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SOCIO-ECONOMIC ACCOUNTS FOR THE NETHERLANDS

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In this paper the authors present Socio-economic Accounts for the Netherlands for the year 1981. Detailed information on income components, consumption components and savings for 52 household types are provided. The household types are a cross-classification of household size, income source and income level. For each income and consumption component, the sum of the amounts over the houshold types and three intermediary funds equals the macro amount in the National Accounts. The accounts are constructed by intregating macrodata from the National Accounts and microdata from the Income Statistics and the Budget Survey.

1. INTRODUCTION

In the Netherlands there is a large demand for coherent statistical information on the socio-economic situation of population subgroups. The information which is currently published by the Netherlands Central Bureau of Statistics (CBS) is very detailed, but usually concentrates on only one aspect of the socio-economic situation, for example income, consumption or unemployment. In order to meet the demand for more coherent information, the CBS has recently started the compilation of *Socio-economic Accounts* (SEA): a systematic description of income components, consumption components and savings for subgroups of the population. In this paper we describe the construction of the accounts and give the numerical results for 1981. The paper is a summary of a more extensive publication in the Dutch language, CBS (1982).

The SEA are constructed by integrating three data sources already existing within the CBS: the Income Statistics, the Budget Survey and the National Accounts. The Income Statistics and the Budget Survey provide very detailed micro-information on components of income and consumption, respectively. They will be described in more detail in Section 5. The National Accounts give a quantitative description of the Dutch economy. Thereby several large sectors of the economy are distinguished, including one household sector, a business sector and a government sector. The accounts for the household sector comprise the income and consumption transactions of all individuals living in the Netherlands. No distinction is made within the household sector: subgroups of the population are not distinguished separately.

Note: The results in this paper are part of a research project which was carried out in close cooperation with Kees Den Dulk, Ep Harmsen, Marius Kriek, Paul Van der Laan, Frank Linder and Jaap Schippers. Further information on these accounts can be obtained from Paul van der Laan of the Department of Social Accounts, who is now in charge of the project.

In the SEA the two microdata sources and the macrodata from the National Accounts are integrated in order to get results at the meso-level of population subgroups. To a large extent, the National Accounts thereby serve as a benchmark, both for the numerical outcomes for the Netherlands as a whole and for the definitions of the various concepts. There are two reasons for this. The first reason is that the concepts in the National Accounts are based on long experience and tradition and on several international guidelines (in particular the System of National Accounts from the United Nations, 1953, 1968). The second reason is that currently in the Netherlands the National Accounts are the only data source which provide consistent statistical information on total income, consumption and savings of households simultaneously. A description of the way household sector accounts are compiled in the Netherlands National Accounts is provided by Van der Laan (1987).

However, as is discussed in more detail in section 3 of this paper, the National Accounts have drawbacks for a statistical description of population subgroups. The household sector of the National Accounts includes for example the private non-profit institutions, and the treatment of pensions in the National Accounts is unsatisfactory. Several authors therefore have proposed corrections in the concepts, see for example Ruggles and Ruggles (1986). An explicit description of the corrections we have used for the SEA, is given in Table 2 in Section 3.

The SEA in this paper can be considered to be the household part of a Social Accounting Matrix (SAM). A SAM describes all economic transactions between subsectors of both the household sector and the business sector. The first proposal for the construction of a SAM came from Richard Stone. At this moment a large number of SAM's have been constructed, in particular for developing countries (Pyatt and Round, 1977). A SAM for the Netherlands is given in Cohen (1988).

Datasets on the meso-level similar to a SAM are also used for policy evaluation by means of general-equilibrium models. Most applications focus on the effects of changes in taxes. Shoven and Whalley (1984) give a general introduction and survey of these models. The data collection for the SEA in this paper is largely based on the data collection for the general-equilibrium model in Keller (1980). The data which are required for this model are called the Total Accounts and have the form of a goods $\times$ sectors matrix of outlays of the sector on the good, and a matrix with the same dimensions which gives the corresponding taxes and subsidies. At this moment Total Accounts are being constructed at the Netherlands CBS for the year 1981, and these accounts are used for a number of policy evaluations based on Keller's general-equilibrium model. The number of sectors in the Total Accounts equals 102 and the number of goods 67.

The demographic information in the SEA in this paper is restricted to the number of households in each household type. Simultaneously with the Socio-economic Accounts, the CBS is developing a system of Socio-demographic Accounts describing the number of persons in various population subgroups and the transitions between the various subgroups (Koesoebjono, 1987). Until now the classifications of population subgroups in both types of Accounts were not coordinated. It goes without saying that this coordination offers an important challenge for the future.

The contents of this paper are as follows. In the next section the concept of household is defined and the classification of households into population subgroups (household types) is discussed. In section 3 we discuss the relationships between the SEA and the National Accounts, and describe the corrections mentioned above. The process of integrating the two microdata sets and the macrodata set is the subject of section 4. The resulting accounts are shown, summarized and discussed in section 5. Finally in section 6 we conclude with some remarks on future extensions of the SEA.

2. Households and Household Types

2.1. *The Household Definition*

The statistical unit in the Socio-economic Accounts (SEA) is the *household.* The household is defined in accordance with the usual CBS-definition: a person or a group of persons who occupy the whole or part of a housing unit and who provide themselves with food and possibly other essentials for living. This group may pool their incomes to a greater or lesser extent.

Choosing the household instead of the individual as the statistical unit in the SEA is almost unavoidable in view of the importance of the information on consumption in the Accounts. In the statistical practice consumption is always measured at the household level, and attributing this household consumption to individuals is difficult, both theoretically and empirically. In the CBS Budget Survey, one of the data sources for the SEA, consumption therefore is measured and published at the household level. A consequence of this choice is that at the income side of the SEA the incomes of all members of the household (main breadwinner, partner, children and others) are added together.

The definition of household given above is sometimes referred to as the *housekeeping unit* definition. In the Recommendations for the 1990 Round of Population Censuses (UN, 1987), this is one of the two recommended definitions. The other is the *household-dwelling unit*: a person or a group of persons who fully occupy a private dwelling or housing unit. However, it is also recommended that countries applying the household-dwelling concept should at least give an estimate of the total number of housekeeping units in their census report. The housekeeping unit definition can therefore be considered to be the preferred definition, and since it also seems the most useful definition for the description and analysis of income, consumption and savings, it is used here. An extensive discussion of both definitions is provided by Priest (1986). In the Netherlands, the difference between both definitions is not negligible quantitatively: in 1981 the average household size according to the housekeeping unit definition was 2.75 persons and according to the dwelling unit definition 2.87 persons (Nijsten, 1984).

The Socio-economic Accounts describe the complete Dutch population, including the so-called *institutional households.* The income- and consumption data of these households are often difficult to interprete since they are usually closely related to the money flows of the institutions where they live. Ideally, they should be distinguished separately in the accounts. However, in the current

version of the SEA this has not been done for practical reasons: institutional households are included in the various household types dependent on their household size, income source, income level and age structure (section 2.3). Thereby each single individual and married couple in the institution is considered a separate household.

2.2. *Classification of Households*

The classification of households into household types is based on four general principles:

(a) The target variables should agree as closely as possible *within* cells of the classification variables, and they should differ as much as possible *between* cells. For the SEA, this implies that classification variables with a maximum influence on income and consumption patterns should be chosen.

(b) The user of the statistics should be interested in the classification. For the SEA this implies that the household types should be clearly recognizable for government policy and for the society as a whole.

(c) The number of households in each cell should not be too small, both for fundamental and for practical reasons.

(d) Each household should belong to exactly one household type.

Households can be classified according to characteristics of one member (or more members) of the household, or according to characteristics of the household as a whole. The problem with the first option is of course that a household member has to be chosen whose characteristics are considered the most important. Irrespective whether this member is called "head", "main breadwinner" or "reference person", such a choice remains unsatisfactory for obvious reasons. In the SEA therefore households are only classified according to characteristics of the household as a whole.

2.3. *The Classification Variables*

On the basis of the principles mentioned above, four classification variables are chosen.

(a) Number of household members older than 65 years
- -zero
- -one or more

(b) Main income source of the household
- -wages and salaries from the private sector
- -wages and salaries from the public sector
- -transfers
- -entrepreneurial income from the agricultural sector
- -entrepreneurial income from the sector trade
- -entrepreneurial income from the sector other services[1]
- -entrepreneurial income from other sectors and property income

[1]These households contain individuals such as lawyers, dentists, etc.

(c) Number of household members
  -one
  -two
  -three or more
(d) Income level of the household
  -first 25% group of the household income distribution
  -second 25% group of the household income distribution
  -third 25% group of the household income distribution
  -fourth 25% group of the household income distribution

The main income source of the household is determined in two steps. In the first step the income sources of all household members are added per source. In the second step the maximum of these household income sources is determined (in CBS, 1987, a more precise description is given). It follows that the main income source of the household is not necessarily equal to any of the main income sources of the household members, and this procedure therefore is in agreement with the requirement in the previous section that households should not be classified by the characteristics of one single household member.

The income concept for the classification variable "income level of the household" is approximately equal to the concept of disposable income discussed in the next section. Differences stem from practical considerations: a large number of (usually very small) components of disposable income are not measured at the household level but only at the level of household types. This is sufficient for the accounts themselves, but not for the classification of households into household types: for that purpose a measure of income for each household in the microdata sets is needed. Since the household types are determined by a crossing of all the classification variables (see below), income has *not* been corrected separately for differences in the size of the household, for example by means of a so-called equivalence factor.

Households are classified into four income classes: 25% groups of the distribution of household incomes. The boundaries of these classes are the three quartiles of the income distribution: the first quartile, the median and the third quartile. For 1981 they equal hfl. 23,560, 33,500 and 46,120 per year, respectively.

2.4. *The 52 Household Types*

The complete crossing of the four classification variables yields $2 * 7 * 3 * 4 = 168$ household types, a number too large in view of the principles mentioned in section 2.2. Therefore some combinations are made:

(a) Households with a member older than 65 years of age are not distinguised according to main source.
(b) Households with entrepreneurial income or property income as the main income source are not distinguised according to household size or income level.

These combinations result in $4 * 3 * 4 + 4 = 52$ household types, schematically shown in Table 1. The household types are numbered with the same number as is used in Table 4. The numbers of the combined household types are equal. In

TABLE 1

THE 52 HOUSEHOLD TYPES

Household Size	25% Group of household Income	No Household Members Older than 65 Main Income Source							With Household Members Older than 65
		Wages private sector	Wages public sector	Transfers	Entrepreneurial- and property income				
					Agriculture	Trade	Other Services	Others	
One	First	1	13	25	49	50	51	52	37
	Second	2	14	26	49	50	51	52	38
	Third	3	15	27	49	50	51	52	39
	Fourth	4	16	28	49	50	51	52	40
Two	First	5	17	29	49	50	51	52	41
	Second	6	18	30	49	50	51	52	42
	Third	7	19	31	49	50	51	52	43
	Fourth	8	20	32	49	50	51	52	44
Three or more	First	9	21	33	49	50	51	52	45
	Second	10	22	34	49	50	51	52	46
	Third	11	23	35	49	50	51	52	47
	Fourth	12	24	36	49	50	51	52	48

our view, the resulting set of household types is a satisfactory compromise between the four general principles mentioned in section 2.2.

3. The Relationship Between the SEA and the National Accounts

3.1. *The Netherlands National Accounts*

A quantitative description of the economic developments in the Netherlands is published yearly by the CBS in the form of the *National Accounts.* As mentioned in section 1, the National Accounts are an important source of information for the Socio-economic Accounts. In this section we discuss the relationships between both systems of accounts.

The National Accounts offer a *complete* and *systematic* description of the economic process which has taken place in a country during a given period. The description is complete in the sense that in principle all economic transactions of all individuals and institutions in the country are recorded. The description is systematic in the sense that there is a uniform system of definitions and classifications which are used for the grouping of the economic transactions and for the individuals and institutions in the country: the transactors. A set of similar transactors is called a *sector.*

In the Netherlands National Accounts seven sectors are distinguished:

(a) Non-financial enterprises;
(b) Government: central government and other public authorities;
(c) Government: social security funds;
(d) Households and private non-profit institutions;
(e) Banks;
(f) Pension funds and life insurance companies;
(g) The rest of the world.

Sector (d), households and private non-profit institutions, is called the household sector. Sector (a), (e) and (f), the financial and nonfinancial enterprises, might be called the business sectors. In the National Accounts, much attention is given to a detailed breakdown of the business sectors: the different branches of enterprises. For example, the input-output table records all economic transactions between the branches and this table is consistent with the National Accounts themselves. However, until now such an extension to a lower level of aggregation was only available for the business sectors, not for the household sector. Therefore, an important motive for the construction of the SEA as described in this paper is our wish to disaggregate the household sector similarly. See Ruggles and Ruggles (1986) for a similar statement.

The relationship between the SEA and the household sector of the National Accounts has two important aspects. The first aspect is that in both systems of accounts the same transaction *concepts* are used: the definitions of the components of income, consumption and savings are identical. The other aspect is that the same transaction *amounts* are used: the sum of the amounts recorded in the SEA for the 52 household types equals the amount recorded in the National Accounts for the household sector. There are three exceptions to this general rule: transactions with respect to private non-profit institutions, pension funds and medical consumption are treated differently, see below.

3.2. *The Three Intermediary Funds*

It is a well known problem that the macro view in the National Accounts often leads to definitions which are less suited for the analysis of micro behavior and for the statistical description of micro units (individuals and households). The problem and solutions have been discussed in a number of publications from the United Nations (1977a, b) and also for example by Ruggles and Ruggles (1983, 1986) and Van Bochove and Van Tuinen (1986). The three most important problems probably are that the household sector also includes the private non-profit institutions, the treatment of pension premiums and the interest received by pension funds as income and savings of the household sector, and the attribution of medical consumption to the household sector. For the SEA, we have tried to solve these problems by introducing three *intermediary funds.* The intermediary funds provide the link between the totals for the 52 household types in the SEA and the household sector in the National Accounts.

This link is explained in table 2. The last column of the table yields the macro totals for the household sector according to the National Accounts, 1981. Most of these totals can be found in CBS (1984a). The column starts with the components of primary income (hfl. 258,180 million in 1981), continues with the components of disposable income (hfl. 243,430 million in 1981) and ends with consumption and savings. The first column of the table yields the totals for the 52 household types in the Socio-economic Accounts 1981. The accounts in Table 4 at the end of this paper are a disaggregation of this column. Both columns are linked by the three intermediary funds in column two, three and four. The sum of column one to four equals column five.

In Table 2 we also show the composition of the two income concepts, primary income and disposable income. The same concepts are used in table 4, which also gives a breakdown of consumption. The numbers of the components in table 2 are equal to the numbers in table 4.

The three intermediary funds are called private non-profit institutions (column 4), pension insurance (column 3) and medical consumption (column 2). We will discuss each of them separately.

(a) Private Non-profit Institutions

In the National Accounts the private non-profit institutions are included in the household sector. However, these insititutions are not households according to the definition given in section 2.1, and their incomes and outlays should therefore not be included in the Socio-economic Accounts. This can easily be achieved by introducing an intermediary fund which receives the incomes of these institutions (property income, and contributions from government and households) and pays their outlays. In Table 2 this fund can be found in column four. Since some of the amounts are based on very rough estimates, the numerical values should be treated with due reserve. For the SEA, the introduction of this fund implies that the contributions of the households are included in the accounts for the households (row 13, hfl. 6,230 million). The contributions are recorded as consumer expenditure rather than as transfer, because from the point of view of the

TABLE 2

THE LINK BETWEEN THE SEA (HOUSEHOLDS) AND THE NATIONAL ACCOUNTS (HOUSEHOLD SECTOR), 1981

Components	Households (SEA) 1	Intermediary funds: Medical Consumption 2	Intermediary funds: Pension Insurance 3	Intermediary funds: Private Non-profit Institutions 4	Household Sector (National Accounts) 5
	Million hfl.				
1. Wages and salaries	155,080	—	—	—	155,080
2. Employers' contributions for social security	44,920	—	—	—	44,920
3.1. Entrepreneurial income	22,850	—	—	—	22,850
3.2. Interest received	12,880	—	—	1,240	14,120
3.3. Other property income	4,900	—	—	770	5,670
3.4. Rental value own house	7,300	—	—	—	7,300
3.5. Mortgage interest	9,650	—	—	—	9,650
3.6. Other interest paid	1,990	—	—	80	2,070
3.7. Imputed interest pension funds and life insurance comp.	—	—	19,960	—	19,960
4. (1+2+3.1+3.2+3.3+3.4−3.5−3.6+3.7) Primary Income	236,290	—	19,960	1,930	258,180
5.1. Transfers from government	17,210	580	—	4,800	22,590
5.2. Transfers from social security funds	54,330	20,770	—	—	75,100
5.3. Transfers from pension insurance	13,850	—	−13,850	—	—
5.4. Transfers paid	4,120	—	—	—	4,120
6.1. Premiums social security funds	66,140	—	—	—	66,140
6.2. Premiums pension insurance	20,630	—	−20,630	—	—
6.3. Premiums private health insurance	3,370	−3,370	—	—	—
7. Direct taxes	42,180	—	—	—	42,180
8. (4+5.1+5.2+5.3−5.4−6.1−6.2−6.3−7) Disposable Income	185,240	24,740	26,740	6,730	243,430
15. Consumer Expenditure	180,730	24,720	2,530	5,250	213,230
including					
Medical services	1,180	22,520	—	—	23,690
Administration costs insurances	1,300	520	2,530	70	4,420
13. Contributions of households to private non-profit institutions	6,230	—	—	−6,230	—
16. (8—15) Savings	4,510	—	24,210	1,480	30,200

household the goods and services received are comparable to goods and services which result from "production" as defined in the National Accounts.

(b) Pension insurance[2]

In the National Accounts, the wealth of pension funds is treated as if it is owned by the households. This implies that pension premiums are treated as savings for the household sector, and pension benefits as dissavings. It furthermore implies that the interest pension funds receive on their reserves is imputed to the household sector ("imputed interest"). In the SEA these income components are treated in a way which is more in accordance with the experience of households: the pension premiums are a negative component of disposable income, the pension benefits a positive component and the imputed interest does not enter the accounts at all. This is achieved by introducing the intermediary fund pension insurance which receives the pension premiums (hfl. 20,630 million in 1981) and the imputed interest (hfl. 19,960 million in 1981) and pays the pension benefits (hfl. 13,850 million in 1981). All amounts are shown in table 2.[3]

(c) Medical Consumption

In the National Accounts, medical outlays for households financed by public health insurance are treated as part of both disposable income and consumption of the household sector. The (obligatory) premium for this insurance is furthermore treated as a negative component of disposable income. Attributing the publicly financed medical outlays to the different household types is however very difficult, both conceptually and practically (most attributions will result in a very high disposable income for elderly households with a high incidence of hospital treatment). Therefore in the SEA these outlays are not attributed to the households, but to an intermediary fund "medical consumption." The premiums are still treated as a negative component of disposable income. In order to enhance comparability between publicly and privately insured, the premiums for private health insurances are also treated as a negative income component for the households, and a positive component for the intermediary fund medical consumption.

4. The Integration of Micro and Macro Data

In the Socio-economic Accounts data from several sources are combined. The construction of the accounts is therefore less straightforward than the construction of statistics based on a single data source. More specifically the problem is that the macro amounts derived from the microdata sources are not equal to the correponding amounts derived from the macrodata source. Usually there are several causes for these differences. in this section we summarize them and describe the process for integrating the micro and macrodata for the SEA.

[2]Throughout this paper "pension insurance" stands for "pension and life insurance," and "pension funds" stands for "pension funds and life insurance companies."

[3]Some of the amounts in table 2 necessarily have a negative sign because they refer to transactions between the households and one of the intermediary funds. In these cases, the name of the component has been chosen in such a way that it is in accordance with common parlance for the households.

Integration of data from more than one source is a well-known problem in the compilation of statistics. Three examples are the compilation of an input-output table for the National Accounts, the weighting of microdata to make a sample representative and the construction of synthetic estimators for the combination of data from a register and a household survey. In each of these examples, data from one source contradict the data from an other source, and the data from both sources should be combined in one or another way. Usually this is done by constructing an estimator which is a function of the data in both sources and which is optimal in some sense.

For the compilation of the SEA this has also been done. Micro- and macro information is combined (integrated) in order to estimate the income and consumption components of the 52 household types as closely as possible. For each of the components, this is done after a very detailed analysis of the differences between the information on that component in the different data sources. The resulting estimator usually depends in a complicated way on various institutional aspects of the data sources and of the Dutch society. We will not go further into these institutional aspects here but suffice with a reference to CBS (1988), Chapter 4 and 5). It is however worth mentioning that the whole integration process was kept manageable by explicitly writing down all estimating equations and by performing the complete process on the computer.

In the integration process, the following four steps can be distinguished:

(a) Choice of the components of income, consumption and savings to be included in the SEA, and determination of their macro amounts from the National Accounts.[4]

(b) Choice of similar components in one of the micro data sets.

(c) Analysis of the definitional differences between the SEA-components and the components in the microdata set, and determination of the corresponding macro amounts. The remaining (not simply explainable) differences are called the statistical differences.

(d) Estimation of the SEA components for each household type as a function of the results of step (a), (b) and (c).

The four steps can probably be explained most easily by introducing some notation and by working out the process for one component, wages.

Let the variables be defined as in Table 3. In the first step of the integration process the components c in the SEA are chosen, for example wages. In this step the macro amount Y_c is determined from the National Accounts, hfl. 155,080 million in the case of wages (see Table 2). In the second step a microdata set is chosen with a similar component, in the example of wages the Income Statistics. From that source the total of wages within householdtype h, m_{ch}, is determined for $h = 1, \ldots, 52$. In the third step the differences between the definition of wages in the National Accounts and in the Income Statistics are analyzed. Two important differences are that the Income Statistics do not contain the wage of persons who are deceased or emigrated during the year, and that in the definition of wage pension premiums are excluded. The total amount involved with these definitional

[4]The amounts for the intermediary funds are also determined in this step. They are treated as is shown in Table 2. In this section we will not discuss them separately.

TABLE 3

NOTATION OF VARIABLES FOR COMPONENT c AND HOUSEHOLD TYPE h

Variable	Notation	Notation Macro Amount	Macro Amount for c = Wages
			hfl. million
Component in micro data set	m_{ch}	$M_c\left(=\sum_{h=1}^{52} m_{ch}\right)$	148,440
Definitional difference	d_{ch}	$D_c\left(=\sum_{h=1}^{52} d_{ch}\right)$	5,910
Statistical difference	s_{ch}	$S_c\left(=\sum_{h=1}^{52} s_{ch}\right)$	730
Component in SEA	y_{ch}	$Y_c\left(=\sum_{h=1}^{52} y_{ch}\right)$	155,080

differences, D_c, is estimated at hfl. 5,910 million. For many variables these amounts are based on Van der Laan and De Waard (1985).

The problem now is to estimate y_{ch} for $h = 1, \ldots, 52$ given Y_c, D_c and the m_{ch}. Firstly M_c and S_c are computed:

$$M_c := \sum_{h=1}^{52} m_{ch}; \tag{1}$$

$$S_c := Y_c - M_c - D_c. \tag{2}$$

For wages, these values are already given in Table 3. (It should be mentioned here that for a number of variables the statistical difference is larger than in the case of wages). The next step then is to estimate d_{ch} for $h = 1, \ldots, 52$. For most components this is the most difficult step. Usually it is done by first approximating d_{ch} on the basis of the information available in the microdata set. For example, in the case of wages, the pension premiums paid by households are estimated on the basis of the wage level and the branch of industry, and the wages of the deceased and the emigrants are estimated on the basis of the known probabilities of dying and emigration in each household type. If the approximation is called d^*_{ch}, the d_{ch} then are estimated by

$$d_{ch} := d^*_{ch} * \left(D_c \Big/ \sum_{h=1}^{52} d^*_{ch}\right). \tag{3}$$

The remaining steps are easy. First the statistical differences are estimated per household type:

$$s_{ch} := S_c * (m_{ch} + d_{ch})/(M_c + D_c). \tag{4}$$

Hence the statistical differences are distributed among the household types proportionally with the sum of the component in the microdata set and the definitional difference. The final step for component c is the computation of the components in the SEA per household type:

$$y_{ch} := m_{ch} + d_{ch} + s_{ch}. \tag{5}$$

This completes the description for component c. Equations (1) to (5) are used for every component except savings. Let c run from 1 to C and let $c = C$ be savings. Savings for household type h are estimated by

$$(6) \qquad y_{Ch} := -\sum_{c=1}^{C-1} y_{ch},$$

where components of consumption and savings are defined with a minus sign. Equation (6) implies that for every household type savings automatically equals income minus consumption. An alternative would have been to get a direct estimate of savings for household type h (e.g. from a budget survey), and to estimate all y_{ch} simultaneously subject to the two sets of restrictions

$$(7) \quad \sum_{h=1}^{52} y_{ch} = Y_c \quad \text{for } c = 1, \ldots, C \qquad \text{and} \qquad \sum_{c=1}^{C} y_{ch} = 0 \quad \text{for } h = 1, \ldots, 52.$$

There are several methods to solve this well-known problem (for example, Iterative Proportional Fitting). For the SEA this alternative is not used because no reliable estimate for savings is available.

5. Data and Results

It has already been mentioned in the introduction that the integration process for the Socio-economic Accounts is based on two microdata sets (the CBS Income Statistics and the CBS Budget Survey) and one macrodata set (the CBS National Accounts). In this section we will first describe the two microdata sets. We then conclude the section with a discussion of the resulting accounts.

Every two years the Income Statistics give a complete description of the income distribution for individuals and households in the Netherlands. It is *not* based on a household survey but on register data, with the administration of the income tax as the most important data source. The sample size in 1981 was equal to about 175,000 households, 3.3 percent of the Dutch population (CBS, 1986). For all individuals in these households a large amount of information on their income components is collected from the tax administration. From this sample a new sample of 20,000 households was drawn to be used for the construction of the SEA.

The CBS Budget Survey gives yearly a complete description of the consumption patterns of households in the Netherlands. It is based on a survey among approximately 3,000 households, who have to record all their outlays during one month of the year. Furthermore, additional information on income components and on large and regular outlays is collected during the whole year (CBS, 1984b).

The sample size of about 3,000 households is too small to obtain enough observations in each of the 52 household types of the SEA. The amounts included in the SEA are therefore not based on a simple arithmetical average of the consumption of households in the relevant household type, but on an estimated average. The following method was used. For each consumption component, a regression was done with the outlays of the household on that component as the dependent variable, and household size, income source and income level as the

independent variables (in the form of dummies). The average outlays on the component in a household type were then estimated as the structural part of this regression equation (with the dummies set at the appropriate values). Hence, in order to obtain better estimates of the consumption in a household type, information is used (implicitly) of the consumption in other household types.

The resulting Socio-economic Accounts are shown in Table 4. The table shows the averages, not the total amounts. Let N_h denote the number of households in household type h, then Table 4 is a matrix with household types h as rows, income and consumption components c as columns and y_{ch}/N_h as cells. The components in Table 4 are an aggregation of the components which were used in the process of constructing the SEA. In CBS (1988) the complete accounts are given, with a detailed disaggregation of income and consumption for the same 52 household types.

The amounts in Table 2 and Table 4 are attuned to each other, of course. Table 2 (and Table 3) give for example a macro amount of hfl. 155,080 million for wages and salaries, and because the total number of households equals 5,281,500 the average of wages and salaries among all households equals 155,080 mln/5,281,500 = 29,400, the amount given in the last row of Table 4.

6. Concluding Remarks

In this paper the construction is described of a system of Socio-economic Accounts (SEA) for the Netherlands for 1981. The accounts give an integrated description of the socio-economic situation for large subgroups of the Dutch population. In the accounts in this paper the description is restricted to the most important components of income, consumption and savings. The amounts for the 52 household types which are distinguished add up to the macro amounts for the household sector in the National Accounts of the Netherlands. The income and consumption concepts in the SEA therefore are closely related to the similar concepts in the National Accounts. The relationship has been made explicit by introducing three intermediary funds: private non-profit institutions, pension insurance and medical consumption.

Apart from its statistical purposes, the SEA also serves as a detector of missing links in the system of CBS statistics. Since essentially all money that flows from households, to households and between households should be described by the SEA, it becomes immediately clear if no statistical information is available on specific flows. This offers a guiding principle in the process of developing new statistics. From the construction of the SEA in this paper it has for example become clear that accurate information on savings, financial transactions and private non-profit institutions is scarce. The relevant amounts in Table 2 and Table 4 should therefore be treated with due reserve.

Future extensions of the SEA are currently being developed. The first purpose is to update the accounts to later years. A next step is to extend the information to a number of other topics. We now end this paper with a short description of four of these topics.

TABLE 4
SOCIO-ECONOMIC ACCOUNTS FOR THE NETHERLANDS, 1981
(Average Amount per Household)

Household Type										
Main income source /age	Household size (pers)	Household income class	Number (see table 1)	Number of Households	Wages and salaries 1.	Employers Contributions 2.	Entrepreneurial and Property Income 3.	Primary Income (1+2+3) 4.	Transfers Received 5.	Premiums for Social Security, Pensions Health Insurance 6.
				×1000	hfl. 1000					
Wage	1	1st	1	141	17.2	4.1	0.2	21.5	3.6	8.9
Private		2nd	2	86	35.8	10.3	0.2	46.3	3.8	20.1
Sector		3rd	3	22	53.7	14.6	1.2	69.5	4.1	29.7
		4th	4	6						
	2	1st	5	42	20.9	5.1	−0.2	25.8	3.9	10.7
		2nd	6	118	32.9	8.9	0.1	41.8	4.8	17.4
		3rd	7	177	47.8	12.6	0.2	60.6	7.0	24.7
		4th	8	127	79.7	20.9	3.4	104.0	5.6	39.1
	≥3	1st	9	36	21.7	5.3	−1.2	25.8	4.9	11.2
		2nd	10	378	33.5	9.7	−0.4	42.8	6.1	18.5
		3rd	11	434	46.1	13.0	−0.1	59.0	7.7	25.3
		4th	12	485	77.4	19.9	4.2	101.6	12.0	39.8
Wage	1	1st	13	30	21.8	8.6	−0.8	29.7	0.6	11.8
Public		2nd	14	47	37.0	13.4	0.1	50.5	0.2	18.6
Sector		3rd	15	20	54.1	17.9	1.2	73.1	1.4	25.3
		4th	16	6						
	2	1st	17	4						
		2nd	18	38	36.0	13.5	−0.0	49.4	0.9	19.2
		3rd	19	67	50.2	16.8	−0.2	66.8	3.3	24.8
		4th	20	72	75.9	23.9	1.4	101.2	3.1	34.8
	≥3	1st	21	2						
		2nd	22	85	36.5	14.1	−1.4	49.2	2.4	19.6
		3rd	23	190	47.4	17.1	−0.9	63.6	3.7	24.0
		4th	24	200	74.6	23.6	0.9	99.1	6.7	34.5
Transfers	1	1st	25	246	0.5	0.1	0.8	1.4	20.4	2.7
		2nd	26	44	1.9	1.0	2.6	5.6	34.1	6.1
		3rd	27	12	2.6	3.0	6.4	12.0	44.4	9.5
		4th	20	2						
	2	1st	29	91	0.7	0.2	0.7	1.6	25.4	5.1
		2nd	30	96	2.5	2.1	2.2	6.8	31.3	6.6
		3rd	31	51	7.3	4.2	2.5	13.9	40.9	10.4
		4th	32	17	10.5	7.0	15.9	33.3	55.9	14.1
	≥3	1st	33	62	1.1	0.3	−0.3	1.0	27.1	6.5
		2nd	34	88	4.4	1.6	1.2	7.3	31.6	8.3
		3rd	35	75	9.7	3.0	2.4	15.1	38.8	10.6
		4th	36	66	22.1	7.6	5.4	35.1	49.4	17.7
With	1	1st	37	419	0.0	0.0	1.7	1.7	16.7	0.6
Household		2nd	38	114	0.1	0.0	5.8	5.9	28.6	0.3
Members		3rd	39	49	0.4	0.0	13.3	13.7	38.7	0.9
Older than 65		4th	40	14	0.3	0.0	63.5	63.7	47.4	1.4
	2	1st	41	200	0.1	0.0	1.3	1.5	22.3	1.4
		2nd	42	151	1.0	0.2	4.7	5.9	27.1	1.0
		3rd	43	98	7.9	2.1	10.4	20.5	32.3	5.6
		4th	44	64	12.2	2.7	37.3	52.2	56.4	8.4
	≥3	1st	45	10	1.1	0.1	−1.8	−0.6	20.4	1.9
		2nd	46	16	2.8	0.7	4.3	7.8	27.4	3.5
		3rd	47	47	15.3	4.2	4.4	23.9	30.6	10.9
		4th	48	95	36.5	10.2	18.9	65.6	34.6	23.1

TABLE 4—continued

Household Type										
Main income source /age	Household size (pers)	Household income class	Number (see table 1)	Number of Households	Wages and salaries 1.	Employers Contributions 2.	Entrepreneurial and Property Income 3.	Primary Income (1+2+3) 4.	Transfers Received 5.	Premiums for Social Security, Pensions Health Insurance 6.
				×1000	hfl. 1000					
Entrep. inc. agricult.			49	80	6.3	1.7	58.5	66.5	7.1	13.8
Entrep. inc. trade			50	102	4.7	1.1	57.0	62.8	5.2	14.4
Entrep. inc. services			51	68	10.3	2.5	104.2	117.1	17.2	31.5
Oth. entrep. prop. inc.			52	92	7.9	1.8	57.4	67.0	15.0	13.4
Households Total			HT	5,281	29.4	8.5	6.9	44.7	15.4	17.1
Intermediary funds:										
Medical consumption			MC	—	—	—	—	—	4.0	−0.6
Pension insurance			PI	—	—	—	3.8	3.8	−2.6	−3.9
Private non-profit instit.			PN	—	—	—	0.4	0.4	0.9	—
Total			Total	5,281	29.4	8.5	11.0	48.9	17.7	12.5

Household Type	Direct taxes 7.	Disposable Income (4+5−6−7) 8.	Food 9.	Luxury food, Beverages and Tobacco 10.	Durables 11.	Other Goods and Services 12.	Contrib. to Priv. Non-prof. Institut. 13.	Expenditure Abroad 14.	Consumption Expenditure (9+10+11+12+13+14) 15.	Savings (8-15) 16.
	hfl. 1000									
1	2.5	13.7	2.0	1.3	4.8	10.3	1.0	0.9	20.3	−6.6
2	5.9	24.1	2.5	1.6	6.2	12.8	0.5	1.7	25.3	−1.1
3	11.1	32.9	3.0	1.9	8.0	15.3	0.6	2.4	31.2	1.7
4										
5	2.2	16.8	3.9	1.9	6.7	11.7	0.2	0.9	25.3	−8.5
6	4.3	24.9	4.2	2.3	8.0	13.7	0.3	1.6	30.1	−5.1
7	7.2	35.7	4.8	2.5	9.8	16.2	0.5	2.3	36.0	−0.4
8	17.9	52.5	5.9	2.9	14.2	22.4	0.7	3.8	50.0	2.6
9	3.4	16.2	5.8	2.4	6.9	12.6	0.3	0.2	28.3	−12.1
10	4.2	26.2	6.1	2.7	8.2	14.5	0.5	0.9	32.9	−6.7
11	6.7	34.7	6.6	3.0	10.1	17.0	0.5	1.6	38.8	−4.1
12	17.1	56.6	7.8	3.4	14.5	23.1	0.8	3.2	52.6	4.0
13	2.9	15.7	1.6	1.0	4.4	10.0	2.1	0.8	19.9	−4.2
14	6.3	25.8	2.4	1.4	5.9	13.1	0.6	1.7	25.1	0.6
15	11.7	37.6	2.9	1.6	7.8	15.5	0.9	2.4	31.0	6.6
16										
17										
18	5.1	26.0	4.2	2.0	7.7	14.0	0.4	1.7	30.0	−4.0
19	8.1	37.3	4.7	2.3	9.6	16.5	0.6	2.4	35.9	1.4
20	16.4	53.1	5.8	2.6	13.9	22.5	0.8	3.9	49.7	3.4
21	4.7	27.3	6.0	2.5	8.0	14.8	0.5	1.0	32.8	−5.4
22	7.4	35.8	6.5	2.7	9.9	17.3	0.6	1.7	38.7	−2.8
23	15.3	56.0	7.7	3.1	14.2	23.2	0.9	3.2	52.4	3.6
24										
25	1.3	17.8	2.1	1.2	3.5	9.3	0.3	0.9	17.4	0.5
26	5.1	28.6	2.4	1.5	4.7	11.3	0.4	1.6	22.0	6.5
27	10.1	36.8	2.7	1.7	6.1	13.0	0.6	2.1	26.3	10.5
28										

TABLE 4—continued

Household Type	Direct taxes 7.	Disposable Income (4+5−6−7) 8.	Food 9.	Luxury food, Beverages and Tobacco 10.	Durables 11.	Other Goods and Services 12.	Contrib. to Priv. Non-prof. Institut. 13.	Expenditure Abroad 14.	Consumption Expenditure (9+10+11+ 12+13+14) 15.	Savings (8-15) 16.
	hfl. 1000									
29	1.8	20.1	4.1	1.9	5.5	11.1	0.2	0.9	23.7	−3.6
30	4.0	27.5	4.4	2.2	6.8	13.2	0.3	1.6	28.6	−1.0
31	6.9	37.5	4.9	2.5	8.7	15.6	0.4	2.3	34.4	3.1
32	18.1	57.1	6.1	2.9	13.0	21.6	0.7	3.9	48.2	8.9
33	1.6	20.0	5.9	2.4	5.8	12.0	0.3	0.2	26.6	−6.7
34	3.2	27.5	6.2	2.7	7.0	14.0	0.4	0.9	31.4	−3.8
35	5.1	38.2	6.8	3.0	8.9	16.5	0.5	1.6	37.3	0.9
36	11.3	55.5	7.9	3.4	13.3	22.5	0.8	3.2	51.0	4.5
37	1.1	16.7	2.1	0.8	2.1	8.3	3.3	0.7	17.2	−0.5
38	3.6	30.6	1.3	0.8	2.4	5.8	10.8	0.7	21.7	8.9
39	8.0	43.5	1.9	1.0	3.7	8.6	8.5	1.2	24.9	18.6
40	29.0	80.6	4.0	1.7	8.9	19.7	2.5	3.4	40.3	40.3
41	1.8	20.5	4.1	1.5	3.9	10.4	0.6	0.7	21.2	−0.7
42	3.3	28.7	4.4	1.8	5.2	12.4	0.9	1.4	26.1	2.6
43	7.5	39.7	4.8	2.1	7.0	14.9	1.1	2.1	32.0	7.7
44	27.5	72.6	5.4	2.3	10.5	19.5	4.5	3.3	45.5	27.0
45	5.4	12.4	5.9	2.0	4.5	11.3	0.5	0.0	24.1	−11.7
46	2.7	29.0	6.2	2.3	5.5	13.5	0.6	0.7	28.8	0.2
47	4.8	38.7	6.7	2.6	7.4	15.8	0.7	1.4	34.5	4.2
48	13.1	64.0	7.9	2.9	11.7	22.0	1.0	3.0	48.4	15.6
49	11.4	48.4	7.5	2.5	9.3	17.9	0.9	1.2	39.2	9.2
50	11.1	42.5	6.1	2.5	11.1	19.1	0.4	3.7	43.0	−0.5
51	38.3	64.4	6.9	3.0	14.0	24.0	0.8	3.2	52.0	12.4
52	17.3	51.2	6.4	2.7	10.5	18.0	0.5	2.5	40.5	10.7
HT	8.0	35.1	5.1	2.3	8.4	15.5	1.2	1.8	34.2	0.8
MC	—	4.7	—	—	0.0	4.7	—	—	4.7	—
PI	—	5.1	—	—	—	0.5	—	—	0.5	4.6
PN	—	1.3	0.1	0.1	0.1	1.8	−1.2	—	1.0	0.3
Total	8.0	46.1	5.2	2.4	8.5	22.4	—	1.8	40.4	5.7

(a) *Provision of Public Goods*

Consumption in the current SEA is restricted to the consumption of private goods and services. In view of the large flows of money involved in the consumption of public goods (e.g. public transport, museums, education, housing subsidies), supplementing the SEA with information on the consumption of public goods and the corresponding subsidies has a high priority. In the Netherlands research on this topic has until now only been done by the Social and Cultural Planning Bureau. See Van't Eind et al. (1986).

(b) *Demographic Component*

The demographic component in the current SEA is restricted to the number of households in each household type. For the future, it is important to extend this information and to coordinate it with the Socio-demographic Accounts which are also published by the CBS.

(c) *Savings and Financial Transactions*

A complete description of all capital transactions of households is lacking in the current SEA. Important in this context is a detailed breakdown of savings and dissavings and information on components of property, investment transactions and capital gains.

(d) *Time Use*

A topic for the more distant future is the inclusion in the SEA of information on time use. Categories which should then be distinguished are time spent on paid work, unpaid productive activities including do-it-yourself work and leisure.

References

CBS, *Nationale Rekeningen 1983*, Staatsuitgeverij, The Hague, 1984a.

CBS, *Budgetonderzoek 1978-1981*, Staatsuitgeverij, The Hague, 1984b.

CBS, *Personele Inkomensverdeling 1981, Huishoudens*, Staatsuitgeverij, The Hague, 1986.

CBS, *Sociaal-Economische Rekeningen, Methodebeschrijving en Toepassing voor 1981*, Staatsuitgeverij, The Hague, 1988.

Cohen, S. I., A Social Accounting Matrix Analysis for the Netherlands, *De Economist* 136 (2), 253-272, 1988.

Keller, W. J., *Tax Incidence: A General Equilibrium Approach*, North Holland, Amsterdam, 1980.

Koesoebjono, S., *Socio-demographic Accounts: Framework to Measure the Dynamics of Population* Staatsuitgeverij, The Hague, 1987.

Nijsten, F. P. M. M., Huishoudens en Woningbezetting, 1960-1983; Berekening op Basis van de Woningvoorraad, *Supplement bij de Sociaal-economische maandstatistiek*, 5, 21-28, 1984.

Priest, G. E., *Proposed Definitions and Classifications of Households, Families and Related Variables for the Recommendations for the 1990 Round of Population and Housing Censuses in the ECE Region*, United Nations, New York, 1986.

Pyatt, G. and Round, J. I., Social Accounting Matrices for Development Planning, *The Review of Income and Wealth*, 23, 339-364, 1977.

Ruggles, N. D. and Ruggles, R., The Treatment of Pensions and Insurance in National Accounts, *The Review of Income and Wealth*, 29, 371-404, 1983.

Ruggles, R. and Ruggles N. D., The Integration of Macro and Micro Data for the Household Sector, *The Review of Income and Wealth*, 32, 245-276, 1986.

Shoven, J. B. and Whalley, J. Applied General-Equilibrium Models of Taxation Models of Taxation and International Trade: An Introduction and Survey, *Journal of Economic Literature*, 22, 1007-1051, 1984.

United Nations, *System of National Accounts and Supporting Tables*, United Nations, New York, 1953.

United Nations, *A System of National Accounts*, United Nations, New York, 1968.

United Nations, (1977a) *The Feasibility of Welfare-oriented Measures to Supplement the National Accounts and Balances: A Technical Report*, United Nations, New York, 1977.

United Nations, (1977b), *Provisional Guidelines on Statistics of the Distribution of Income, Consumption and Accumulation of Households*, United Nations, New York, 1977.

United Nations, *Recommendations for the 1990 Round of Censuses in the ECE Region*, United Nations, New York, 1987.

Van Bochove C. A. and Van Tuinen, H. K., Flexibility in the Next SNA: The Case for an Institutional Core, *The Review of Income and Wealth*, 32, 127-154, 1986.

Van der Laan, P., *Compilation of Household Sector Accounts in the Netherlands National Accounts* Occasional paper NA/23, CBS, 1987.

Van der Laan, P. and De Waard, J. W. B., *Vergelijking tussen de Inkomens statistiek en de Nationale Rekeningen*, Statistische Onderzoekingen M26, Staatsuitgeverij, The Hague, 1985.

Van't Eind, G. J., Van Fulpen, H., Pommer, E., and Ruitenberg, L., Evaluating the Distribution of Public Expenditure, *The Review of Income and Wealth*, 32, 299-312, 1986.