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AN ECONOMIC CORE SYSTEM AND THE SOCIO-ECONOMIC ACCOUNTS MODULE FOR THE NETHERLANDS

BY COR GORTER AND PAUL VAN DER LAAN

Netherlands Central Bureau of Statistics

In this article the authors discuss some elements of the structure of an overall integrating system of economy-related statistics. First of all attention is paid to the core of such a system. Next, the various types of modules which could supplement this core are described. Modules with a social connotation are discussed with the help of the Socio-economic Accounts which have been developed recently in the Netherlands. Finally, the link between the Socio-economic Accounts and the National Accounts Core System is addressed and numerically illustrated.

1. INTRODUCTION

The United Nations System of National Accounts (SNA), which finds its first expression in the 1947 report on the Measurement of National Income and the Construction of Social Accounts, has been developed and modernized step by step over the years. In the 1968 revision for example, a firm linkage with input-output analysis was established and a matrix representation of the System was designed in order to make it possible to grasp the System as a whole without losing sight of its components. The current revision of the System will include, among other things, a more thorough connection with financial statistics and greater emphasis on the flexibility of the System. This evolution has been spurred by developments in economic theory, the demand for better forecasting and more effective government policy.

Since the late sixties the urge for further development of the National Accounts has been voiced by many parties. From the academic side, welfare economists have pleaded for additional data on household activities and alternative classifications which would allow for the phenomenon of "regrettable necessities." There is a wide support for the introduction of additional information on the environmental aspects of economic behaviour. More detail is requested in order to enhance the link with microeconomic data and concepts. The need for guidelines on the differentiation of the household sector has become evident. Increasingly the pressure is felt to arrange various kinds of monetary, quantitative and qualitative information on the objects of government concern in a systematic way.

How can the System cope with all these demands? In our view, the time has come to take an essential step forward in the co-ordination of many, maybe all, present-day statistics. This task exceeds by far the traditional field of the National

Note: The authors are staff members of the Netherlands Central Bureau of Statistics (at the Department for National Accounts and the Department for Social Accounts, respectively). The opinions expressed in this article do not necessarily coincide with the views of the Netherlands CBS.

Accountant. On the other hand, it is clear that the National Accounts have a crucial role to play.

In this paper, we want to treat some of the problems indicated above. A tentative answer is given by the use of an economic Core System. The properties of such a Core are investigated in section 2. This section also contains a numerical example of the sectoral information to be included in the Core. Next discussed are the types of modules that could be constructed around the Core, thus creating an extended but flexible system of integrated statistical data which offers the opportunity for carrying out many different types of analysis. Quite independent of the Core/module concept, the Netherlands CBS has been developing so-called Socio-economic Accounts. It turns out that these Accounts fit well in the theoretical framework of an extended system of statistics, in particular bridging the gap between conventional *National Accounts* and household income and expenditure statistics. The Socio-economic Accounts are outlined in section 4. The links between these Accounts and the *National Accounts* are discussed in section 5. Section 6 contains some numerical results.

2. Main Features of a Core System

2.1. *Introduction*

One could try to develop linkages between economic, social, demographic and environmental data from a purely abstract, theoretical point of view. This approach would possibly result in a conceptually elegant overall system of statistics. However, that road is a very intricate and even a slippery one as it is not self-evident that at the end of the day a system would emerge that could be implemented in practice. Therefore, it is advisable to follow the steps of Sir Richard Stone and approach the question from a more realistic point of view: start out from what has been established and try to develop the system gradually on that foundation.

This approach implies that the SNA, which is the most extensive and generally applied integrating framework, be it principally of economic signature, is chosen as a starting point. Nevertheless, it is advisable to scrutinize this System in order to be entirely sure that it is suited for its new task. In the following subsections the scope, the transactors and the transaction classification of the SNA will be discussed in this light. The last part of section 2 contains a numerical example of a somewhat simplified SNA.

2.2. *Scope*

At many instances, Richard Ruggles and Nancy Ruggles have argued that the present-day SNA is too complicated and that the link between the macro description of the economy and micro statistics should be improved. Indeed it appears to us that the position of the SNA would be greatly enhanced if current conventions were simplified, in particular with respect to its imputations and re-routings. (Imputations are non-monetary extentions of the transaction boundary; re-routings imply the registration of transactions with other units than the

payer and receiver of the relevant monetary sums.) A number of arguments can be given.

First, the behaviour of the economic agents is for the greater part determined by readily observable facts of life, to which imputations and re-routings clearly do not belong. Second, respondents to statistical surveys, in particular households, are usually not able to furnish any information on the flows imputed to them. The resulting necessity to make corrections on the household data constitutes a perpetual nuisance in compiling statistics. Third, the intelligability of many variables in the SNA is seriously reduced by imputations and re-routings. Even specialists sometimes have difficulties in interpreting figures which include these elements. Finally, it is important to draw a clear dividing line between flows which can be valued precisely and flows of which the value is more or less arbitrarily set, although one should not be too dogmatic on this subject.

This last remark deserves some further explanation. In fact, only a small part of the SNA transactions and virtually no information on balances can be valued directly. This may be illustrated by Table 1 which gives an overview of the economic phenomena which can be described by statistics that use money as the unit of account. Questions on precise boundaries, detailed classifications, etc. are disregarded. Neither are commitments listed.

The items listed in Table 1 are divided into two main categories: those pertaining to a point in time (situations) and those occurring in a period of time (events). A partial registration of economic situations is contained in the balance sheets anticipated by the 1968 SNA. Economic events may be divided in two classes. First of all there are events which are induced by units (however defined); these are usually registered in the flow accounts. Secondly, there are events which are not brought about by some human action. In accordance with the terminology of the current SNA revision these latter are designated as "other events."

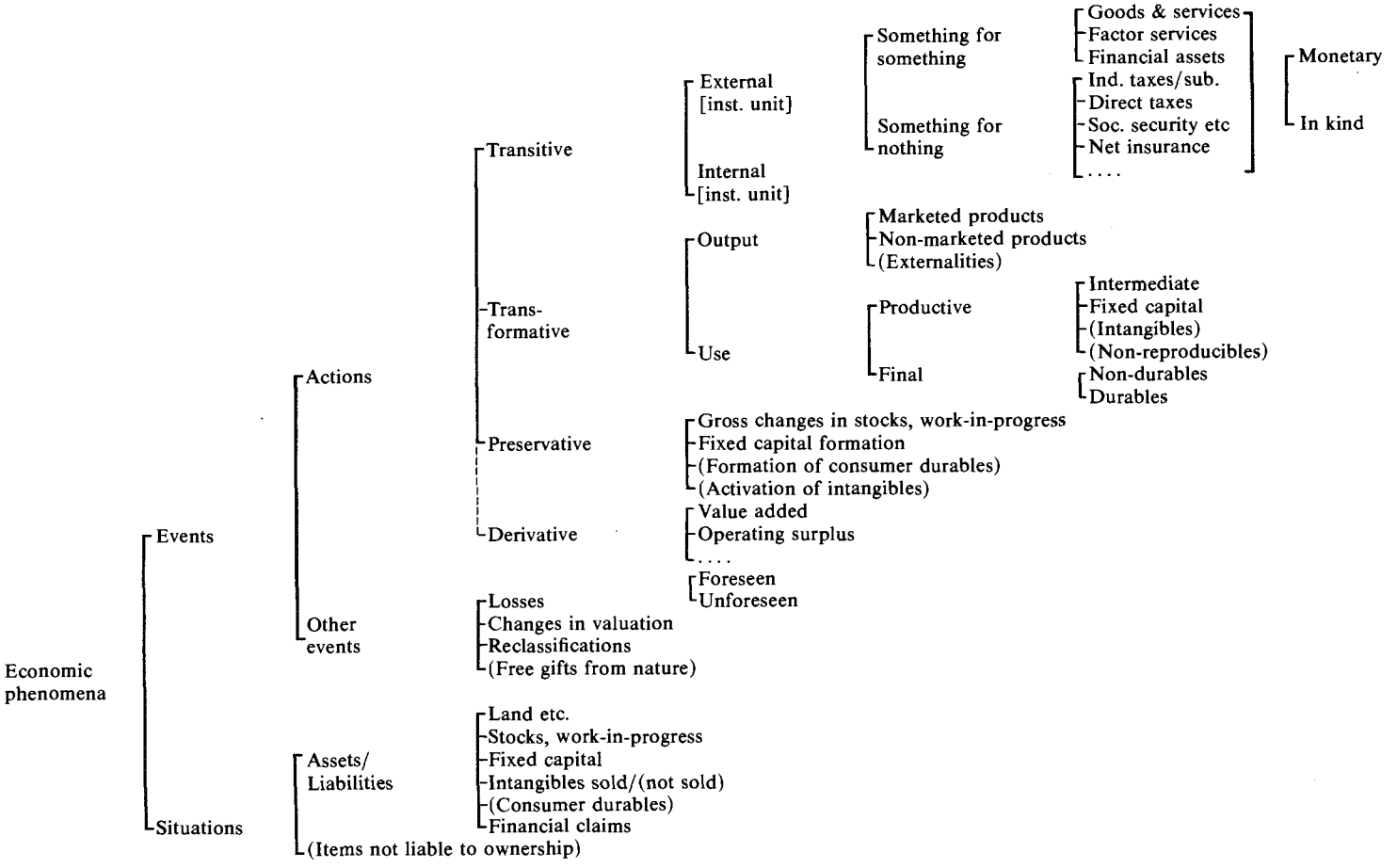
Human actions can be further classified into three main categories: *transitive*, *transformative* and *preservative* actions. The first type concerns "trans" actions in the true sense of the word because they involve the transfer of an economic good from one unit to another unit. These type of actions describe the changes in ownership or possession of economic values. Totally different in character are the transformative actions, i.e. those activities by which goods and services are created or consumed. The difference in time between the moment in which economic goods become available by means of purchase or production and the time of disposal through sale or consumption is reflected in the third type of action, here dubbed "preservative." In Table 1 still another type of action is defined, but this should not be seen as an independent category because its value is calculated exclusively from information on the three types listed above. Examples are balances like Operating Surplus and Saving.

The "Other events" in Table 1 are changes which are not due mainly to explicit acts of recognizable transactors. Some, like earthquakes may be seen as "acts of God." Other ones, like the occurance of bad debts and price changes are at least to a certain extent the result of human behaviour.

From Table 1 it can be read that only those transitive actions which involve a monetary settlement have verifiable exchange values. Even these may not be fully acceptable, for example when the transfer of an economic good and the

TABLE 1

GENERAL TABLE OF ECONOMIC PHENOMENA



Note: Items between round parentheses are not included in the present system of National Accounts and Balances.

related monetary settlement(s) lie far apart in time or when some special relationship exists between the transaction partners involved (transfer pricing). The value of *all* other flows and stocks have to be approximated by comparison with monetary transitive transactions.

Considerations on valuation may lead to the wish to restrict the registration in the System to monetary transactions alone. This, however, is not acceptable. The scope of the System would be too limited in respect to most kinds of economic analysis. The ultimate raison-être of any statistics is its usefulness and not the simple measurability of the phenomena it covers. The anomaly with which we are confronted here can be remedied by the careful introduction of two types of supplements to monetary transitives.

First, the transformatives "intermediate consumption" and "output" can be added if at some instance they are associated with monetary transactions. This supplement considerably improves the description of the production processes of market goods and services owing to more correct timing. It furthermore implies that the output of government and private non-profit institutions are registered in the System. In both cases reasonable valuation on the basis of actual payments seems feasible.

Second, a further improvement can be achieved by enhancing the homogeneity of the description of the production process. This implies that some flows within legal units are taken into account. Generally, such flows cannot be valued easily. Additions of this type should therefore be restricted to those cases in which the description of the production processes solely on the basis of monetary flows would seriously impair the usefulness of the statistical results. The far-reaching acknowledgement of intra-institutional flows and reallocations concerning secondary products as a consequence of the use of homogeneous production units certainly has to be avoided in a Core System. The careful application of the establishment-type unit as recommended in the 1968 SNA appears to constitute a reasonable middle course between analytical needs and requirements of data reliability.

In order to be somewhat more precise as to the consequences with respect to the economic units in the System, we suggest that in the following three cases it should be permitted to split legal units into smaller economic units and thus to widen the transaction boundary in the core System beyond monetary transactions and related productive transformative actions:

—a corporate enterprise produces very different types of goods and services and there is enough statistical data available to describe the underlying production processes separately;

—a government institution produces goods and market services of considerable value;

—a household runs an unincorporated enterprise.

(Of course, splitting is inevitable when a legal unit is active in more than one economy.)

The conclusions of the discussion in respect to the transaction boundary is recapitulated in Table 2.

If the scope of transactions is restricted along the lines suggested above and if those transactions are registered with the units actually involved in the monetary

TABLE 2

THE TRANSACTION BOUNDARY IN THE CORE SYSTEM

Kind of transactions	Remarks
1. Transitive actions with a monetary settlement	Verifiable exchange values
2. Transformative actions which at some stage are connected with a monetary settlement	Serve the description of creation and goods and services
3. Preservative actions connected with actions of type 1 and 2	Account for the timing difference between transitive and transformative actions
4. Intra-institutional transitive flows; division of successive production processes according to establishment units	Allows for a more homogeneous description of the production process; problems related to valuation
5. Preservative actions connected with the introduction of type 4 actions	
6. Various derivatives constituted from the actions of type 1 through 5	

Note: See section 2.4 below for a further discussion.

settlements, the problem of imputations and re-routings would be solved for the greater part without applying major alterations to the SNA.

2.3. *Transactors*

The delineation of the scope of the flows included in the core System is interdependent with the definition of transactors. In the previous subsection a number of non-monetary flows which occur within legal units were defined which improve the description of the production process. This implies that legal units may be split into a number of smaller economic units.

Such a breakdown leads to a nasty problem. In most cases, the sub-legal units thus defined are irrelevant when describing the various financing processes. Neither is it feasible to gather data on these processes for enterprise-type units. This implies that *two* types of units must be included in the Core: one relevant to the production process and one relevant to the financing process. It can be deplored that it is not possible to employ one single type of transactor in the Core, but a limitation to either one would severely handicap the analytical value of the System.

Of course, the interrelation between the two types of units should be made very clear. The 1968 SNA does not recommend a link between the classification of total value added by groups of producer units and by institutional sectors otherwise than at the most aggregate level. The reason is purely a practical one (United Nations, 1968, section 2.31). The obstacles which prevented a recommendation in 1968 for a direct interaction of these two classifications are removed by now. The introduction of a three-dimensional table in the revised SNA in which the elements of value added are classified according to activity and sector should also be part of the Core System.

It is an interesting feature that in social statistics an analogous problem occurs. Some processes pertain to individuals, while households are the principal units with respect to other processes. The parallel goes even further. The transition

from economic units relevant to the production process to units relevant to the financing process is made at the point where the description of both processes meet, that is to say, in the distribution of income. The contribution of the household sector to the processes of income generation is mainly determined by individual factors, but its consumption and financial decisions mainly apply to the household as a whole. These two kinds of processes meet equally at some stage in the distribution of income (direct taxes for example, usually, but not always, apply to households units). In other words, the description of the income distribution process is essential both to economic and social statistics. In a Core System it is preferably specified according to four types of units: *establishments, institutional units, individuals* and *households.* The analysis of interactions between various economic and social processes would be enhanced if it were possible to link income data on these types of units at a very detailed level.

2.4. *Transaction Classifications*

The next question which should be addressed is whether the transaction classification in the SNA is adequate for serving in a Core System. The basic classification of economic transactions can be derived directly from the four archetypes of economic function: *output, consumption, distribution* and *financing.* A subdivision of these functions is more problematic—for example, the distinction between intermediate and final consumption. In the end the decision is a subjective one. Stone remarked in 1947: "It seems clear that what is normally regarded as a net benefit is dependent on social valuations and changes as these valuations change. Thus, for example, the existence of pit-head baths at a coal mine would, a hundred years ago, have been something quite exceptional, in no sense a cost of doing business, and would doubtless have been regarded as a net benefit to the employee rather than as a compensation for the particular disadvantages of his trade. Nowadays, perhaps, the matter would be differently regarded, as such amenities would hardly be regarded as income in kind" (Stone, 1947, p. 57). Particularly welfare economists and business accountants have made clear that there is no such thing as a general accepted interpretation of flows, not even in the short run.

A number of conclusions can be drawn from this observation. A first conclusion is that every classification of transactions necessarily is a *subjective* one, liable to changes in individual appreciation in time and space. This implies that there is no such thing as an objective system of National Accounts, or for that matter, Core System. Another consequence is that, where opinions differ, the statisticians must allow for reinterpretation of the statistical results.

There are two main ways in which the flexibility of a system can be improved in this respect. One way is to extend the transaction classification. By further specification for example, the "instrumental" character of some outlays can be shown. Another option is the introduction of a multiple classification of transactions. But how should this be done?

The concept of "function" which constitutes the basis of the transaction classification in broad economic categories, gives little support when one tries to use it for a more detailed classification. Sometimes the functional aspect is

too vague. As a result, for example the specification of the function of production in different types of activities is probably based more on practical considerations than on functions derived from economic theory. Equally, the classification of transactions sometimes tends to intertwine with those of the *objects* of transactions (types of goods, financial items, etc.).

On the other hand, complications arise when more than one single functional category may be applicable. The options may exclude one another or overlap. An example of the first type is government subsidies, in respect to which it is hard to tell whether the purpose is supporting consumers' purchasing power, stimulating the output of particular products (e.g. for health or military reasons) or granting an income to producers. The overlapping type may be illustrated as follows: a person writes in order to make a paper in order to improve statistics in order to make better models in order to conduct economic policy in order to win the next elections for the government. So what is that person doing: writing, making statistics, practicing economic science, preparing for economic policy or defending the sitting cabinet? This "matrusjka"-type problem occurs both in social and economic statistics and it is both cause of requests for further "functional" data (on education, on R&D, etc.) which cannot be found in the more global statistics and a continuous fight on the definition of various types of units. It may be observed that the solution of applying double transaction classifications is not easy to be implemented. Nevertheless, it seems worthwhile to experiment with the Purpose classification of business (COIP), which can be seen as an effort in this direction.

One measure which improves the flexibility in the System considerably at virtually neglectable costs is the use of *many* alternative definitions with respect to the derivatives. In subsection 2.2 it was argued that derivative transactions are balances defined for the convenience of analysis. The most important and debated derivative transaction is the concept of "income" (notably the profit element in it). Often the balances in the present National Accounting systems are already defined with some alternatives: gross or net, at market prices or at factor costs, etc. This flexible character of derivatives should be given more weight in the System. Of course, it is advisable to choose a particular set of derivative transactions as the central concept, so as to avoid confusion with non-specialized users.[1]

2.5. *An Example of the Sectoral Information in the Core*

On the basis of the discussion in the sections above, an example of the information concerning institutional sectors in the Core may be given (Table 3). The figures, which relate to the 1984 National Accounts for the Netherlands, are derived from Gorter (1988). The four types of actions are treated separately. The transitive actions of the institutional sectors form a closed set which answers to

[1]Several well-known derivative transactions cannot be assessed as a balance in a set of co-ordinated accounts without the introduction of re-routings. For example, the operating surplus as defined in the SNA contains a number of elementary flows which pertain not only to the process of income generation but also to other processes. Examples are employers' contributions to social security funds and pension funds. If these flows are to be recorded in the income generation account *and* in the income distribution account or capital finance account, they need to be re-routed via the household sector.

TABLE 3

INDICATION OF SECTORAL INFORMATION IN THE CORE SYSTEM, NETHERLANDS, 1984

			NF Disburse-ments	FE	GG	HH	Domestic	Row	Total	NF Receipts	FE	GG	HH	Domestic	Row	Total
Transitive transactions			min gld													
A	1.	Goods & serv. on the market[1]	393,020	10,200	63,960	200,580	667,760	240,690	908,450	656,790	27,270	4,290		688,350	220,100	908,450
A	3.	Wages	120,310	7,920	37,990		166,220	1,270	167,490				166,370	166,370	1,120	167,490
A	4.	Entrpr. & property income	98,220	43,250	30,940	12,580	184,990	29,600	214,590	27,870	70,410	33,610	52,450	184,340	30,250	214,590
A	4.1	Entrpr. inc. from uninc. ent.	(30,980)				(30,980)		(30,980)				(30,980)	(30,980)		(30,980)
A	4.2	Withdrawls from quasi-c. ent.	(4,700)	(170)			(4,870)		(4,870)		(1,470)	(3,400)		(4,870)		(4,870)
A	4.3	*Interest*	(29,710)	(40,260)	(30,670)	(12,500)	(113,140)	(23,600)	(136,740)	(6,110)	(82,610)	(11,310)	(14,610)	(114,640)	(22,100)	(136,740)
A	4.4	Corr. banking services								(16,420)	(−16,420)			(0)		(0)
A	4.5	Dividends, rents	(32,830)	(2,820)	(270)	(80)	(36,000)	(6,000)	(42,000)	(5,340)	(2,750)	(18,900)	(6,860)	(33,850)	(8,150)	(42,000)
A	5.	Indirect taxes	45,540	830	420		46,790		46,790			46,790		46,790		46,790
A	6.	Subsidies			12,610		12,610		12,610	12,600	10			12,610		12,610
A	7.	Direct taxes, fees, fines	8,900	1,400		44,030	54,330	0	54,330			54,330	0	54,330		54,330
A	8.	Social security contr.	25,280	1,410	5,030	51,140	82,860		82,860			82,860		82,860		82,860
A	9.	Social security benefits			57,960		57,960		57,960				57,260	57,260	700	57,960
A	10.	Social assistence grants		140	20,150		20,290		20,290				20,290	20,290		20,290
A	11.	Current p. & l.i. premiums	5,830	820	3,100	8,560	18,310	190	18,500		18,480			18,480	20	18,500
A	12.	Current p. & l.i. benefits		12,790			12,790	110	12,900				12,360	12,360	540	12,900
A	13.	Current transfers nec			72,160	2,510	74,670	6,220	80,890		140	67,360	4,410	71,910	8,980	80,890
A	14.	Lump-sum p. & l.i. premiums	2,210	0	740	1,480	4,430		4,430		4,430			4,430	0	4,430
A	15.	Lump-sum p. & l.i. benefits		2,580			2,580	0	2,580				2,580	2,580	0	2,580
A	16.	Capital transfers	1,150	0	14,770	1,430	17,350	620	17,970	9,820	130	5,720	1,190	16,860	1,110	17,970
A	17/18.	Land, intngbls, net lending	6,620	39,530	−24,870	−5,400	15,880	−15,880	0							
			out							in						
Transformative transactions																
B	1.	Output	665,570	29,440	71,490		766,500									
B	2.	Intermediate consumption								351,130	8,690	22,170		381,990		
B	3.	Final consumption									3,240	97,800	200,580	301,620		
Preservative transactions																
C	div.	Net incr. stocks & w-i-progress								1,990				1,990		
C	3.	Cons. of fixed capital	34,520	350	2,620		37,490									
C	7.	Fixed cap. formation purchases								46,310	440	10,550		57,300		
C	8.	Fixed cap. formation own acc.								2,370		640		3,010		
Derivative transactions (example)																
Gross Domestic Product (mp) in the Core (B1-B2)			(314,440)	(20,750)	(49,320)		384,510									

[1]Trade transactions are not registered gross.

the rules of double bookkeeping. The transformative and preservative actions can be regarded as entries on two special accounts relating to mutations in goods and services. The derivatives shown in Table 3 are only examples, as this type of item constitutes an open-end category.

The transaction classification in Table 3 differs slightly from the usual SNA classification but is easily converted into it. In several transactions relating to goods and services an explicitation of intra-institutional flows is applied (similar proposals are made e.g. in Stahmer, 1988; Schäfer and Stahmer, 1988). Purchases and sales of commodities, which are ture transactions, are distinguished from their destination (additions to stocks, intermediate consumption, etc.) and origin (stocks, output). The latter are accounted for by transformative and preservative actions. Lack of data may necessitate equating the timing of some of the transformative transactions at the moment the relevant purchases and sales are made. So, for the sake of simplicity no stocks of products with the consumers are introduced. Sales and purchases of commodities are recorded at purchasers' values. The SNA concept "compensation of employees" is regarded as a derivative transaction, encompassing wages paid to employees plus employers' contributions paid to social security and pension institutions. This method of registration avoids the necessity to re-route employers' social contributions via the household sector.

In Table 3 imputations and re-routings have been omitted as much as possible. Corrections in this respect relate in particular to:

—Employers' social contributions. Social security and pension benefits paid by employers are registered as direct payments to the relevant institutions. Unfunded employee welfare benefits are entered as Wages.

—Owner-occupied dwellings. Relevant intermediate consumption is reclassified as final consumption. Other corrections encompass inter alia the conversion of indirect taxes to direct taxes.

—Transfers in kind in respect to wages, social security, social assistance, and gifts to and from the Rest of the World. The goods and services concerned are reclassified as consumption of the institution that pays for them. These corrections account for a rise of final consumption of general government to 47 percent if compared with present SNA conventions.

—Pension funds and life insurance companies. The transaction Imputed rent, which previously accounted for more than 57 percent of property income of the household sector, is removed. In addition, a distinction between current and lump-sum premiums and benefits is introduced. The consumption of the services of pension funds and life insurance companies is registered with the financial institutions themselves.

—Processing trade with the Rest of the World is registered net as a service item instead of gross in merchandise imports and exports. Accordingly, total imports and exports are adjusted downwards to somewhat more than 4 percent.

—Registration of imports and exports at purchasers' prices.

—Gross registration of transactions within the general government sector. (Netting can be regarded as a negative imputation.)

Also, a number of adjustments are made for imputations and re-routings which are particular to the Dutch *National Accounts.*

At the bottom of Table 3, an example of a derivative transaction is given. Gross Domestic Product at market prices is nearly 4 percent lower in the Core than according to SNA conventions, which is mainly due to the deletion of the imputation for owner-occupied dwellings.

3. The Modules in an Extended System

A "module" in an extended system of statistical data on economic, social and environmental phenomena can be defined as a coherent set of statistical information which can be linked directly to the central System and which enables a more profound analysis of the object studied than is allowed for by the standard summary of transactions. The nature of such information may be very diverse. One may think of the volume and price components of the flows registered in the Core. For certain purposes the scope of the transactions may be widened by introducing imputations. A more detailed or alternative transaction classification may facilitate certain types of economic analysis. Data on stocks and revaluations often are indispensable supplements to figures on flows. Sometimes, both monetary and non-monetary information are required.

It is not an easy task to give rules on how such information should be grouped into logical and practical modules around the Core System. Yet, it should be tried, as there is much to be gained from a coherent approach. A number of tentative suggestions is made here.

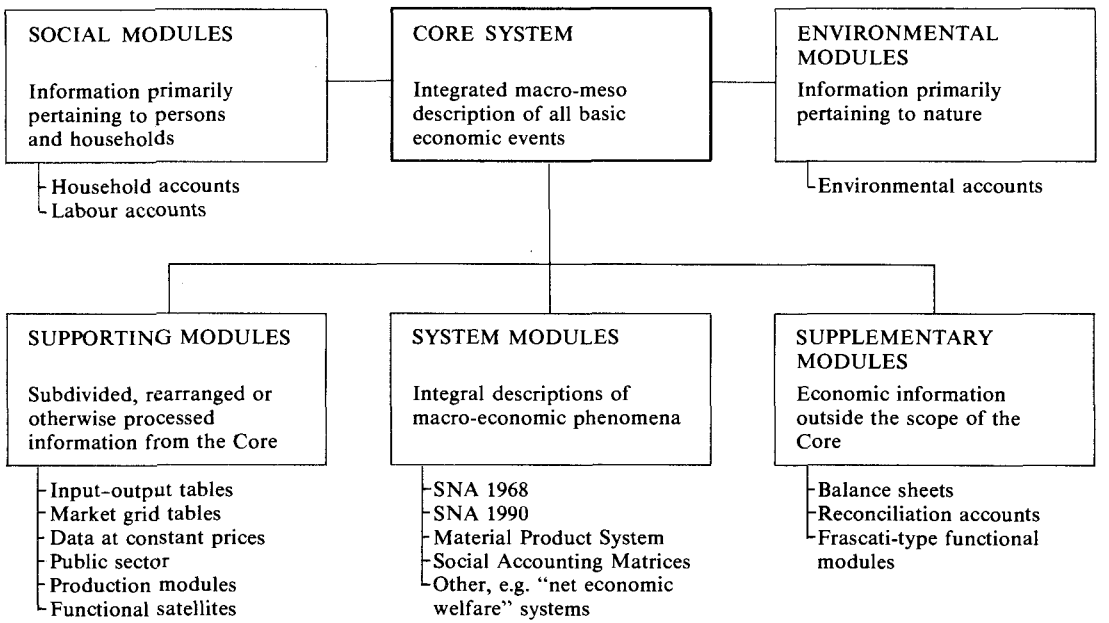
In distinguishing various types of modules, the terminology of the SNA is taken as a starting-point. The 1968 SNA contains a classification of information according to importance. Going from the highest order downward there are standard accounts, standard supporting tables; supplementary classifications, sets of accounts and tables; and finally the somewhat amorphous group of supplementary entries, memorandum items and supplementary memoranda. The standard accounts delineate the basic features of the System and furnish guidance concerning the presentation of the System's main series. Standard supporting tables portray certain limited facets of the System, for example, the schemes of detailed classification. Supplementary data are constituted by information which does not fit exactly into the structure of the System, but is important enough to be reported regularly.

This classification of data is reflected in Table 4, which furnishes a blue-print for the organization of data in an enlarged system of economy-related statistics. Naturally, the central position in such a system is occupied by the Core. Without pretence to being exhaustive, it appears to be convenient to distinguish between modules which contain primarily information on persons and households, on the environment and on economic matters. These three types are situated respectively left, right and under the Core System in Table 4. Classified as *Social modules* are the Household Accounts and Labour Accounts. There are three types of economic modules distinguished in Table 4: Supporting modules, System modules and Supplementary modules.

Information which falls in principle within the transaction boundary of the central System and implies a subdivision, rearrangement or a processing of the data thereof is classified as *Supporting modules.* In Table 4 a number of probable

TABLE 4

A SYSTEM OF ECONOMY-RELATED STATISTICS



Supporting tables is shown. First of all there are the various types of input-output tables (excluding the make and use tables, which are included in the Core). Some of these are absolutely necessary for the purpose of economic analysis and should be considered mandatory. Market grid tables, a translation of German term "Marktverflechtungstabelle," are tables in which the true transactions of sectors are specified according to the sectors involved. Of course, the module containing *National Accounts* data at constant prices is mandatory as well. This information is a regular component of the present-day SNA. This applies equally to data on the public sector. Production modules (economic satellites in the French terminology) are modules with additional classifications and quantitative information which are directed on the specification of a particular production process and related processes. A good example of a production module is constituted by the Eurostat Economic Accounts for Agriculture and Forestry.

Functional satellites are an important and very useful type of module which were developed by the French INSEE (see e.g. Vanoli, 1986; Lemaire, 1987). Starting out from a "characteristic activity" (cf. Teillet, 1988), a description is given of the production, beneficiaries and the financing of a group of goods and services. As there is the possibility of adding non-monetary data, these satellites contain all the information a policy-maker could wish to have on a particular field of interest. Yet, from a systematical point of view, the French functional satellites have a serious flaw: there are overlaps which prevent the proper adjunction of detailed information contained in two modules. This drawback can be met by the adoption of two conventions. Firstly, the starting point should be a functional consumption category, such as food, clothing, housing, health, etc., rather than a characteristic activity. Secondly, the production process should (in the first instance) not be broken down into sub-processes that imply a widening of the production boundary. Modules which answer to these two conditions are listed in Table 4 under the heading of *supporting modules*. It must be admitted, though, that descriptions of sub-processes of production (among which ancillary activities) can be very useful. An example is the so-called Frascati Manual which furnishes recommendations with respect to research and development. This type of module, rather confusingly often also designated as functional, is considered as a species of Supplementary modules in Table 4.

The *System modules* of Table 4 concern integral descriptions of macro-economic phenomena, differing in the transaction boundary, classifications, valuations, etc. from the data in the central System. Typically, in this category come the various international reporting systems. Those systems often contain imputations and re-routings in order to promote the comparability of data from countries with different institutional settings.

Supplementary modules contain economic information which lies clearly outside the scope of the data recorded in the Core. Above, the Frascati-type functional modules were mentioned as Supplementary modules. In those modules, functions are assessed to some flows within establishments. This implies an essential widening of the production boundary as defined in the Core. Well-known other supplementary modules are the "Other events" accounts and the balance-sheets. These modules supplement the information on transactions and surely must be considered mandatory. Balance-sheets are an important element in the

analysis of economic behaviour. Revaluations and volume losses are closely connected with conceptions of profits and holding gains, and so with the concept of income. For certain types of business accounting and probably also for national accounting (cf. Van Bochove and Van Sorge, 1989), derivative transactions should also include events which are not due to actions of units.

4. Socio-economic Accounts as a Social Module

4.1. *Introduction*

It has been pointed out in section 3 that around the economic Core a number of modules can be constructed. Among these is the group of Social Modules which primarily contain information on households and persons. In the remaining part of this article the authors focus on the Dutch Socio-economic Accounts, which may be regarded as an example of such a Social Module. As the Socio-economic Accounts were developed independently of the Core/module concepts, first some historical background will be given. Next, the outlines of the Socio-economic Accounts will be sketched, followed by a discussion of the links with the Core and a table with some numerical results.

Several years ago the Netherlands Central Bureau of Statistics decided to undertake the development of a full-fledged System of Social Accounts, capable of serving a broad spectrum of demographic, social, and economic research. The term "Social Accounts" is used in the Netherlands to specify a statistical framework comparable with what is internationally known as a "Framework for the Integration of Social and Demographic Statistics" (cf. United Nations, 1975). Given the complexity of this project (cf. e.g. Stone, 1971; United Nations, 1975, 1977a and 1979; Saunders, 1985), the Social Accounts will be developed gradually from statistical sub-systems according to different aspects of the quality of life of the population. Operational aspects in this context include "demography," "labour," "economy" (including, *inter alia*, income, consumption, wealth, and social security), "traffic," "politics and government," "justice and security," "culture and recreation," "education and science," "health and welfare," and "environment."

At present, two partial systems are elaborated upon at the Department for Social Accounts, namely a set of *Socio-demographic Accounts*, principally focusing on population movements (see e.g. Koesoebjono *et al.*, 1989; CBS, 1989 and 1990), and a set of *Socio-economic Accounts* principally focusing on the economic well-being of the population (see e.g. CBS, 1988; Huigen *et al.*, 1989; Van der Laan, 1992). In a next stage, the statistical interrelation between these two systems is to be consolidated further. The intended System of Social Accounts in the Netherlands should embrace the current Socio-demographic Accounts, the current Socio-economic Accounts, and also Time-use Accounts. The last, however, still have to be developed. In addition, the development of a system of Labour Accounts has recently started (see e.g. Bos *et al.*, 1988). Moreover, systems of Educational Matrices and of Health Statistics have already been developed at The Netherlands CBS some years ago (see e.g. Smulders, 1980; Bonte and Van Son, 1988).

4.2. *Outline of the Socio-economic Accounts*

The Socio-economic Accounts (SEA) provide a comprehensive description of income and outlay for about 50 subgroups of the population. This description is attained by implementing the premises of an accounting system. The system of accounts of the SEA consists of an income account and a use of income account. In these accounts all economic transactions incurred by households are recorded. The Dutch SEA correspond to a high degree with a set of accounts which is often described as "Household accounts" (see particularly United Nations, 1977b), or with the household part of a Social Accounting Matrix.[2] In this subsection the SEA will be described in broad outlines.

The purpose of the SEA is to provide a quantitative statement, which in a systematic and consistent way describes how the *socio-economic process* takes place yearly. Socio-economic process is understood as the economic process, *as far as the population*—consisting of persons and households—*participates in it.* Persons and households are distinguished according to socio-demographic and socio-economic characteristics. The aspects of the socio-economic process described in the SEA relate in particular to the acquisition of income and property, income distribution and redistribution, consumption of marketed goods and non-marketed goods, non-market activities such as voluntary work and household production, and the distribution of wealth. Moreover, the interactions between the population and organizations in society (enterprises, government and such) play a part as well. Also the role of demographic factors in the socio-economic process is a point for attention in the SEA.

The size and distribution of economic welfare among members of the population is set out in the SEA on the basis of the total acquisition of goods and services by the population, i.e. *individual* consumption of both marketed and non-marketed output (the latter also including goods and services which are the yield of household activities not covered in the SNA), where the population is distinguished by subgroups relevant to the description of the distribution in question.[3]

In the accounts of the SEA, the generation of income, distribution and redistribution of income, saving and capital accumulation, and distribution of wealth are described for population subgroups. The accounting structure is generally based on the so-called transactor-transaction principle, and the following two conventions:

—the *economic identity* between income ("receipts") on the one hand, and final consumption expenditure plus saving ("disbursements") on the other (i.e. for every income there is a corresponding outlay);

—the *accounting identity* that changes in wealth—defined as the difference between the stock of wealth at the beginning of the period in question

[2]See for a recent exposition on Social Accounting Matrices, e.g. Keuning and De Ruijter (1988) or Pyatt (1988). Keuning and De Ruijter (1988, p. 73) apply the term Socio-economic Accounts to a more wide-ranging system than the Dutch SEA.

[3]Naturally, we are well aware that by doing so we are substituting a measure of consumption for a measure of economic welfare. So, economic welfare is considered that part of human welfare which results from the consumption of goods and services.

and the stock of wealth at the end of that period—are the result of receipts and disbursements ("flows") during that period, after adjustments for any revaluations ("capital gains and losses"). The length of the accounting period in the SEA is the same as in the SNA, i.e. one year.

5. Links Between the National Accounts and the Socio-economic Accounts

It is obvious that the link between the Core System and the Socio-economic accounts is vital for analytical purposes. The role of the SEA as a Social module is, besides supplementing the central economic System, above all to provide a framework for the micro-macro linkages of statistical data on the household sector. Recent contributions have stressed the importance of this linkage (notably Ruggles and Ruggles, 1983 and 1986).

It hardly needs explanation that the link between the SEA and the present-day SNA is rather cumbersome. To maintain the link between the results of the SEA for the total population and the household sector in the National Accounts three so-called intermediary funds had to be introduced in the compilation process of the SEA, i.e. "private non-profit institutions," "pension and life insurance," and "medical consumption."

In the present-day Dutch *National Accounts*, the *private non-profit institutions* are included in the household sector. However, in the view of the SEA these institutions do not belong to the population as such. For that reason, the transactions of private non-profit institutions incorporated in the household sector in the National Accounts are estimated and attributed to a separate intermediary fund in the SEA. Consequently, the contributions of households to private non-profit institutions need to be introduced. In the SEA, these voluntary contributions are recorded as final consumption expenditure rather than recorded as current transfer, because, from the point of view of the household, the goods and services received from these institutions are to a high degree comparable to the goods and services defined as final consumption expenditure of households in the SNA.

Also the treatment of *pension and life insurance* in the SNA gives rise to differences between the SEA and the SNA. As is well-known, the SNA treats the wealth of life insurance companies and pension funds as if it is owned by households. This implies that pension and life insurance premiums (with the exception of the so-called service charge) are treated as saving by the household sector, and pension and life insurance benefits as dissavings. Consequently, the total amount of the property income received by pension funds and life insurance companies is distributed to the households in the form of imputed interest (cf. United Nations, 1968, sections 6.36–6.40 and 7.95–7.98; see also Ruggles and Ruggles, 1983, for a critical discussion and alternative solutions). In the SEA, these transactions are treated more in accordance with the perception of households. The pension and life insurance premiums are treated as a negative component of disposable income, and the pension and life insurance benefits as a positive component of disposable income. The imputed interest on pension and life insurance reserves does not enter the income accounts of the SEA at all. To

achieve this, an intermediary fund "pension and life insurance" is introduced in the SEA, which receives the pension and life insurance premiums from households and the imputed interest on pension and life insurance reserves, and which pays the pension and life insurance benefits to households. The "savings" of this intermediary fund reflect the increase in net equity of households in pension funds and life insurance reserves.

Finally, the attribution of *medical consumption* financed by public or private health insurance to the household sector in the present-day Dutch *National Accounts* causes a difference in registration between the SEA and the household sector. In the Dutch *National Accounts*, medical expenses by households reimbursed by public health insurance funds or consumption of health services by households directly paid for by public health insurance funds are treated as part of both disposable income and consumption expenditure of the household sector. The (obligatory) premiums for this type of insurance are treated as a negative component of disposable income. In the SEA, the money value of consumption of health services reimbursed by either private or public health insurance is considered part of those goods and services produced, distributed or paid for by general government or private non-profit institutions that are assignable to the population (i.e. intended for individual consumption; cf. section 4.2). So, in the SEA the money value of consumption of health services reimbursed by either private or public health insurance is not included in final consumption expenditure of households: it is considered part of an enlarged consumption concept (often termed "total consumption of the population;" see especially United Nations, 1977b). Or, to put it more generally, the consumption expenditure concept in the SEA is based on the ultimate bearer principle, i.e. reimbursed expenditures initially made by households are regarded as expenditures of the reimbursing companies or funds. Therefore, the health costs for households that are reimbursed by public health insurance, are attributed to the intermediary fund "Medical consumption." The premiums paid by households are treated as a negative component of disposable income in the SEA. In order to enhance comparability in the SEA between the publicly and the privately insured, the (gross) premiums for private health insurance are likewise treated as a negative income component of households. In the Dutch *National Accounts* these premiums are not deducted from disposable income of households.

From section 2 it may be clear that the proposed economic Core System overcomes the above-mentioned obstacles with respect to the linkage of the SEA and the SNA. In the new situation, the amounts in the SEA regarding the total population will also appear in the accounts for the household sector in the Core System. This implies that results from the SEA relevant to the Dutch *National Accounts* can easily be incorporated in the System to provide a disaggregation of the household sector (see also the next section).

6. Data and Results

In this section we present some results of the SEA and their relation with the data in the Dutch *National Accounts*. Before presenting figures it is helpful to make a few general remarks about the SEA. For a more extensive description

of the construction of the SEA the reader is referred to CBS (1988), Huigen *et al.* (1989), and Van der Laan (1992).

The central statistical unit in the SEA is the *household.* The household is defined as a set of one or more persons, occupying one living accommodation and having the disposal of a private, or alternatively a joint provision of domestic services at that place, i.e. a provision of food and other essentials for living. This implies that the SEA is primarily interested in the distribution of phenomena among households, and not among individuals. The SEA cover both private households and institutional households. Institutional households consist mainly of residents of old-age homes. The remainder are prolonged sick and mentally or physically handicapped people in welfare institutions, persons in correctional and penal institutions, persons in boarding schools or religious institutions, servicemen, and resident personnel.

Choosing the household instead of the individual as the statistical unit in the SEA is almost unavoidable considering the importance of the information on consumption expenditure in the accounts. For, in statistical practice consumption expenditure is always measured at the household level (cf. in this context subsection 2.3). Besides, attributing household consumption expenditure to individual members of the household is not recommended on both theoretical and practical grounds (see e.g. Deaton and Muellbauer, 1980).

In the SEA, the classification of households into *household types* is based on combination of the following four variables:

—Category of households, i.e. private versus institutional households;
—Household composition (number of household members and age structure of the household);
—Main source of income of the (entire) household;
—Size of household income.

These variables are principally chosen based on their impact on income and consumption patterns of households, so they make the target variables of the SEA agree as closely as possible within the household types.

The information contained in the SEA is the result of a process of *integrating* micro- and macro-data from several sources, as is the case with the *National Accounts.* The construction of the SEA is therefore less straightforward than the construction of statistics based on a single data source. More specifically, solutions need to be found in the instances when corresponding figures in different sources are not identical. Usually there are several causes for these numerical discrepancies, which need to be eliminated during the process of integration.

The definitive results of the SEA are primarily based on the micro-data from the *Statistics of Income Distribution* and the *Budget Survey,* and the macro-data from the *National Accounts*; all three compiled by the Netherlands CBS. The *Statistics of Income Distribution* provide a description of the income distribution for individuals as well as for households. It is based on administrative records, with the administration of the wage and income tax as the most important data source. The *Budget Survey* provides a description of expenditure patterns of households. It is based on a yearly sample survey among some 2,000 households. The macro-data used in compiling the SEA are obtained from the accounts for the household sector of the *National Accounts,* resulting in totals for all single

income transactions for the entire population. This applies for the definitive macro-data of the SEA as well as for the provisional macro-data of the SEA which always relate to the two most recent years under review. Besides, statistical sources such as the *Socioeconomic Panel Survey*, the *Housing Demand Survey*, *Statistics on Public Assistance*, *Statistics on Social Well-being*, *and Statistics on Homes for the Elderly* are also used. Socio-demographic data are taken from the *Population Statistics*, *Statistics on Households*, and the *Socio-demographic Accounts.*

To a large extent, the numerical outcomes of the *National Accounts* serve as a *benchmark* for the data about transactions for the entire population in the SEA. There are at least three reasons for this. The first and most important reason is, that the *National Accounts* are the most unbiassed and therefore the most reliable source for data about income and final consumption expenditure of the Dutch population as a whole. This stems from the circumstances that the *National Accounts* in the Netherlands are the result of a process of integrating data from a great number of statistical sources, which yields annually, *inter alia*, a very detailed description of the supply and disposition of goods and services in the entire Dutch economy. This implies that data about the generation of income (e.g. entrepreneurial and property income) and about final consumption expenditure (e.g. consumption of tobacco and beverages) in the *National Accounts* are superior to comparable data from household income or expenditure surveys or from administrative sources. The second reason is that the *National Accounts* are the only data source in the Netherlands which offer consistent statistical information on income, final consumption expenditure and savings of households combined. The third reason is that the link between the SEA and the household sector in the *National Accounts* is thereby warranted, which of course is a necessary condition for the sub-sectoring of the household sector in the *National Accounts.*

During the process of integration of the SEA the necessary adjustments are made to the micro-data for gaps resulting from non-response biases, under-reporting and omissions of income or outlays in the *Statistics of Income Distribution* or the *Budget Survey.* All socio-demographic data are reduced to annual averages.

To conclude this short summary of sources and methods of the SEA, a comment needs to be made about the sample size of the *Budget Survey.* The yearly sample size of the *Budget Survey* is too small to obtain sufficient observations in each of the household types distinguished in the SEA. For that reason, data on consumption expenditure in the SEA are not based on the observed arithmetical averages of the consumption expenditure per household in the household type in question, but on estimated averages by utilizing *regression techniques* that make use of a merged micro-data set for four consecutive years. Pooling data of different years means that the regression estimators benefit from a robust increase in degrees of freedom. A regression is run for every component of consumption expenditure with the expenditure of a household on that component as the dependent variable, and year, household composition, main source of household income, size of household income, and the combination of household composition and size of household income as the explanatory variables. Since the independent variables are qualitative and the dependent variables are

TABLE 5

INTERRELATION OF THE SEA, THE CORE AND THE PRESENT-DAY DUTCH NATIONAL ACCOUNTS, 1985

Income and Outlay Account	Private Households by Main Source of Income of the Household				Institutional Households	Total Households (SEA)[a]	Consolidations etc.	Intermediary funds			Household Sector (Present-day Dutch National Accounts)
	Wages	Entrepren. and Property Income	Transfers	Total Private Households				Medical Consumption	Pension and Life Insurance	Private Non-profit Institutions	
1 2	3	4	5	6(=3+4+5)	7	8(=6+7)	9	10	11	12	13(=8−12)
	×1,000										
Number of households	3,110	399	2,045	5,554							
Number of persons	9,182	1,237	3,803	14,222	266	14,488					
	mln gld										
1. Compensation of employees[b]	208,120	3,090	5,160	216,370	480	216,850	—				216,850
of which:											
1.1. Gross wages and salaries	159,230	2,430	4,090	165,750	350	166,100	—				166,100
1.2. Employers' social contributions	48,890	660	1,070	50,620	130	50,750	—				50,750
2. Entrepreneurial and property income	5,970	37,010	7,860	50,840	560	51,400	—		31,080	2,240	84,720
of which:											
2.1. Entrepreneurial income	2,390	29,090	620	32,100	10	32,110	—				32,110
2.2. Income from owner-occupied dwellings[c]	−1,320	260	1,440	380	10	390	—				390
2.3. Interest received	4,730	4,690	4,800	14,220	430	14,650	−110			1,390	15,930
2.4. Other property income received	1,430	3,200	1,210	5,840	120	5,960	—			910	6,870
2.5. Other interest paid	1,260	230	210	1,700	10	1,710	−110			60	1,660

2.6.	Imputed interest on pension and life insurance reserves									31,080		31,080
3.	PRIMARY INCOME (=1+2)[b]	214,090	40,100	13,020	267,210	1,040	268,250	—	—	31,080	2,240	301,570
4.	Social benefits	30,100	3,390	50,230	83,720	3,650	87,370	−3,520	24,730			108,580
5.	Unrequited current transfers n.e.c. received	2,220	170	2,140	4,530	80	4,610	−2,170	70		8,700	11,210
6.	Pension and life insurance benefits	1,060	1,660	14,310	17,030	530	17,560	—		−17,560		—
7.	Unrequited current transfers n.e.c. paid	3,760	520	1,270	5,550	30	5,580	−800			360	5,140
8.	Social contributions	77,450	4,470	11,720	93,640	590	94,230	−4,520	990			90,700
9.	Pension and life insurance premiums	20,120	2,190	510	22,820	40	22,860	—		−22,860		—
10.	Private health insurance premiums	2,880	820	1,340	5,040	10	5,050	—	−5,050			—
11.	Direct taxes	26,510	6,570	7,590	40,670	370	41,040	−1,230				39,810
12.	DISPOSABLE INCOME (=3+4+5+6−7−8−9−10−11)[b]	116,750	30,750	57,270	204,770	4,260	209,030	860	28,860	36,380	10,580	285,710
13.	CONSUMPTION EXPENDITURE	128,390	17,750	55,230	201,370	4,260	205,630	—	28,860	3,700	9,530	247,720
	of which:											
13a.	Imputed rent of owner-occupied dwellings[c]	7,380	1,740	2,170	11,290	10	11,300	—				11,300
13b.	Service charge insurance[d]	—	—	—	—	—	840	50	460	3,700	200	5,250
13c.	Health services	1,590	320	610	2,520	620	3,140	70	24,270		−140	27,340
13d.	Contributions to private non-profit institutions	2,380	370	1,140	3,890	10	3,900	—			−3,900	—
14.	SAVING (=12−13)[b]	−11,640	13,000	2,040	3,400	—	3,400	860	—	32,680[e]	1,050	37,990

[a]Equals the household sector in the Core system except for differences explained in the text.
[b]Derivative transaction in the Core System.
[c]Transaction not included in the Core System.
[d]Casualty insurance, life insurance and pension funds.
[e]Increase in net equity of households in pension and life insurance reserves.

quantitative, the multivariate analysis of variance (MANOVA) technique can be used for these regressions.

In the SEA, we distinguish four main effects and one interaction effect on consumption expenditure. The average expenditure on the consumption component in question by a household type is then estimated as the structural part of the regression equation (with the dummy variables set at the appropriate values). Hence, in order to obtain more reliable (i.e. more efficient) estimates of the consumption pattern of a certain household type, implicit information is used on consumption patterns of other household types. The MANOVA model is not used when estimating the consumption expenditure of persons living in institutions, though, since these persons are not covered by the *Budget Survey*. In the SEA, the consumption expenditure of the institutionalized population is estimated by means of other sources, for the most part administrative data.

The adjusted means per household of the consumption expenditure components multiplied per household type by the total number of households in that household type subsequently form the input in the next stage of the process of integration of the SEA: agreement per household type with income data, and reconciliation with corresponding macro-data on consumption expenditure of the entire population obtained from the *National Accounts*. More specifically, the latter implies a correction for systematic under-reporting in the *Budget Survey* for certain kinds of expenditures.

In Table 5 we show some summary results of the SEA and also show the link of the SEA with the household sector in the Dutch *National Accounts*. In addition, the position of the household sector in the Core System is indicated. Only four household types are reported in Table 5. First of all, a distinction is made between private and institutional households. Private households are further distinguished by main source of income of the household (i.e. wages, entrepreneurial income plus property income, and transfers).

In Table 5 there are a few differences compared with the transactions in the Core System. First, imputed rent of owner-occupied dwellings is included in the SEA, but is excluded from the Core, because, as was argued in subsection 2.2, it is not connected with a monetary settlement. Second, employers' social contributions (current and lump-sum employers' social security and pension contributions plus unfunded social benefits from employers) are recorded as an income flow in the SEA, but are for the greater part no income flow of households in the Core by force of the transactor-transaction principle. Third, wages and salaries-in-kind form part of the flow of wages and salaries in the SEA. These differences between the SEA and the Core stem from the fact that when the SEA were devised, for practical reasons it seemed appropriate to retain the link with the present-day Dutch *National Accounts*. Naturally, the implementation of the Core/module concept in the *National Accounts* will shed new light on the interrelationship between the SEA and the National Accounts.

7. Concluding Remarks

Many statistics we know today originated from the need to analyse a particular phenomenon of political and economic interest. Gradually the various

statistics were made to converge by adoption of commonly shared units, definitions, classifications, valuations, etc. The advantages of convergence are obvious. It considerably facilitates the study into the causes of observed facts and thus indirectly increases the quality of forecasting and the effectiveness of policy measures. Also, it allows for the construction of reliable global or "macro" statistics. A coherent system of statistics has the additional advantage of indicating the fields where information is still lacking.

The process of convergence of the economy-related statistics has been stimulated immensely by the development of the *National Accounts.* They grew from statistics showing the relation between some national aggregates into a true integrating framework of economic "base" statistics. Concomitantly, the scope of the *National Accounts* has been widened and deepened over the years. The inclusion of input-output tables and the inclusion of financial statistics in the 1968 SNA are the latest examples of this enlargement. The question may be addressed whether the convergence of statistics around the *National Accounts* should be regarded as completed. The eminent National Accountant Sir Richard Stone appears to have answered this question in the affirmative, at least for the time being (Stone, 1986, p. 468).

We would answer that question differently. It is obvious that the demand for convergence persists to this day. There is an urgent demand for a coherent framework including social and environmental statistics. In respect of the economy-related statistics, for example the strengthening of the micro-macro link is advocated with convincing arguments. Moreover, our French colleagues have shown both from a theoretical point of view and in practice that the System can be enlarged in a useful way. Finally, to put it in a physicist's words, the SNA has surpassed the "critical mass." The process of linking statistics to the SNA cannot be stopped, even if we would want to do so.

It is of utmost importance that the final outcome of these processes is a coherent and practical system of statistics. In our view, the idea originating from Van Tuinen to construct a clear and easily understood economic Core system is therefore a very useful one. It may be expedient to devise secondary Core Systems in respect to social and environmental statistics (cf. Bartelmus, 1987; De Boo *et al.*, 1991). All metaphors derived from astronomics seem to apply, ranging from satellites to double stars and black holes. We should allow ourselves some time to develop this universe gradually. The revised SNA makes essential steps in this direction, in particular by the explicitation of imputations, the introduction of a three dimensional table on the generation of income and the inclusion of a chapter on the flexibility of the System.

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