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Social Accounting: The State of Play

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Abstract

This paper is a continuation of my Nobel Memorial Lecture, in which instead of looking back over the past I try to gauge the present position and discuss some of the important problems which are likely to occupy the attention of social accountants in the coming generation.

I. Introduction

The past generation has seen a burgeoning of the systematic quantitative description of social systems, particularly in their economic aspect, by means of social accounts. In my Nobel Memorial Lecture I gave a short account of these developments, tracing them back to their beginnings in earlier eras; Stone (1984). Here I shall take stock of the position that has now been reached, indicate areas that are attracting attention and try to look forward into possible developments in the coming generation.

In a single paper devoted to so large a subject I can do no more than outline what seem to me the more important topics and indicate how far they are still at an exploratory stage, the subject of academic debate, how far they are ready for incorporation in the national accounts of individual countries and how far they can be considered ripe for international harmonisation.

I shall begin with general problems of data collection and processing, then consider issues in specific economic fields and finally indicate how demographic and social variables can be brought into the economic picture.

II. Data Sources and Data Processing

Most countries produce large quantities of economic statistics and it is from these that the national accounts have to be constructed. We never

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start from a *tabula rasa* and the practical problem is not to devise an ideal data collection scheme *ab initio* but to introduce more design and coherence into the one that already exists.

This is not an easy matter. Thus information from tax sources is affected by the changing laws and conventions under which tax authorities operate, information from household budget surveys is affected by the fact that some questions are more sensitive than others, and information from business accounts is affected by the fact that here too conventions vary, accounting dates are not uniform and the published records usually deal with profits and their distribution and seldom show sales and costs. Frequently there is no register of reporting units which is used for all purposes: the classification of establishments used in reporting output in a census of production may differ from that used in an earnings enquiry, so that, industry by industry, output and earnings will not match.

Before the advent of computers the processing of statistical data largely took the form of preparing summary tables from the mass of individual reporting units. It was recognised that consistency checks were desirable, so that what was tabulated was an edited form of the raw data. But separate bodies of data were often treated independently and the individual returns were usually not preserved after the summary tables had been constructed. In recent decades more attention has been given to the use of common definitions and classifications in different bodies of data and to the preservation of at least representative samples of the returns relating to individual respondents. As Richard and Nancy Ruggles (1970, 1982) have frequently emphasised, the formation of these micro-data sets has many advantages. First, they provide a basis for relating the national accounts to the accounts of their constituent transactors; second, they simplify the problem of reconciling discordant classifications; and third, they enable accounting data to be related to other social and economic information. The ideal would be so to align the statistics that it would be possible to pass directly from the micro-data to the aggregations in the national accounts. Any supplementary information which might be needed could be introduced through the construction of bridge tables, as in USDC (1981), or through the development of intermediate accounts, as in Fr. INSEE (1976) and Vanoli (1985).

A somewhat different method of introducing additional information into the national accounts by means of "satellite" accounts has been developed in France. These accounts may be drawn up for economic

activities, such as transport or research, or for social concerns, such as education, health or alcoholism. They bring together a full range of data, monetary and non-monetary, relevant to the topic in question and relate them to the central system. They are not exclusive, for instance school health services appear in the satellite systems both for health and for education. Thus each topic can be treated fully without overloading the central system. Good descriptions will be found in Fr. INSEE (1976), Pommier (1981) and Lemaire (1985).

III. Adjusting and Completing the System of National Accounts

However much effort is put into improving the use of existing sources and developing new ones, it is fairly safe to say that a complete and consistent set of initial estimates cannot be obtained solely by direct measurement. This is reflected in the residual errors, unidentified items and balancing entries that appear in all national accounts.

To obtain a fully balanced set of accounts it is necessary to adjust the initial estimates in the light of what we know about their reliability. The method of least squares suggests that this should be done by minimising the sum of the squares of the adjustment to each entry weighted by the reciprocal of the entry's variance. These variances cannot be measured objectively but estimates can be based on the subjective impressions of the compilers of the accounts about the reliability of the material at their disposal. Only relative measures of the variances are required in the adjustment procedure, so it does not matter if the compilers are uniformly over-optimistic or uniformly over-pessimistic in the assessment of their results.

Although this method was proposed in Stone, Champernowne and Meade (1942) it did not catch on at the time and the earliest application I know of is in Byron (1978). In this paper the author reformulates the problem in terms of minimising a quadratic loss function by means of the conjugate gradient algorithm and in this way brings the adjustment of very large accounting systems within the range of feasibility. Other applications are given in Stone (1981*b*), van der Ploeg (1981) and Barker, van der Ploeg and Weale (1984).

In its simplest form, the method enables an accounting matrix to be adjusted subject to a set of linear constraints but it can be adapted to adjusting a series of matrices subject to systematic, proportional and autocorrelated errors. It can also handle cases in which the constraints

can only be applied sequentially following an iterative procedure, as shown in Stone (1975). The constraints can often be partitioned into two sets, one of which is used to adjust the initial estimates and the other to estimate items initially missing, as illustrated in a practical example in Stone (1981*b*).

The method depends on the introduction of additional information in the form of a variance matrix and so is not properly regarded as a mechanical method like the RAS procedure, which is based on the assumption that the adjustments can be made by means of row and column multipliers. It does not provide a causal analysis of the adjustments, but if we are to wait for this it may be wondered if we shall ever see fully balanced systems of national accounts. So far, the work in this field has been the result of private initiative though a few statistical offices have expressed a sympathetic interest in the problem.

IV. The Production Boundary

Although in the SNA the production boundary is drawn comparatively widely in that it includes all goods and services produced for the market, valued at market prices, and all goods and services produced by government departments, valued at cost, it does not include goods and services produced in households by household members and amateurs. This omission has come in for much criticism in recent years by those who point out that a great deal of production of goods and particularly of services takes place in households and that their exclusion distorts measured output as an indicator of material welfare. On the other hand, unpaid household activities are very numerous, largely unrecorded and merge imperceptibly into the process of living.

A survey of empirical estimates, made since the first world war, of the value of household services is given in Hawrylyshyn (1976). These estimates are based on valuing unpaid work by a variety of methods: the wage which the performer of the services could earn in the time taken; the cost of employing a housekeeper to perform all the unpaid services; and the cost of hiring specialists to perform the separate functions such as cleaning, cooking etc. What emerges is that on any of these bases unpaid household services amount to some 30 to 40 per cent of the GNP. Further discussion is provided in Gronau (1971), Hawrylyshyn (1977), Adler and Hawrylyshyn (1978), Murphy (1978), Adler (1982) and many others. It is necessary to define the services to be included, to consider various types of household and the contribu-

tion of different household members, and to treat consumer durables so that their services are an intermediate input into such activities as cooking and cleaning.

The problems of definition and of obtaining acceptable measures are difficult in this area and regular information is not usually available. I should not recommend that unpaid household services be included in the annual official accounts but I think the unofficial estimates made from time to time are useful as a reminder of the magnitude of activity that is excluded.

A fortiori my opinion is the same on proposals to include still more far-reaching imputations in the accounts, as suggested for example in Nordhaus and Tobin (1972), Eisner (1977) and Kendrick (1977). Though many of their proposals are sound, I cannot see school work, still less leisure, as an output. The former may show up in terms of output later on, and the latter as a decrease in input and therefore as a contribution to a rise in productivity.

If non-market services in households were included the national product might rise by about one-third, and if all "non-market services" were included it might rise by two-thirds. If annual series could be constructed it is not likely that they would move in the same way as the components included at present. We have some experience of building models with the present national accounts; it would be interesting to know whether they would be better or worse if the extended definitions were used.

V. Changes in the Classification of Output

A number of issues arise under this heading. For instance, producers may incur expenses which benefit consumers, be they specific employees, their labour force as a whole or the general public. These expenses appear among production costs either as supplements to wages and salaries or as intermediate product. A similar situation arises in general government, many of whose expenditures, for example on health and education, are for the benefit of specific individuals or groups of individuals. These expenses appear in government final expenditure. As a consequence the consumption of the population exceeds the value of goods and services bought out of personal income. In order to measure the total consumption of the population, all these expenditures must be brought together. If this is to be done within an accounting system it is desirable to distinguish between transfers in cash and transfers in kind

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and between transfers to individuals and transfers to groups. The problems of bringing together estimates of personal consumption, however financed, are discussed in Solari and du Pasquier, eds. (1976) and Petre (1981).

Another question is the line to be drawn between current and capital expenditure. Until fairly recently capital expenditure on fixed assets was usually confined to business investment in buildings, works and equipment, including housing. But government expenditure on hospitals, roads and schools and personal expenditure on consumers' durables such as cars and cookers were excluded. Now it is generally accepted that government expenditure on non-military fixed assets and equipment should be treated as capital expenditure, even if these assets are not expected to yield a financial return, and there is a strong move to accord a similar treatment at least to the major items of personal expenditure on durable goods. To do this it is necessary to have information on depreciation which will serve as a measure of the consumption of the services of these goods. The valuation of these services is discussed at length in Katz (1983).

Although this is not a well-documented field, regular estimates are now available for a number of countries and in view of the importance of the subject it may be expected that these will improve with the passage of time.

VI. Regrettable Necessities and Pollution

As I have implied above, it is still usual to classify investment in military equipment as current expenditure because of the difficulties of estimating depreciation and obsolescence as a result of uncertainty and technical change. Some people would like to go further and leave military expenditures altogether out of the picture, on the ground that they are regrettable necessities which not only are not wanted for their own sake but do not even guarantee a state of peace.

If we are trying to account for the world as it is we cannot simply leave military expenditures out. We can always form an output total from which their value is subtracted, and the same goes for other regrettable necessities, but by proceeding in this way we may end up emptying the concept of output of much of its content. Doubtless if things were different, people would be glad not to have to incur expenses for medical care, heating, commuting and so on. But things being as they are, people are glad to avail themselves of these goods and services.

Pollution presents a more real problem to the national accountant. While the accounts deal in full with the positive goods and services emerging from industrial and government production, they deal only partially with the negative by-products of these and other human activities, which infest our air, land and water to an unprecedented degree. These negative by-products are reflected in the national accounts only in so far as they are treated, and the cost of treatment may appear either as intermediate or as final product depending on the nature of the treatment and on who carries it out.

A method of introducing pollutants and the corresponding treatment services into the national accounts was proposed in Leontief (1970). It consists of extending the input-output table by introducing a number of additional columns containing the cost structures of the treatment services and an equal number of rows containing the emissions of pollutants which could be handled by the corresponding service. Emissions appear among the cost elements of the various industries and provide a measure of the output of the service needed to remove them, an arrangement that can be applied to final users as well as to productive activities.

This last solution leaves several questions for further discussion. In the first place we might want to consider the question of how much of each pollutant would have to be removed in order to strike a balance between the gains from reducing pollution and the loss of regular goods and services which the cost of this treatment would entail; and in the second place we should recognise that the community is more interested in the state of the air, land and water after treatment than in the amount of treatment carried out. These questions are discussed in Stone (1972) and Meade (1972).

In the third place there are so many methods and institutional arrangements for dealing with pollutants that the conceptual and practical problems of fitting them into the national accounts are very numerous. Cremeans (1977) describes the US Environmental Studies Project, provides a number of definitions, distinguishes between direct and indirect costs and benefits and sets out a table of national expenditures in the United States for pollution abatement and control in 1972 and 1973 which is the beginning of an annual series on the subject.

VII. The Disaggregation of the Household Sector

In the SNA the production accounts are divided by product but the income and outlay accounts are only divided by the main sectors,

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companies, households, government and so on, with no subdivision of the household sector. This was recognised as a deficiency at the time and something was done to repair it in UNSO (1977*b*) which provides provisional guidelines on statistics of the distribution of income, consumption and accumulation of households.

Although studies of the distribution of personal income by size have long been made, the lack of a classification of households means that the SNA as it stands cannot be used to study distribution in detail in the way that it can be used to study production. This is a serious shortcoming and substantial efforts to repair this gap have been made in recent years, particularly by Graham Pyatt and his colleagues at the ILO and the World Bank.

These studies make use of a social accounting matrix (SAM) which is an extension of the SNA and contains a classification of households. Factor incomes are paid to the different sectors, including the different types of household. This primary income is altered by transfers between sectors, and this disposable income is then either spent on commodities or saved. This current expenditure forms part of the revenue of producers, who close the circle by paying out income to the factors of production.

A general discussion of the construction of SAMs and of their uses in economic planning is given in Pyatt and Round, eds. (1985), and specific applications to the economies of four developing countries, Iran, Sri Lanka, Swaziland and Malaysia, are described in Pyatt, Roe *et al.* (1977) and Pyatt and Round (1977, 1984). In these studies the authors were free, within the limits of the available data and processing capacity, to choose the classifications best suited to the policy needs they were trying to serve. In Iran only three types of household are distinguished, rural, relatively rich urban, and other urban. In Malaysia a more elaborate classification was possible: the first distinction is between urban and rural; within each of these categories four ethnic groups are distinguished, and each of these is divided into four categories of employment status, giving 32 types of household.

These studies bring out the value of household surveys in constructing national accounts, particularly in developing countries. The movement to set up such surveys has been assisted by the establishment of the National Household Survey Capability Programme described in Goldberg (1982). The programme was launched in 1979 and is coordinated and managed through a unit in the UN Statistical Office. Emphasis is laid on the need to meet the evolving needs of users in each

country and the desirability of continuity in survey arrangements is stressed. Another international initiative, the Living Standards Measurement Study, is designed to consider the problems of collecting data on living standards for policy purposes. This study is undertaken at the Development Research Center of the World Bank and a series of LSMS Working Papers is issued by the World Bank (1980–). A considerable amount of information on experience with household surveys in developing countries is provided in this series.

VIII. Capital Accounts and Balance Sheets

I have already mentioned in Section IV above the move to reclassify consumer and government expenditure on durable goods to capital rather than current expenditure. The desirability of this move is enhanced by the introduction of balance sheets into national accounting systems.

In UNSO (1968), national and sector balance sheets were included for the first time in the SNA, but no specific definitions and classifications were provided, nor were the links between balance sheets and flow accounts spelt out. Guidelines on these matters were given in UNSO (1977*a*), and further suggestions on the recording of tangible assets, applicable to the MPS as well as to the SNA, were made in UNSO (1979*a*). This was a step forward, since while in the past the national capital had been studied almost as much as the national income, the 30 years since the beginning of the second world war saw a concentration on flows to the almost total exclusion of stocks. Raymond Goldsmith, who has done more than any other writer in the last half century for the study of national wealth and its components not only in the United States but all over the world, provides an excellent survey of the present position and of the historical developments that led up to it in Goldsmith (1985).

There is another aspect to capital investment. The term is usually confined to tangible and financial assets, but it has always been recognised that it is possible to invest in human capital, in the sense of spending to enhance an individual's skills, productivity and earning capacity. This idea has been emphasised in the past generation particularly in connection with educational expenditure, for example in Becker (1964), but it is not generally thought that human capital should be included in national balance sheets, largely because of the difficulty of measuring it and the wide range of values yielded by alternative plaus-

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ible methods; Goldsmith (1985, pp. 83–5). Estimates can be made either by capitalising expected net earnings or by reference to the costs of rearing, educating, training and maintaining the health of individuals. Either method gives rise to innumerable variants and the first tends to give higher figures than the second. Earnings depend on many things besides education and training, and education is not undertaken simply for the purpose of improving earning prospects. On the other hand the adjustment of labour inputs for level of education helps to reduce the difference between the growth of output and the growth of factor inputs, a difference which Denison (1962, 1985) terms the “residual” and which is also used in Jorgenson and Griliches (1967) in a similar way.

Many of the problems of making these calculations are set out in Blaug (1970). At present they are a suitable subject for research but the stage has not yet been reached when human capital can be represented in the national accounts, still less standardised for different countries.

IX. Comparisons of Product Flows over Space and Time

By means of index-numbers, product flows can be expressed at constant prices. Time series of production, consumption, investment and foreign trade in terms of the prices of a particular year, which make it possible to distinguish between price changes and quantity changes within a country over a period of years, have a fairly long history and are now made in most countries. But comparisons between countries are a more recent though equally important development. Two main obstacles have to be surmounted in order to make such comparisons. One is the existence of two substantially different standard systems of national accounts, the SNA and the MPS. The other is the difficulty of devising a common unit of account.

As is well known, the SNA includes in production all the services produced by business and government whereas in the centrally planned economies the concept of production is almost entirely restricted to material production, an approach which is reflected in the MPS. In the *Yearbook of National Accounts Statistics* (UNSO, 1957–) the accounts for each country are set out following either the SNA or the MPS conventions, depending on which system the country in question has adopted, but the differences between the two systems are such that comparisons cannot be made with the data as they are. With some

elaboration, however, the two systems can be related, as shown in a two-part report published as UNSO (1977*c*, 1981): the first part explains in detail how it is possible to pass from one system to the other by adding and subtracting components, and the second gives numerical examples of SNA aggregates recast in MPS form and *vice versa*.

The continuation of this work should enable economic structure and change to be compared across countries using either system, but in order to compare levels it is necessary to devise a unit of account applicable to all countries. This is not easy. Exchange rates are misleading because they do not always reflect purchasing power. Better results are obtained by using index-number methods analogous to those used in constructing time series at constant prices. Stone (1981*a*) contains a short survey of international comparisons based on a common unit of account, beginning with the work of Colin Clark (1940) and ending with the International Comparison Project (ICP) carried out for the UN Statistical Office and the World Bank under the direction of Irving Kravis and reported in Kravis *et al.* (1975, 1978, 1982).

In this impressive study, detailed information on prices and expenditures is combined to yield binary comparisons between pairs of countries and also to form a set of 'international prices' in terms of which all countries can be compared. Despite the very large number of data involved, Kravis and his colleagues, in phase III of the ICP, have succeeded in making a full analysis for 34 countries, of which 30 are market economies and four are centrally planned ones. In each country the GDP is divided into 151 components, and estimates of quantities per head at 1975 international prices are given in Appendix Table 6.5. In Table 6.5 itself these data are presented in grouped form, the primary classification distinguishing between private consumption (defined to include government expenditure for housing, health, education, recreation and welfare), government consumption, domestic fixed investment, change in stocks of goods, and net exports.

For the remaining countries of the world it has not so far been possible to make such detailed calculations, but in Summers and Heston (1984) estimates are given of the GDP of 124 countries, with a subdivision into the main categories of final expenditure for the 115 market economies included in the comparison. These estimates provide a measure of the growth of world production since 1950 and show that the use of exchange rates in converting local currencies would tend to underestimate the product of poor countries relative to that of rich ones.

Further discussion of the subject will be found in Kravis, Heston and Summers (1978), Summers, Kravis and Heston (1980) and in a number of papers by other authors in the June 1984 issue of the *Review of Income and Wealth*.

X. The Present Revision of the SNA

Since 1975 discussions have taken place about the further revision of the revised SNA of 1968. The UN Statistical Office has convened numerous meetings, including expert group meetings in 1980 and 1982. At the first of these it was concluded that modifications of the system should be minor but the importance of clarifying the system and aligning it more closely with other international standards was emphasised. The second meeting had before it an inventory of major issues, given in Ruggles (1982), and agreed with the conclusion of the earlier committee but was more specific in its recommendations. After this meeting an Intersecretariat Working Group on National Accounts was established on which the UN, the OECD, the EEC, the IMF and the IBRD are represented. In the summer of 1985 the programme of revisions was discussed at a general conference of the International Association for Research in Income and Wealth. The meeting was opened with a paper by the director of UNSO, Kurabayashi (1985), giving details of the work programme on the revisions. Despite the decision not to introduce major changes the programme covers a good deal of ground.

In my opinion the decision that has been taken is a wise one. The main need at present is to simplify the work of national statistical offices rather than to force them into innovations that would be difficult to implement. Tidying up existing concepts and definitions and harmonising them as far as possible with those used by other organisations will help in the process of simplification.

XI. Introducing Social and Demographic Variables

So far I have been concerned with economic flows and stocks but for many purposes we need to link these up with social and demographic variables. The behaviour of economic man is affected by all sorts of non-economic factors, such as family background, social status, health, education and cultural traditions. As we saw in Sections II and VII above, it may be possible to introduce some of these characteristics as

criteria of classification in the economic accounts; but there is a limit to what can be done in this way and it is useful therefore to have an independent set of socio-demographic accounts in which we can trace the changing states of individuals and which can be linked to the economic accounts as and when appropriate.

In setting up these accounts the first thing to do is classify the population by states. The simplest example of a state is the combination of sex and age. To these basic distinctions there can then be added whatever characteristics are relevant to the aspect of society we want to represent. Thus if we are interested in the occupational distribution of the population we must add a classification by activity: going to school, attending university, being employed, being a housewife and so on. A typical state in this sequence is being a boy aged 17 attending secondary school. If we are interested in the health distribution we must add a medical classification: nature of disease, type of treatment, place of treatment and so on. Of course in the active sequence there will be a large proportion of the population which is neither educationally nor economically active, the most obvious examples being babies, tramps and old people, and for them we must have a category labelled "inactive". Similarly, in the medical classification there must be a category labelled "healthy".

If we record the distribution of the population over states at the beginning and end of a period, say a year, we shall find that the numbers in each state at the end of the year differ from the numbers in the same state at the beginning of the year. Some individuals will have died, some emigrated, some moved to other states, and all will have grown a year older. At the same time the state will have received a number of new entrants, whether from births, from immigrations or from other states. Thus our schoolboy of 17 will have become 18 and may have moved on to higher education or entered the labour force.

This kind of information can be brought together in an accounting system, with individuals as the unit of account, which connects the opening and closing stocks of population by means of the human flows that take place during the year. These accounts can take the form of a matrix of inter-state flows very similar to the inter-industry matrix in economics except that the role of rows and columns is inverted: the inputs are in the rows and the outputs in the columns. The matrix contains all the people who have survived in our country from one year to the next and is supplemented by two rows and two columns for the "outside world": the rows contain deaths and emigrations, the columns

contain births and immigrations. The column sums of the matrix give the opening stock distributed over the various states and the row sums give the closing stock similarly distributed.

From this flow matrix we can derive a set of coefficients which show in what proportions the number in each state have redistributed themselves over all states in the course of the year. Many interesting calculations can be made with these transition proportions. For instance, in Stone (1971*a*) I used an early version of this scheme to analyse the movements of boys and girls through the school system of England and Wales in the mid-1960s, and in Stone (1971*b*) I applied the scheme to the whole male population, from the new-born through those engaged in learning and earning activities to the old and retired. By treating migrants as net immigrants, adjusting the numbers to what would have been observed had the population been stationary and had all deaths occurred in the middle of the year, and making the Markov assumption, we can obtain a coefficient matrix the Leontief inverse of which can be regarded as the fundamental matrix of an absorbing Markov chain.

In this matrix each column relates to a state: the column sum shows the life expectancy of an individual from the moment he enters that state, and the elements in the column divide this life expectancy into the mean times spent thereafter in different states, as illustrated in Stone (1980, Table 7.3). In Stone (1971*c*) I applied this formula to data on the movements of patients within a psychiatric service system, and in Stone (1972*b*) I applied it to the analysis of an imaginary disease so as to trace the consequences of alternative treatments. In Shishido and others (1976) it is combined with regression analysis to study the changes in internal migration in Japan.

Similar methods have been employed to model social phenomena by many other authors. It is impossible here to give a full bibliography of the subject but I may mention Prais (1955), Kemeny and Snell (1962), Bartholomew (1967), Thonstad (1969), Freytag and Weizsäcker, eds. (1969), White (1970), Rees and Wilson (1977). Although many of these studies were made outside the context of demographic accounting they can all be viewed as valuable contributions to its methodology.

By an appropriate choice of classifications the demographic accounts can be linked with the economic accounts. This is useful both for descriptive and for analytical purposes. For instance, the life table information contained in the fundamental matrix can be combined with data on the cost of spending time in the various states. An example is

given in Meredith (1973). This study shows the potential saving to a hospital system of a screening programme that would permit geriatric patients in a mental hospital to spend as much time as possible outside the hospital in boarding homes. It turns out that the saving would be considerable even if future costs were discounted at a rate of 10 per cent a year.

This method would in principle enable us to calculate the net gain from any sequence of learning and earning activities. But there are many difficulties: populations are not homogeneous, different groups have different life expectancies and these are divided differently between different activities; transition proportions change and those relevant to the future have to be guessed; it is not obvious what should be included in costs nor which gains are properly attributable to these costs; and, like the transition proportions, the prices of inputs and outputs are likely to change in the future.

Demographic accounts can also be linked with data on the use of time. Information on the use of time, as given for instance in Szalai *et al.* (1972), when related to the composition of the population is particularly relevant to attempts to include household activities in the production boundary, which were discussed in Section IV above.

Although the literature on socio-demographic accounting is not extensive, enough has been published to give a fairly comprehensive view of the subject. A full description of the system I have just outlined is given in part one of UNSO (1975, especially chs. III and VII); the second part of this report discusses sequences and subsystems and the third gives a number of examples and applications. At the end of the 1970s three studies dealing with the improvement of social statistics and their integration with demographic and economic statistics were issued by UNSO (1979*b*, 1979*c*, 1979*d*). In 1980 a workshop on social accounting systems was held in Washington and the proceedings were published in Juster and Land, eds. (1981); this volume gives a good idea of the direction of work in America.

XII. Conclusions

National economic accounting has now become an established practice all over the world. In its progress through time it has increased enormously both in breadth and in depth, and the search for further improvements is still going on. Not surprisingly, there is not complete unanimity on the exact form the national accounts should have as a tool for description and analysis. The conventions adopted differ in dif-

ferent parts of the world, and even where agreement exists on the basic concepts and classifications new suggestions are constantly being made for refining and extending their coverage. In these circumstances it is important to keep one's head and try to put these suggestions in some sort of perspective. Also, it must not be forgotten that many of them imply a vast effort of data collection and processing on the part of official statisticians, and there are limits to what the already overstretched personnel of statistical offices can do. Gradually these obstacles may be overcome but in the meantime it seems to me that the principal need is to consolidate the position reached. The present work of international organisations to this end, referred to in Sections IX and X above, is very much a step in the right direction.

Socio-demographic accounting is much less advanced. Demographic statistics are plentiful in many countries and social statistics are also fairly well developed, but in no country that I know of are such data organised in a framework connecting stocks and flows. The only demographic accounts we possess are one-off studies undertaken by academic enquirers. On the methodological side, however, work is progressing fast and has already reached sizeable results. The international organisations, notably the OECD and the Statistical Office of the UN, have given their backing to the idea and this may encourage some countries to take it up. There will then be the inevitable bottleneck presented by the difficulties of data collecting and data processing. But if that is surmounted the demographic accounts can move from the drawing board to the building site.

Environmental accounting is still in its infancy. Although in my Nobel lecture I called it the third pillar on which the study of society must rest, I have not mentioned it in this survey because from an accounting point of view there is, with one exception, nothing to mention. The exception is pollution, which in Section VI above I presented as a candidate for inclusion in the national accounts. But there are many more problems connected with the natural and man-made environment and it is not clear that all of them have economic implications. In any case environmental variables are too numerous and too heterogeneous to be accommodated in the economic accounts. Much has been written on these subjects but there is not yet an agreed framework for the organisation of environmental statistics. A beginning has been made, however, in UNSO (1984).

All in all, there seems likely to be plenty of work for social accountants, both official and academic, for many years to come.

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