

A SYNOPTIC STRUCTURE OF THE SYSTEM OF NATIONAL ACCOUNTS

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The next UN System of National Accounts (SNA) should have two basic characteristics. *First*, it has to be a modular system. Its core is an institutional system without imputations and attributions. Next to that there are several modules. By means of imputations and attributions they transform the core into alternative systems. *Second*, it has to be an integrated meso-system. There is a need for a more detailed breakdown of households and enterprises than the present SNA provides. At the same time a description of all interrelations between activities and sectors is necessary. This requires a linkage between input-output tables and sector accounts at a detailed level. The paper shows the synoptic structure of such a system. The heart of this structure is the three-dimensional generation of value added table. It shows not only how much of each component of value added is generated by the establishments in each activity, but it also provides the breakdown of each of these cells according to the sector of the enterprise to which the establishments belong. The paper shows how the synoptic structure clarifies the delineation of imputations and attributions.

1. INTRODUCTION

In a world with an enormous diversity in thinking about social and economic phenomena, national accounts are a remarkable example of international agreement. Virtually the same concepts are applied in all countries for which they are applicable, i.e. all non-centrally planned economies. This is due in no small part to the existence of the United Nations System of National Accounts (SNA). The SNA is one of the most influential guidelines ever issued by the UN. This success can be attributed to its quality. Both the first version, issued in 1953, and the second one, released in 1968, incorporated the central economic and statistical views of their time. The 1953 SNA reflected the "real" macro-economic thinking of the 1950s. Thus it provided consistent data on national income, production, consumption and investment. The basic approach was "functional": the focus was on the variables which were defined from a macro-economic theoretical point of view; consequently, the economic actors were invisible in the system. When, in the 1960s, the focus of economics shifted towards more disaggregate analysis, financial analysis and a greater emphasis on economic actors like government and financial institutions, the SNA was adjusted accordingly. Whereas the 1953 SNA contained tables with disaggregate data but no consistent disaggregation of the whole system, the 1968 SNA took a crucial step in the latter direction by integrating input-output data in the system. The institutional sectors were introduced, putting economic actors into the heart of the system; and financial data were provided by the capital finance account.

Currently, another revision of the SNA is in progress. Originally this was envisaged to be a minor revision, its main purposes being clarification and improved coordination with guidelines in other areas of statistics. However, in

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the twenty years since the last revision developments occurred in both economic reality and economic analysis that should have consequences for national accounts and the SNA if the latter is to retain its influence. Increased attention for informal (unmarketed) production in both developing and developed countries led to a demand for national accounting data on this subject. Greater attention to environmental constraints led many to call for adjustment of the accounts. The growth of micro data bases and micro analysis generated a need for micro-macro linkage. The development of Social Accounting Matrices (SAM's) and applied general equilibrium modelling caused a need for a more integrated "meso" structure of the SNA.

Other developments could be mentioned as well. Taken together, they led to a debate on the foundations of national accounting and on the structure of the system. An important consideration in this debate was that many of the demands placed on the system are conflicting. To take account of environmental constraints would require imputed and attributed flows. These, however, make micro-macro linkage still more problematic than it already is in the 1968 SNA. To solve this dilemma, an approach to the structure of the SNA has been developed, by a number of authors,¹ that aims to achieve greater flexibility of the system. To this end the system should be restructured into a core and an expandable set of modules. The core satisfies three principles. The intersection principle requires the core to contain all the structural elements necessary for the various major alternative descriptions of the economy as a whole, but as few special purpose elements as possible. The parsimony principle states that the perceptions of the economic actors themselves should be followed as closely as possible, avoiding constructions based on analytical points of view that depart from these perceptions. The parsimony principle is constrained, however, by the consistency principle which requires the core to be a true system of national accounts with uniform valuations, consistent balancing, complete enumeration, and so on.²

These principles have two major implications for the core. Firstly, the core contains not just the macro aggregates required for macro-economic analysis, but also a full-fledged integrated meso system that allows the accounts to serve as the basis for social accounting matrices. Secondly, the core is an institutional system: it is based on the transactor-transaction principle (flows are recorded at the economic actors paying or receiving the money involved) and the production boundary is determined by the presence of a monetary remuneration of production factors. In addition to the core, the system should contain modules. Some of

¹Cf. Van Bochove and Van Tuinen (1986), Ruggles and Ruggles (1986), Van Bochove and Bloem (1986).

²Application of the consistency principle implies that we do not adopt the perspectives of actors to the degree Postner (1987) advocates. Postner advocates adoption of business accounting concepts, even if they lead to a difference in the treatment of a single transaction between the two participating companies. Aggregation then leads to "perpetually imbalanced accounts." In our opinion, however, the resulting aggregates have no meaningful interpretation. Even if they would have an interpretation, they would still be impossible to compile with any accuracy, because of the lack of the balancing identities that are a central tool in the compilation of national accounts.

these, referred to as standard modules, contain the imputations and attributions that cause the main conceptual differences between the present SNA and the proposed core. The aim of the present paper is to demonstrate the synoptic structure to which these proposals for restructuring national accounts lead. In section 2 the core is presented in the familiar form of tables. It is illustrated with some simplified numerical examples. Section 3 discusses some general properties of the core. Section 4 gives a tabular representation of the standard modules for imputations and attributions.

To a degree, as noted above, the 1968 SNA already is an integrated meso system.³ But its meso structure needs strengthening in three respects.

- (i) Disaggregation of the household sector. This is essential in view of the increased importance of policy tools for influencing the distribution of income and outlays over households and, more generally, the increasing attention economic analysis pays to households.
- (ii) Disaggregation of the enterprise sector in the income and outlay accounts and the capital accounts. This is necessary because of the increasing attention paid to institutional differences between enterprises.
- (iii) The integration of the input-output framework and the income/outlay and capital accounts for the “institutional” sectors.

The first two proposals do not need much explaining, though the precise delineation of sectors still requires further research. However, the third proposal is less straightforward and requires elaboration. Al (1986) provides a detailed discussion which we summarize here. The input-output framework is meant to describe the production process whereas the income/outlay and capital accounts are drawn up in order to describe other processes, notably those of income distribution and capital finance. The differences in the nature of these processes have two consequences for the structure of the two parts of the system. The first is that the *sectoring* has to be different in both parts. Generally speaking, sectoring has to be such that the within-sector homogeneity with respect to the relevant characteristics of the processes concerned is maximized. In case of the input-output framework, the relevant characteristics have to be selected from the perspective of the production process, in case of the income/outlay accounts the perspective of the income distribution process is to be adopted. Thus in the input-output framework industries are defined on the basis of input and output homogeneity whereas in the income and outlay accounts and the capital finance accounts, sectors and subsectors have to be defined on the basis of homogeneity with respect to roles in the income distribution process and the capital finance process. Put differently, dual sectoring is necessary: the classes distinguished on the income/outlay accounts are neither the same as nor an aggregate of those distinguished in the input-output tables. The second consequence of the different nature of the processes concerns *the statistical units* and reinforces this need for dual sectoring. The production process is usually organized in smaller units (*viz.* establishments) than the income distribution and capital finance processes (*viz.* enterprises). Therefore within-industry homogeneity can only be achieved by

³As emphasized by Sir Richard Stone in correspondence with one of the authors.

classifying *establishments*,⁴ whereas meaningful financial data can be only obtained for *enterprises*, implying that only the latter can be classified into appropriate sectors in the income/outlay and capital accounts.⁵

The dual sectoring of the 1968 SNA implies that disaggregate linkage between the activities in the input-output framework and production accounts on the one hand and the sectors in the income/outlay and capital accounts on the other, is not straightforward. Just the total value added generated by all activities and the total value added of all sectors are equal in both parts of the system: there is a link at the top only. The 1968 SNA attempts to remedy this by also classifying the transactors on the income/outlay and capital finance accounts according to economic activity, viz. the main activity of the enterprises and other transactors. This, however, still does not provide the disaggregate linkage: on the production accounts, an establishment's output may be classified into another activity than on the income/outlay accounts. However, a possible solution does exist that considerably simplifies matters *vis à vis* the 1968 SNA. This solution is to provide, on the production accounts, a breakdown of the value added (and its components) generated in each activity, viz. according to the sectors of the enterprises to which the activity's establishments belong. This way, the system shows in which sectors each activity's value added is generated; next it can be shown to which sector this value added is allocated. The latter then yields the point of departure for the income distribution process.

2. AN INTEGRATED DESCRIPTION OF PRODUCTION, EXPENDITURE AND INCOME

2.1. Overview of the System

In this section we consider the integration of the input-output framework with the income and outlay accounts. The capital finance accounts can be omitted for the purpose at hand. Figure 1 presents an overview of the relevant part of the core. The three sets of rows and six sets of columns yield eighteen blocks of matrices and vectors, five of which are empty. The remaining thirteen contain all basic information needed for an integrated meso description of production, expenditure, income distribution. We discuss them row-wise.

Commodities in Make and Use Matrices

The subjects of the transactions described in the first set of rows are the commodities, i.e. goods and services. The first two blocks relate to the production

⁴Because of the parsimony principle, the definitions of economic actors have to harmonize as far as possible with the perceptions they have of themselves. Consequently, establishments must be actual organizational units with some discretionary power on the production process. This, in turn, implies that reasonably complete information on production transactions at the establishment level must be available. This definition coincides, by and large, with that of the establishment-type unit of the 1968 SNA. It contrasts with the homogeneous production units of the European ESA. The latter are far "smaller" and are artificially constructed. This does not imply that the 1968 SNA definition of the establishment is without problems of its own. Fergie (1986) justly notes that there is some tension between the SNA definition and the perceptions of producing agents.

⁵We have restricted this brief discussion to the relation between industries and enterprises for presentational convenience only. The arguments also hold true for the other activities *vis à vis* government, private non-profit institutions, and so on.

Kind of transaction Transactors		P. for inputs Activities 1, 2, ..., <i>a</i>	R. for outputs Activities 1, 2, ..., <i>a</i>	P. to R.O.W.	R. from R.O.W.	Other P. Sectors 1, 2, ..., <i>s</i>	Other R. Sectors 1, 2, ..., <i>s</i>
Transactors Subjects of transactions							
Commodities 1 2 ⋮ <i>c</i>		Intermediate use matrix	Total production matrix	Import of goods and services	Exports of goods and services	Final expenditure matrix (each sector's column subdivided in three columns: change in stocks, investment, con- sumption)	
Sectors 1 ⋮ 2 ⋮ <i>s</i>	Components of value added 1 ⋮ <i>va</i> 1 ⋮ <i>va</i> 1 ⋮ <i>va</i>	Primary use matrix = Generation of value added matrix		Imports of factor services	Exports of factor services		Distribution of value added matrix = Acquisition of income matrix
Categories of income distribution transactions 1 2 ⋮ <i>id</i>				Non-factor income to R.O.W.	Non-factor income from R.O.W.	Income distribution payments matrix	Income distribution receipts matrix

Figure 1. Overview of the production, expenditure and income tables of the core. P = payments; R = receipts

process; they are the familiar intermediate use and make matrices of the 1968 SNA. These two matrices belong in the core because they are the point of departure for the construction of all other input-output tables (industry by industry, commodity by commodity).

There follow two blocks of one vector each, describing the imports and exports of goods and services. Next comes the final domestic expenditure block. Total final domestic expenditure on each commodity is simply equal to the total production of the second block, plus the imports vector less the exports vector, less the total intermediate use as found in the first block. Naturally, final domestic expenditure is to be broken down into the usual categories of consumption, investments, inventory changes. In addition, however, these three categories are provided for each of the sectors of the system. In the standard accounts and tables of the 1968 SNA a rudimentary form of such a breakdown is provided, but in the core much more detail is required if an integrated meso system is to be obtained.

Sectors and Components of Value Added

The second set of rows is a novelty and contains the essential meso links between the production process on the one hand and the income distribution process on the other. Whereas the first set of rows describes the “production of commodities by means of commodities,” this second set shows how the production process generates value added and how this value added is transformed into income. There are three dimensions in the generation of value added. First, it is generated by specific economic *activities* like, e.g. printing. These activities are carried out in establishments. Second, these establishments belong to enterprises, government or are part of households. In the case of printing, one establishment may be a 200-employee independent enterprise, another one may belong to a multinational multiactivity corporation, still another one may be the government printing office and there may also be unincorporate enterprises. Thus, with an appropriate sector breakdown, each of these is part of a different sector, implying that there is a *sectoral* dimension to the generation of value added. Thirdly, value added consists of various *components*, such as wages, indirect taxes, operating surplus, and so on. This is the third dimension. It may be considered from two different points of view. The first one is the income perspective: each of the various components of value added plays a different role in the income acquisition process. The second is the production perspective: each of the components might be considered as a reward of different (groups of) primary production factors. Hence the generation of value added matrix may also be referred to as the primary use matrix.

All three dimensions are included in the generation of value added matrix⁶ in Figure 1. This matrix is, essentially, a sectoral breakdown of the standard

⁶There is, at first glance, some similarity between the generation of value added matrix and table 17 of the 1968 SNA. The latter shows the breakdown of operating surplus and compensation of employees of some of the institutional sectors by kind of economic activity. However, in Table 17 this is the economic activity of *enterprises*, whereas in the generation of value added matrix the breakdown is according to the activity of the establishments. This is what makes it possible to provide the breakdown for the GDP *at market prices*, i.e. including indirect taxes. Incidentally, in the notes to Table 17 (p. 203), the 1968 SNA indicates that the table might be further elaborated by providing,

primary use matrix of input-output tables. The latter specifies how much of each of the components of value added is generated in each of the activities. In Figure 1 each of the cells of this standard primary use matrix is broken down by sector. Thus the operating surplus of the printing activity is broken down according to the sectors to which the establishments mentioned above belong. Similarly, the generation of value added matrix shows how much of the wages generated in each sector are due to printing activity.

The generation of value added matrix does not show *to* which sectors each of the components of value added is distributed. This is shown in the last block of the second set of rows (for the time being we skip the two columns imports and exports of factor services): the distribution of value added matrix. This matrix can also be called the acquisition of income matrix, because it shows how much income each sector receives as a direct consequence of the production process. The matrix takes the form of a sector of origin/sector of destination breakdown of each of the components of value added. In case of the operating surplus, both are the same. In case of, e.g. wages and indirect taxes, the origin is the sector to which the paying establishments belong, whereas the sectors of destination are (with some exceptions discussed in section 4.3) household and government sectors, respectively. If households are broken down in a number of sectors, the distribution of value added matrix is of particular interest since it shows the incoming wages of each of the household sectors. If government is broken down in, e.g. national, state and local government, the distribution of value added matrix immediately shows how much indirect tax is received by each of them. As a consequence, the distribution of value added matrix will contain a lot of information required to construct multi-sector models.

Income Distribution

The income acquired from the production process is the point of departure for the income distribution process. This is described in the last set of rows in Figure 1. These rows classify the categories of income distribution transactions according to the reason for the transactions. Part of these transactions are generated by property rights, e.g. interest and dividend. Categories like direct taxes, social insurance benefits, social assistance grants might be summarized under the heading "income policy." Note that indirect taxes are not a category of income distribution transactions, since they are a component of value added and appear in the income acquisition matrix.

The last two blocks of the income distribution rows display the total sectoral payments and receipts in each of the categories of income distribution transactions. The two resulting matrices are somewhat analogous to the use and make (production) matrices. In case of the latter, the classes of (trans)actors are

for the enterprise sector, a breakdown by the economic activity of the establishments as well. This, then, would be similar to our generation of value added matrix. However, the 1968 SNA proposes to do this for a curious purpose: to provide a cross-tabulation of value added (at factor prices) by activity of the enterprises and by that of the establishments. This is curious, because the breakdown of the enterprise sector by kind of economic activity of the enterprise is superfluous, at least from the linkage point of view, as soon as the breakdown of the sector by the kind of economic activity of the establishments is available.

“activities,” i.e. the basic groupings of actors in the production process, the subjects of the transactions are the commodities. In case of the income distribution matrices the classes of actors are sectors, the basic groupings of actors in the income distribution process; and the subjects of the transactions are categories of income distribution transactions. The analogy goes a bit further still: in case of the make and use table, one may construct an industry \times industry input-output table; in case of the income distribution matrices one may construct (using some additional information) a sector \times sector income distribution table. But this is not needed in the core.

2.2. Main Aggregates and National Accounting Identities

The overview of the core in figure 1 contains just the basic vectors and matrices. In practice, the layout has to be modified slightly in order to introduce a number of important aggregates and national accounting identities. In fact, the proposed structure of the core has some consequences for the definition of GNP. To clarify these issues we discuss them with the aid of a numerical example (Table I). In the example we distinguish six commodities, three activities, three sectors and the three domestic categories of final expenditure. All commodity transactions have been valued in purchasers' prices in order to avoid the problems of trade or other margins. The final expenditure matrix is simplified slightly by assuming no increase in stocks in the government and household sectors. Note that households invest, implying that unincorporate enterprises are included in this sector. The primary inputs are broken down into the usual categories. We do not explicitly show consumption of fixed capital; thus the operating surplus is gross. In the generation of value added block we add, next to the sectoral submatrices, a matrix for all sectors combined. This is, of course, the standard primary input matrix of, e.g. 1968 SNA. The block also contains a column of totals. This column shows, for each sector, the components of value added generated in the sector. Its sum is the Gross Domestic Product. Thus, whereas the row with totals in the generation of value added matrix provides a breakdown of GDP by economic activity, the column with totals gives the breakdown of GDP by institutional sector of origin, for each of the components of value added.

The two columns “imports and exports of factor services” contain no entries for operating surplus: there exist no direct payments across borders of the latter. The items “property and the entrepreneurial income” to and from the rest of the world as distinguished in 1968 SNA are not a payment of operating surplus as such, but are income distribution transactions. As a consequence, the columns contain only entries for compensation of employees and indirect taxes. The latter item is relevant for members of the European Community, since the community levies indirect taxes.

The destination of the row totals of the generation of value added matrix is either the rest of the world or one of the domestic sectors. Similarly, the origin of the domestic sectors' income is either a domestic sector or the rest of the world. Thus, essentially we have a sector \times sector matrix augmented with both a column and a row for the rest of the world. In order to visualize this, we have left the column imports of factor services from the rest of the world empty and

added an additional row, line 25, for the only item of this column, the compensation of employees from the rest of the world.

The sector × sector distribution of value added matrix contains flows of value added between the domestic sectors. After addition of the compensation of employees from the rest of the world, a grand total is obtained that is a halfway station between GDP and Gross National Income. It differs from the former because it includes net compensation of employees and indirect taxes from the rest of the world; and from the latter because it does not include net property and entrepreneurial income from the rest of the world, as this is not a flow related directly to production. It is tempting to give this halfway concept the label “Gross National Product”. Unfortunately, this term is usually defined differently, viz. as equal to national income. However, the 1968 SNA does not seem to use the term; the European system, ESA, defines it (section 129) but does not integrate it in the system. Thus it seems acceptable to redefine the concept in the sense indicated above. Omitting the indirect taxes to the rest of the world that should be included in both the modified GNP and a modernized traditional GNP, this yields:

$$\begin{aligned}
 & \textit{Gross Domestic Product} \\
 & \quad \text{plus} \\
 & \text{net compensation of employees from the rest of the world} \\
 & \quad \text{equals} \\
 & \text{modified } \textit{Gross National Product} \\
 & \quad \text{plus} \\
 & \text{net property and entrepreneurial income from the rest of the world} \\
 & \quad \text{equals} \\
 & \textit{Gross National Income} \text{ and traditional } \textit{Gross National Product}
 \end{aligned}$$

The row totals of the distribution of value added matrix (column u) give the modified GNP's breakdown by sector of origin; the column totals (row 26) give its breakdown by sector of destination. Needless to say that these sectoral decompositions of GNP are the more interesting, the larger the number of sectors.

In the income distribution rows of our example we specify six explicit categories of income distribution transactions, grouped under the two headings “property” and “income policy.” The definition of the items is similar to that in the 1968 SNA income and outlay accounts, with one very important exception: there is no consolidation of within-sector flows. Thus, e.g. total interest payments are the payments by all actors of a sector (i.e. enterprises, government units, households), irrespective of whether the payment is to an actor in the same sector. The reason for this is the meso nature of the core. In a properly designed meso system, the value of aggregates should be independent of the level of detail of the groupings of actors. With intrasectoral consolidation, disaggregation would immediately boost total payments in various categories. In our approach, this total is untouched by such disaggregation.⁷ Deconsolidation also greatly clarifies

⁷Perhaps in practice this deconsolidated approach needs some modification. In particular, the interest flows between banks are different in character from those between other enterprises. Therefore more useful total payments and total receipts concepts might exclude between-banks flows. There may be other examples of specific categories of transactions between specific transactors that should be excluded from the income distribution payments and receipts matrices.

TABLE I
THE CORE AS A WHOLE

	Payments for Inputs Activities				Receipts for Outputs Activities				P to R from ROW ROW		Other Payments Sectors						Other Receipts Sectors					
	Ag.	Manuf.	Serv.	Total	Ag.	Manuf.	Serv.	Total	Imports	Exports	Ent.	Housh.	Govrn.	Total	Ent.	Housh.	Govrn.	Total				
	Intermediate Use				Production						Inc. St.	Inv.	Inv.	Cons.	Inv.	Cons.						
	a	b	c	d	e	f	g	h	i	j	k	l	m	n	o	p	q	r	s	t	u	
Commodities																						
Food	20	30	10	60	110	25	0	135	45	75	0	0	0	45	0	0	45				1	
Materials	30	200	0	230	25	150	0	175	115	50	5	0	0	5	0	0	10				2	
Durables	0	0	0	0	0	110	0	110	30	73	0	10	10	45	2	0	67				3	
Buildings	0	0	0	0	0	40	0	40	0	0	0	22	10	0	8	0	40				4	
Health	0	0	0	0	0	0	30	30	0	0	0	0	0	5	0	25	30				5	
Other	20	20	40	80	4	50	156	210	7	10	0	0	0	90	0	37	127				6	
Total	70	250	50	370	139	375	186	700	197	208	5	32	20	190	10	62	319				7	
	Primary Use = Generation of Value Added								Imp. of fact. serv.	Exp. of fact. serv.								Distribution of Value Added = Acquisition of Income				
Enterprises																						
Comp. of Empl.	10	40	20	70					1									69		69	8	
Social Sec. Charg.	3	12	5	20																20	9	
Indirect Tax Net	4	8	4	16					1											15	10	
Operating Surpl.	10	20	10	40														40		40	11	
Households																						
Comp. of Empl.	15	20	21	56																56	12	
Social Sec. Charg.	2	5	5	12																12	13	
Indirect Tax Net	5	5	5	15					1											14	14	
Operating Surpl.	20	15	15	50														50		50	15	
Government																						
Comp. of Empl.	0	0	34	34																34	16	
Social Sec. Charg.	0	0	15	15																15	17	
Indirect Tax Net	0	0	2	2																2	18	
Operating Surpl.	0	0	0	0																0	19	

All sectors																
Comp. of Empl.	25	60	75	160		1				159		159	20			
Social Sec. Charg.	5	17	25	47						47		47	21			
Indirect Tax Net	9	13	11	33		2				31		31	22			
Operating Surpl.	30	35	25	90					40	50		90	23			
Total	69	125	136	330	GDP	3			40	209	78	327	24			
Comp. of Empl. from ROW						1			1			1	25			
Total						3	1		40	210	78	328	26 GNP			
						Non-factor P.	R.	Distribution of Income								
Property Interest						1	4	14	18	24	56	30	29	0	59	27
Dividend						3	0	18	—	—	18	2	8	5	15	28
Rent						0	0	4	2	1	7	2	5	0	7	29
Income Policy																
Direct Tax						—	—	10	56	—	66	—	—	66	66	30
Social security						5	0	—	—	52	52	—	47	—	47	31
Social grants						0	0	—	—	20	20	—	20	—	20	32
Other						0	2	0	5	0	5	2	2	3	7	33
Total						9	6	46	81	97	224	36	111	74	221	34
Net Receipts							-3					-10	30	-23	-3	35
								Income and Outlay								
								Disposition				Disposable				
Disposable Income												30	240	55	325	36 DNI
Consumption								0	190	62	252					37
Savings								30	50	-7	73					38
Income Disposed								30	240	55	325					39
								Capital Finance								
Savings												30	50	-7	73	40
Increase in Stocks								5	0	0	5					41
Gross Fixed Cap Form								32	20	10	62					42
Net Lending						6		-7	30	-17	6					43
Disposed Savings								30	50	-7	73					44

the linkage of the core with specialized statistical systems. For example, the issue of whether social security funds should be consolidated with general government, as in IMF's Government Finance Statistics (GFS), or deconsolidated, as in 1968 SNA, vanishes. Given the core, the only thing needed to link up with GFS is to show separately in a linkage module the sectoral destination of income distribution payments and the sectoral origin of income distribution receipts. The GFS then is simply a more detailed analysis of a part of these flows.

Total receipts and payments of all sectors combined are not equal in each of the categories of income distribution transactions: they differ by the balance of payments to (column i) and receipts from (column j) the rest of the world in each category. In table 1 this yields, for all categories combined, a difference of -3, net receipts from the rest of the world.

In row 34 the total payments and receipts of the sectors are shown, in row 35 their balance, the net receipts of each sector from the income distribution process. Adding this to each sector's part of GNP (row 26), we obtain the sectoral disposable incomes. Naturally, they add up to Disposable National Income in the last column. This equals GNP plus the net non-factor receipts⁸ from the rest of the world.

This completes our discussion of the tabular representation of the scheme of Figure 1: the description of production, expenditure and income distribution. For the sake of completeness, rudimentary capital accounts have been added.

2.3. The Compilation of the Core

The final expenditure matrix and the generation of value added matrix contain the essential new information *vis à vis* the 1968 SNA. Therefore some attention should be given to their method of compilation. The production—final expenditure—generation of value added block of the core is basically a truncated three-dimensional system, the three dimensions being sectors, commodities and activities. Its compilation is a three-stage process. In the first stage, “unbalanced” information is collected for each of the sectors. Consider one of the enterprise sectors, say *i*. For this sector we may collect a “use table” as in Figure 2 and a

		Establishments belonging to enterprises of sector <i>i</i> , classified according to the activity of the establishment	All establishments belonging to enterprises of sector <i>i</i>	
		Activity 1, . . . , <i>a</i>	Investment	Change in stocks
Commodity	1	I	III	
	<i>c</i>			
Components of value added		II		

Figure 2. Unbalanced Use Table for Enterprise Sector *i*

⁸Defined to include net property and entrepreneurial income from the rest of the world.

similar commodity \times activity make table. These tables can be filled with information from production surveys of establishments. The operating surplus to be included in the unbalanced use table is the one resulting from the combination of the remainder of the use table with the make table. The only truly novel information required to do so is a labelling of establishments according to the sector of the enterprise to which they belong. This is no problem as long as an adequate register of enterprises and establishments is available. If this is absent, sampling techniques can be employed.

The information used to fill-in Figure 2 and the corresponding make table is unbalanced in the sense that no system-wide commodity balancing has been achieved. But the information must be homogenized, in the sense of uniform valuation of commodities and stocks. Moreover, the information must be complete in the sense that *all* establishments are covered; if establishments are not observed directly, the information on them must be estimated using what partial information is available.

For household sectors a consumption column must be added, to be filled by means of expenditure information from, e.g. budget surveys. For household sectors without unincorporate enterprises this consumption column is all information required, whereas for sectors of households with an unincorporate enterprise complete use and make tables are to be compiled as well. For government sectors the tables are completely analogous to those of the sectors of households with an unincorporate enterprise. Finally, rows for the imports and exports of commodities—valued at the same uniform prices employed in the make and use matrices (except, of course, for margins)—must be compiled.

The second stage of the compilation of the production/expenditure/generation of value added block of the core is the system-wide balancing. To this end, the first-stage make and use tables of all sectors are added up; consumption of the government sectors is, of course, to be kept apart from that of the households. With the resulting system-wide make and use tables the usual balancing procedure is followed. This process yields an operating surplus for each activity.

Next comes the third stage. Here the balancing corrections have to be disaggregated by sector. There is no need to do this for all the elements of the make and use tables: in the core only the final expenditure block and the primary input block are broken down by sectors. Consequently it suffices to calculate for each sector corrected data on:

- the categories of final expenditure, by commodity;
- total production and total intermediate use, by activity;
- the components of value added, by activity.

The sector by sector distribution of value added matrix can be filled-in as soon as the generation of value added matrix has been compiled. Only one important new piece of information is required: the breakdown of the compensation of employees according to the sector of destination. Naturally, this information is required only if more than one household sector is introduced. The breakdown can be only achieved employing income data, e.g. fiscal data. Thus the commodity-flow method has to be supplemented with income data, whereas without disaggregation income data on households are not necessary to complete national accounts.

2.4. Extension of the Commodity-Flow Method

One of the great advantages of the core as developed in sections 2.1 and 2.2 is that its adoption will make it possible to improve the quality of the national accounting data very considerably. This is because within the core framework it will for the first time become possible to combine all three methods for measuring national income at a very disaggregate level: the output, expenditure and income methods. This amounts to an extension of the commodity-flow method.

Consider the unbalanced table described in Figure 2. This table provides information for enterprise sector *i* but is based on information obtained from *establishments*. As a consequence, the information in it is—at least to a considerable extent—independent of the information on this enterprise sector that can be obtained from *enterprises*. Therefore a confrontation of the information in Figure 2 with similar enterprise-derived information is useful. In particular, this confrontation is possible for the components of value added and for investments. For *compensation of employees* and *investments* the confrontation is straightforward: there are no conceptual differences between establishment-derived data and enterprise-derived data. Consequently, discrepancies may be used as control information in the next stage of the compilation, the system-wide balancing.

The comparison between the *operating surpluses* derived from the two alternative sources is the cornerstone of the extension of the commodity-flow method. In Figure 2, the operating surplus is calculated as the difference between the production and the costs of the *establishments* belonging to the enterprises of enterprise sector *i*. An independent estimate of this sectoral operating surplus can be obtained from the profit and loss accounts of the *enterprises* of the sector. The basic procedure is to start with after tax profits, add direct (enterprise) taxes, net interest payments and the other items given on the income distribution accounts to obtain a crude estimate of gross operating surplus. Next a number of conceptual differences with the national accounting operating surplus have to be removed. Partially, this can be achieved using just the profit and loss accounts of the enterprises. An important example of a conceptual difference that can be removed this way is the addition to contingency reserves. After these modifications, a sectoral operating surplus results that is conceptually equivalent to the establishment-derived one except for one major difference: the underlying change in the value of stocks. It is precisely with respect to this conceptual difference that the proposed structure of the core is most helpful.

The cause of the conceptual difference is a difference in the valuation of stocks between national accounts and enterprise accounts and balances. The latter employ a number of different systems to recalculate the value of initial stocks and to calculate the end-of-year value; in case of national accounts changes in stocks are valued at the average market prices during the year. The latter calculation is, to a considerable degree, based on valuation of changes in the quantities of the products held in stock. This quantity information is available on the establishment level (i.e. in production surveys) but not in the enterprise accounts. Hence, the operating surplus derived from the latter cannot be easily corrected for differences in valuation. However, the sectoral change in stocks can be calculated from establishment data, as is done in the use table in Figure 2.

As a consequence, the establishment-based sectoral operating surplus can be recalculated *net* of change in stocks. The same applies to the enterprise-based operating surplus, where the recalculation *net* of change in stocks is done using enterprise data only. Thus an operating surplus net of change in stocks is obtained independently from both sources. The difference between the two for the sector as a whole can be employed as a control variable in the system-wide balancing. Naturally, after the system-wide balancing the resulting operating surpluses have to be adjusted again, in order to include the change in stocks once more.

This way of integrating the commodity-flow method with income method data can be extended further. In the process of compilation, all enterprises in each enterprise sector may be broken down in two groups: single-establishment enterprises and multi-establishment enterprises. For the former, a one-to-one correspondence with the activity classification can be achieved. Hence the income method operating surplus for this part of each sector can be compared directly, for each activity, with the commodity-flow operating surplus. This again considerably strengthens the statistical process.

3. CONTENTS OF THE CORE

3.1. *The Basic View of the Economic System*

In section 1 we indicated that the core should be an integrated meso-system and that this implies that input-output data must be integrated in the system. In this sense the core requires more integration than the celebrated integrated economic accounts of Ruggles and Ruggles (1982). A major criticism of these accounts was that they represented only a partial integration because they did not solve the problem of linking the establishment-based production system with the enterprise-based income distribution system. Thus Carson and Jaszi (1982) conclude: "The integrated economic accounts [· · ·] cannot be fully evaluated as an integrated system without knowing how the obstacles that arise because of the establishment-firm dichotomy are to be dealt with" (p. 57). The core-structure solves this problem, at least in concept, by the introduction of the generation of value added matrix, the breakdown of final commodity demand by institutional sectors and the introduction of the distribution of value added matrix. By solving the dual sectoring problem, the core restores to its proper central position the most basic national accounting notion of them all: the "identity" of production, income and expenditure. Only this time this notion is applied at the meso level. Put succinctly: the core shows that production is what generates income, that the distributed income is what generates expenditure and that expenditure on commodities is what links the flows back to production. This essentially simple scheme of circular flows was obfuscated by the complexities generated in the 1968 SNA as a consequence of the "obstacles that arise because of the establishment-firm dichotomy."

3.2. *Classifications in the Core*

A crucial element in the design of an adequate meso system is the definition of the relevant classes of transactors and items. There are several aspects to this.

In any classification, two basic issues are which units are to be classified and with respect to which characteristics homogeneity has to be achieved. Both have to be decided from the perspective of the process for which the classification is designed. We already devoted a lot of attention to the differences between an activity classification and a sector classification. The former is designed from the perspective of the production process, the latter from that of the income distribution and of the capital finance process. Hence a difference in units (establishments/enterprises) and in characteristics to be homogenized.

Next to the transactors, goods and services must be classified, viz. into commodity groups. In addition to the perspective of the production process, other perspectives play a role as well: foreign trade, consumption, investment. Therefore, the definition of commodities as the characteristic outputs of activities is inadequate: this is a purely production process oriented classification instead of the more general one that is needed in an integrated system. Therefore, in the revised SNA, the commodity classification should be less like the ISIC and more like the SITC. Put succinctly: we need a *Standard International Commodity Classification* that includes both goods and services and that can be used both to classify international trade and the intermediate inputs and outputs in the use and make matrices, including the deliveries to final demand.

A related issue is the level of detail that should be included as an international standard in the core. Here an important point of view is that of the flexibility that the core should lend to the SNA. Consider the example of sectors. In section 2 we avoided the word "subsectors," because designating a grouping of transactors as a subsector implies definition of the parent sectors. And the delineation of sectors is precisely what generates so much debate among national accountants. Consider private non-profit institutions working for households. No one wants them. Those interested in households do not want them in the household sector, because they spoil the micro-macro linkage for that sector. Those interested in enterprises do not want them there, because they spoil the linkage for that sector. And a lot of other things as well. Therefore, the core should, as 1968 SNA, leave them as a separate sector. But the same reasoning applies to other groups of transactors. Households with an unincorporate enterprise are an example, as well as, in the United States, members of the Armed Forces and the institutional population of which Carson and Jaszi (1982) point out that they, too, spoil the micro-macro linkage for households.

These examples should suffice to demonstrate that a certain minimum level of detail is not only necessary for analytical purposes, but also for flexibility. Moreover, it seems easy to achieve consensus on sectoring from this point of view. To a considerable degree, the inventories of controversial groups of transactors that have been drawn up are the consensus minimum list.

3.3. *The Production Boundary and the Routing of Transactions*

Our point of departure with respect to the core was that it should be an institutional system: a production boundary determined by market transactions and recording rules based on the tracing of actual money flows. In section 2 we avoided these issues, as the synoptic structure developed there is equally well-

suiting to any other production boundary and to any treatment of specific groups of transactions. In this sense, the structure is independent of the content. But the core will have its greatest analytical use and will achieve the greatest flexibility if it is strictly institutional. With respect to the treatment of transactions, “institutional” means that money flows are the yardstick: the *production boundary* is determined by market production and the *routing of flows* conforms to the money flows. Here market production is defined as all production that is sold in the market, plus all production that is not sold, but *does* lead to a monetary remuneration of the production factors involved in its production. *Imputations* are monetary valuations of production beyond this production boundary. This concept of market production has caused some debate. Carson and Jaszi (1982, p. 59) already indicated that the definition of imputations (and hence of the production boundary) was not clearcut: “further work on the subject—including going back to the basics of defining imputation—would be desirable.” Our definition of “market production” as all production that leads to a monetary remuneration of the production factors involved is far more comprehensive than the one given by e.g. Lützel (1986): we include a lot of production that is not sold in the market but that does lead to monetary remunerations of factors. Examples are government services, banking services (the banking “imputation” thus is not an imputation), production of own-account investment goods carried out by employees that are paid wages and for which inputs are bought. Actually, our definition removes just three major items from the 1968 SNA: production of services by owner-occupied dwellings, subsistence primary production and processing, and compensation of employees in kind. This way, only non-market production by households is left out of the core.

In a number of cases the 1968 SNA does not follow the routing of money flows in its recording of transactions, but records them between other actors; that is, *attributions* are made.

The delineation between imputations and attributions is simply that the former raise GDP whereas the latter do not. The important attributions of 1968 SNA are discussed in Van Bochove and Van Tuinen (1986) and Ruggles and Ruggles (1986). It is useful to consider an example of the way the removal of attributions works out in the synoptic structure of the core as given in section 2. The example concerns withheld wage taxes and social security charges. From the point of view of enterprises and activities, these are compensation of employees. But households are hardly aware of them because the money does not pass through their bank accounts. Thus there is a difference in perceptions. This difference in perceptions can easily be handled in the core. In the generation of value added matrix, the items are simply recorded as a part of compensation of employees, perhaps as separate sub-items, in the activities and sectors where they are paid. Then in the distribution of value added matrix, the value of the items is recorded directly as a receipt of the government sector. Thus this part of the compensation of employees does not flow to the household sector and does not spoil their accounts. This is a simple and easily comprehensible treatment. It leaves all essential information in the core while yet providing pictures of both enterprises’ (and government’s) production accounts and households’ income accounts that harmonize with each sector’s own perceptions.

4. THE TWO STANDARD MODULES OF THE CENTRAL SYSTEM

In the Van Bochove and Bloem (1986) paper, two standard modules are proposed as a complement to the core. The first one describes non-market production, hence extending the strict production boundary of the core. The second relaxes the strict transactor-transaction principle of the core by describing attributions. The purpose of the present section is to show what the two standard modules look like.

4.1. The Standard Imputations Module

The distinctive feature of imputations is that they add to the value added of the economy as described in the core. There exist two basic types of imputations.

- (i) *Imputations of household production.* The two standard examples in 1968 SNA are owner-occupied dwellings and subsistence primary production and processing. In addition, some important new imputations could be added, either in the standard module or, as Ruggles and Ruggles (1986) propose, in an extended module: do-it-yourself activities, services produced by consumer durables, and so on.
- (ii) *Imputations of enterprise and government production.* Here the standard example in 1968 SNA is compensation in kind of employees. In the standard imputations module of the core it seems useful to adopt a part of Pêtre's proposals and add some items of intermediate consumption that may be considered as final individual consumption. Formally, these are equivalent to compensation of employees in kind.

Both types of imputation have in common that they occur only in the upper part of the core: the production/expenditure/generation and distribution of value added block. They do not alter the income distribution block. Therefore the general scheme of the imputations module is analogous to that of the upper blocks of the core. We show the layout for the first category of imputations by means of an example; the basic information consists of:

- (i) The value of non-market production ("*make*"), specified by activity, commodity and the household sector in which the activity occurs;
- (ii) The value of the commodities that the core records as final consumption but that in the imputations module should be reclassified as intermediate use.

TABLE II
NUMERICAL EXAMPLE OF NON-MARKET PRODUCTION MODULE

		Owner occupied housing (All households)	
		Use	Make
Commodities	Food		
	Materials	5	
	Durables		
	Buildings		
	Health		20
	Other		
Operating surplus = contr. to GDP.		15	

In Table II we provide an example of the household production module. The example concerns owner-occupied housing. There are just two basic items: use of materials and production of housing services, included in the "other" commodities. One item is not included: purchases of new houses. Their value if included in the core. The two basic items of information in Table II cause many more changes in the system as a whole, if they would be incorporated in the core. This is demonstrated in Table III, where the additions and subtractions their inclusion would cause are shown. Note that the intermediate use of materials causes a fall in the final consumption of materials.

4.2. *The Attributions Module*

Attributions are re-routings of actual flows, based on a principle like, e.g., the recording of transactions at the beneficiary. Two groups of attributions may be distinguished.

1. Reclassification of final expenditure of non-household sectors as individual consumption. This is a category of attributions of increasing importance that is a subject of the Pêtre proposals. Moreover, it is essential for international welfare comparisons. It should be included in the attributions module, even though the 1968 SNA lacks it.

2. Attributions in the income distribution transactions. The attribution of, e.g. the increase of actuarial reserves to households is one example. Attributions in the central system do not alter GDP, since they do not influence the production, generation and distribution of value added blocks. Instead, their impact is restricted to the expenditure and income distribution blocks of the core as shown in Figure 1. Thus the attributions module can be structured as in the numerical example in Table IV. The *second* group of attributions appears in the lower part of the module (the income distribution block) only.

The *first* type of attribution, in contrast, appears in both the upper and the lower part. In the upper part expenditure is reclassified. Here positive items in the household columns are exactly balanced by negative items in the columns for other sectors. The same items return in the income distribution blocks, as receipts of the household sectors and payments of other sectors. The example in table IV is an attribution related to the Pêtre proposals: individual consumption of health services produced by the government. The only basic information is the value of this item: 20. It shows at four places in the module. Table V shows the way the attribution would alter the system as a whole if it were to be incorporated in it. This also demonstrates how many changes have to be made if one wishes to remove an attribution like this from an SNA that includes attributions in its basic tables.

5. CONCLUDING REMARKS

Some of the proposals of the present paper, of which an earlier version was discussed at the May 1986 OECD National accounts meeting, were considered by the expert group meeting on the structure of the SNA which was held in June 1986 as part of the SNA revision process. It is worthwhile quoting some of the

TABLE III
AN IMPUTATION: OWN ACCOUNT HOUSING

	Payments for Inputs Activities				Receipts for Outputs Activities				P to R from ROW ROW		Other Payments Sectors						Other Receipts Sectors					
	Agr.	Manuf.	Serv.	Total	Agr.	Manuf.	Serv.	Total	Imports	Exports	Ent.	Housh.	Govrn.	Total	Ent.	Housh.	Govrn.	Total				
	Intermediate Use				Production				Inc. St.	Inv.	Inv.	Cons.	Inv.	Cons.								
	a	b	c	d	e	f	g	h	i	j	k	l	m	n	o	p	q	r	s	t	u	
Commodities																						
Food																					1	
Materials																					1	
Durables			+5	+5																	3	
Buildings																					4	
Health																					5	
Other							+20	+20							+20		+20				6	
Total			+5	+5			+20	+20							+15		+15				7	
	Primary Inputs = Generation of Value Added								Imp. of serv.	Exp. of fact. serv.								Distribution of Value Added = Acquisition of Income				
Enterprises																						
Comp. of Empl.																					8	
Social Sec. Charg.																					9	
Indirect Tax Net																					10	
Operating Surpl.																					11	
Households																						
Comp. of Empl.																					12	
Social Sec. Charg.																					13	
Indirect Tax Net																					14	
Operating Surpl.			+15	+15														+15		+15	15	
Government																						
Comp. of Empl.																					16	
Social Sec. Charg.																					17	
Indirect Tax Net																					18	
Operating Surpl.																					19	

TABLE IV
NUMERICAL EXAMPLE OF ATTRIBUTIONS MODULE

		Payments		Receipts		
		Ent.	Househ.	Govrn.	Ent.	Househ.
<i>Commodity</i>	Food					
	Materials					
	Durables					
	Buildings					
	Health		+20	-20		
	Other					
<hr/>						
<i>Property</i>						
Interest						
Dividend						
Rent						
<i>Income Policy</i>						
Direct tax						
Soc. Sec.						
Soc. Ass. Grants						+20
<i>Other</i>						

conclusions and recommendations of the expert group. A central proposal of the present paper is to include the three-dimensional generation of value added matrix in the next "Blue Book" (i.e. the SNA). The relevant recommendation of the expert group is:

"The Blue Book will show the links between the kind of activity units and institutional sectors by means of a three-dimensional matrix, in which the components of value added are cross-classified both by kind of activity of the establishment and by sector of the institutional unit."

"It was noted that a link-matrix of this kind could most easily be completed by countries which had established a central integrated register linking producing and institutional units. The appropriate Handbooks should emphasize the importance of establishing registers of these kinds and provide guidance on their creation".

Another central feature of the synoptic structure presented here is the deconsolidation of the income and outlay data of institutional sectors. On consolidation the expert group concludes:

"Although some consolidation is desirable, often consolidation leads to loss of useful information and in general it should be avoided."

Decisions on the third central feature of our structure were less clearcut: the institutional nature of the core:

"The group did not accept the proposal to identify a set of core accounts excluding imputations and reroutings."

However:

"The imputations and reroutings in the present SNA were considered to be broadly acceptable, but so far as possible they should be separately distinguished."

TABLE V (cont.)

	Payments for Inputs Activities				Receipts for Outputs Activities				P to R from ROW ROW		Other Payments Sectors						Other Receipts Sectors						
	Agr.	Manuf.	Serv.	Total	Agr.	Manuf.	Serv.	Total	Imports	Exports	Ent.	Housh.	Govt.	Total	Ent.	Housh.	Govrn.	Total					
	Intermediate Use				Production						Inc.	Final Expenditure											
	a	b	c	d	e	f	g	h	i	j	k	l	m	n	o	p	q	r	s	t	u		
Households																							
Comp. of Empl.																						12	
Social Sec. Charg.																						13	
Indirect Tax Net																						14	
Operating Surpl.																						15	
Government																							
Comp. of Empl.																						16	
Social Sec. Charg.																						17	
Indirect Tax Net																						18	
Operating Surpl.																						19	
All sectors																							
Comp. of Empl.																						20	
Social Sec. Charg.																						21	
Indirect Tax Net																						22	
Operating Surpl.																						23	
Total					GDP																		24
Comp. of Empl. from ROW																						25	
Total																						26 GNP	

Thus, though the majority of the expert group opted for an approach where the conceptual institutional core of the national accounts is not presented explicitly, the information to reconstruct it is to be provided "as far as possible." This is a big step forward. But we believe that the decision to hide the core as such will not stand the test of time.

The institutional core is the conceptual data structure underlying national accounts. Hiding this structure impedes micro-macro linkage, diminishes the value of national accounts as a coordinating framework, places unnecessary obstacles on the way to general equilibrium data bases, and restricts the capacity of the system to deal with evolving economic reality and demand for alternative concepts. In our opinion, user demand will eventually force individual countries to produce institutional national accounts on their own.

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