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REVISION OF THE SYSTEM OF NATIONAL ACCOUNTS: THE CASE FOR FLEXIBILITY*)

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Abstract

This paper examines the purposes of the SNA and concludes that they frequently conflict with one another. Consequently, the structure of the SNA should be made more flexible. This can be achieved by means of a system of a core with building blocks. This core is a full-fledged, detailed system of national accounts with a greater institutional content than present SNA and a more elaborate description of the economy at the meso-level. The building blocks are more analytic and reflect special purposes and specific theoretical views. It is argued that future revisions will concentrate on the building blocks and that the core is more durable than systems like present SNA.

1. Introduction

National accounting has a venerable tradition, as old as economic science itself, dating back to the seventeenth century work of Petty (1665) and King (1696). Until the twentieth century, however, it remained just a fringe activity of a few private scholars. Only with the advent of empirical economics did it move to the centrestage and became a concern of public authorities. This, in turn, has led to the formulation of international guidelines. The most important of these, the United Nations System of National Accounts (SNA for short), was first published in 1953. This event marks the coming-off-age of the field, but this does not mean that national accounting has remained static since. On the contrary, it is constantly changing and expanding in order to stay in tune with changes in the economy, economic theory and the demands of users. This process has already caused a major revision of the SNA in 1968 and a second one is now underway. Frequently, it is argued that this revision should be limited in scope; its main purpose, in this view, being clarification and harmonization with related systems. The present paper argues against this view. Even significant clarification and harmonization with existing and future related systems calls for a reconsideration of the structure of the SNA. But apart from this, the changing and growing demands on national accounts necessitate a reconstruction of the SNA. To substantiate this view we first, in section 2, reexamine the essential purposes of national accounting and the SNA. The section concludes that the purposes of the SNA may frequently be in conflict with one another. This is borne out by an examination, carried out in section 3, of proposals for changes in the SNA that have been put forward in the course of the revision process. Many of these proposals mould the system to tally with one of its purposes to the detriment of another one. Section 4 evaluates the solutions developed in the past to deal with the problem of conflicting demands and purposes. We conclude that an alternative structure of the system is necessary in order to achieve greater flexibility. This structure is that of a general purpose core with special purpose building blocks. The principles for the development of the core, its structure and a number of its details are described in section 5. Section 6 sketches examples of building blocks. Finally, section 7 summarizes our approach.

Many of the ideas in this paper are not elaborated into detail, but the presentation sometimes is fairly straightforward in order to avoid ambiguity. If the ideas are accepted in practice much will have to be elaborated further.

2. Purposes of national accounts and the SNA

Section 2.1 discusses the purposes of national accounts as such. As distinct from these, the SNA also has a number of specific purposes that stem from its being an international guideline; these are surveyed in section 2.2.

2.1. Purposes of national accounts

National accounts are used for many purposes. An inquiry as to these purposes among national statistical offices would probably yield as many different replies as there are national offices. Yet some common ground exists, as a few quotations from the SNA and the European system ESA demonstrate: 'Its usefulness lies in the fact that it gives a systematic representation of the major economic flows in the framework of a comprehensive accounting system and that it facilitates the understanding of the statistical relationships among these flows' (1960 SNA, p.i). 'The new SNA provides a comprehensive and detailed framework for the systematic and integrated recording of the flows and stocks of an economy' (1968 SNA, p.iii). '[...] a coherent and detailed set of accounts and tables which are intended to provide a systematic, [internationally] comparable and, as far as possible, complete picture of the economic activity [...]' (ESA, p.9).

Thus a few catchwords summarize the consensus: 'systematic', 'comprehensive', 'complete', 'economic', 'statistical relationships'. However, a detailed specification of these concepts is necessary if they are to be operational: 'In practice (economic) activity consists of an enormous number of flows of many kinds taking place between a great number of units within the country's own economy or in the rest of the world. The essential function of any system of national accounts is to classify this immense variety of units and economic flows into a limited number of fundamental categories' (ESA, p.9). How to achieve this, and which units and flows should be classified depends again on the purposes for which the accounts are to be used: '[...] meaningful and suitable for economic analysis, forecasting and policy' (ESA, p.9). These three purposes alone may call for widely different approaches to national account-

ting. But in addition, neither economic analysis, nor forecasting, nor policy needs are homogeneous. There are many different schools in economic theory, many different forecasting techniques and a host of policy issues, each with their own data requirements. Moreover, these constantly change and vary from country to country. This multifariousness of purposes and within purposes puts stress on the systems of national accounts in three essential ways.

First, it renders the boundaries of the systems open to debate: which transactors and transactions should be covered by the accounts? Consider one of the major examples of boundaries: the production boundary. A monetarist would prefer a national product concept to be confined to production traded for money in the market. Development economists take a wider view, whereas representatives of the new home economics and related schools need a still more comprehensive coverage.

Second, the levels of aggregation upon which the systems focus depend on prevailing views of economic theory and aims of public policy. The roots of the system are macro-economic: the seventeenth century originators of national accounting primarily aimed to measure national income, and this macro-economic focus was reinforced by the Keynesian influence of the 1930's. Next, however, the need for more detailed planning of production caused the input-output tables to be added to the system. Meanwhile, the ever greater involvement of public policy with detailed aspects of the economy increased the demand for detailed data; the resurgence of neoclassical and other types of micro-economic and meso-economic general equilibrium analysis reinforced this demand for detail. Of course, to some extent this demand can be met by straightforward disaggregation. This might be dubbed the top-down method. However, frequently the emphasis of the analysis is on the interrelations below the macro-level or on partial study of micro- and intermediate variables; aggregating the variables involved to macro-levels, the bottom-up method, may well yield other aggregates than the traditional ones. Anyone who has ever inspected a Social Accounting Matrix for a developing country or the data base for a general equilibrium tax model of a developed country will realize that there is a tension between them and the straightforward disaggregation of, e.g., the SNA's accounts of the nation.

The third and most important consequence of the multiplicity of purposes and views underlying systems of national accounts is that the structure of the systems is controvertible. Essentially, this structure consists of rules for grouping and classifying transactors and transactions. Classification then amounts to minimizing within group and maximizing between group differences with respect to the relevant characteristics. Consequently, the central issue is the choice of the relevant characteristics. There are two basic approaches to this: the institutional and the functional one. Though the differences between these approaches have not been spelled out too explicitly by the literature, the distinction is a useful one.

We employ the term 'institutional' when we want to stress formal and organizational features of transactors and, to a lesser extent, transactions. Thus an institutional definition of transactors emphasizes the units that make decisions, an institutional definition of transactions the formal appearance of these transactions. As a consequence institutional definitions and classifications remain close to the actual experience of the economic agents.

The functional approach, in contrast, is analytic: it starts out with an analysis of the function of transactions. It looks behind the formal appearance of the latter to determine their 'true' nature. In fact, it frequently concentrates on 'processes', 'products' and similar categories rather than on transactions. Consequently, transactions that are quite different in formal appearance may be lumped together and vice versa. Transactors are, in the functional approach, defined (if at all) in an indirect way, viz. as the performers of functions. They do not have to correspond to directly observable persons or institutions. Clearly, functional definitions and classifications reflect the views and judgements of the designer of the statistical system rather than those of the economic agents.

The 1968 SNA is an institutional system containing a number of functional elements: transactions that are quite different from an institutional point of view are lumped together for functional reasons. Usually, this is achieved by registering them as though they were similar. Thus their grouping and

classifying can only be achieved by adopting one institutional model as the standard model, moulding all transactions with the same function into the shape of the selected standard model. The SNA accomplishes this by means of 'imputations' and 'attributions'.

An example will clarify the above. There are two ways of producing housing services: houseowning for own use and letting. Since, from a particular functional point of view, both these institutional forms may be thought to serve the same true function the SNA lumps them together as though only letting/ renting occurred. This is done by introducing an imputation for owner-occupied dwellings; to this end households in their rôle as owners of dwellings are viewed as a part of an industry: the Dutch national accounts, e.g., contain an industry called 'ownership of dwellings'. This example illustrates several points:

- not only the structure of the system is affected, but the production boundary as well;
- the adoption of a treatment geared to one purpose may hurt other purposes: if one wants to analyse the effects of a 10% rise in rents on the purchases of consumer goods, the imputation for owner-occupied dwellings should be removed first;
- introducing imputations and attributions hurts the interpretability and clarity of the data: frequently users ask for data on the enterprise sector net of owner-occupied dwellings.

The upshot of this discussion of the purposes of national accounting is that there are so many conflicting purposes and views underlying the accounts that it would be a miracle if one single set of accounts could serve them all. This situation is still exacerbated by the fact that the SNA, as an international guideline, still has a number of additional purposes of its own.

2.2. Purposes of the SNA

International comparability

The first main purpose of the SNA as such is to achieve international

comparability of national accounting data: it serves 'as a basis for the reporting of comparable national accounting data to the United Nations and other international bodies' (1968 SNA, p. iii). This purpose implies that the SNA may differ from the most desirable national systems of individual countries, since the latter are to be geared to the countries' own institutional setting, economic conditions and policy traditions.

In addition, however, the purpose of international comparability as such may give rise to conflicting alternative options, the basic question being: what is international comparability. Societies and national economies differ in many ways: levels of output of industries, prices, tastes, institutional arrangements, and so on. Inevitably, these differences in many dimensions pose a considerable number of conceptual and practical problems if one wishes to compare two economies. Thus, if one wishes to compare the volume of output, industry by industry, the data should be cleared of differences in institutional arrangements. If, on the other hand, differences in economic behaviour are to be compared, institutional arrangements are of the essence.

Just as in the shaping of the structure of national accounts, discussed above, two alternative approaches to international comparability can be adopted: the institutional and the functional one. The first one would record transactions as they actually occur at the transactors that carry them out; the second one employs a host of imputations and attributions to construct 'institution-free' data on abstract flows and stocks. Both approaches have their own merits and demerits, depending on the purpose of the comparison. Thus a necessary preamble to any discussion of international comparability would be a discussion of the purposes of the comparison and the points of view these imply. Peculiarly, the 1968 SNA does not contain any such discussion. Neither has an explicit, well-reasoned consensus been achieved since. However, inspection of imputations and attributions prescribed by the 1968 SNA, as well as of a number of proposals to enhance international comparability (c.f. section 3), reveal that the point of view adopted is, by and large, the functional one. The focus appears to be on the comparison of activities, c.q. 'real' flows, whereas institutional differences are abstracted from. As noted above, this choice

implies that for each group of, abstractly defined, transactions a standard institutional model has to be adopted. Internationally, however, the range of different institutional frameworks for the same abstract 'transaction' is wider than in a single national economy. Thus, the international dimension exacerbates the problems already inherent in the functional approach to national accounting.

Handbook of national accounting

The second major purpose of the SNA is to serve as a handbook of national accounting: 'The new system [...] is designed to provide international guidance to national statistical authorities who wish to improve, elaborate and extend their national accounts and their system of basic statistics'. (1968 SNA, p. iii). This purpose, too, may conflict with other purposes. Clearly, one internationally uniform handbook cannot be easily applied indiscriminately to diverse national situations. Sophisticated constructions that are essential for one country may be unnecessary and too burdensome for others.

Here too, the functional point of view adopted to some extent in the SNA hampers the purpose of serving as a handbook. Sophisticated constructions are usually necessary to mould the data into an institutional framework that differs from the one in which the actual transactions occurred. The same applies to the systems of basic statistics: the more pervasive the functional point of view, the more difficult the link with these basic systems is, as well as the link with the micro-data underlying them. This is all the more true, because the systems of basic statistics serve more limited purposes than the national accounts and derive a lot of their usefulness from their immediate comprehensibility by the transactors they describe. Thus the SNA's function of serving as a handbook compounds the problems of reconciling conflicting purposes within the system.

Framework for other international guidelines

The third major purpose of the SNA arises from the special character of national accounts as the integrating framework for specialized statistics: the

SNA is to serve as framework for other international economic-statistical guidelines and standards . Again quoting the 1968 SNA (p. iii): 'the SNA is to serve as a basis [...] for constructing coordinated international guidelines and standards in respect of more specialized bodies of economic, financial and other statistics. Thus, for example, the recently revised international recommendations concerning industrial statistics have been made consistent with the system; FAO, UNESCO and WHO are elaborating statistics in respect of agriculture, education and health, respectively, from the new SNA; and the Statistical Office of the United Nations is constructing systems of income distribution statistics and price and quantity index numbers in the framework of the new SNA [...]'. Other examples are the ILO's labour statistics and the IMF's Balance of Payments and Government Finance Statistics. Naturally, here too purposes may conflict. If the SNA is structured so as to achieve an ideal linkage with one set of specialized guidelines, this may well impede linkage with another set.

Apart from this, the purposes of the specialized system frequently conflict with those of the SNA. Since the latter aims to provide a comprehensive picture of the national economy, the most adequate description of one sector or group of transactions must often be sacrificed to the demand of system-wide consistency. In section 3 we shall consider some examples of this problem. In this case, too, the more functional the bent of the accounts, the more difficult the linkage with specialized systems frequently is; a more institutional approach often remains closer to the specialized system. This, however, needs not be a law of the Medes and Persians: occasionally, specialized guidelines, like those of the IMF, contain strongly functional elements and prescribe imputations and attributions that are useful for their own subject but would be detrimental if employed in a comprehensive system like the SNA.

3. Proposals for the revision

The preceding section distinguished between the purposes of national accounts as such and those of the SNA. Sections 3.1. and 3.2., respectively, discuss the types of proposals for revision of the SNA that are inspired by these two groups of purposes. There is no need for a full-fledged review of all major proposals, since an excellent survey was recently provided by Ruggles (1984). Instead we concentrate on the way the various types of proposals interact with the purposes of national accounts and the SNA. The leading theme of sections 3.1. and 3.2. is that most revision proposals would increase the SNA's usefulness from one viewpoint, but diminish it from another.

3.1. Consequences of the evolving purposes and uses of national accounts

National accounts should be meaningful and suitable for economic analysis and policy. Therefore they must be regularly adjusted to developments in these areas. In addition, the national economies themselves are subject to changes which may necessitate adaptation of the accounts, at least if the latter are to remain comprehensive. The revision proposals induced by these changing uses of and demands on national accounts are intended to provide information of three different kinds: additional information on transactions already covered by the accounts, information on transactions not yet covered and, thirdly, revision of concepts used in the accounts.

New information on transactions already covered

One frequently requested type of additional information is the provision of more cross-classifications. Essentially, the need for these is generated by the accounts' purpose of providing an integrated description of the economy. This purpose is to some extent impeded by the need to be comprehensive, which has led to the use of various classifications. The latter are necessary to allow detailed description of separate processes (which is necessary for comprehensiveness) but impede integrated description of different processes for given groups of units. Hence the need for cross-classifying at least a number

of transactions. The problem with such cross-classifications is that they are rarely easy to carry out and that, even if they are, they tend to make the system still more complicated. The latter can be avoided by restricting the introduction of the alternative classification to a supplementary table, i.e. by restricting it to a simple alternative breakdown of the aggregate; but if a true cross-classification of all objects from two different points of view is to be integrated into the system, the degree of complexity rapidly increases.

Another type of additional information often called for is the detailing of groups of transactions or units into smaller groups. Thus one of the revision proposals is to specify a number of imputations - like owner-occupied housing - explicitly; another one is disaggregation of the household sector by social or income class; still another one is the subsectoring of the enterprise sector. Disaggregation poses a conundrum similar to the one connected with cross-classifications: if they are to be fully integrated into the system, this means a great expansion of the latter; in addition, it frequently overtaxes the available data. Hence the usual option is to provide disaggregations of a few key variables only, in supplementary tables.

The demands for new information on transactions already covered may also take the form of proposals for a new treatment - by means of additional imputations and attributions - of transactions that already existed but have come to be conducted in a different way. An example of this is the proposed novel treatment of financial leasing.

Financial leasing occurs when a capital good is rented, on a long-term contract, by a lessee (user) who, however, carries all risks as to breakdown and maintenance. The current convention still is to treat the transaction just like it is organized institutionally: the rental is recorded as intermediate consumption of the lessor. The new proposal is to act as though the lessee owned the capital good and the lessor provided just a loan to finance it. This way, intertemporal differences in the extent of financial leasing are abstracted from. This example demonstrates a tendency to introduce a conservative bias in the accounts, by treating transactions that have come to be conducted in a novel way as though they were still conducted traditionally. In addition, the

example demonstrates that the SNA has to be revised again and again: as soon as the institutional setting of a group of transactions begins to change, this necessitates a revision of the SNA if the accounts are to remain intertemporally comparable from the functional point of view.

Information on transactions not yet covered

Both developments in the economy and changes in theory and policy stimulate a demand for information on transactions that was not provided previously. A prime example is information on transactions beyond the present production boundary: do-it-yourself activities, housekeeping activities. A major problem in this respect is the proper valuation: equivalent market prices or minimum wages or wages the participants in these informal activities could get for other activities and so on. A similar problem arises in case of two other examples: the introduction of the costs of external effects like pollution; and the cost of depletion and benefits from discovery of natural resources. Here too, the proper valuation is not unambiguous. As a consequence, the conventional wisdom of national accountants holds that these categories should not be included in the accounts. However, the demand for this kind of information refuses to be satisfied with this rejection. And it cannot be denied that a lot of the activities and effects concerned influence the part of the economy that is covered in the accounts, thus making the latter a non-comprehensive description of the economy. On the other hand, inclusion would diminish the system's usefulness for many other purposes, not only because of the arbitrariness of valuations.

Alternative concepts

For a number of purposes, alternative definitions of concepts presently employed in the accounts are proposed. One example is the introduction of a correction of sectoral incomes for the impact of inflation on the real value of intersectoral debts with fixed nominal values. Another example is the proposal to redefine final outputs net of costs incurred to avoid pollution, treating the latter as intermediate consumption instead. Here too, what is good for one purpose is bad for another.

3.2. Proposals inspired by specific SNA-purposes

Many proposals for revision are not made in response to novel developments in national economies or changes in the uses of national accounts, but are due to purposes specific to the SNA. The existence of international guidelines has generated an autonomous process with its own momentum. This may seriously damage the usefulness of the accounts for domestic purposes. To show this, we consider the type of proposals to which each of the specific purposes of the SNA has given rise.

Enhancing international comparability

No doubt, the desire for greater international comparability is one of the major driving forces of the revision process. In section 2 we already noted that 'international comparability' usually appears to be approached from a functional point of view; and that this often implies that an 'institutional' standard model has to be adopted for each category of transactions.

The proposal with respect to financial leasing, discussed above, was an example of this in case of intertemporal comparability; however, it has an international dimension as well, since the extent of financial leasing varies from country to country.

One set of proposals purely inspired by the desire for greater international comparability has become known as the Pêtre proposals. These relate to the treatment of government subsidies to consumption; to direct government funding of private consumption; and to items of government consumption, expenditure of non-profit institutions and of enterprises that could be considered as household consumption. In this case, it are not the proposals that reflect a conservative bias but rather the present SNA-treatment. The treatment of government in the accounts clearly brings out some of the functions of government, e.g:

- the provision of purely collective goods and services, the benefits of which do not accrue to any particular individual or group;
- rectifying inequities in the personal income distribution by taxation and transfers, the latter being spent with full discretion by the recipient;

- influencing production of specific industries by differential subsidies and (i.a. indirect) taxation, with production-related effects in mind, like employment.

However, the 1968 SNA is insufficiently explicit about another function of government, viz. the influencing of the composition of individual consumption. This has been a concern of governments for a long time, but on a fairly limited scale, which is probably the reason why the SNA provides no explicit treatment of this function. However, in the past few decades, governments of industrial countries have greatly increased their intervention in the market in order to achieve desired levels of consumption of a number of specific goods and services, e.g. medical services, housing, cultural services. This is done by a variety of methods. Institutionally, the industries concerned may be nationalized or social insurance schemes may be drawn up or public funds may be used to pay for the services. As to the method of distribution of the benefits of intervention, the services may be provided freely, or expenditure on them may be reimbursed; in some cases only a part of the value of the service is paid for, where subsidies may both be paid to producers and to consumers.

In the present SNA all these transactions and institutional arrangements are treated as though they were aimed at one of the other functions of government; this implies that measures with essentially the same function are treated quite differently depending on how closely the specific methods employed resemble those associated with either of the other functions of government. Thus, medical services provided freely by a nationalized industry are treated as a collective good i.e. as public consumption, but if a reimbursement procedure is followed and consumers have free choice it is considered as a transfer payment; housing subsidies given directly to low-income strata may also be considered as a transfer, but if they are paid directly to the construction industry or the lessor they may be considered as a subsidy of the latter, and so on. As a consequence, the accounts do not show systematically how much government spends in order to achieve desired levels of consumption of specific goods and services; nor do they provide an adequate picture of individual consumption and the part thereof that is paid for by the government. The Pêtre proposals would rectify this. Essentially they achieve this by explicitizing a function

of governments; this way one would obtain a better international comparability from a modernized functional point of view.

The example of financial leasing shows that the introduction of a new formal way of conducting a transaction necessitates a revision of the national accounts if the latter concentrate on the function of transactions rather than on their institutional form. In the example of the Pêtre proposals there was no change in the institutional form of transactions, but instead existing institutional forms were seen to be employed for a new function. However, this too necessitates a revision if the statistical system concentrates on the functions of transactions instead of on their institutional form. Consequently, adoption of the functional approach to international comparability will continue to necessitate revisions of the SNA that would be unnecessary in a truly institutional system.

Strengthening the role of the SNA as a handbook of national accounting

The SNA can only achieve the objective of being a universally accepted 'handbook of national accounting' if it is unambiguous in its rules and prescriptions and if its categories of transactions and transactors have clear and univalent interpretations. A number of proposals has been forwarded to achieve greater clarity of the SNA in this respect. Examples are proposals for improved criteria for the distinction of quasi-corporate and unincorporated enterprises; and for delineation of the distinction between 'producers of government services' and the institutional sector 'general government'. A somewhat different proposal is to separate, in each category of transactions, the imputations and attributions from the 'natural' transactions. This proposal is interesting, because it represents an attempt to reconcile conflicting purposes of the accounts: on the one hand, imputations and attributions are made to satisfy functional purposes; on the other hand, many users are interested in the 'actual' flows as observed from payments and consider the imputations as artificial constructs hampering interpretation of the data. Of course, the proposal to provide for an explicit treatment of imputations and attributions has a disadvantage too: it increases the number of items that has to be published and hence makes the accounts more unwieldy and makes it less easy to see the wood for the trees.

Harmonization with other guidelines

Moulding the SNA and statistical guidelines on specialized subjects into a single coordinated economic statistical system is an ongoing concern of considerable complexity. Section 2.1 identified two ways of integrating detailed information on specialized subjects with national accounts: the top-down and the bottom-up methods. Of course, the same distinction applies to the relation with international guidelines on specialized subjects. An example of the top-down method are the FAO statistics, a fairly straightforward disaggregation of the SNA. The harmonization with IMF guidelines, currently in progress, is an example of bottom-up integration. Clearly, the latter approach produces proposals for revision of the SNA. These, however, are based on the specific purposes of the specialized system concerned. This may be detrimental to other SNA purposes. A case in point are two adjustments proposed in order to harmonize the SNA with the IMF Balance of Payments (BOP) Manual. One of these is to adopt the Manual's treatment of financial leasing in the SNA. This treatment is the same as the new treatment already discussed above. The other one is to adopt the BOP Manual's treatment of reinvested earnings of foreign-owned companies: the manual treats these as though they were additional foreign direct investment. This is useful if the focus is essentially on changes in foreign claims. However, this way reinvested earnings of foreign-owned companies would be treated differently from those of domestically owned companies. To remedy this, imputed flows would have to be introduced between the domestic sectors as well; this would not only create considerable problems of valuation but would have not much analytic value either.

It is worthwhile to consider two differences between the SNA's and the IMF's handling of transactions that have not led to proposals for the adjustment of either. First, the SNA holds as a general principle that what is a capital transfer for one transactor is so for the other transactor too. Thus, estate and inheritance taxes are booked as capital transfers both on the household accounts and on the government account. Here too, the SNA imposes an analytic standard on the data that conflicts with institutional (or, more appropriately in this case: subjective) reality: to the government these taxes are current

revenues rather than capital transfers. The IMF's Government Finance Statistics manual recognizes this viewpoint, and indeed records estate and inheritance taxes as current revenues. The SNA principle has an obvious reason: suppose the IMF-treatment were to be adopted in the SNA while retaining the SNA treatment of the household sector; this way, there would be an outgoing transfer in the households' capital finance account and an incoming current transfer in government's income and outlay account. Then government 'saving' would increase by the value of the estate and inheritance taxes. Upon consolidation, national saving would be raised by the same amount (compensated for by an additional item on the national capital finance accounts, like 'net capital transfers between residents'). This is a clearcut case of conflicting purposes within the SNA. Either governments' or households' income and savings concepts must depart from their subjective notions if the SNA principle is retained that a transfer is either a capital transfer for both sectors concerned, or a current one for both.

A similar problem exists in the relation of the SNA with another specialized system, viz. the UN's guideline on income distribution statistics published in 1977. This guideline accepts the income concept of the SNA; hence, strictly speaking, it is fully harmonized with the SNA. However, in this case harmonisation has only been achieved at the cost of applicability: virtually no income distribution statistics have been calculated anywhere that actually achieve consistency with the accounts. One of the reasons is that the SNA income concept includes a whole range of items that do not belong to households subjective notion of 'income', or are valued differently: examples are income from owner-occupied dwellings, and imputed interest on life insurance and pensionfunds reserves and so on. Consequently, the data sources for distribution data do not reflect the SNA income concept. This is certainly true for household surveys, but also for income-tax derived data. Thus here too subjective views of transactions and SNA purposes conflict.

The case of income distribution statistics is only one example of a far wider class of linkages: that between micro- and macro-data. Increasingly, there is a need for micro-bases linked to the national accounts. This reflects the growing awareness that much relevant information is lost in the process of

aggregation: the possibilities for drowning in a lake with an average depth of one metre have been rediscovered in such fields as the average profits of firms, average incomes of households, and so on. But second, as noted in section 2.1, the growing demand for consistent micro-data is caused by the trend in mainstream economics away from macro-economic analysis and toward micro-economics, be they e.g. neo-classical or Schumpeterian or neo-structuralist.

This two-pronged demand for more disaggregated analysis and data is also reflected in the construction of social accounting matrices (SAM's). Broadly, these can be classified in two groups: SAM's for developing countries and tax-modelling SAM's for developed countries. In the first group of SAM's the emphasis is on the distribution of the benefits of economic growth over social and economic groups and on the feedbacks to production; the second group of SAM's are constructed as data bases for the general equilibrium modelling of the distributional effects of alternative tax instruments and, again, their feedbacks on production and growth. Presently, the state of the art in SAM's is comparable to that of national income accounting in the mid-nineteen forties: for each country and each purpose a different SAM is constructed; each of these, of course, meets with its own special problems in linking with the national accounts. Potentially, however, SAM's are a comprehensive framework for the description of a national economy, just like national accounts aim to be. However, SAM's must of necessity start out from the subjective experience and 'institutional' environment of the social and economic groups they are designed to analyse. Thus, if the SNA is to serve as the basis for the construction of SAM's, the need to bring it closer to institutional reality and subjective experience of transactors bulks large.

4. Options for the revision

4.1. Past and current response to conflicting and evolving demands

The central conclusion of the preceding sections is that the SNA has to satisfy many conflicting demands: its purposes may conflict with each other and there are different views on the best way to achieve a purpose. How has this situation been dealt with in the past?

The first SNA has a flavour of a quest for the philosophers' stone: an attempt to provide the description of the economy. That is, a single, objective, description of the economy as it really is. Thus chapter 2 (p.4) opens with the sentence 'The aim of national accounting is to describe the structure of an economic system in terms of transactions'. Above, we have referred to it as the functional approach; however, if the aim is to describe the structure, the underlying assumption is that each transaction has one and only one function. If this is true, the task of the economic statistician is simply to discover this function. Any difference of opinion would then just reflect imperfect knowledge or incorrect views. The possibility that there will always remain valid differences of views, without any one being 'better' than the others, is then denied. Though it is hardly likely that this radically positivist view was actually held by the authors of the first SNA, the further development of the system as envisaged in the preface to its 1960 edition, was still thought to be restricted to elaboration and extension, particularly with flow of funds and input-output tables. The latter was indeed realized in the 1968 SNA, but in addition that system introduced institutional sector accounts. The latter may be considered as a move away from the more functional approach of the first SNA. Nevertheless, the concept of one monolithic description of the economy was still maintained. Consequently, purposes and views not accommodated within that framework had to be accommodated in a different way. Several alternative ways to do this have been employed meanwhile.

The most elaborate SNA-based development is that of the French national accounts. In addition to the SNA-based accounts and input-output tables they contain three different types of additional accounts:

- complementary analyses. These simply provide an alternative breakdown of one or more key SNA-variables for some sector, e.g. a breakdown of household final consumption by purpose;
- intermediate accounts. These employ micro-economic concepts, as distinct from macro-concepts, and aggregate micro-data according to them. The link with the SNA-framework is not complete: most macro-concepts can be derived from the intermediate accounts by regrouping them; however, the intermediate accounts are a straightforward aggregation of micro-data and do not incorporate the adjustments resulting from system-wide statistical integration that are so valuable in the national accounts.
- satellite accounts. These do not refer to just one variable or sector of the SNA, but rather to a field, e.g. education, R & D, etc. They provide non-monetary indicators and link up with the SNA through a comprehensive description of the monetary, or monetized, flows in the field concerned that are incorporated in the SNA. Typically, this analysis of monetary and monetized flows comes in three parts: an analysis of the financing of the characteristic activities, etc. by sector of source of finance; an analysis of production by uses and resources; and an analysis showing how much each sector receives of each characteristic good, service, money transfers, etc.

Essentially, the French system accepts the SNA-view of the economy as a whole. The additions detail specific groups of transactions or provide a comprehensive economy-wide view of a single field. But no provision is made for alternative paradigms in the description of the economy as a whole. Complementary analyses and satellite accounts are not sufficient as tools to change, e.g., the production boundary of the system. Attempts to achieve this have been made outside statistical offices, e.g. by Nordhaus and Tobin (1972), Economic Council of Japan (1973), Juster, Courant and Dow (1981). In these cases SNA-based data are used, but the framework is altered. If it were not so difficult for researchers outside statistical offices, the difference with the SNA would probably be even more dramatic. Given the complicated nature of the SNA and its mixed institutional/functional approach it is very difficult to employ its data for the construction of an alternative comprehensive system. This is probably the main reason why attempts to build systems employing different production boundaries have been sporadic in spite of the demand for them.

Another type of alternative system is the one where the essential macro-economic nature of the SNA is replaced by a meso-economic paradigm. SAM's are the prime example of this. Here too, often, national accounting data are employed, but the structure of the system may differ substantially. SAM's may employ a different sectoring than the SNA, subsectoring is of the essence, the relations between subsectors being specified; production boundaries may differ from the SNA, and so on. Construction of SAM's is thus frequently hampered by the need to remove a number of constructions from the national accounts data.

Summarizing: the 1968 SNA still gives the impression that it attempts to provide, in one monolithic system, the single 'true' vision of the economy; wherever this approach conflicted with other purposes and views, additional tables and accounts have been developed as well as complete alternative systems. But the latter has been hampered by the functional constructions in the SNA.

4.2. An alternative approach: core and building blocks

The discussion above leads to the conclusion that a basic change in the approach to designing systems of national accounts is called for. We should not attempt to construct, in a single monolithic framework, the 'true' or 'best' all-purpose description of national economies. Simply, because there is no 'true' and no 'best' description. Instead, there are various alternative descriptions, each useful for its own purpose, each 'best' and 'true' from its own underlying theoretical point of view. Thus we propose to depart from the 'physics' approach to economics and recognize economics for what it is: a social science where no single comprehensive model will ever be able to obtain consensus. Put differently, we should cease to force our data into a single, restrictive, model.

This view is gaining currency with other disciplines of economic science too. Not only with narrow schools, like the neo-structuralists, but throughout

the discipline. Consider three quotes of economists that might, at first glance, be thought to be the high priests of the highly technical 'physics' approach to economic science.

'We should be using the newly available data sets to help us find out what is actually going on in the economy and in the sectors that we are analyzing without trying to force our puny models on them. The real challenge is to stay open, to learn from the data, but also, at the same time, not drown in the individual detail. We should keep looking for the forest among all these trees' (Griliches, Harvard University, 1985).

'The example of national income analysis does remind us of a danger in the use of economic theory in economic history. There is a bias towards flattening out the particularities of the past. The more one uses categories drawn from the need to generalize, the less marked is the difference among the instantiations' (Arrow, Stanford University, 1985).

'My impression is that the best and the brightest in the profession proceed as if economics is the physics of society. There is a single universally valid model of the world. It need only be applied (...) . Of course there are holdouts against this routine, bless their hearts (...). We need a different approach. The function of the economist in this approach is still to make models and test them as best one can but the models are more likely to be partial in scope and limited in applicability'. (Solow, Massachusetts Institute of Technology, 1985).

The implication for the SNA is that it should, instead of trying to provide the comprehensive framework for the statistical description of economic systems, be comprehensive in the sense of facilitating the construction of all the alternative descriptions that are relevant for science, policy, business, both now and in the future. The best way to achieve this is by means of a systems structure that consists of, on the one hand, a core and on the other a range of building blocks.

Since this proposal was first forwarded (Van Eck, Gorter en Van Tuinen, 1983) it has been misunderstood in several ways. One of these is that the core is just a simple aggregated version of the 1968-SNA, e.g. consisting of a streamlined version of the accounts of the nation and accounts for as small a number of insitutional sectors as possible, without any disaggregation, input-output table, cross-classification and so on, all of which would have to be provided in building blocks. This, however, would be a retrogression. This core would simply be a Keynesian, macro-economic description of the economy and thus represent a return to the economic thinking of the early 1950's and ignore the changes that have occurred since. Only if all other approaches to economic analysis would be simple disaggregations and extensions of the Keynesian macro model, would this interpretation of the core make sense. However, since there are now a number of wholly alternative views of economic systems, the core cannot be designed such as to accommodate just the Keynesian one but must anticipate the need to construct several alternative descriptions of the economy as a whole.

A second misunderstanding concerning the core-building block approach is that the core would represent the authoritative and detailed description of the economy as a whole whereas the building blocks would, in the vein of the French system, be merely elaborations of specific groups of transactions, transactors or special fields.

Instead, our proposal is to construct a core that is, as such, a detailed description of the whole economy, but constructed in such a way - by proper choice of the production boundary, sectoring and subsectoring, units and classifications - that it is easy to transform it into an alternative description of the whole economy. One set of building blocks is to be designed to achieve the latter. Thus, this set does not contain modules for just the elaboration of a special field or for complementary analysis, but building blocks that, added to the core, achieve a drastic transformation of the latter, e.g. a change in the production boundary, an alternative sectoring, and so on. Naturally, there are other sets of building blocks too, e.g. building blocks for linkage with other statistical guidelines, and for specialized topics.

Another misunderstanding is that only the core is the statistical standard according to which data are to be reported to international statistical institutions. Instead there are three classes of building blocks:

- 'mandatory'. These should be constructed by all countries.

Examples are building blocks to achieve international comparability in some sense, building blocks for linkage with e.g. IMF guidelines, and so on. For the time being it is conceivable that a building block is considered as mandatory that, in conjunction with the core, yields the 1968 SNA. In that case the new SNA could, at least temporarily, be simply an alternative presentation of the 1968 SNA.

- 'recommended'. These, too, are to be agreed on internationally but countries will not be asked to commit themselves to produce them; they have a 'handbook' function if a country decides to tackle a given subject.
- 'experimental'. Building blocks in this group can be developed by individual countries or researchers; they are, as it were, the laboratory of national accountants.

Of course, the classification of building blocks in these three classes is not static. Building blocks may be moved out of the laboratory class to, eventually, 'mandatory' status, whereas mandatory ones may become obsolete. The core, however, should be designed for durability; without need for revision every 20 years or so. This way, the process of adjustment simply takes the form of adding or removing building blocks. This provides both a greater flexibility in the course of time and a greater versatility at any given moment. Adjustments can be made as soon as the need arises, without requiring a complete overhaul of the whole system. Naturally, whether or not this is actually achieved depends to a large extent on the proper choice of the core. Therefore the next section considers the principles the latter should satisfy and a number of implications of these principles for the actual construction of the core.

5. The core

A fascinating aspect of national accounting is that there are so many engrossing issues on which a stand must be taken: shall we retain this imputation, do we want that attribution, and so on. The great pitfall, however, is to enter this decision making process without sufficiently specific guiding principles. In terms of Griliches 'cri de coeur': the wood should be designed properly before coming down to the trees. The preceding section introduced the basic notion of a core with building blocks but we still have to specify more precisely the principles of the development of the core (section 5.1.) before we can safely start to fill in some of the details (section 5.2.). In section 5.3. we disentangle from the details again and evaluate some features of the resulting core to conclude that the core is not a radical departure from present SNA but rather the logical next step in the evolution of national accounting.

5.1. Principles of the core

At least three principles of the core are implied by the discussion in the preceding sections. They can be designated as the 'Intersection Principle', the 'Parsimony Principle' and the 'Canonicity Principle'.

Intersection Principle

The core is the point of departure for alle conceivable systems of economic statistics. One way to achieve this would be to define it as the intersection of all systems, i.e. as the collection of all elements common to all systems, with the exclusion of all elements that are absent from the major alternative systems. Clearly, though, the common elements may be so few that a core defined this way might be virtually empty. Therefore, the intersection concept cannot be maintained in its unadulterated form. Instead, the intersection principle has a more limited meaning and consists of two parts:

- the core should contain as few special purpose elements as possible. Special purpose elements are revaluations, imputations, attributions, classifications, that are useful or necessary for one or two purposes but have to be removed for other major purposes or if important theoretical points of view are to be reflected.

- the core should contain the essential structural components that are the basis for the construction of the major alternative descriptions of the economy as a whole. Structural components are sector and subsector specifications, archetypical concepts, and so on.

The second part of the principle merits some elaboration. Currently there are two sets of alternative descriptions of the economy as a whole. The first, more traditional, one is the macro-economic archetype. It is reflected in the accounts of the nation and in the accounts of the major institutional sectors. Of course, within the set of macro-economic theories there are a number of alternative schools, e.g. primitive and more sophisticated Keynesian ones, the monetarist school, the neo-classical school. Each of these requires a different set of aggregated accounts, each employing its own boundaries, etc. But the core should, by the second part of the intersection principle, contain some archetypical form of a macro-economic statistical system; by the first part of the principle it should, as far as possible, be structured in such a way that the various alternative macro-systems can be obtained from it by adding information without having to remove anything.

At this point it should come as no surprise that we believe that the second major alternative archetype of the economy as a whole is the meso-economic one. This, too, comes in various alternative forms, already mentioned before: Leontief - von Neuman models and the related neo-Ricardian models; neo-classical general equilibrium models; SAM-based planning and taxation models. Each requires its own specific statistical system. But, as in the case of the macro-economic approach, the essence of the second part of the intersection principle is that the core must contain an archetypical form of the meso-economic approach from which, by the first part of the principle, the alternative meso-systems can be derived by adding building blocks. Without this second basic ingredient the core would be a parochial, outdated construct instead of a cosmopolitan modern system.

Parsimony principle.

For most users of statistical information, the value of the data decreases

proportionally with the effort required to understand them. Acquiring a minimal understanding of national accounts presently demands the close reading of a 10 to 20 page printed explanation. Further extensions of the accounts would actually decrease their value to many users if they would necessitate still more elaborate explanation. Consequently, the value of the core as such is the higher, the more self-explanatory its data are. This means that the concepts of the core have to be in close harmony with the daily experience of the non-sophisticated users. This, in turn, implies that the core-concepts have to be free, as far as ever possible, of the influence of hypotheses that are based on theoretical analysis instead of subjective experience: the core must be parsimonious in the use of constructions that are intended to capture the 'reality' behind the perceptions of economic agents. This is the parsimony principle.

Naturally, this principle cannot be applied absolutely. The perceptions of the two partners to a transaction may differ and it may not always be possible to reflect both perceptions in the core; for if the latter were to be attempted too liberally, system-wide consistency would have to be sacrificed, which would be incompatible with both the intersection principle as explained above and the canonicity principle to be introduced below. Nevertheless, to adhere to the parsimony principle as well as possible yields considerable benefits. To mention the three most obvious ones:

- it will be easier for the core to serve as the coördinating framework for specialized statistical systems, since the latters' concepts tend to reflect fairly closely the subjective perceptions of the units they describe.
- economic agents are not just users of the accounts, but are also respondents to the surveys on which these are based. Consequently, staying close to the agents' own concepts facilitates the integration of micro-data and the core. The same applies to construction of meso-systems.
- economic science increasingly recongnizes that, in modelling agents' reactions to changes in economic variables, attention should be paid to the way they obtain information on these variables. One example of this tendency is the greatly increased attention to the way expectations are formed.

Clearly, from an informational point of view, concepts should be preferred that are in close harmony with the conceptual perceptions of the agents whose behaviour and expectations are analysed.

In practice, application of the parsimony principle tends to increase the institutional content of the core. The institutional approach emphasizes the way transactors and transactions are organized. The way the transactors are organized and the organizational form of their transactions is, to a large extent, the basic structure within which the daily experience of these transactors occurs. Thus, transactors' perceptions are, to a considerable degree, preconditioned by their institutional form and the institutional form of their transactions. Of course, there are exceptions to this. Agents, too, think and ascribe the same function to transactions with differing institutional forms. But by and large, adoption of agents' own subjective concepts requires an institutional approach to statistical systems design.

Canonicity principle

National accounts are now extremely widely used. The vast majority of users employ the data for quite general purposes: they need key indicators on economic performance, a point of reference to illustrate the relative magnitude of some activity, an authoritative statement of the structure of the economy, and so on. These users are not interested in the precise concepts underlying the accounts. In fact, they could work with various systems of national accounts. Thus, the core can satisfy their needs, provided it is a self-contained system of national accounts, just as the 1968 SNA is. This, then, is a major requirement that the core must satisfy. We can, for brevity, refer to it as the canonicity principle: the core has to satisfy the canonical properties of social accounting systems. Thus:

- the concepts of the core have to be at least as useful to the non-specialized, non-sophisticated user as those of present SNA.
- the core must satisfy consistency requirements: aggregates must be the consolidations of disaggregated core data; classifications must be exhaustive and unambiguous; principles of valuation specified; a proper accounting structure adopted; etc.

- proper attention must be paid to the intertemporal comparability of the most important indicators in the core.
- the core must have internal cohesion .

The last property requires some elaboration. Social accounting systems generally describe groups and subgroups of processes for groups and subgroups of units. However, to describe one group of processes adequately, another grouping of units may frequently be necessary than is required for the description of another group of processes. Thus we may have one type of sectoring for one process (e.g. capital finance) and another for another process (e.g. production). Internal cohesion is then achieved by introducing at least one level of aggregation of (sub)groups of units where at least summary characteristics of all processes can be described. It seems safe to say that the internal cohesion is the stronger, the lower the levels of aggregation are at which all the major processes concerned are described jointly. To provide one example: the 1968 SNA by and large describes production at the industry level and capital finance at the level of institutional (sub)sectors. Only at a very high level of aggregation (i.e. economy wide) the two processes are summarized for the same set of units. Consequently, the SNA resembles two pillars, leaning against each other for support, but joined together only at the very top. The strength of the system would be greatly enhanced if more connections could be achieved between these two pillars. Incidentally, this would also increase the possibilities for joining these two processes with other ones and hence increase the flexibility of the system.

Application of the canonicity principle will guarantee that there is a continuity between present SNA and the core. Not in the sense of continuity in the time series: different concepts imply different figures and it goes without saying that consistent time series will have to be obtained by recalculating historical data according to core concepts. Instead, there will be continuity in the usefulness to the majority of users of the core vis à vis the 1968 SNA.

5.2. Structure and a sample of details of the core

As a consequence of the canonicity principle, there is a presumption against

differences between the core and the 1968 SNA. Only those differences are to be accepted that are essential in view of the intersection and parsimony principles. Therefore, the natural way to develop the core is to start out from the 1968 SNA and reconsider its features bearing the intersection and parsimony principles in mind. Examples of SNA-features we retain are the use of a flow concept of income, limited by the production boundary, and registration of all transactions at the time they occur, not at the time of payment. As in these two cases, we usually shall omit the argumentation if we simply retain the treatment of present SNA. As to the description of the core, we shall first consider its basic features and next discuss a number of details. The latter is not an exhaustive or definitive treatment of all details in which the core must differ from the 1968 SNA, but rather an illustration of the logical implications of the three principles we propose.

Types of accounts and tables

Just like the 1968 SNA the core must describe the economy as a whole in an integrated, systematic and consistent way. It must be a self-sufficient system. This is not just required by the canonicity principle, but also by the intersection principle. Consequently the core contains:

- i) a production, income, capital and external account for the nation;
- ii) production, income and outlay, and capital finance and accumulation accounts for the institutional sectors.

The introduction of production accounts for the institutional sectors is a departure from the 1968 SNA, that is already accepted in the European System of Accounts. It is useful in view of the intersection principle. For many purposes analysis of the production of the institutional sectors is valuable, whereas inclusion of production accounts for institutional sectors does not hurt the system's usefulness for any other purpose. Another argument for their inclusion was already precluded upon in section 5.1: the inclusion of production accounts for institutional sectors will considerably strengthen the cohesion of the system. Below we will return to this argument.

The two sets of accounts indicated above are the first, macro-economic, component of the core. But, as argued above, the system must also contain a strong meso-economic component if it is to satisfy the intersection principle. This requires the inclusion of two essential ingredients, both to be discussed in some detail below:

- i) Input-output tables for industries and commodities;
- ii) Disaggregation of institutional sector accounts into appropriate subsector accounts.

Sectoring

The parsimony principle requires that units are grouped into (sub)sectors in accordance with their own perceptions. The dual sectoring principle of the 1968 SNA admirably satisfies this requirement. On the one hand, the processes of income distribution, outlays and capital finance, accumulation are decided upon by larger units, viz. enterprises, than the process of production which is mainly decided upon in establishment-type units. Hence it stands to reason to suppose that the variables on the income and capital accounts are most likely to correspond with the perceptions of the enterprise-type units; and those on the production accounts with the perceptions of the establishment-type units. Consequently, a sectoring of both types of units according to their characteristics with respect to their respective central processes is most likely to be recognizable to the units themselves. Put differently: enterprises, households, government should be (sub)sectored in such a way that maximum within-subsector homogeneity is achieved regarding behaviour with respect to income distribution, outlay and capital finance, accumulation; whereas, on the other hand, production units should be (sub)sectored in such a way that maximum homogeneity is obtained with respect to the characteristics of the production process.

The latter is already done by the 1968 SNA. Thus, the basic treatment can be retained in the core. However, the treatment of the 1968 SNA is less than satisfactory in view of the intersection and canonicity principles. The internal cohesion of the system is not as strong as it could be and neither are

the linkages, between production on the one hand and income and outlay, capital finance, accumulation processes on the other, given at a level of disaggregation that is sufficient if the core is to serve as the basis of a full-fledged meso-economic system. Therefore we propose to improve the linkage in three ways, in addition to the introduction of production accounts for institutional sectors already discussed above.

- i) To abandon the special treatment of departmental enterprises in the production accounts. If these are included in the industry 'producers of government services' the latter would coincide with the institutional sector of government.
- ii) A breakdown of value added, its major components and total production of each industry according to institutional (sub)sector.
- iii) An appropriate subsectoring of the institutional sectors.

The second proposal requires the classification of data on output and value added of each industry by institutional subsectors. In an era of computerized registers of establishments, enterprises and enterprise-groups it is possible to provide each establishment-type unit with other labels than just the one indicating its economic activity. Thus, another label could be the institutional (sub)sector code of the enterprise or enterprise-group to which the establishment belongs. This way the desired cross-classification of production data as to institutional (sub)sector could be achieved.

Perhaps even more important is to provide for an adequate subsectoring of institutional sectors. Consider the non-financial enterprises. This sector could be divided into two subsectors. The first one would contain only enterprises that consist of just one establishment-type unit, the second one of enterprises that comprise more than one establishment. The first subsector could then be subdivided according to industry and a full-fledged integrated analysis of production, income distribution and outlay, capital finance and accumulation by industry could thus be provided. In the core a further subdivision of the second subsector into, e.g. multinationals and non-multinationals is conceivable in order to improve linkage with external accounts. But a breakdown of this second subsector by the major economic

activity of the enterprises, as proposed in section 5.59 of the 1968 SNA, is definitely not an element of the core; it violates the intersection principle because it is typically a special purpose element; therefore it might be an interesting building block but does not belong in the core. This is the more true because it does not improve the internal cohesion of the system as there will be a discrepancy between the standard production accounts by industry and the breakdown of the institutional sectors' production account by industry. Finally, it would violate the parsimony principle since it is hardly likely that, e.g. a multi-product multinational perceives itself to be essentially a single economic activity enterprise.

The cohesion of the system can, similarly, be raised by an adequate subsectoring of the household sector. Thus, introducing a subsector of private unincorporated (not quasi-corporate) non-financial enterprises would yield the same benefits as that of the first subsector of the non-financial enterprises introduced above. This subsector, too, could be subdivided by economic activity. Furthermore, the household sector should be broken down into a number of subsectors that are homogeneous with respect to 'institutional' characteristics. An example of such a breakdown would be subsectors of government employees, non-government employees, unemployed, aged, or, alternatively, by per capita income. These breakdowns, however, require further consideration: there are problems like the classification of households with more than one income earner, and so on. Yet it is important to introduce a subsectoring in the core as this is an essential element in meso-economic systems building; it goes without saying that these subsectors should be fully integrated in the system. Thus, e.g., the system should provide a breakdown of the destination of commodities by the subsectors of the household sector.

A final element of the sectoring of the system requiring consideration is that of the standard production accounts. We already emphasized the need for input-output tables for industries and commodities and applauded the SNA principle of classifying establishment-type units into industries. Clearly, the parsimony principle requires that the input-output tables in the core are of the industry x commodity and commodity x industry type, just as in the 1968 SNA. All other types of input-output tables are analytical rather than

parsimonious. These commodity x commodity and industry x industry tables are derivatives, obtained by introducing hypotheses and analytical devices. Though, e.g., commodity x commodity they are extremely useful as building blocks, the core should firmly adhere to the rule that establishment-type units are not to be broken down into processes, commodities, and so on, but are to be treated as a whole. Of course, inclusion of input-output tables in the core poses considerable practical problems for many countries. Construction of reliable annual input-output tables is tantamount to employing the full-blown commodity flow method in compiling national accounts. Though this method has been recognized (cf. e.g. Studenski; 1958) as the most reliable method of compilation, it is also the most laborious one. As a consequence, it is employed by a few countries only. However, the core is a conceptual system, and not just the most elaborate system that can still be constructed by a majority of countries. Therefore input-output tables must be included in the core, as they are essential from a conceptual point of view.

The production boundary

The intersection and parsimony principles unequivocally demand a narrower production boundary than employed by present SNA, particularly a production boundary which includes all productive activity that leads to a monetary remuneration of the production factors involved. This way (neglecting Marxist analysis) no 'productive' activities have to be removed from the core for any major purpose. As the data base for monetary analysis the core as such would suffice, for Keynesian and neo-classical analysis it is probably adequate as well, though possibly some activities might be added (but none removed), for other analyses more activities should be added but, again, none removed. This strict production boundary is also parsimonious: it is easily understood by laymen precisely because no sophisticated monetization is necessary of flows that do not lead to monetary remunerations. Moreover, linkage with micro-data bases is considerably simplified.

The proposed production boundary excludes from present SNA some items of imputed production for own use, particularly products for own use by

professionals, primary production and processing of primary production for own use, the production of investment goods for own use and owner-occupied housing. As indicated in section 2.2, one major argument for including them is 'international comparability'; another one is 'intertemporal comparability'. But we already concluded that including these items achieves comparability only from one particular functional point of view and diminishes it from another. Moreover, they are completely insufficient to achieve the desired type of functional comparability. Hence these imputations are special purpose elements and violate the intersection principle from this point of view too. They should be excluded from the core and included in building blocks only.

Origin and destination of flows

The parsimony principle requires that flows are registered as far as possible between the transactors who directly experience them and that reroutings are avoided wherever feasible. This principle has implications for the delineation of intermediate and final expenditure and for a number of issues regarding attributions made in present SNA.

As to the first point, the definition of intermediate consumption must necessarily start with the identification of the producers in the economy. Given the production boundary described above, these are the same groups of agents as in present SNA. Given this point of departure, the most parsimonious definition of intermediate consumption is: all output of non-investment goods and services paid for by producers. All other output is then registered as final expenditure. This approach implies some deviations from present SNA. Benefits in kind supplied to employees are not registered as final consumption of households, but as intermediate consumption of producers. This probably coincides with the perception of most producers. It may not harmonize with the perception of employees, particularly if the benefits are taxable; however, to record them as though they were completely similar to other outlays does not correspond with households' subjective experience either since they are not outlays paid from freely disposable income. Anyway, specialized building blocks might be constructed by applying a functional cross-classification to

the intermediate consumption in order to arrive at the total consumption of the population. But this treatment should not be included in the core as it violates the parsimony principle, and is not required by either the intersection or canonicity principle. The core should register consumption of the payees, building blocks may attempt to register it at the much more functional (and hence more debatable) categories of 'consumers'.

Present SNA knows several other attributions of flows paid for by one sector to another sector. One example is employers' contributions to social security (attributed to households). This example clearly violates the parsimony principle; moreover, it is not of general analytic value. So in the core this attribution should be dropped. A related issue is employees' contribution to social security that is not paid to the employees first but directly to the social security funds; similarly, frequently wage-related income taxes are paid directly by the employer to the government. The distinction between these flows and formal employers' contributions is that employees are informed of them; however, their subjective experience of these flows differs considerably from that of other income components since they themselves cannot dispose of this income component at any time. Hence it is preferable to record these flows in accordance with the way the payments are made, i.e. as a transaction between e.g. enterprises on the one hand and social security funds and general government on the other. By recording them as separate items on the accounts, reclassifications can always be made in a building block.

Another example of an attribution in present SNA is payments of insurance companies to medical services (attributed to households). This case is more difficult than that of social security contributions. If the insurance company pays the household which, in turn, pays the medical service there is no problem with present SNA; no attribution either, for that matter. But if the insurance company pays the medical service directly, the parsimony principle suggests the recording of a direct transaction between insurance company and medical service. Though this creates some difficult borderline cases, there seems to be no overriding reason not to follow the parsimonious approach in this case. One might argue that the core would, given this treatment, not

adequately reflect households' consumption of medical services. But it would adequately reflect households' expenditure on them, i.e. insurance premiums plus direct expenditure less disbursements. Thus, elimination of the attribution is again a step in the direction of core based on consumption by the payees. Naturally, the same treatment should be followed in the input-output tables of the core.

Some special issues

The discussion so far sketched the outline of the core and illuminated this with some specific details. It seems useful to illustrate the principles of the core still a bit more by considering a few special issues.

One famous problem of national accounting is the treatment of the banking imputation: the margin between interest received and interest paid by banks. One approach (favoured by Sunga, 1984) would be to register all interest flows just like they occur, at the transactors between which they occur. This could be defended if interest might be considered as a payment for a non-factor service, just like rents are a payment for housing services. This, however, conflicts with the parsimony principle, since all enterprises, except for the banks, regard it as payment for a factor service (a negative property income). Consequently, this treatment should not be adopted in the core. A second approach would be to drop the imputation altogether. This, however, would violate the parsimony principle: in the perception of the banks the margin between interest received and interest paid is a return for the services they render. Thus the banking imputation should be retained.

This, however, raises the problem whether the services of banks that are represented by the imputation are a final or (as the SNA treats it) an intermediate service. The parsimony principle implies the former: since non-financial enterprises do not consider interest to be a non-factor service, the banking service represented by the imputations cannot be an intermediate service either. To treat the banking imputations as final expenditure is completely consistent with the treatment of other unmarketed costs for the

economy as a whole. There is a good analogy between the banking imputation and, e.g., the maintenance of public roads (final output), since both are connected with unmarketed services.

Another special issue is whether or not to adopt the proposed new treatment of financial leasing, discussed in section 3. This treatment should not be adopted in the core as it is a clear violation of the parsimony principle without any benefits in regard to the intersection and canonicity principles.

Another example of an imputation that should not be adopted in the core concerns the interest on life insurances' and pension funds' reserves. Present SNA imputes this interest to the household sector, as an addition to household saving. This imputation clearly violates the parsimony principle as is illustrated by the fact that many users remove the imputation before analysing data on the household sector. Naturally, the imputation might be included in a special building block.

Still another special issue, mentioned in section 3.2, is the treatment of estate and inheritance taxes. The parsimony principle would require them to be registered as outgoings on households' capital account and as incomings on governments' current account. Thus this principle should be followed unless the two other principles are opposed to it. This does not seem to be the case. The treatment would yield income and accumulation concepts that harmonize with sectors' subjective perceptions and consequently are useful for the connection with other statistical systems, e.g. the IMF's Government Finance Statistics. The canonicity principle is not violated. It might be violated if the rule were to be adhered to that saving and income of the nation have to be the sum of, respectively, sectoral savings and sectoral incomes. This, however, does not seem to be an essential feature of a system of national accounts. In defining national disposable income we might, without any consistency problems, define it as the sum of sectoral disposable incomes minus net capital transfers between residents. This way, national disposable income would not be influenced by the proposed registration of estate and inheritance taxes, and neither would national saving.

A final special issue to be discussed is the consumption of fixed capital. This item is defined in present SNA in terms of the current price level and the true economic life time of the fixed assets concerned. This yields a concept which differs from the concepts of producers; in addition, there are many countries where producers' own concept varies widely. This violation of the parsimony principle results from the fact that the consumption of fixed capital is not directly connected with a transaction. It is an obviously functional element in the SNA which, strictly speaking, does not belong in the core. Various alternative concepts of capital consumption should be developed in a valuable building block. This is the more recommendable because depreciation based on current costs can be considered as an inconsistency in the income concept of present SNA as has been pointed out in Van der Laan and Van Tuinen (1985).

Of course we might devote a lot more pages to many more special issues, e.g. that of reinvested earnings of foreign-owned companies, discussed in section 3.2. However, the outline of the core and the application of its guiding principles would not be clarified further this way. Instead, it is now more useful to devote some attention to the properties of the core that emerge from the discussion so far.

5.3. Properties of the core

The core is, due to the application of the canonicity principle, a multi-purpose system describing the economy as a whole in an integrated and systematic fashion. The core describes the minimal part of the economy for which it is still possible to establish all interrelations specified in advanced systems of social accounting; thus it is a canonical national accounting system. Its concepts are, due to the parsimony principle, as close as possible to those of the economic agents themselves and hence, too, to those of the respondents to the surveys on which its accounts and tables are based. As a consequence, the core is the system with the maximum institutional content. It is, in this sense, merely the logical next step in the evolution of the SNA, since conceptually a major difference between the 1968 SNA and the 1953 SNA was the increased institutional content.

In another respect, too, the core is simply the logical next step in the evolution of the SNA. The 1953 SNA was essentially a macro-economic system; the 1968 SNA took a giant stride in the direction of a meso-economic system by the inclusion of input-output tables. The core continues this process by adding disaggregated linkages between the institutional sectors' accounts and the input-output tables and by a further subsectoring of the institutional sectors.

The choice of the production boundary in the core, which was dictated by the parsimony and intersection principles, implies that the core is restricted to flows which are directly connected with market transactions. A further implication of the outline of the core sketched in section 5.2. is a fairly strict application of the 'transactor-transaction principle'. This principle could be described as the rule that transactions have to be recorded at the transactors who pay or receive the money involved in the transactions. These two properties of the core together imply that the core provides basically a description of the monetary part of the economic process. The tables and accounts of the core are, therefore, optimally suited for monetary analysis. This choice does not imply that we consider monetary or monetarist analysis the most important approaches to economic analysis; nor that we consider the monetary part of the economy to be the most important. Rather, the monetary part of the economy is the minimum part in which virtually all users are interested.

The core thus obtained on the basis of the intersection, parsimony and canonicity principles is probably a quite durable system. Because its institutional content is high, it is fairly impervious to changes in economic analysis which, in a more functional system, would require additional (or other) imputations and attributions. The same applies to changes in the institutional model adopted for the carrying on of transactions. Since the core does not press any transactions conducted according to one institutional model into the straightjacket of another model, no adjustments of the core will be necessary to keep up with changes in the way transactions are conducted. Thus it is fair to conclude that the core is well suited as the solid, constant center of a system where easy flexibility is achieved by changing building blocks attached to the core.

6. Building blocks

6.1. Building blocks as a tool for analysis

The core, as outlined in section 5, is the economic statistician's exercise in restraint. Wherever possible, the conceptions and perceptions of transactors have been accepted as they are and the transactions described as they appear; the temptations of superimposing the economic statistician's own views have been resisted. The building blocks, in contrast, are the analysts' backyard. Here alternative economic theories, national accountants' own views, purposes of special analysis may be drawn upon to obtain analytic descriptions of the economy or parts of it. Thus, whereas the core has maximum institutional content, building blocks transform the core data to functional systems. This can be done by redefining sectors, transactions; by reclassifying transactions; by adding transactions, revaluating them, and so on.

As a matter of course, the set of possible building blocks is infinite. Yet this set is structured; in section 4.2. we indicated that it consists of three classes: mandatory, recommended and experimental building blocks. However, to attempt an exhaustive enumeration of even the mandatory building blocks would be premature at this stage. The purpose of the present paper is to stress the need for a more flexible System of National Accounts and to demonstrate that the latter can be achieved by means of the core-building block approach. For this purpose it suffices to sketch some illustrative examples of building blocks. Section 6.2. is devoted to this purpose. Only examples of building blocks in their purest form are discussed in section 6.2.: functional descriptions of the economy or a part of the economy, based on a specific point of view. In addition to this, however, building blocks should also serve more mundane purposes like bridging the gap between the core and specialized statistical systems or achieving international or intertemporal comparability. These functions of building blocks are discussed in section 6.3.

6.2. Examples of functional building blocks.

Analytic input-output tables

The core contains only commodity x industry and industry x commodity tables. These are, essentially, institutional tables: the basic units where the decisions on production processes are made are left intact and the make and use matrices simply record their outputs and inputs. However, the 1968 SNA also introduces the industry x industry and commodity x commodity tables.

The industry x industry table might at first glance be considered as an institutional table, since it may be viewed as recording transactions as they actually occur between the units that make the decisions on the transactions. However, the table represents an artificial construction: to obtain it from the original industry x commodity and commodity x industry table assumptions have to be introduced. That assumptions are necessary is a consequence of the nature of the basic data reported by each establishment: the value and composition of the goods and services it buys and sells, respectively; not their origin and destination by industry. This reflects the fact that, where output is concerned, establishments mostly perceive themselves primarily as producer of a set of specific goods and services, not as a supplier of a specific set of industries; the same applies a fortiori, with respect to inputs. Moreover, because a considerable part of interindustry transactions are conducted through the trade industry, enterprises frequently don't know which industry they buy from or sell to. Consequently, the industry x industry table may be considered as an institutional table with functional elements. Its' main purpose is to analyse how events in one industry affect and are affected by other industries. For these reasons it has not been included in the core but it is a useful building block.

The commodity x commodity table is a prime example of a building block. The table analyses how much of each commodity is used in the production of a commodity, and vice versa. But because commodities are defined as the characteristic outputs of industries, the table may essentially be considered as an attempt to analyse the linkages between specific production processes. The agents engaged in these processes have been completely removed from the picture. Clearly, therefore, the table represents an attempt to capture a reality that is inspired by economic analysis (e.g. Von Neuman models) rather than by the subjective perceptions of agents. Commodity x commodity tables are

designed to analyse production processes as such. Thus, they are the tables that should be employed if characteristics of the production process are analysed.

In addition to these tables, the input-output building block must also contain a table on indirect taxes, particularly the commodity related taxes. Here, the essential table is one that indicates how much indirect taxes each industry pays for each commodity it sells. This is, actually, an institutional table since it describes simply the experience of the establishments. Consequently, it might even be included in the core. By combining it with the other core tables, employing suitable assumptions, more functional tables may be derived, specifying the indirect taxes related to production, consumption, investment and export processes. These tables, taken together, are an essential ingredient in most general equilibrium tax models.

- The input-output building block as sketched here illustrates several points.
- a building block need not introduce information on transactions not covered by the core, but may, instead, be a regrouping of data from one particular theoretical point of view. In this case that point of view is the one inspired by i.a. the Von Neuman model and its emphasis on processes instead of transactions.
 - construction of a building block may require the use of assumptions and information not required in the core.
 - a building block may contain many tables and be open-ended. An adequate description of the input-output building block and of methods for its construction requires a handbook of its own, which, incidentally, is long overdue.

Extending the production boundary

The core employs a strict production boundary, developed on the basis of a simple criterion: is there a remuneration in money. As soon as the production boundary is extended, it is far more difficult to find such a clearcut criterion and yet still arrive at a practical boundary. Frequently, an attempt is made to employ a criterion, but in practice this turns out to be 'too wide' in one

sense or another; then exceptions are introduced and in the end one is left with a list of items to be included instead of a general criterion. The 1968 SNA has, to some extent, followed this route. Its production boundary is influenced by a criterion like: 'production that is equivalent to market production should be included'. But instead of applying this criterion all the way, it has been watered down to the rule we adopted in the core plus a limited number of items that would be required under the market equivalence criterion. These items, listed above, include some important non-market production, like owner-occupied housing, own-account production of investment goods and own account primary production and processing, but exclude a number of important items as well: do-it-yourself activities that have a clear equivalent in the market place, volunteer services for which the same applies, and so on. Thus, when extending the core's production boundary it would be unsatisfactory from an analytic point of view to stick to the 1968 SNA boundary.

Instead, a useful production boundary building block could start with a fresh look at the reasons for adopting a market-equivalence criterion. There are two of these and each implies a different form of the criterion. The first reason is that, if marketed goods and services have close substitutes that are not marketed, reliable analysis of the former is not possible without taking the latter into account. This implies the first, most restrictive version of the criterion. It may be termed the local and temporary market-equivalence criterion: only close substitutes that are actually available at a given time and in a given country matter. Thus this version of the criterion reads:

'For a given country and a given period all non-marketed activities are productive if, in that country and period

- their non-marketed output is substantial;
- the output is a close substitute for marketed goods or services;
- the sales of the marketed goods and services are substantial.'

The second reason to adopt a market equivalence criterion is that the extent of non-marketed goods and services varies systematically, both from country to country and in the course of time, with, e.g. per capita income or another indicator of welfare, personal income distribution, rate of taxation, rate of

unemployment. Consequently, cross-sectional and intertemporal analysis leads to biased results if non-marketed goods and services are neglected. This yields the second version of the criterion, the global, long-run market-equivalence criterion. It is formulated just like the local, temporary version, except for the phrase 'in that country and period', which is now replaced by 'in any country and period considered to be relevant'.

Of course, in either case a number of decisions will have to be made to obtain operational definitions, but discussing these is beyond the scope of the present paper. The same applies to the optimal methods for compiling the relevant data. In a number of cases, like own-account investment, own-account primary production, owner-occupied housing, there are well-established methods; whereas in other cases (e.g. the examples of do-it-yourself activities and volunteer services) more experimental methods have to be employed.

At present, the major sources of information on a number of these activities are time-budget surveys. It seems wise, therefore, to provide the information on the activities concerned just in terms of hours spent, at least for the time being. This is, as such, already quite useful as a tool for the analysis of the interplay between related activities on both sides of the core's production boundary. At a later stage it is conceivable that reliable information is obtained on the nature and quality of the output of e.g. a number of do-it-yourself activities. This might make a sensible monetary valuation feasible.

This discussion of the 'production boundary building block' clearly illustrates how building blocks could become the laboratory of national accounts. Eventually, this specific building block may evolve into a system that, attached to the core, transforms the latter into an alternative economy-wide statistical system.

Inflation and sectoral income and saving

The two-digit inflation of the 1970's induced a great deal of interest in inflation accounting, since sectoral holding gains and losses could be quite substantial at this rate of inflation. In principle, as Hibbert (1982) pointed

out, the relevant information could be obtained by revaluations of all the assets and liabilities of institutional sectors. In practice, however, many countries do not compile complete balance sheets. Moreover, the balance sheet data that are available are frequently very weak because of valuation problems and, especially in case of fixed assets, insufficient data. Consequently, a less ambitious and more practical approach has to be followed in order to deal with at least the most important aspects of the problem.

Particularly the inflationary gains and losses of fixed claim financial assets and liabilities are of interest in the context of national accounting: Cukierman and Mortensen (1983) justly called the national accounting data on sectoral incomes and savings 'dangerously erroneous' because they fail to take these gains and losses into account. Therefore, a high priority should be given to the development of a building block that, as suggested by Van der Laan and Van Tuinen (1985), supplements the information in the core with data on holding gains and losses on fixed-claim financial assets and liabilities. Because the availability of reliable data on the latter is much greater than in case of most other items on the balance sheets, this approach (though admittedly a partial one) is far more promising than the one mentioned above.

Alternative disaggregations of the household sector.

Disaggregation of the household sector is desirable for several purposes and each of these calls for a different breakdown. We restrict the discussion to two of these. The first one is the analysis of the distributive process. Here, the disaggregation by socio-economic status mentioned in present SNA is appropriate, though its usefulness would be enhanced if the classification would not be based on the status of the head of the household but on the household's main income category.

A second major purpose of disaggregation of the household sector is the analysis of the disposition of income, i.e. of both saving and consumption. The classification by socio-economic status, especially the separate treatment of households of owners of unincorporated enterprises, is of some use in this case too. However, a more relevant disaggregation is that by income bracket, by age

of the earner of the main income and by household composition. Disaggregation by income is indispensable in the analysis of short-term issues like the impact of changes in relative prices on the composition of consumer demand (an essential ingredient of meso-economic general equilibrium analysis) of the consequences of tax-induced changes in personal income distribution and, on a macro-level, the shape of the consumption function. Disaggregation by age and household composition is necessary for long-run analysis and international comparisons. Thus the ageing of the population in all industrial countries has important consequences for the pattern of consumption and saving. Incidentally, the breakdown by age is also useful for the analysis of distributive transactions.

In section 5.2. we already indicated that subsectoring of the household sector along the lines indicated in the preceding paragraphs is essentially an element of the core since it is necessary in view of the intersection principle and desirable in view of parsimony principle as it intensifies the link with the daily experience of the household categories that are distinguished. However, there is as yet insufficient experience in this area to support immediate integration of these two types of classification into the core. Therefore, we propose to consider them, for the time being, as a building block. When more experience has been obtained they can be given their rightful place as the household sectors' counterpart the ISIC.

Consumption by consumers

The core adopts the principle of consumption by the payee as the most parsimonious approach, but for purposes of welfare comparisons (international and intertemporal) consumption by consumers is the more suitable approach, as emphasized in the Pêtre proposals. Since this approach requires attributions and reclassifications of transactions and yields a functional system, it is a natural building block. In this building block, the principle of consumption by consumers can be applied radically, since there is no need for compromise as there would be in a more comprehensive general purpose system of national accounting.

Ruthless application of the consumption by consumers approach calls for at least two large groups of attributions and reclassifications.

i) many items of collective consumption should be recorded as household consumption and, occasionally, as intermediate consumption of producers.

ii) items of intermediate expenditure of enterprises should be recorded as household consumption.

Consequently, there are not only shifts between categories of final expenditure and between household subsectors, but also between final and intermediate consumption. The latter implies, on balance, an increase in national value added. The basic issue in constructing this building block is whether these changes should be ploughed back into the whole system in order to arrive at a completely novel description of the economic system. Whether or not this should be done depends on the purposes for which the building block is constructed. In the present case these purposes appear to be fairly limited in scope: instead of providing the data base for a full-fledged analysis of the economy from a different theoretical point of view, the purpose is to make comparisons of welfare levels. For this limited purpose it does not appear to be needed to provide all the information necessary for a complete overhaul of the system; instead a number of summary tables, e.g. detailing the additions to household consumption by category of consumer expenditure and subsector of the household sector, would seem to suffice.

6.3. Auxiliary functions performed by building blocks

In section 6.2. we provided some examples of building blocks that serve an analytical purpose of their own. They may analyse a major part of the economy in terms of processes rather than transactions between transactors, as the core does; or they may introduce alternative formulations of such central concepts as income or consumption; they may extend the core system to a whole new range of 'quasi-transactions' as in the case of the extension of the production boundary; other examples could be provided. In each of these cases the building block serves a function of its own.

However, a number of the functions of the SNA emphasized in the first

sections of the present paper have to be satisfied as well, particularly international comparability and the coordinating role of the SNA with related statistical systems. In both cases two alternative approaches are conceivable. The first one is a stopgap approach. In case of existing specialized systems building blocks are designed to indicate the relations between core variables and concepts on the one hand and those of the specialized system on the other. In case of, e.g., international comparability a building block is constructed that contains a loose collection of imputations and attributions in order to achieve international comparability of the same type and the same limited value as the present SNA.

A second, far more elegant and satisfactory approach would be to stick to the rule that building blocks have to serve a useful analytic purpose of their own instead of being just auxiliaries. Thus, in case of specialized statistical systems, the latter would have to be redefined in such a way that they take the core as their point of departure: the specialized systems would thus be reformulated as a building block themselves. Actually, the core has been designed precisely to facilitate this, because it adopts concepts that should be easy to take as point of departure for specialized systems. Likewise, instead of developing a slipshot 'international comparability building block' we should specify a number of building blocks analysing specific processes, transactions, and so on, that each yield internationally comparable data on their own field. Thus, given building blocks (discussed above) for input-output tables, consumption by consumers, extension of the production boundary, and so on, most desiderata in the area of international comparisons have been satisfied as well.

Consequently, an approach where building blocks serve their own analytic purpose should be preferred to one where they perform just auxiliary functions. Probably, for the time being stopgap methods will have to be employed until a sufficient number of building blocks has been created and implemented in a sufficiently large number of countries; and until existing specialized systems have been reformulated as building blocks. One of these stopgap building blocks that cannot be avoided for the time being is the one bridging the gap between the core and 1968 SNA. However, it is debatable

whether it is really necessary to be able to reconstruct the 1968 SNA in all its details. Probably a few summary tables providing, e.g., data on the imputations that have been left out of the core, would be sufficient for most purposes: these are enough to reconstruct a number of essential series, like GDP, on the 1968 SNA basis. The differences between 1968 SNA and the core are, as we have seen, a rather disorderly collection of elements: either too much or too little from any coherent point of view. Consequently, once a sufficient number of building blocks that are based on coherent viewpoints have been developed, the 1968 SNA building block becomes superfluous.

7. Epilogue

The SNA is like a big computer serving too many users. It cannot handle all of them at the same time and cannot store all their special data bases, so that it must always disappoint some of them. And ever more users arrive and want to be connected too, and store their special data and run their special programs. Of course there is only one solution: replace the dumb terminals by intelligent micros that can store their own special data, run their own special programs and set the core computer free for its proper role as the center of communication and guardian of the general purpose data base. This, in a nutshell, is what we argued in the preceding sections. The SNA is a multi-purpose system that increasingly faces conflicting demands. In order to satisfy them it has to be made more flexible by providing it with a modular structure. Our proposal is to define a general purpose core, differing slightly from present SNA. Arranged around the core are building blocks for special purposes. These building blocks (the 'intelligent micros') are, in combination with the core, much better suited as tools for special purpose analyses than a single, monolithic system could ever be.

The core is developed on the basis of three principles. Two of them, the parsimony principle ('remain close to the perceptions of the economic agents') and the intersection principle ('avoid special purpose elements but include all general purpose ones') create a limited number of deviations from present SNA, particularly in the direction of a higher institutional content and a more integrated meso-economic description. These deviations are the natural next steps in the evolution of the SNA: the 1968 SNA deviated in the same directions from the more 'functional' and macro-economic 1953 SNA.

An important feature of this core is that it may be expected that future changes in the economic process will require less adjustments of the core than would be necessary in a more functionally oriented SNA. This is a consequence of the fact that - as we demonstrated by examining a number of proposals for revision of the SNA - changing institutional arrangements require revisions only if one adopts functional elements in the SNA. Similarly, novel functions carried out by existing institutional arrangements only necessitate revisions

if a functional approach is adopted. Hence, defining a core with a high institutional content diminishes the need for revisions.

Future revisions of the SNA will, as a consequence, be easier to carry out if the approach proposed here is adopted. There will be no need for a single overall revision every 15 or 20 years. Instead most revisions will not change the core except for just adding to it (e.g. by further disaggregation), but will enlarge the collection of building blocks. Hence they can be implemented as soon as they are agreed upon, without any harm to the continuity of the central system. This way, future revisions need not be such laborious processes of further clarification, elaboration, reforming, extension, reconsideration as the current one.

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- NA/01 *Flexibility in the system of National Accounts*, Eck, R. van, C.N. Gorter and H.K. van Tuinen (1983)
This paper sets out some of the main ideas of what gradually developed into the Dutch view on the fourth revision of the SNA. In particular it focuses on the validity and even desirability of the inclusion of a number of carefully chosen alternative definitions the "Blue Book", and the organization of a flexible system starting from a core that is easier to understand than the 1968 SNA.
- NA/02 *The unobserved economy and the National Accounts in the Netherlands, a sensitivity analysis*, Broesterhuizen, G.A.A.M. (1983)
This paper studies the influence of fraud on macro-economic statistics, especially GDP. The term "fraud" is used as meaning unreporting or underreporting income (e.g. to the tax authorities). The conclusion of the analysis of growth figures is that a bias in the growth of GDP of more than 0.5% is very unlikely.
- NA/03 *Secondary activities and the National Accounts: Aspects of the Dutch measurement practice and its effects on the unofficial economy*, Eck, R. van (1985)
In the process of estimating national product and other variables in the National Accounts a number of methods is used to obtain initial estimates for each economic activity. These methods are described and for each method various possibilities for distortion are considered.
- NA/04 *Comparability of input-output tables in time*, Al, P.G. and G.A.A.M. Broesterhuizen (1985)
In this paper it is argued that the comparability in time of statistics, and input-output tables in particular, can be filled in in various ways. The way in which it is filled depends on the structure and object of the statistics concerned. In this respect it is important to differentiate between coordinated input-output tables, in which groups of units (industries) are divided into rows and columns, and analytical input-output tables, in which the rows and columns refer to homogeneous activities.
- NA/05 *The use of chain indices for deflating the National Accounts*, Al, P.G., B.M. Balk, S. de Boer and G.P. den Bakker (1985)
This paper is devoted to the problem of deflating National Accounts and input-output tables. This problem is approached from the theoretical as well as from the practical side. Although the theoretical argument favors the use of chained Vartia-I indices, the current practice of compiling National Accounts restricts to using chained Paasche and Laspeyres indices. Various possible objections to the use of chained indices are discussed and rejected.
- NA/06 *Revision of the system of National Accounts: the case for flexibility*, Bochove, C.A. van and H.K. van Tuinen (1985)
This paper examines the purposes of the SNA and concludes that they frequently conflict with one another. Consequently, the structure of the SNA should be made more flexible. This can be achieved by means of a system of a general purpose core supplemented with special modules. This core is a full-fledged, detailed system of National Accounts with a greater institutional content than the present SNA and a more elaborate description of the economy at the meso-level. The modules are more analytic and reflect special purposes and specific theoretical views. It is argued that future revisions will concentrate on the modules and that the core is more durable than systems like present SNA.
- NA/07 *Integration of input-output tables and sector accounts; a possible solution*, Bos, C. v.d. (1985)
In this paper, the establishment-enterprise or company problem is tackled by taking the institutional sectors to which the establishments belong into account during the construction of input-output tables. The extra burden on the construction of input-output tables resulting from this approach is examined for the Dutch situation. An adapted sectoring of institutional units is proposed for the construction of input-output tables. The proposed approach contains perspectives on further specification of the institutional sectors,

households and non-financial enterprises and quasi-corporate enterprises.

- NA/08 *A note on Dutch National Accounting data 1900-1984*, Bochove, C.A. van (1985)
This note provides a brief survey of Dutch national accounting data for 1900-1984, concentrating on national income. It indicates where these data can be found and what the major discontinuities are. The note concludes that estimates of the level of national income may contain inaccuracies; that its growth rate is measured accurately for the period since 1948; and that the real income growth rate series for 1900-1984 may contain a systematic bias.
- NA/09 *The structure of the next SNA: review of the basic options*, Bochove, C.A. van and A.M. Bloem (1985)
There are two basic issues with respect to the structure of the next version the UN System of National Accounts. The first is its 'size': reviewing this issue, it can be concluded that the next SNA must be 'large' in the sense of containing an integrated meso-economic statistical system. It is essential that the next SNA contains an institutional system without the imputations and attributions that pollute present SNA. This can be achieved by distinguishing, in the central system of the next SNA, a core (the institutional system), a standard module for non-market production and a standard module describing attributed income and consumption of the household sector.
- NA/10 *Dual sectoring in National Accounts*, Al, P.G. (1985)
The economic process consists of various sub-processes, each requiring its own characteristic classification when described from a statistical point of view. In doing this, the interfaces linking the sub-systems describing the individual processes must be charted in order to reflect the relations existing within the overall process. In this paper, this issue is examined with the special reference to dual sectoring in systems of National Accounts. Following a conceptual explanation of dual sectoring, an outline is given of a statistical system with complete dual sectoring in which the linkages are also defined and worked out. It is shown that the SNA 1968 is incomplete and obscure with respect to the links between the two sub-processes.
- NA/11 *Backward and forward linkages with an application to the Dutch agro-industrial complex*, Harthoorn, R. (1985)
Some industries induce production in other industries. An elegant method is developed for calculating forward and backward linkages avoiding double counting. For 1981 these methods have been applied to determine the influence of Dutch agriculture in the Dutch economy in terms of value added and labour force.
- NA/12 *Production chains*, Harthoorn, R. (1986)
This paper introduces the notion of production chains as a measure of the hierarchy of industries in the production process. Production chains are sequences of transformation of products by successive industries. It is possible to calculate forward transformations as well as backward ones.
- NA/13 *The simultaneous compilation of current price and deflated input-output tables*, Boer, S. de and G.A.A.M. Broesterhuizen (1986)
This paper discusses a number of aspects of the procedure according to which input-output tables are compiled in the Netherlands. A few years ago this method underwent an essential revision. The most significant improvement means that during the entire statistical process, from the processing and analysis of the basic data up to and including the phase of balancing the tables, data in current prices and deflated data are obtained simultaneously and in consistency with each other. Data in current prices first used to be compiled and data in constant prices and changes in volume and prices used to be estimated only afterwards. With the new method the opportunity for the analysis of the interrelations between various kinds of data, and thus better estimates is used.
- NA/14 *A proposal for the synoptic structure of the next SNA*, Al, P.G. and C.A. van Bochove (1986)

- NA/15 *Features of the hidden economy in the Netherlands*, Eck, R. van and B. Kazemier (1986)
This paper presents survey results on the size and structure of the hidden labour market in the Netherlands.
- NA/16 *Uncovering hidden income distributions: the Dutch approach*, Bochove, C.A. van (1987)
- NA/17 *Main national accounting series 1900-1986*, Bochove, C.A. van and T.A. Huitker (1987)
The main national accounting series for the Netherlands, 1900-1986, are provided, along with a brief explanation.
- NA/18 *The Dutch economy, 1921-1939 and 1969-1985. A comparison based on revised macro-economic data for the interwar period*, Bakker, G.P. den, T.A. Huitker and C.A. van Bochove (1987)
- NA/19 *Constant wealth national income: accounting for war damage with an application to the Netherlands, 1940-1945*, Bochove, C.A. van and W. van Sorge (1987)
- NA/20 *The micro-meso-macro linkage for business in an SNA-compatible system of economic statistics*, Bochove, C.A. van (1987)
- NA/21 *Micro-macro link for government*, Bloem, A.M. (1987)
This paper describes the way the link between the statistics on government finance and national accounts is provided for in the Dutch government finance statistics.
- NA/22 *Some extensions of the static open Leontief model*, Harthoorn, R. (1987)
The results of input-output analysis are invariant for a transformation of the system of units. Such transformation can be used to derive the Leontief price model, for forecasting input-output tables and for the calculation of cumulative factor costs. Finally the series expansion of the Leontief inverse is used to describe how certain economic processes are spread out over time.
- NA/23 *Compilation of household sector accounts in the Netherlands National Accounts*, Laan, P. van der (1987)
This paper provides a concise description of the way in which household sector accounts are compiled within the Netherlands National Accounts. Special attention is paid to differences with the recommendations in the United Nations System of National Accounts (SNA).
- NA/24 *On the adjustment of tables with Lagrange multipliers*, Harthoorn, R. and J. van Dalen (1987)
An efficient variant of the Lagrange method is given, which uses no more computer time and central memory than the widely used RAS method. Also some special cases are discussed: the adjustment of row sums and column sums, additional restraints, mutual connections between tables and three dimensional tables.

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