropriate computer algorithms for reconciling differences among different data sources.

Social indicators and the use of the integrated system of macroeconomic accounts and microdata sets

As was pointed out initially, the function of social indicators is to provide for the monitoring and evaluation of various dimensions of the quality of life and the functioning of society. By their very nature, social indicators embrace both economic and non-economic elements of individuals' wellbeing. It is apparent that the selection of social indicators will in major part depend on the particular observer's set of values. In absolute terms there is no "correct" set of indicators, and as society's view of its problems changes, the particular social indicators needed will also change.

In contrast, the integrated system of macroeconomic accounts and microdata sets does provide a fully integrated framework into which

many different kinds of information can be fitted and interrelated, and it can be used as the basis for the construction of a wide variety of meaningful and useful social indicators. An example may clarify more precisely how an integrated system of macroeconomic accounts and microdata sets can be used for such purposes.

There is considerable interest at the present time in the topic of air pollution, and measurements of how much air pollution is generated by society are needed. On the one hand, the production of goods and services causes air pollution. Industrial plants, the production of electricity, the transportation of goods over highways are all sources of air pollution. On the other hand, households also generate air pollution through the use of their automobiles, the heating of their homes, and even through the smoking of cigarettes.

Mere observation of the air pollution at various places and points in time would be difficult both to obtain and to interpret in terms of the contributions and interactions of various pollution sources relative to population density in different localities. By using the framework of integrated macro and micro data, however, it is possible to put the known pieces of information together into a comprehensive picture of air pollution conditions in different regions or localities.

In a paper recently presented to the Conference on Income and Wealth by Henry Peskin, Leonard Gianessi, and Edward Wolff, a microdata set for households was used to estimate for the year 1970 how much pollution each household was responsible for generating in terms of (a) that household's involvement in productive activity, and (b) its consumption of use of automobiles, heating, and other polluting activities. The 1970 Census Public Use Sample, which provides for a representative sample of households information on employment, ownership of automobiles, type of heating fuel and expenditure on heating fuel, and other information on personal habits relevant to pollution, was used to estimate the total amount of pollution each household was likely to generate. Computer programs were written to carry out this estimation process for each household in a given area, and to this information were added other factors known to affect air pollution within that area. Data on forest fires, climatic conditions, dust particles, etc., were added in at the regional level. Because the Public Use Sample of households is comprehensive, its use yielded estimates of air pollution for each county group and for each Standard Metropolitan Area in the country. Once the area air pollution due to both natural and human causes had been estimated, it was then possible to examine who was affected by air pollution to determine how many people were subject to the various levels of air pollution. In this connection, actual observations of air pollution can play an important role in determining the validity of the basic information relating to sources of air pollution. If actual observations of air pollution and estimates based on known sources generate different results, this strongly suggests that we lack a full understanding of the causal factors at work. Although it was not possible to validate the current study fully against measurements of air pollution, there did appear to be general agreement between the estimates and generally known air pollution conditions in specific areas.

Given such basic estimates of air pollution by type of pollutant, it is possible to make alternative evaluations of air pollution damage using different criteria. These in turn can be contrasted with estimates of the cost of reducing air pollution. In this manner the body of information which has been generated not only provides social indicators relating to the seriousness of air pollution in various localities, but it can link these indicators with an understanding of how such air pollution is generated and how it can be alleviated.

Social indicators for specific regions or localities are not the only possible use for the system of macro and micro data. Attention can also be focused on specific social and demographic groups. Thus for example social indicators can be developed relating to the status of the aged population. Information on household composition, length of life, condition of health, housing, and level of economic wellbeing can all be handled within the household microdata set. This does not mean that a microdata set will automatically have all of the information required to construct any desired social indicator. Rather it provides a basis for systematically recording information in its full detail and interrelating different bodies of information.

In more formal terms, microdata sets can be utilized for more analytic evaluations. Thus for example, a sample of tax returns integrated with a microdata set on households is being used at the Brookings Institution to analyze and evaluate the incidence of various taxes and to determine how changes in the tax system would affect the total amount of revenue generated and the tax burden of specific groups. Similar techniques could be used to determine how much different groups benefit from different government expenditure or transfer programs. Such analyses go far beyond what is normally considered to be the function of social indicators, but they are extremely important if we are actually to develop policies and programs which do improve the quality of life for specific groups.

A further potential use of the system of integrated macro and micro data is in the development of microanalytic models which introduce behavioral relationships into a dynamic analysis of change over time. At the Urban Institute a microanalytic model is being developed to study demographic change over time, including questions of intergenerational transfers that affect the economic and social condition of later generations. One of the advantages of such a microanalytic model is its ability to test the sensitivity of the outcome to various assumptions regarding behavioral relations or policy actions. Of particular importance for this use is the ability of the integrated macro and micro data system to portray the interaction of economic, social, and demographic factors.