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BALANCE SHEET VALUATION:

Produced intangible assets and non-produced assets

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BALANCE SHEET VALUATION: PRODUCED INTANGIBLE ASSETS AND NON-PRODUCED ASSETS

Abstract

This paper deals with the estimation of opening and closing stocks of produced intangible assets such as mineral exploration, computer software and artistic originals and non-produced assets such as land, sub-soil assets, patented entities and purchased goodwill.

The first section elaborates on the main conceptual issues related to the compilation of stock data such as the asset boundary, the relation between flows and stocks and principles of valuation. Several valuation methods are discussed including the perpetual inventory method and the net present value of expected future returns.

The following sections discuss each of the assets categories in detail. Each section starts with definitions and the identification of sources. Subsequently, volumes, prices and values are estimated for almost all these asset categories. The estimates pertain to the beginning (January 1st) and end (December 31st) of 1990.

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1. Introduction

The national accounts generally provide a comprehensive, yet detailed record of the transactions and other flows that occur in the national economy in a particular period. In addition to these economic flows, the national accounts also include the opening and closing stocks of assets and liabilities at the beginning and end of the accounting period. These stocks generally consist of non-financial assets such as land and buildings, as well as financial assets and liabilities such as shares, deposits and loans.

The flows and stocks are closely related as stocks result from the accumulation of transactions and other flows during the accounting period. In addition to consistency within the accounting period (between flows and stocks), consistency between accounting periods in principle exists as the closing balance sheet at the end of the accounting period equals the opening balance sheet at the beginning of the subsequent period (i.e. balance sheet continuity).

Balance sheets are in principle compiled for individual sectors as well as for the total economy. In the balance sheets of the total economy, the financial claims on (and liabilities to) resident sectors completely cancel out. Only financial assets and liabilities with the rest of the world remain.

The compilation of balance sheets may further improve the quality of flow data, especially if stocks are derived from other sources than the flows. The confrontation of independently estimated stock data with related flows may lead to the identification of statistical discrepancies. Removing these discrepancies typically increases the plausibility of data.

Balance sheets also yield an important summary indicator of the state of the national economy, namely net worth. The national net worth is often referred to in economic literature as the "national wealth", i.e. the total of economic assets in a country less its liabilities. The changes

in the national net worth include for example the discovery of natural resources, whereas the depletion of these resources is deducted. Countries relying heavily on the exploitation of these natural resources may witness high growth rates of their gross domestic product (GDP), yet may be faced with large reductions in their national wealth. In addition to the GDP, therefore, the national net worth is an important indicator of the state of the economy.

This paper is more limited in its aim as it focuses on the estimation of opening and closing stocks of non-financial assets in the Netherlands. The reference year is 1990. The paper especially elaborates on the estimation of stocks of produced intangible assets and non-produced tangible and intangible assets. These mainly concern items for which no estimates were available in the Netherlands.

The estimates presented here should be considered as tentative, as they are the outcome of a first step in the compilation of balance sheets for the Netherlands. The estimations may be further refined in subsequent stages of balance sheet compilation. For example, the valuation of land may be improved by using more detailed price data than are currently available at Statistics Netherlands.

The paper is broadly structured according to the classification of assets as used in the 1993 System of National Accounts (SNA). Section 2 discusses the main conceptual issues. Section 3 elaborates on produced intangible fixed assets. Section 4 deals with a particular category of produced assets, namely valuables. Sections 5 and 6 elaborate on non-produced tangible assets and non-produced intangible assets, respectively. The last section summarizes the findings and contains some concluding remarks.

Each section starts with the definition of asset categories and the identification of sources. Subsequently, volumes, prices and values are estimated for most of the asset categories. These estimates pertain to the beginning (January 1st) and end (December 31st) of 1990. In a few cases, however, estimates could not be compiled as sufficient data were

not available. Sometimes it was concluded that the stock value is negligible.

2. Balance sheets: conceptual issues

This section elaborates on conceptual issues related to the compilation of balance sheets. The first sub-section deals with the asset boundary. This boundary especially determine what is recorded on the balance sheets. The second sub-section deals with the various institutional sectors which are distinguished in the Netherlands. It shows for whom balance sheets are in principle compiled. The third sub-section deals with flows and stocks, and the way they are related. The fourth sub-section elaborates on categories of non-financial assets. The fifth sub-section deals with principles of valuation.

2.1 Asset boundary

The asset boundary includes all assets that are owned by institutional units from which economic benefits can be derived by holding or using them over a period of time. Included here are financial assets such as shares and bills and bonds as well as non-financial assets such as buildings and equipment, which themselves have been produced in the past. Moreover, non-financial assets that have not been produced are also included in the asset boundary provided that institutional units exercise ownership rights over them and that benefits can be derived from them. These assets include items such as land, mineral deposits, fuel reserves, uncultivated forests and so on (SNA 1.26, 2.40 and 2.41).

Some assets fall outside the asset boundary like the atmosphere and the open seas, because no ownership rights can be exercised over them or because no benefits can be derived from them at present. This pertains for instance to mineral or fuel deposits that are economically not viable, i.e. given the technology and relative prices incapable of bringing any benefits to their owners.

2.2 Institutional sectors

Institutional units are the basic units in the national accounts for which it is in principle possible to compile a complete set of flow accounts and balance sheets. These units are capable of owning assets, incurring liabilities, and engaging in transactions on their own account. The institutional units that are resident in the economy are presently classified into five main sectors:

- 1) non-financial corporations
- 2) credit institutions
- 3) insurance corporations and pension funds
- 4) general government
- 5) households

These five resident sectors together make up the total economy. In addition, the transactions between these resident units and non-residents are recorded on the rest of the world account.

Each sector may be divided into sub-sectors. The general government, for example, is sub-divided into central government, local government and social security funds.

2.3 Flows and stocks

The institutional units described above may engage in various economic activities, for example in the production of goods and services, the consumption of goods and services, and saving and investment. These actions result in economic flows and corresponding changes in the volume, composition or value of the institutions' assets or liabilities. All these economic activities are called transactions.

Transactions do not make up the full spectrum of economic flows. For example, the destruction of economic assets by natural disasters or changes in the value of assets and liabilities due to price changes are not transactions. Nevertheless, these events are also recorded in the

system as they affect the value of the assets or liabilities of an institutional unit. These so-called 'other flows' are by convention recorded on the 'other changes in assets' account.

In contrast to economic flows, the stocks of assets and liabilities are recorded at one point in time, such as the beginning of the accounting period or the end of the accounting period. However, stocks and flows are closely related as stocks result from the accumulation of transactions and other flows during the accounting period.

2.4 Categories of non-financial assets

The SNA distinguishes a large number of asset categories. In the first instance, assets are classified into non-financial assets and financial assets. The non-financial assets are further subdivided into produced assets and non-produced assets (SNA 10.4 to 10.8).

Produced assets are outputs of a production process. These assets are further classified into fixed assets, inventories and valuables. Fixed assets are used repeatedly or continuously in processes of production for more than one year. Inventories consist both of stocks of output held by units that produced them and stock of products acquired from other units that are used up in processes of production or resold without further processing. Valuables are not used for production, but mainly function as stores of value.

Fixed assets consist of tangible and intangible assets. Tangible fixed assets include buildings, structures, machinery and equipment. Intangible fixed assets include mineral exploration, computer software, and entertainment, literary or artistic originals.

In contrast to the produced assets, the non-produced assets do not come into existence through processes of production. These assets are further classified on the basis of the way they come into existence. Some of these assets occur in nature, while others appear through legal or accounting

actions.

Similar to produced assets, non-produced assets consist of tangible and intangible assets. The non-produced tangible assets occur in nature and include land, subsoil assets, non-cultivated biological resources and water resources. The non-produced intangible assets are constructs devised by society and include patented entities, leases and other transferable contracts and purchased goodwill.

The main categories of non-financial assets are summarized in table 1. A complete list of categories of assets is given at the end of this report (see annex 1).

Table 1: Main categories of non-financial assets

Categories
Non-financial assets
Produced assets
Fixed assets
Tangible fixed assets
Intangible fixed assets
Inventories
Valuables
Non-produced assets
Tangible assets
Intangible assets

2.5 Principles of valuation

Just like economic transactions, assets and liabilities are also in principle valued at current market prices; i.e. not at historical cost prices as is often pursued in business accounting. This principle implies that assets and liabilities are regularly revalued at observed market prices for similar items. However, if such prices are not available, they may be approximated by accumulating and revaluing transactions over time (i.e. by using the perpetual inventory method) or by estimating the present value of future returns expected from a given asset (SNA 13.25 to 13.35).

Thus, assets and liabilities are preferably valued at observed prices in markets. Such prices are mostly available for financial claims (e.g. from the stock exchange). Market prices may also be available for existing real estate such as buildings, other structures and underlying land (e.g. from real estate brokers), existing transportation equipment, crops and livestock as well as for newly produced fixed assets and inventories. However, these prices are not always easy to obtain. Furthermore, in the case of land, for example, prices may show wide variations by region and by type of use, and may also fluctuate substantially from year to year (and even within years). This puts a heavy burden on the collection of data.

The perpetual inventory method may be used for the valuation of assets if market prices are not available. This method approximates the value of assets by accumulating and revaluing the acquisitions less disposals of the asset over its lifetime. The value of such an asset equals its current acquisition price less the accumulated amortization. The amortization pattern is often derived from tax laws or business accounting conventions¹⁾. This valuation method is typically used for fixed assets²⁾.

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- 1) Fixed assets are often recorded in the balance sheet at current written-down values, i.e. at current prices written-down for the accumulated consumption of fixed capital (often "referred to as written-down replacement cost"). This method of valuation is consistent with the valuation concept of the national accounts.
 - 2) The perpetual inventory method has been applied here for the valuation of mineral exploration, computer software and patented entities. The value of amortization has simply been derived from the revaluated expenditures (investments) of the current year. This procedure leads to a slight overestimation of amortization of investments which have taken place at the end of the year. It is more realistic, however, to derive the amortization from the (unweighted) average of the expenditures in the current year and the previous year (assuming a uniform distribution of investments during the year). This latter procedure is also applied for estimating the amortization of tangible fixed assets in the Netherlands. As the estimations are still preliminary and subject to revisions, it has not been applied in this study. However, the above-mentioned procedure is intended to be utilized in a later stage in order to estimate the amortization on these assets as accurate as possible and to ensure consistency with the estimations of tangible fixed assets.

Market prices may also be approximated by estimating the present value of future returns expected from a given asset. A rate of discount is then utilized to compute the present value of expected future returns³⁾. The SNA recommends to derive the rate of discount from information relating to transactions in the particular types of assets rather than using a general rate of interest (SNA 13.34). This method is typically used for assets with delayed returns (as with most non-cultivated biological resources) or with returns that are spread over a lengthy period (as with subsoil assets).

A practical difficulty with this method is that the estimated value of future returns from an asset is normally not disclosed by corporations. In many cases, therefore, these values can only be approximated. In the case of reserves of natural gas and oil, for example, the value of the future returns has been approximated by the estimated government receipts of gas and oil revenues as direct information regarding the net value of the future returns from these assets is not available (see section 5.2.1).

There are generally two ways of determining the rate of discount. The first is based on the concept of opportunity cost: the rate of discount is in this case equivalent to the rate of return of the second best investment alternative. This rate is generally not easy to obtain. The second way is based on the rate of interest.

In the following section, the above conceptual conclusions are applied to the estimation of balance sheets for produced intangible assets and non-produced assets.

3) The present value of the expected future returns is calculated as:

$$\text{Present value of expected future returns} = \sum_{t=0}^T \frac{A^t}{(1+i)^t}$$

Where i = rate of discount, T = total number of years,
and A^t = expected return in year t .

3. Produced assets: intangible fixed assets

Produced intangible fixed assets include mineral exploration, computer software, entertainment, literary and artistic originals. These asset categories are discussed in the sub-sections below.

3.1 Mineral exploration

The SNA defines mineral exploration as: "the value of expenditures on exploration for petroleum and natural gas and for non-petroleum deposits. These expenditures include prelicense costs, license and acquisition costs, appraisal costs and the costs of actual test drilling and boring, as well as the costs of aerial and other surveys, and transportation costs incurred to make it possible to carry out the tests" (SNA, p. 307).

Concerning valuation of mineral exploration the SNA recommends that: "mineral exploration should be valued either on the basis of the amounts paid under contracts awarded to other institutional units ... or on the basis of the costs incurred for exploration undertaken on own account. That part of exploration undertaken in the past that has not yet been fully written off should be revalued at the prices and costs of the current period" (SNA 13.43).

The exploration of minerals is pursued in order to discover new reserves of minerals or fuels that may be exploited commercially. Therefore, all expenditure on mineral exploration, whether successful or not, should be treated as capital expenditure (i.e. the acquisition of intangible fixed assets) rather than intermediate consumption (SNA 6.166 and 10.90/91).

In business accounting, on the contrary, only expenditure on successful efforts is regarded as capital expenditure (the so-called successful efforts method), while expenditure on unsuccessful efforts is usually regarded as current expenditure: i.e. directly charged to the profit of the year in which the effort has been judged to be unsuccessful. Because

of these practices, it is usually not possible to derive total expenditures on mineral exploration from published business accounts.

As a consequence of these business accounting practices, expenditures on mineral exploration have been estimated in retrospect on the basis of quantity data as published by the Ministry of Economic Affairs⁴⁾.

In the Netherlands, mineral exploration is limited to oil and natural gas exploration. This exploration broadly consists of seismic surveying and drilling activities (exploration/appraisal), which are pursued both onshore and offshore.

The "Energie Beheer Nederland B.V." (EBN) at Heerlen provides rough estimates of average expenditures for these different types of exploration for the period 1980-1990. The rates are as follows:

Seismic surveying:	onshore; line km	df1	25,000	per km
	square km	df1	60,000	per km ²
	offshore; line km	df1	2,000	per km
	square km	df1	25,000	per km ²
Drilling activities:	onshore	df1	12,000,000	per well
	offshore	df1	18,000,000	per well

As more details were not available, these rates have been used for the year 1985, while rates for other years (1980 to 1990) have been adjusted on the basis of the price index for mineral exploration (available from the national accounts).

4) See Ministry of Economic Affairs, Mining Division of the Directorate General for Energy, "Oil and Gas in the Netherlands, Exploration and Production 1990", annex 13 and 16.

Total expenditures on mineral exploration have been obtained by multiplying the quantity data by these prices and include also other expenses such as reconnaissance licences (see table 2). Balance sheet values for mineral exploration have been obtained on the basis of the perpetual inventory method. Based on the accounting practices of "Energie Beheer Nederland B.V." (EBN), the average useful service life has been set at ten years. The estimates appear in table 3.

Table 2: Mineral exploration: expenditures

	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990
A: Seismic surveying											
Quantities	1000 km										
- Onshore: line km	2.0	4.6	4.3	3.9	2.5	3.4	2.3	2.2	1.1	.8	.1
- Onshore: sq. km	.0	.0	.1	.4	.5	1.2	.9	.6	1.7	1.2	1.8
- Offshore: line km	15.4	22.1	14.7	24.4	9.3	41.5	11.7	24.5	14.3	4.0	8.2
- Offshore: sq. km	.0	.1	.3	.2	.4	.8	.2	1.6	1.9	3.2	4.9
Rates	1000 dfl										
- Onshore: line km	24.5	24.5	24.8	24.8	24.8	25.0	25.0	25.0	25.3	25.5	25.8
- Onshore: sq. km	58.8	58.8	59.4	59.4	59.4	60.0	60.0	60.0	60.6	61.2	61.8
- Offshore: line km	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1
- Offshore: sq. km	24.5	24.5	24.8	24.8	24.8	25.0	25.0	25.0	25.3	25.5	25.8
Expenditures	mln dfl										
	80	160	149	175	121	260	140	180	208	183	257
- Onshore: line km	49	113	107	97	62	85	58	55	28	20	3
- Onshore: sq. km	0	0	6	24	30	72	54	36	103	73	111
- Offshore: line km	31	44	29	49	19	83	23	49	29	8	17
- Offshore: sq. km	0	3	7	5	10	20	5	40	48	82	126
B: Drilling activities											
Quantities	wells										
- Onshore: wells	21	16	13	18	19	18	5	4	11	10	8
- Offshore: wells	14	15	20	7	11	18	15	14	17	14	14
Rates	mln dfl										
- Onshore: wells	11.8	11.8	11.9	11.9	11.9	12.0	12.0	12.0	12.1	12.2	12.4
- Offshore: wells	17.6	17.6	17.8	17.8	17.8	18.0	18.0	18.0	18.2	18.4	18.5
Expenditures	mln dfl										
	494	453	511	339	422	540	330	300	442	380	358
- Onshore: wells	248	189	155	214	226	216	60	48	133	122	99
- Offshore: wells	246	264	356	125	196	324	270	252	309	258	259
C: Other expenses¹⁾	mln dfl										
	0	0	0	0	0	1	0	0	0	0	0
Total expenses	mln dfl										
	574	613	660	514	543	801	470	480	650	563	615

1) These include reconnaissance licenses as collected by the Ministry of Economic Affairs (Dir. Gen. for Energy and Dir. Gen. for Oil and Gas).

Table 3: Mineral exploration: valuation

	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990
mln dfl											
Expenditure (tot.)	574	613	660	514	543	801	470	480	650	563	615
Expenditure (rev.)	603	644	686	535	565	825	484	494	663	569	615
Expenditure (acc.)	603	1247	1933	2468	3033	3858	4342	4836	5499	6068	6080
Amortization (10 y.)	60	60	60	60	60	60	60	60	60	60	
		64	64	64	64	64	64	64	64	64	64
			69	69	69	69	69	69	69	69	69
				54	54	54	54	54	54	54	54
					57	57	57	57	57	57	57
						83	83	83	83	83	83
							48	48	48	48	48
								49	49	49	49
									66	66	66
										57	57
											62
Amortization (acc.)	60	184	377	624	928	1315	1750	2234	2784	3391	3397
Balance sheet value:											
- 1990 prices										2677	2683
- 1989 prices										2648	

3.2 Computer software

The SNA defines computer software as: "computer programs, program descriptions and supporting materials for both systems and applications software. Included are purchased software and software developed on own account, if the expenditure is large. Large expenditures on the purchase, development or extension of computer databases that are expected to be used for more than one year, whether marketed or not, are also included" (SNA, p. 307).

The SNA recommends to value computer software: "on the basis of the purchasers' price paid for the software or, in the absence of such prices, on the basis of costs of production when produced in-house. Software acquired in previous years and not yet fully written down should be revalued at current prices or costs (which may be less than the original price or cost)" (SNA, 13.44).

The estimates of expenditure on computer software have been based on the "Automation Statistics" as published by Statistics Netherlands. These statistics cover expenditures on computer software by private enterprises, subdivided into a large number of industries, and the general government, subdivided into various levels of government. The expenditures consist of purchased software (both standard off-the-shelf and specially developed software), staff costs and investments in special software designed to facilitate production processes (computer aided manufacturing and computer aided planning). The following categories of expenditure on computer software are distinguished:

- a) Software, standard (purchased, rented or leased)
- b) Software, special (purchased, rented or leased)
- c) Staff costs, wages (partly own account production)
- d) Investment in computer aided manufacturing (CAM)
- e) Investment in computer aided planning (CAP)

Because the expenditures on software developed in-house for own use are not directly available from the Automation Statistics, the wage costs of application programmers and other software developers have been taken as an approximation⁵⁾. These costs constitute about 30 per cent of the total wages of automation personnel. This is only a rough approximation, as other automation personnel may also be involved in the development of software for own use, while application programmers, for example, may undertake other activities as well. Moreover, training costs such as special courses related to the development of software for own use are not taken into account.

The total expenditures on computer software have been revalued to prices of 1990 on the basis of the price index of computer services from the national accounts.

The balance sheet values for computer software at the beginning and end of 1990 have been estimated on the basis of the perpetual inventory method (assuming an average useful service life of three years). The estimates have been compiled for non-financial enterprises (corporations and unincorporated enterprises), credit institutions, insurance enterprises and pension funds, and the general government. The estimates appear in table 4 below.

5) The other software developers comprise of system designers and programmers and information analysts. The wage costs of software developers employed by software houses have been excluded here, as these programmers are predominantly involved in the development of software for external use.

Table 4: Computer software: valuation

	1985	1986	1987	1988	1989	1990
mln dfl						
Non-financial enterprises:						
Expenditure (total)	2148	2415	2624	2640	3220	3656
- Software, standard	443	443	462	441	587	600
- Software, special	465	576	734	735	953	1274
- Staff costs, wages	1080	1206	1188	1194	1380	1452
- Computer aided manuf. (CAM)	80	100	130	150	170	180
- Computer aided plann. (CAP)	80	90	110	120	130	150
Expenditure (rev.)	2363	2632	2834	2772	3349	3656
Expenditure (acc.)	2363	4995	7829	8238	8955	9777
Amortization (3 y.)	788	788	788			
		877	877	877		
			945	945	945	
				924	924	924
					1116	1116
						1218
Amortization (acc.)	788	2453	5063	5446	5799	6223
Balance sheet value:						
- 1990 prices			2766	2792	3156	3554
- 1989 prices					3033	
Credit institutions:						
Expenditure (total)	321	453	388	397	530	686
- Software, standard	56	70	76	67	112	130
- Software, special	121	179	168	186	256	382
- Staff costs, wages	144	204	144	144	162	174
Expenditure (rev.)	353	494	419	417	551	686
Expenditure (acc.)	353	847	1266	1330	1387	1654
Amortization (3 y.)	118	118	118			
		165	165	165		
			140	140	140	
				139	139	139
					184	184
						229
Amortization (acc.)	118	401	824	915	884	1017
Balance sheet value:						
- 1990 prices			442	415	503	637
- 1989 prices					483	

continued..

	1985	1986	1987	1988	1989	1990
mln dfl						
<u>Insurance corporations & pension funds:</u>						
Expenditure (total)	155	218	181	200	266	298
- Software, standard	31	52	40	40	53	53
- Software, special	40	64	63	70	105	131
- Staff costs, wages	84	102	78	90	108	114
Expenditure (rev.)	171	238	196	210	277	298
Expenditure (acc.)	171	409	605	644	683	810
Amortization (3 y.)	57	57	57			
		79	79	79		
			65	65	65	
				70	70	70
					92	92
						99
Amortization (acc.)	57	193	394	437	426	491
Balance sheet value:						
- 1990 prices			211	207	257	319
- 1989 prices					247	
<u>General government:</u>						
Expenditure (total)	546	575	605	773	712	725
- Software, standard ¹⁾	128	135	142	147	120	161
- Software, special ¹⁾	237	250	263	407	374	343
- Staff costs, wages ¹⁾	181	190	200	219	218	221
Expenditure (rev.)	601	627	653	812	740	725
Expenditure (acc.)	601	1228	1881	2092	2205	2277
Amortization (3 y.)	200	200	200			
		209	209	209		
			218	218	218	
				271	271	271
					247	247
						242
Amortization (acc.)	200	609	1236	1333	1442	1549
Balance sheet value						
- 1990 prices			645	759	763	728
- 1989 prices					734	

continued..

	1985	1986	1987	1988	1989	1990
mln dfl						
Total economy:						
Balance sheet values:						
- 1990 prices			4064	4173	4679	5238
- 1989 prices					4497	

1) As these expenditures are only available for the years 1987 onwards, the expenditures for the years 1985 and 1986 have been derived from the 1987 estimates using an annual deflation rate of 5 per cent.

Source: Automation Statistics, Statistics Netherlands, several years.

3.3 Entertainment, literary or artistic originals

The SNA defines the category entertainment, literary or artistic originals as: "original films, sound recordings, manuscripts, tapes, models, etc. on which drama performances, radio and television programming, musical performances, sporting events, literary and artistic output, etc., are recorded and embodied. Included are works produced on own account. In some cases, such as films, there may be multiple originals" (SNA, p. 307).

According to the SNA, valuation of these assets should be pursued: "at the acquisition price when these intangible assets are actually traded on markets. In the case of intangible assets that have been produced on own-account, it may be necessary to value them on the basis of their costs of production, appropriately revalued at prices of the current period and written down. Otherwise, it may be necessary to use estimates of the present value of the expected future receipts to be received by the owners of such assets (SNA 13.45).

In our approach, the valuation of these assets has been based on the present value of the future receipts, estimated from expenditure data of publishing agencies and record companies and payments from the rest of the world. Straightforward estimates of future receipts of the owners of artistic originals are not available.

This approach is based on the notion that the expenditures of publishing agencies and record companies usually occur on a recurrent basis: as a regular compensation to the owners of artistic originals. On the other hand, publishing agencies and record companies sometimes also buy the artistic originals proper (thereby investing in artistic originals). In this case, the balance sheet value of the artistic originals could be approximated on the basis of the perpetual inventory method. In most cases, however, the artistic originals are not bought from the original owners so that an approach based on the present value of future receipts is more appropriate.

In the first instance, the annual expenditures on these assets have been derived from the production statistics of publishing agencies (honoraria) and record companies (studio recordings, artist- and pressing fees, purchase of repertoire, broadcasting fees, etc.), as collected by Statistics Netherlands (only the payments to resident owners have been included here). Film rights, honoraria and other payments for artistic originals from abroad have been derived from the balance of payments.

Subsequently, these expenditures have been considered as incomes to the owners of artistic originals. Assuming a useful service life of 5 years, the owners annually receive a part of the income. It has been assumed that the owners receive 50 per cent of the income in the current year (for the originals created in that year), 20 per cent in the following year and 10 per cent in each of the remaining three years (as the originals generate income during a period of 5 years).

For the years 1986 to 1989, it has been assumed that half of the current expenditure relates to originals developed in the respective years. From 1990 onwards, current income has been set equal to current expenditure. Consequently, the income from originals created in the current year has been derived as a residual, i.e. df1 860 million in 1990 and df1 1346 million in 1991 (see table 5).

The balance sheet value at the beginning of 1990 has been set equal to the net present value of the receipts from 1990 to 1994. Similarly, the balance sheet value at the end of 1990 is equivalent to the net present value of the receipts from 1991 to 1995. The net present value of the future receipts is based on a discount rate of 8.0 per cent in 1990 and 7.8 per cent in 1991 (equivalent to a moving 10-year average of the long term rate of interest).

The balance sheet values for entertainment, literary or artistic originals at the beginning and end of 1990 appear in table 5 below. The amounts have been increased by the book values of advance productions as derived from the annual reports of Dutch broadcasting corporations.

Table 5: Entertainment, literary or artistic originals: valuation

	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	Total
mln dfl											
Expenditure (total)	688	997	1131	1292	1400	2032					
- Recorded media (CDs, etc.):											
* Honoraria, studio rec., etc.	17	23	41	33	33	28					
* Artist and pressing fees, adv.	125	87	89	111	174	285					
* Broadcasting fees	35	49	43	56	55	58					
- Publishers: honoraria	273	280	287	302	326	304					
- Abroad: film rights, hon. etc.	238	558	671	790	812	1357					
Incomes											
	344	138	69	69	69						
		498	199	100	100	100					
			566	226	113	113	113				
				646	258	129	129	129			
					860	344	172	172	172		
						1346	538	269	269	269	
Incomes: current values					1400	686	414	301	172		
Incomes: present values 01/01/90					1296	588	329	221	117		2551
Incomes: advance productions¹⁾											128
Balance sheet total 01/01/90											2679
Incomes: current values					2032	683	570	441	269		
Incomes: present values 31/12/90					1885	588	455	326	185	3439	
Incomes: advance productions¹⁾											150
Balance sheet total 31/12/90											3589

1) The advance productions of broadcasting corporations include the following enterprises: MCRV, NOP, AVRO, EO, KRO, TROS, VARA, VERONICA, VPRO, NOS, IKON (appr.) and WO.

4. Produced assets: valuables

The SNA defines valuables as: "produced assets that are not used primarily for production or consumption, that are expected to appreciate or at least not to decline in real value, that do not deteriorate over time under normal conditions and that are acquired and held primarily as stores of value. Valuables consist of precious metals and stones, antiques and other art objects and other valuables" (SNA, p. 308).

Valuables are further classified as follows:

- a) Precious metals and stones that are not held for use as inputs into processes of production,
- b) Antiques and other art objects such as paintings and sculptures,
- c) Other valuables such as collections of jewellery of significant value fashioned out of precious stones and metals (SNA, p. 309).

Valuables are predominantly owned by households and governments, but other sectors are also likely to own (substantial) stocks of valuables. Corporations, for example, often possess paintings and sculptures which are used for decoration purposes. Nevertheless, these valuables are usually not separately recorded on their balance sheets. Thus far, stocks of valuables have not been recorded by Statistics Netherlands.

The value of these assets may be derived from the accounts of insurance corporations, who normally keep records of valuables such as precious stones and consumer durables. Such information, however, cannot be easily converted to SNA concepts. Moreover, valuables are often not insured, as premiums are usually prohibitive.

On the other hand, a project to estimate the stock value of valuables is a huge and costly operation. For example, the central government possesses substantial stocks of art objects which are mostly stored in the national musea. These musea store a collection of about 800.000 pictures and drawings which widely range in value. As a central registration of the collections does not exist, the approximate 700 musea

must be surveyed individually.

Valuation of these paintings is difficult as the collection is neither recorded on the balance sheet nor insured. Valuation is also subject to a high degree of uncertainty because of lack of transactions. In addition to these paintings, sculptures and other valuables must be taken into account as well. Finally, sectorization of these assets may be hazardous, as objects stored in museums may belong to other owners.

It is interesting to note that valuation on the basis of the future returns is also not fruitful, as the average operating costs of the musea far outweigh their receipts (from donations, tickets, etc). In view of these conceptual and practical difficulties, estimation of stocks of valuables is as yet not undertaken.

5. Non-produced assets: tangible assets

This section deals with non-produced tangible assets such as land, subsoil assets, non-cultivated biological resources and water resources. These categories are discussed in detail below.

5.1 Land

The SNA defines land as: "the ground, including the soil covering and any associated surface waters, over which ownership rights are enforced. Also included are major improvements that cannot be physically separated from the land itself. Excluded are any buildings or other structures situated on it or running through it; cultivated crops, trees and animals; subsoil assets; non-cultivated biological resources and water resources below the ground (SNA, p. 309).

The category land is further classified in the SNA into land underlying buildings and structures, land under cultivation, recreational land and associated surface waters, and other land and associated surface waters.

The category land underlying buildings and structures is defined as: "land on which dwellings, non-residential buildings and structures are constructed or into which their foundations are dug, including yards and gardens deemed an integral part of farm and non-farm dwellings and access roads to farms".

Land under cultivation is defined as: "land under which agricultural or horticultural production is carried on for commercial or subsistence purposes, including, in principle, land under plantations, orchards and vineyards".

Recreational land and associated surface waters is defined as: "land that is used as privately owned amenity land, parklands and pleasure grounds and publicly owned parks and recreational areas, together with associated surface waters".

Other land and associated surface waters is defined as: "land not elsewhere classified, including private gardens and plots not cultivated for subsistence or commercial purposes, communal grazing land, land surrounding dwellings in excess of those yards and gardens deemed an integral part of farm and non-farm dwellings and associated surface water" (SNA p. 309).

The value of land should include: "the value of the stock of major improvements that cannot be physically separated from the land itself. Thus, although expenditures on land improvements are treated as gross fixed capital formation in the System, they do not lead to tangible assets that can be shown in the balance sheets separately from the land itself. Land is valued at its current price paid by a new owner, including written down costs of ownership transfer" (SNA 13.55).

The SNA further recommends to indentify specific pieces of land and to price them accordingly, since the prices of land usually vary enormously with their location and use. Furthermore, it is often difficult to separate the value of land from the buildings erected on it. In these cases, the estimated value of land or value of the buildings may be deducted from the combined land and buildings. If this is not possible, the composite asset should be classified in the category representing the greater part of its value (SNA 13.56 and 13.57).

The "Land use statistics" (Bodemstatistiek) is the major data source available for the estimation of the quantities of land use by type in the Netherlands. The Land use statistics yield a complete set of data according to the main categories as recommended in the SNA (see above). The smallest unit is a plot of 25 hectare. These data are based on maps from the Topographical Service, completed with information from aerial views and urban plans.

The data for January 1st 1989 have been taken as a basis for estimating the quantities of land at the beginning and end of 1990, as data for subsequent years are not yet available. However, comparison with earlier data reveals that changes in the use of land tend to be rather small, in

both absolute and relative terms.

The Land use statistics yield data on the total quantity of land under cultivation (including the cultivated area under glass), but do not provide information on the quantities of other sub-categories of land under cultivation (which is necessary for subsequent valuation).

Therefore, the land under cultivation is further broken down by sub-categories as used in the "Agricultural Census" (Landbouwtelling). This source provides specific information on different types of use for agricultural purposes. These sub-categories (i.e. farmland, grassland, and market gardens) are similar to those used in the "Statistics on rents and on prices of farmlands" (Statistiek overdrachten en verpachtingen van landbouwgronden), which serves as the basis for the valuation of land under cultivation.

The Agricultural Census is usually held in May, i.e. according to the situation of the following crop year. Most changes in ownership and/or use take place in the first half of the year: from January to May. The balance sheet quantities of January 1st 1990 are, therefore, based on the May census of agriculture 1989 and the quantities of December 31st 1990 are based on the May census of 1990.

The estimations of the quantities of land under cultivation appear in table 6 below.

Table 6: Land: quantity under cultivation

	Source data	
	1990	1991
	hectares	
Land under cultivation (total)	2388105	2388105
- Cultivation under glass	13457	13457
- Farmland	796291	805373
- Grassland	1114008	1096496
- Market gardening	101370	103739
- Hedges and paths 1)	196872	217120
- Allotments	4796	4796
- Others	161311	147124

	Balance Sheet 1990	
	January 1	December 31
Land under cultivation (total) 2)	2388105	2388105
- Cultivation under glass	13457	13457
- Farmland	860144	864452
- Grassland	1203337	1176931
- Market gardening	109499	111349
- Hedges and paths	196872	217120
- Allotments	4796	4796

1) The area under "Hedges and paths" is calculated residually as follows:

	1990	1991
Land under cultivation (total)	2383309	2383309
Less: Cadastral surface cultivated land (total)	2186437	2166189
Hedges and paths	196872	217120

It should be noted that allotments are not included here.

2) The category "Others" has been proportionally distributed over the categories "Farmland", "Grassland" and "Market gardening".

Sources: Land use statistics, Jan. 1st 1989, for estimates on Land under cultivation (total) and Cultivation under glass, respectively Census of Agriculture, May 1989 and May 1990 for Farmland, Grassland, Marketing gardens and Cadastral surface cultivated land (total).

The estimated quantities, prices and values of the different categories of land appear in table 7 below. The values are obtained by multiplying quantities and prices.

Residential areas are by far the most important category in value terms. It has been sub-divided into plots (40%) and other areas including streets, parking lots and public greens (60%) on the basis of information on land under buildings and total residential land in a large number of municipalities in order to allow for differences in prices (derived from the Land Use Statistics). The plot prices have been derived from information published by the Ministry of Housing, Physical Planning and the Environment (Development of Soil and Plot Prices 1991). The prices for other areas (usually owned by local government) have been set equal to the weighted average of the prices of farmland and grassland as an approximation of their purchase prices.

A similar procedure as described above has been applied in the cases of industrial and dock areas, building sites, other trade areas, social cultural facilities and other public facilities.

The prices for industrial and dock areas have been derived from detailed price data (selling prices) of industrial sites made available by the Department of Physical Planning (Ministry of Housing, Physical Planning and the Environment) and further processed by Statistics Netherlands. Prices for building sites have been tentatively set at 75 per cent of the price of industrial and dock areas. In the absence of other information, the prices for other trade areas have been set equal to the prices for residential areas (see above). It is important to note that the above prices have been applied uniformly, although in practice they may vary considerably, depending on location and type of use. Prices may also show large fluctuations from year to year (and even within years).

The estimates for airfields and airports have been obtained from Schiphol Airport. The prices for other infrastructural land such as land under railways, tramways and metros and the prices of roads (metalled and unmetalled) have been tentatively set at the weighted average of the

price of farmland and grassland, as more direct information was not available (see below).

The valuation of land under cultivation has been based on the annual publications "Statistics on rents and on prices of farmlands" which yield information on purchasers' prices of land with different types of cultivation (farmland, grassland, and market gardening). These purchasers' prices show considerable fluctuations over time, as they are based on incidental transfers of land. In order to mitigate these fluctuations, moving four years averages of these prices have been utilized for valuation purposes. Thus, for prices per December 31st 1989 (equals January 1st 1990) moving four years averages of the prices per January 1st 1988 until January 1st 1991 have been used while for December 31st 1990 (equals January 1st 1991) moving four years averages of the prices per January 1st 1989 until January 1st 1992 have been used.

In the absence of other information, the price of allotments has been set equal to the price of grassland. The category "Hedges and paths" has been valued tentatively at the weighted average of the prices of farmland and grassland.

Recreational land such as woodland has been valued on the basis of price information on woodlands from the "Statistics on rents and on prices of farmlands" using again moving four years averages. The value of sport grounds has been derived from estimations by five municipal development corporations (Amsterdam, Rotterdam, Utrecht, Groningen and Eindhoven). The prices for other recreational land such as parks and public gardens, holiday recreation (camping, recreational dwellings, etc.), and other recreational areas have been set equal to those for sports grounds. The prices of land under social and cultural facilities (schools, hospitals, museums, etc.) have been set equal to those for residential areas. The prices of land under other public facilities (land for utility services, storage, etc.) have been set equal to those for industrial and dock areas.

The natural areas, both dry and wet, have been valued on the basis of

price information on natural areas from the "Statistics on rents and on prices of farmlands" using moving four years averages. The value of remaining other land, i.e. cemeteries, dumping sites, car wreck sites and other areas, has been set at the weighted average of the prices of farmland and grassland.

National waters such as Wadden Sea, North Sea, IJssel Lake, Eastern and Western Scheldt are not included in the valuation of land. As in the case of airspace, these waters are not considered economic assets, since no ownership is enforced upon them. In a future extension of the environmental module of the national accounts of the Netherlands, it may be attempted to value these natural assets as well⁶⁾.

6) See Haan, M. de and Keuning, S.J., 1996, "What's in a NAMEA?: Recent Results of the NAMEA-Approach to Environmental Accounting", paper presented at the International Symposium on Integrated Environmental and Economic Accounting in Theory and Practice, Tokyo, March 5-8, 1996.

Table 7: Land: valuation

	Quantities 1990		Prices 1990		Values 1990	
	Jan. 1	Dec. 31	Jan. 1	Dec. 31	Jan. 1	Dec. 31
	hectare		1000 dfl per ha		mln dfl	
A: Land underlying buildings, etc (total)	436501	436501			176046	171987
- Mining areas	6250	6250	41.7	42.2	261	264
- Industrial & dock areas	50185	50185			16111	16266
- Plots	20074	20074	740.0	747.0	14855	14995
- Streets, public greens, etc.	30111	30111	41.7	42.2	1256	1271
- Building sites for ind. & dock areas	10849	10849			2679	2705
- Plots	4340	4340	555.0	560.0	2408	2430
- Streets, public greens, etc.	6509	6509	41.7	42.2	271	275
- Building sites for other purposes	11589	11589			2863	2889
- Plots	4636	4636	555.0	560.0	2573	2596
- Streets, public greens, etc.	6953	6953	41.7	42.2	290	293
- Other trade areas (shops, banks, etc.)	7065	7065			4755	4616
- Plots	2826	2826	1620.0	1570.0	4578	4437
- Streets, public greens, etc.	4239	4239	41.7	42.2	177	179
- Residential areas (incl. streets, etc.)	213108	213108			143425	139227
- Plots	85243	85243	1620.0	1570.0	138093	133831
- Streets, public greens, etc.	127865	127865	41.7	42.2	5332	5396
- Infrastructure (sub-total)	137455	137455			5952	6020
- Railways, tramways & metro's	10559	10559	41.7	42.2	440	446
- Metalled roads (incl. verges)	108498	108498	41.7	42.2	4524	4579
- Unmetalled & half metalled roads	14385	14385	41.7	42.2	600	607
- Airfields & airports	4003	4003	97.0	97.0	388	388
B: Land under cultivation (total)	2388105	2388105			106597	108312
- Cultivation under glass	13457	13457	97.5	102.5	1312	1380
- Farmland	860144	864452	36.4	37.7	31309	32589
- Grassland	1203337	1176931	45.6	45.5	54872	53550
- Market gardening	109499	111349	97.5	102.5	10676	11413
- Hedges and paths	196872	217120	41.7	42.2	8209	9162
- Allotments	4796	4796	45.6	45.5	219	218

continued..

	Quantities 1990		Prices 1990		Values 1990	
	Jan. 1	Dec. 31	Jan. 1	Dec. 31	Jan. 1	Dec. 31
	hectare		1000 dfl per ha		mln dfl	
C: Recreational land & surface water (total)	404597	404597			43984	43889
- Woodland	304068	304068	11.7	12.4	3558	3770
- Sports fields	26186	26186	350.0	350.0	9165	9165
- Recreation (sub-total)	47443	47443			16606	16606
- Parks & public gardens	16090	16090	350.0	350.0	5632	5632
- Holiday recreation	18159	18159	350.0	350.0	6356	6356
- Recreational areas	13194	13194	350.0	350.0	4618	4618
- Social-cultural facilities	17103	17103			11510	11173
- Plots	6841	6841	1620.0	1570.0	11082	10740
- Streets, public greens, etc.	10262	10262	41.7	42.2	428	433
- Other public facilities	9797	9797			3145	3175
- Plots	3919	3919	740.0	747.0	2900	2927
- Streets, public greens, etc.	5878	5878	41.7	42.2	245	248
D: Other land & surface waters (total)	150329	150329			5103	4939
- Dry natural areas	86401	86401	14.2	12.8	1227	1106
- Wet natural areas	57349	57349	14.2	12.8	814	734
- Cemeteries	3797	3797	41.7	42.2	1583	1602
- Dumping sites	2301	2301	41.7	42.2	959	971
- Car wreck sites	481	481	41.7	42.2	201	203
- Other areas	7661	7661	41.7	42.2	319	323
Land (total)	3387193	3387193			331730	329127

5.2 Subsoil assets

Subsoil assets are defined in the SNA as: "proven reserves of mineral deposits located on or below the earth's surface that are economically exploitable, given current technology and relative prices. Ownership rights to the subsoil assets are usually separated from those to the land itself" (SNA, p. 309). The subsoil assets consist of coal, oil and natural gas reserves, metallic mineral reserves and non-metallic mineral reserves.

Substantial reserves of natural gas occur onshore in the north of the Netherlands and (for a minor part) below the continental shelf. The reserves of oil are much smaller. In addition, reserves of coal are found in the south of the Netherlands, but their exploitation is economically not viable anymore. Non-metallic mineral reserves mainly consist of salt deposits and some quarrying products. Metallic ores are not found in the Netherlands.

5.2.1 *Natural gas and oil reserves*

The SNA defines coal, oil and natural gas reserves as: "antracite, bituminous and brown coal deposits; petroleum and natural gas reserves and fields" (SNA, p. 310).

As to subsoil assets, the SNA utilizes the following stock concept: "Subsoil assets are proven reserves of mineral deposits located on or below the earth's surface that are economically exploitable given current technology and relative prices" (SNA 13.59).

The SNA further recommends to value these subsoil assets on the basis of the net present value of the future returns: "the value of the reserves is usually determined by the present value of the expected net returns resulting from the commercial exploitation of those assets, although such valuations are subject to uncertainty and revision. As the ownership of subsoil assets does not change frequently on markets, it may be difficult

to obtain appropriate prices, which can be used for valuation purposes. In practice, it may be necessary to use the valuations which the owners of the assets place on them in their own accounts" (SNA 13.60).

The quantity data on stocks and flows of natural gas and oil have been based on various geological surveys pursued by the Geological Survey of the Netherlands (RGD) and published annually in "Oil and Gas in the Netherlands: Exploration and Production" (Ministry of Economic Affairs, Directorate-General for Supply of Energy). This publication discusses various stock concepts, but considers the concept of remaining expected reserves the most realistic for estimating the reserves of recoverable natural gas and oil: i.e. the estimated volume of hydrocarbons in a reservoir ultimately recoverable less the cumulative production from the reservoir before the end of the year under review.

The concept of the remaining expected reserves is therefore utilized in our study, although the SNA recommends to use the concept of proven reserves (see above). Estimates of proven reserves are also available from the Geological Survey of the Netherlands. These estimates are based on somewhat more conservative assumptions of the quantities of hydrocarbons extractable from a reservoir (and are therefore about 7 per cent lower than the estimates of the expected reserves). Nevertheless, the concept of the expected reserves is used here, as it provides the most realistic estimate of recoverable reserves in the Netherlands⁷⁾.

The stocks have only been taken into account as far as they are economically recoverable: i.e. for 97 per cent (based on long time experience with the dominant "Groningen" gas field). The stocks and flows of natural gas and oil appear in table 8 below.

7) The Australian Bureau of Statistics also utilizes a broad interpretation of the concept of proven reserves as it uses the concept of "economic demonstrated resources": those resources whose geological assurance is demonstrated (i.e. the sum of measured and indicated resources) and for which extraction is profitable over the life of the mine (Australian Bureau of Statistics, 1995 National Balance Sheet for Australia, Issues and Experimental Estimates 1989 to 1992, Occasional paper, Canberra).

On the basis of the estimates of remaining expected reserves (only recoverable for 97 per cent) and annual production, the reserves of oil are expected to be sufficient for about 17 years in 1989 and 16 years in 1990. The reserves of natural gas are expected to last for about 22 years in both 1989 and 1990 (based on remaining reserves and estimates of future production available from the Plan of Gas Supply and the annual reports of Dutch Gas ("Gasunie")).

Table 8: Natural gas and oil: volumes

	Balance Sheet 1990	
	January 1	December 31
	mln m ³	
Remaining expected reserves (total)	1933	2177
- Natural gas	1865	2113
- Oil	68	64
	1989	1990
Production (total)	75.7	76.3
- Natural gas	82.0	94.0
- Oil	3.8	3.9

Sources: Oil and Gas in the Netherlands: Exploration and Production 1993, Ministry of Economic Affairs, Directorate-General for Supply of Energy, for estimates of remaining expected reserves and production of oil, and, Plan of Gas Supply 1990 and Annual Report 1991, Dutch Gas ("Gasunie"), for estimates of future production of natural gas.

Valuation of the reserves of natural gas and oil is pursued on the basis of the net present value of the expected specific revenues by the government from natural gas and oil, as an approximate of the expected

net future returns recommended in the SNA (see below).

This method is based on the assumption that these specific government revenues are equivalent to the net returns (revenues less cost, including a normal remuneration of capital) of the enterprises involved in the exploitation of natural gas and oil. The equivalence between government revenues and the net returns of enterprises is secured because of the assumption of perfect competition. If the government revenues would be lower, the enterprises would initially witness a surplus. But this surplus would in turn disappear because selling prices would be lower or because wage demands would be higher⁸⁾.

The expected specific revenues from natural gas appear in the annually published National Budget and predominantly consist of legal shares in the revenues of two enterprises ("Nederlandse Aardolie Maatschappij" and "Energie Beheer Nederland"). The revenues of oil are comparably much smaller and mainly consist of license fees and concessions ("Opbrengsten mijnwetgeving").

The National Budget of 1990 yields estimates for the expected revenues of gas and oil for the years 1990 to 1994. As the total reserves of natural gas are sufficient for 22 years (see above), the revenues for 1994 have been applied to the remaining years in order to obtain estimates of total revenues. Similarly, the National Budget of 1991 estimates the expected revenues from 1991 to 1995. As the total reserves of natural gas are sufficient for 22 years, the revenues for 1995 have been applied to the remaining years.

8) See also Keuning, S.J., 1996, "The NAMEA Experience: An Interim Evaluation of the Netherlands'; Integrated Accounts and Indicators for the Environment and the Economy", paper presented at the International Symposium on Integrated and Economic Accounting in Theory and Practice, Tokyo, March 5-8, 1996.

A similar procedure has been applied for estimating the future revenues of oil (see table 9 below)⁹⁾.

The estimated revenues of gas and oil which appear in the National Budget are regularly up-dated and revised. In the compilation process of balance sheet data, these revisions are taken into account as far as they concern estimates of current and subsequent years. However, the revisions are not included when they concern estimates of past years, as they are based on ex-post information (i.e. information that was not available at the time to which the balance sheet refers), while the national accounts are in principle based on ex-ante information (especially because actors take decisions on the basis of ex-ante information).

The expected revenues in current prices and the corresponding present values appear in table 9 below. The rate of discount has been set equal to a moving 10-year average of the long term (nominal) rate of interest in the Netherlands (which is actually equivalent to the interest on long term government bonds), and amounts to 8.0 per cent in the period 1981-1990 and 7.8 per cent in the period 1982-1991 (derived from the Statistical Bulletin published by Statistics Netherlands)¹⁰⁾.

9) The Ministry of Economic Affairs uses a somewhat different method to determine the value of natural gas and oil reserves. Following the Plan of Gas Supply of Dutch Gas, it uses a production period of 25 years (based on the plan period of the Plan of Gas Supply) and calculates for each year the expected government revenues, based on assumptions of annual production, oil and gas prices, the exchange rate of the Dutch guilder vis-à-vis other currencies and some other variables. The residual reserves, those remaining after 25 years, are not valued. This procedure is not in line with the recommendations of the SNA which uses the (more narrowly defined) concept of the proven reserves in the accounting period.

10) The estimation method applied by the Ministry of Economic Affairs (see also footnote 9) uses a discount rate which has been set equal to the current long term (nominal) rate of interest for the first five years as forecasted in the National Budget, while for the remaining production period (20 years) a real discount rate of 4 per cent has been applied (in accordance with the official recommendations of the Netherlands' Ministry of Finance: Governments' Standpoint; Reconsidering the Discount Rate). The application of two discount rates is justified by the valuation in current prices of the expected revenues for the first five years and the implicit valuation in constant prices of the expected revenues in the remaining production period (which have been set equal to expected revenues of the last year forecasted in the National Budget). These discount rates will probably also be applied in the forthcoming revision and update of the estimates of natural gas and oil reserves.

The issue of ownership of the reserves of natural gas and oil has not yet been completely resolved. From a strict legal point of view, the oil companies are the owners of the reserves, as the government has transferred both concession rights and ownership to them. From an economic point of view, however, it may be argued that the government holds the ownership, as the net returns from these assets actually accrue to the government in the form of legal shares in the revenues of the oil companies, license fees and concessions. In the current national accounting practice, these government revenues are recorded as rents (which by definition accrue only to the owner of the assets).

Furthermore, the estimated revenues of gas and oil by the Government are subject to considerable fluctuations, due to the instability of (international) prices of gas and oil, and the exchange rate of the US dollar vis-à-vis the Dutch guilder. As a consequence, the estimated values of the reserves of natural gas and oil may also fluctuate from year to year.

Finally, compensation payments related to subsidence caused by the extraction of subsoil assets are implicitly taken into account. Such payments have been regularly made by the "Nederlandse Aardolie Maatschappij" and have implicitly led to a reduction of government receipts of natural gas and oil revenues¹¹⁾. More generally, when estimating balance sheet values on the basis of the present value of future receipts, the value of future outlays including those of anticipated outlays should be taken into account.

11) In 1983, the "Committee Groningen - NAM Subsidence by the winning of natural gas" created a contingency of dfl 650 million. From 1984 to 1994, the Committee paid dfl 88 million in claims to third parties (all in purchasing power of 1980).

Table 9: Natural gas and oil: revenues

	1990	1991	1992	1993	1994	1994-2011	1995-2012	Total
Revenues of natural gas								
	mln dfl							
National Budget 1990:								
- Current values	4100	4182	4182	3939		69444		85847
- Present values 01/01/90	3796	3585	3319	2895		23393		36988
National Budget 1991:								
- Current values		4900	4818	4408	4326		79344	97796
- Present values 31/12/90		4545	4145	3518	3203		27289	42700
	1990	1991	1992	1993	1994	1994-2006	1995-2006	Total
Revenues of oil								
	mln dfl							
National Budget 1990:								
- Current values	980	998	998	941		11664		15903
- Present values 01/01/90	907	855	792	691		4233		7478
National Budget 1991:								
- Current values		1080	1062	972	954		11986	15732
- Present values 31/12/90		1001	913	775	706		4167	7562

Source: National Budget 1990 and 1991, Chapter XIII Economic Affairs, Section 06.00 Energy policy, Paragraph 06.01 Income from Natural gas.

Note: The revenues of oil are derived from the National Budget for the years 1990 and 1991. As these data are not available for subsequent years, the proportion of oil revenues in total estimated revenues of natural gas and oil has been kept constant.

5.2.2 *Non-metallic mineral reserves*

The SNA defines the non-metallic mineral reserves as: "stone quarries and clay and sand pits; chemical and fertilizer mineral deposits; salt deposits; deposits of quartz, gypsum, natural gem stones, asphalt and bitumen, peat and other non-metallic minerals other than coal and petroleum" (SNA, p. 310).

In the Netherlands, these non-metallic mineral reserves predominantly consist of salt deposits and quarrying products such as marl, sand and gravel.

Valuation of the salt deposits is pursued on the basis of the present value of receipts from concession holders by the Central Government. According to the National Budget of 1991, these receipts from salt mining concessions currently amount to dfl 3 million a year¹²⁾.

As annual production of salt is rather small in relation to total reserves, the value of the subsoil stocks has been approximated by the present value of a perpetuity of dfl 3 million per annum on the basis of a rate of discount of 8.0 per cent in 1990 and 7.8 per cent in 1991 (see also previous section). The total value of subsoil stocks of salt equals dfl 37 million at January 1st 1990 and dfl 38 million at December 31st 1990. In national balance sheet terms, however, these amounts are very small.

Valuation of quarrying products may also be pursued on the basis of the present value of future net cash flows, approximated by government receipts from quarrying concessions. However, actual valuation of these assets has not been pursued as the receipts from quarrying concessions are rather small and, more importantly, mainly consist of compensations for administrative costs.

12) See National Budget of 1991, Chapter XIII Economic Affairs, Section 06.00 Energy Policy, Paragraph 06.01 Receipts from Salt Mining.

5.3 Non-cultivated biological resources

The SNA defines non-cultivated biological resources as: "Animals and plants that yield both once-only and repeat products over which ownership rights are enforced but for which natural growth and/or regeneration is not under the direct control, responsibility and management of institutional units. Examples are virgin forests and fisheries within the territory of the country. Only those resources that are currently, or are likely soon to be exploitable for economic purposes should be included" (SNA, p. 310).

In the Netherlands, these non-cultivated biological resources mainly consist of woods (valued on the basis of logging concessions), animals (hunting licences) and fish (fishing rights). These assets are usually valued by the present value of the expected future returns (SNA 13.61).

The revenues from hunting licenses and fishing rights range from about dfl 7 million to dfl 8 million annually (Ministry of Agriculture, Conservation and Fisheries). The value of these stocks has been approximated by the present value of a perpetuity of dfl 7 million per annum on the basis of a rate of discount of 8.0 per cent in 1990 and 7.8 per cent in 1991. The total value of these stocks equals dfl 87 million at January 1st 1990 and dfl 89 million at December 31st 1990. The value of logging concessions is negligible.

5.4 Water resources

The SNA defines water resources as: "Aquifers and other groundwater resources to the extent that their scarcity leads to the enforcement of ownership and/or use rights, market valuation and some measure of economic control" (SNA, p. 310).

Similar to the non-cultivated biological resources, these assets are usually valued by the present value of the expected net future returns (SNA 13.61).

Water resources in the form of open wells, fountains or hot springs do not occur in the Netherlands. Nevertheless, special water-collection areas exist in the western dune lands and in the eastern provinces which are utilized for the preparation of drinking water. Valuation of these water resources, however, is not pursued as the net returns are negligible (as these activities are carried out on a non-profit basis).

The Government also does not charge water collection activities; i.e. does not receive any concession payments. Otherwise, the valuation of water resources could have been based on the net present value of the concession payments (similar to the valuation of subsoil assets and non-cultivated biological resources).

Furthermore, deposits of hot salt water with temperatures of about 120 degrees Celsius are found in the south of the Netherlands. The exploitation of these deposits is economically not viable, as geothermic energy is currently not competitive with gas energy. Valuation is therefore not pursued.

6. Non-produced assets: intangible assets

The SNA defines the intangible non-produced assets as: "non-produced assets that are the constructs of society. They are evidenced by legal or accounting actions, such as the granting of a patent or the conveyance of some economic benefit to a third party. Some entitle their owners to engage in certain specific activities and to exclude other institutional units from doing so except with the permission of the owner" (SNA, p. 310).

The non-produced intangible assets comprise of several sub-categories such as patented entities, leases and other transferable contracts, and purchased goodwill. These sub-categories are discussed in more detail below.

6.1 Patented entities

The SNA defines patented entities as: "inventions in categories of technical novelties that, by law or by judicial decision, can be afforded patent protection. Examples include constitutions of matter, processes, mechanisms, electrical and electronic circuits and devices, pharmaceutical formulations and new varieties of living things produced by artifice" (SNA, p. 310).

According to the SNA, patented entities should be valued "at current prices when they are actually traded on markets. Otherwise, it may be necessary to use estimates of the present value of the expected future returns to be received by the owners of such assets (SNA, 13.63). As market prices or expected returns of patented entities are not available at Statistics Netherlands, valuation of these assets has been based on a cost approach (see below).

The value of the patented entities is usually not separately available from the enterprise accounts. Intangible assets are often recorded as a single item in the enterprise accounts and usually include both produced

and non-produced intangible assets (whereas the SNA clearly distinguishes between these types of assets). Moreover, intangible assets as recorded in the enterprise accounts sometimes include assets which are treated as current expenditures in the SNA such as preliminary expenses for starting an enterprise and issuance of shares, and costs for research and development.

Therefore, the value of patented entities has been based on the costs of Dutch patent applications submitted to the Dutch Patent Office and the European Patent Office¹³⁾.

The total costs of patent applications has been obtained by the number of patent applications rejected times the costs of the patent applications rejected plus the number of patent applications granted times the costs of the patent applications granted (both in the Netherlands and Europe).

The patent offices record the number of applications submitted and the patents granted. The number of patents rejected have been derived on the assumption that the decision to grant or reject is taken after three years. The patents rejected are thus estimated on the basis of the patents submitted less the patents granted after three years.

All patent applications, whether rejected or granted, involve costs, as can be derived from the Dutch Patent Office and the European Patent Office¹⁴⁾. The cost of each patent application rejected amounts to dfl 2,020 in the Netherlands and dfl 13,690 in Europe in 1993. The cost of each patent application granted amounts to dfl 15,000 in the Netherlands and dfl 112,000 in Europe in 1993. In both cases, these costs have been deflated with 5 per cent per annum for other years (1980 to 1992). The costs of patent applications appear in table 10.

13) See, Dutch Patent Office (Nederlandse Octrooiraad) annual report 1993 (p. 14 and 45), and the European Patent Office annual report 1993 (p. 72 and 78).

14) The costs of the patents rejected are equal to the costs for filing new patents applications, the costs for search and supplementary search, and the costs for examination (Dutch Patent Office) and the costs for filing and search, and examination, opposition and appeal (European Patent Office).

The subsequent valuation of patented entities on the balance sheet is based on the perpetual inventory method (assuming an average useful service life of 10 years). The estimations appear in table 11. It is clear that these figures represent a lower bound of the actual stock value of patents (as they are based on the costs of patent applications submitted rather than their actual, often much higher, value).

Table 10: Patented entities: expenditures

	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993
A: Dutch Patents														
	no.													
Applications:														
- Submitted	1900	1900	1875	1889	1840	1939	1866	1970	2158	2205	2147	1605	1753	1733
- Rejected	1604	1586	1594	1615	1639	1767	1725	1823	2028	2083	2031	1500	1653	1633
- Granted	460	462	444	296	314	281	274	201	172	141	147	130	122	116
	each													
Costs:														
- Rejected	1070	1130	1180	1240	1300	1370	1440	1510	1580	1660	1740	1830	1920	2020
- Granted	7950	8350	8770	9210	9670	10150	10660	11190	11750	12340	12960	13610	14290	15000
	1000 dfl													
Expenses:														
- Rejected	1720	1790	1880	2000	2130	2420	2480	2750	3200	3460	3530	2750	3170	3300
- Granted	3660	3860	3890	2730	3040	2850	2920	2250	2020	1740	1910	1770	1740	1740
- Total	5380	5650	5770	4730	5170	5270	5400	5000	5220	5200	5440	4520	4910	5040
B: European Patents														
	no.													
Applications:														
- Submitted	800	800	878	1009	1123	1204	1289	1473	1668	1821	2021	2051	2418	2152
- Rejected	443	319	325	364	518	550	449	559	743	865	866	925	1190	900
- Granted	200	200	199	357	481	553	645	605	654	840	914	925	956	1155
	each													
Costs:														
- Rejected	7260	7620	8000	8400	8820	9270	9730	10220	10730	11260	11830	12420	13040	13690
- Granted	59400	62370	65480	68760	72200	75810	79600	83580	87750	92140	96750	101590	106670	112000
	1000 dfl													
Expenses:														
- Rejected	3220	2430	2600	3060	4570	5100	4370	5710	7970	9740	10240	11490	15520	12320
- Granted	11880	12470	13030	24550	34730	41920	51340	50570	57390	77400	88430	93970	101980	129360
- Total	15100	14900	15630	27610	39300	47020	55710	56280	65360	87140	98670	105460	117500	141680

Source: Dutch Patent Office, Annual Report 1993, and European Patent Office, Annual Report 1993.

Table 11: Patented entities: valuation

	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990
	mln dfl										
Expenditure (total)	20	21	21	32	45	52	61	61	71	92	104
- Dutch patents	5	6	6	5	5	5	5	5	5	5	5
- European patents	15	15	16	28	39	47	56	56	65	87	99
Expenditure (rev.)¹⁾	33	33	31	45	60	66	74	71	78	97	104
Expenditure (acc.)	33	66	97	142	202	268	342	413	491	588	659
Amortization (10 y.)	3	3	3	3	3	3	3	3	3	3	
		3	3	3	3	3	3	3	3	3	3
			3	3	3	3	3	3	3	3	3
				5	5	5	5	5	5	5	5
					6	6	6	6	6	6	6
						7	7	7	7	7	7
							7	7	7	7	7
								7	7	7	7
									8	8	8
										10	10
											10
Amortization (acc.)	3	9	18	32	52	79	113	154	203	262	295
Balance sheet value:											
- 1990 prices										326	364
- 1989 prices										310	

1) The expenditures have been revalued to prices of 1990 on the basis of an assumed annual increase of 5 per cent.

6.2 Leases and other transferable contracts

The SNA defines leases and other transferable contracts as: "leases or other contracts where the lessee has the right to convey the lease to a third party independently of the lessor. Examples include leases of land and buildings and other structures, concessions or exclusive rights to exploit mineral deposits or fishing grounds, transferable contracts with athletes and authors and options to buy tangible assets not yet produced. Leases on the rental machinery are excluded from non-financial intangible assets" (SNA, p. 310).

Valuation of these assets is not pursued in view of the difficulties of obtaining data and their presumably rather small value. For example, the value of transferable contracts with football players are usually not disclosed by their clubs. In addition, the transfer of leases of residential buildings, which is usually a main item in this category, is mostly prohibited in the Netherlands.

6.3 Purchased goodwill

The SNA defines purchased goodwill as: "the difference between the value paid for an enterprise as a going concern and the sum of its assets less the sum of its liabilities, each item of which has been separately defined and valued. The value of goodwill, therefore, includes anything of long-term benefit to the business that has not been separately identified as an asset, as well as the value of the fact that the group of assets is used jointly and is not simply a collection of separable assets" (SNA, p. 310).

The SNA only considers goodwill an economic asset if it is substantiated by a purchase/sale: goodwill that is not purchased/sold is not considered an economic asset.

Valuation of purchased goodwill of an unincorporated enterprise is

pursued on the basis of the excess of the purchase price over its net worth (derived from its separately identified and valued other assets and liabilities). Valuation of purchased goodwill of a corporation or quasi-corporation is pursued on the basis of the excess of the purchase price of its shares and other equity over their value just prior to the sale/purchase (SNA 12.24).

The value of quoted shares can be derived from the stock exchange, while the value of not quoted shares may be estimated on the basis of the price of quoted shares that are comparable in earnings, dividend history and prospects, adjusting downward, if necessary to allow for the inferior marketability or liquidity of unquoted shares (SNA 13.73).

Furthermore, the SNA recommends to amortize purchased goodwill over a period of time after the purchase of an enterprise, following country specific accounting standards (SNA 12.34).

Purchased goodwill by non-financial corporations, equals dfl 4.3 to 7.8 billion annually in the period 1990-1994 (derived from Financial Statistics of Enterprises, Statistics Netherlands), while purchased goodwill by financial enterprises amounts to about dfl 0.8 and 1.8 billion annually in this period (derived from several large banks and insurance corporations and proportionally adjusted on the basis of total assets in this sector).

In the Netherlands, purchased goodwill is normally fully amortized to equity in the year of acquisition, although other accounting methods are in some cases also applied such as amortization over the total useful life (Dutch Civil Code, section 386 and 389). Following these practices, the above mentioned purchased goodwill has not been recorded on the balance sheet.

It should be added, however, that past research has revealed that a very small part of purchased goodwill is capitalized as part of intangible assets (which also includes items such as licences, patents, trademarks, and research and development costs). Nevertheless, these amounts have not

been estimated here, as they are not separately available from the Financial Statistics of Enterprises.

Moreover, goodwill may occur as an unlimited company becomes a limited company through legal transformation or purchase. Data on purchased goodwill of this nature, however, is not available. Data on purchased goodwill of medical practitioners and/or related professions such as midwives is neither available.

7. Summary and concluding remarks

This paper has presented estimation methods and preliminary estimates for produced intangible assets and non-produced assets in the Netherlands. The balance sheet values at the beginning and end of 1990 have been estimated for nearly all these assets categories. However, balance sheet valuation of valuables was not pursued due to lack of sufficiently reliable quantity and especially price data. Due to lack of transactions, valuation of these assets is hardly possible.

The values of the categories of produced intangible assets and non-produced assets are summarized for 1990 in table 12 below. In value terms, land is by far the most important item, while the reserves of natural gas and oil come second. The value of the remaining asset categories appears rather small.

The valuation of assets has been pursued on the basis of various methods (see also section 2.5). Valuation on the basis of market prices normally yields the most reliable results, and is therefore also recommended by the SNA. Nevertheless, appropriate market prices are sometimes difficult to obtain, such as in the case of land. As a consequence, these prices may only be approximated by using assumptions. The other valuation methods are also subject to some qualifications. The results of the perpetual inventory method are affected by the availability of sufficiently long time series and the rate of amortization, while the results of the net present value method are very much affected by the rate of discount.

The source data did not always offer a sufficient basis for the compilation of sectoral balances, especially in the case of land and patented entities. For these asset categories, therefore, only national estimates are available for the moment.

It is evident that the estimates presented in this paper are still preliminary. They bear the weaknesses of the source data and valuation methods. Finally, the results in this paper still need to be combined

with estimates for financial assets and liabilities and for other fixed capital stocks to yield a complete picture of net worth in the Netherlands.

**Table 12: Produced intangible assets, valuables and non-produced assets
in 1990**

SNA Code	Categories	Balance Sheet Value 1990	
		January 1	December 31
		mln dfl	
AN.1	Produced intangible assets and valuables	9824	11510
AN.112	Intangible fixed assets	9824	11510
AN.1121	Mineral exploration	2648	2683
AN.1122	Computer software	4497	5238
AN.1123	Entertainment, lit. or art. originals	2679	3589
AN.1129	Other intangible fixed assets	0	0
AN.13	Valuables
AN.131	Precious metals and stones
AN.132	Antiques and other art objects
AN.139	Other valuables
AN.2	Non-produced assets	376630	379880
AN.21	Tangible non-produced assets	376320	379516
AN.211	Land	331730	329127
AN.2111	Land underlying buildings and structures	176046	171987
AN.2112	Land under cultivation	106597	108312
AN.2113	Recreational land and ass. surface water	43984	43889
AN.2119	Other land and associated surface water	5103	4939
AN.212	Subsoil assets	44503	50300
AN.2121	Natural gas and oil reserves	44466	50262
AN.2122	Metallic mineral reserves	0	0
AN.2123	Mon-metallic mineral reserves	37	38
AN.213	Non-cultivated biological resources	87	89
AN.214	Water resources	0	0
AN.22	Intangible non-produced assets	310	364
AN.221	Patented entities	310	364
AN.222	Leases and other transferable contracts	0	0
AN.223	Purchased goodwill

.. = Not estimated.

0 = Negligible.

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Annex 1: Categories of non-financial assets in the SNA

Categories	SNA Code
Non-financial assets	AN
Produced assets	AN.1
Fixed assets	AN.11
Tangible fixed assets	AN.111
Dwellings	AN.1111
Other buildings and structures	AN.1112
Machinery and equipment	AN.1113
Cultivated assets	AN.1114
Intangible fixed assets	AN.112
Mineral exploration	AN.1121
Computer software	AN.1122
Entertainment, literary or artistic originals	AN.1123
Other intangible fixed assets	AN.1129
Inventories	AN.12
Valuables	AN.13
Precious metals and stones	AN.131
Antiques and other art objects	AN.132
Other valuables	AN.139
Non-produced assets	AN.2
Tangible non-produced assets	AN.21
Land	AN.211
Land underlying buildings and structures	AN.2111
Land under cultivation	AN.2112
Recreational land and associated surface water	AN.2113
Other land and associated surface water	AN.2119
Subsoil assets	AN.212
Coal, oil and natural gas reserves	AN.2121
Metallic mineral reserves	AN.2122
Non-metallic mineral reserves	AN.2123
Non-cultivated biological resources	AN.213
Water resources	AN.214
Intangible non-produced assets	AN.22
Patented entities	AN.221
Leases and other transferable contracts	AN.222
Purchased goodwill	AN.223

Statistics Netherlands
National Accounts Occasional Papers

- NA/01 Flexibility in the system of National Accounts**, Van Eck, R., C.N. Gorter and H.K. van Tuinen (1983).
This paper sets out some of the main ideas of what gradually developed into the Dutch view on the fourth revision of the SNA. In particular it focuses on the validity and even desirability of the inclusion of a number of carefully chosen alternative definitions in the "Blue Book", and the organization of a flexible system starting from a core that is easier to understand than the 1968 SNA.
- NA/02 The unobserved economy and the National Accounts in the Netherlands, a sensitivity analysis**, Broesterhuizen, G.A.A.M. (1983).
This paper studies the influence of fraud on macro-economic statistics, especially GDP. The term "fraud" is used as meaning unreporting or underreporting income (e.g. to the tax authorities). The conclusion of the analysis of growth figures is that a bias in the growth of GDP of more than 0.5% is very unlikely.
- NA/03 Secondary activities and the National Accounts: Aspects of the Dutch measurement practice and its effects on the unofficial economy**, Van Eck, R. (1985).
In the process of estimating national product and other variables in the National Accounts a number of methods is used to obtain initial estimates for each economic activity. These methods are described and for each method various possibilities for distortion are considered.
- NA/04 Comparability of input-output tables in time**, Al, P.G. and G.A.A.M. Broesterhuizen (1985).
It is argued that the comparability in time of statistics, and input-output tables in particular, can be filled in in various ways. The way in which it is filled depends on the structure and object of the statistics concerned. In this respect it is important to differentiate between coordinated input-output tables, in which groups of units (industries) are divided into rows and columns, and analytical input-output tables, in which the rows and columns refer to homogeneous activities.
- NA/05 The use of chain indices for deflating the National Accounts**, Al, P.G., B.M. Balk, S. de Boer and G.P. den Bakker (1985).
This paper is devoted to the problem of deflating National Accounts and input-output tables. This problem is approached from the theoretical as well as from the practical side. Although the theoretical argument favors the use of chained Vartia-I indices, the current practice of compiling National Accounts restricts to using chained Paasche and Laspeyres indices. Various possible objections to the use of chained indices are discussed and rejected.
- NA/06 Revision of the system of National Accounts: the case for flexibility**, Van Bochove, C.A. and H.K. van Tuinen (1985).
It is argued that the structure of the SNA should be made more flexible. This can be achieved by means of a system of a general purpose core supplemented with special modules. This core is a fully fledged, detailed system of National Accounts with a greater institutional content than the present SNA and a more elaborate description of the economy at the meso-level. The modules are more analytic and reflect special purposes and specific theoretical views.
- NA/07 Integration of input-output tables and sector accounts; a possible solution**, Van den Bos, C. (1985).
The establishment-enterprise problem is tackled by taking the institutional sectors to which the establishments belong into account during the construction of input-output tables. The extra burden on the construction of input-output tables resulting from this approach is examined for the Dutch situation. An adapted sectoring of institutional units is proposed for the construction of input-output tables.
- NA/08 A note on Dutch National Accounting data 1900-1984**, Van Bochove, C.A. (1985).
This note provides a brief survey of Dutch national accounting data for 1900-1984, concentrating on national income. It indicates where these data can be found and what the major discontinuities are. The note concludes that estimates of the level of national income may contain inaccuracies; that its growth rate is measured accurately for the period since 1948; and that the real income growth rate series for 1900-1984 may contain a systematic bias.

- NA/09 The structure of the next SNA: review of the basic options**, Van Bochove, C.A. and A.M. Bloem (1985).
There are two basic issues with respect to the structure of the next version of the UN System of National Accounts. The first is its 'size': reviewing this issue, it can be concluded that the next SNA should contain an integrated meso-economic statistical system. It is essential that the next SNA contains an institutional system without the imputations and attributions that pollute the present SNA. This can be achieved by distinguishing, in the central system of the next SNA, a core (the institutional system), a standard module for non-market production and a standard module describing attributed income and consumption of the household sector.
- NA/10 Dual sectoring in National Accounts**, Al, P.G. (1985).
Following a conceptual explanation of dual sectoring, an outline is given of a statistical system with complete dual sectoring in which the linkages are also defined and worked out. It is shown that the SNA 1968 is incomplete and obscure with respect to the links between the two sub-processes.
- NA/11 Backward and forward linkages with an application to the Dutch agro-industrial complex**, Harthoorn, R. (1985).
Some industries induce production in other industries. An elegant method is developed for calculating forward and backward linkages avoiding double counting. For 1981 these methods have been applied to determine the influence of Dutch agriculture in the Dutch economy in terms of value added and labour force.
- NA/12 Production chains**, Harthoorn, R. (1986).
This paper introduces the notion of production chains as a measure of the hierarchy of industries in the production process. Production chains are sequences of transformation of products by successive industries. It is possible to calculate forward transformations as well as backward ones.
- NA/13 The simultaneous compilation of current price and deflated input-output tables**, De Boer, S. and G.A.A.M. Broesterhuizen (1986).
A few years ago the method of compiling input-output tables underwent in the Netherlands an essential revision. The most significant improvement is that during the entire statistical process, from the processing and analysis of the basic data up to and including the phase of balancing the tables, data in current prices and deflated data are obtained simultaneously and in consistency with each other.
- NA/14 A proposal for the synoptic structure of the next SNA**, Al, P.G. and C.A. van Bochove (1986).
- NA/15 Features of the hidden economy in the Netherlands**, Van Eck, R. and B. Kazemier (1986).
This paper presents survey results on the size and structure of the hidden labour market in the Netherlands.
- NA/16 Uncovering hidden income distributions: the Dutch approach**, Van Bochove, C.A. (1987).
- NA/17 Main national accounting series 1900-1986**, Van Bochove, C.A. and T.A. Huitker (1987).
The main national accounting series for the Netherlands, 1900-1986, are provided, along with a brief explanation.
- NA/18 The Dutch economy, 1921-1939 and 1969-1985. A comparison based on revised macro-economic data for the interwar period**, Den Bakker, G.P., T.A. Huitker and C.A. van Bochove (1987).
A set of macro-economic time series for the Netherlands 1921-1939 is presented. The new series differ considerably from the data that had been published before. They are also more comprehensive, more detailed, and conceptually consistent with the modern National Accounts. The macro-economic developments that are shown by the new series are discussed. It turns out that the traditional economic-historical view of the Dutch economy has to be reversed.
- NA/19 Constant wealth national income: accounting for war damage with an application to the Netherlands, 1940-1945**, Van Bochove, C.A. and W. van Sorge (1987).

- NA/20 The micro-meso-macro linkage for business in an SNA-compatible system of economic statistics**, Van Bochove, C.A. (1987).
- NA/21 Micro-macro link for government**, Bloem, A.M. (1987).
This paper describes the way the link between the statistics on government finance and national accounts is provided for in the Dutch government finance statistics.
- NA/22 Some extensions of the static open Leontief model**, Harthoorn, R.(1987).
The results of input-output analysis are invariant for a transformation of the system of units. Such transformation can be used to derive the Leontief price model, for forecasting input-output tables and for the calculation of cumulative factor costs. Finally the series expansion of the Leontief inverse is used to describe how certain economic processes are spread out over time.
- NA/23 Compilation of household sector accounts in the Netherlands National Accounts**, Van der Laan, P. (1987).
This paper provides a concise description of the way in which household sector accounts are compiled within the Netherlands National Accounts. Special attention is paid to differences with the recommendations in the United Nations System of National Accounts (SNA).
- NA/24 On the adjustment of tables with Lagrange multipliers**, Harthoorn, R. and J. van Dalen (1987).
An efficient variant of the Lagrange method is given, which uses no more computer time and central memory than the widely used RAS method. Also some special cases are discussed: the adjustment of row sums and column sums, additional restraints, mutual connections between tables and three dimensional tables.
- NA/25 The methodology of the Dutch system of quarterly accounts**, Janssen, R.J.A. and S.B. Algera (1988).
In this paper a description is given of the Dutch system of quarterly national accounts. The backbone of the method is the compilation of a quarterly input-output table by integrating short-term economic statistics.
- NA/26 Imputations and re-routeings in the National Accounts**, Gorter, Cor N. (1988).
Starting out from a definition of 'actual' transactions an inventory of all imputations and re-routeings in the SNA is made. It is discussed which of those should be retained in the core of a flexible system of National Accounts. Conceptual and practical questions of presentation are brought up. Numerical examples are given.
- NA/27 Registration of trade in services and market valuation of imports and exports in the National Accounts**, Bos, Frits (1988).
The registration of external trade transactions in the main tables of the National Accounts should be based on invoice value; this is not only conceptually very attractive, but also suitable for data collection purposes.
- NA/28 The institutional sector classification**, Van den Bos, C. (1988).
A background paper on the conceptual side of the grouping of financing units. A limited number of criteria are formulated.
- NA/29 The concept of (transactor-)units in the National Accounts and in the basic system of economic statistics**, Bloem, Adriaan M. (1989).
Units in legal-administrative reality are often not suitable as statistical units in describing economic processes. Some transformation of legal-administrative units into economic statistical units is needed. This paper examines this transformation and furnishes definitions of economic statistical units. Proper definitions are especially important because of the forthcoming revision of the SNA.
- NA/30 Regional income concepts**, Bloem, Adriaan M. and Bas De Vet (1989).
In this paper, the conceptual and statistical problems involved in the regionalization of national accounting variables are discussed. Examples are the regionalization of Gross Domestic Product, Gross National Income, Disposable National Income and Total Income of the Population.

- NA/31 The use of tendency surveys in extrapolating National Accounts**, Ouddeken, Frank and Gerrit Zijlmans (1989).
This paper discusses the feasibility of the use of tendency survey data in the compilation of very timely Quarterly Accounts. Some preliminary estimates of relations between tendency survey data and regular Quarterly Accounts-indicators are also presented.
- NA/32 An economic core system and the socio-economic accounts module for the Netherlands**, Gorter, Cor N. and Paul van der Laan (1989).
A discussion of the core and various types of modules in an overall system of economy related statistics. Special attention is paid to the Dutch Socio-economic Accounts. Tables and figures for the Netherlands are added.
- NA/33 A systems view on concepts of income in the National Accounts**, Bos, Frits (1989).
In this paper, concepts of income are explicitly linked to the purposes of use and to actual circumstances. Main choices in defining income are presented in a general system. The National Accounts is a multi-purpose framework. It should therefore contain several concepts of income, e.g. differing with respect to the production boundary. Furthermore, concepts of national income do not necessarily constitute an aggregation of income at a micro-level.
- NA/34 How to treat borrowing and leasing in the next SNA**, Keuning, Steven J. (1990).
The use of services related to borrowing money, leasing capital goods, and renting land should not be considered as intermediate inputs into specific production processes. It is argued that the way of recording the use of financial services in the present SNA should remain largely intact.
- NA/35 A summary description of sources and methods used in compiling the final estimates of Dutch National Income 1986**, Gorter, Cor N. and others (1990).
Translation of the inventory report submitted to the GNP Management Committee of the European Communities.
- NA/36 The registration of processing in supply and use tables and input-output tables**, Bloem, Adriaan M., Sake De Boer and Pieter Wind (1993).
The registration of processing is discussed primarily with regard to its effects on input-output-type tables and input-output quotes. Links between National Accounts and basic statistics, user demands and international guidelines are examined. Net recording is in general to be preferred. An exception has to be made when processing amounts to a complete production process, e.g. oil refineries in the Netherlands.
- NA/37 A proposal for a SAM which fits into the next System of National Accounts**, Keuning, Steven J. (1990).
This paper shows that all flow accounts which may become part of the next System of National Accounts can be embedded easily in a Social Accounting Matrix (SAM). In fact, for many purposes a SAM format may be preferred to the traditional T-accounts for the institutional sectors, since it allows for more flexibility in selecting relevant classifications and valuation principles.
- NA/38 Net versus gross National Income**, Bos, Frits (1990).
In practice, gross figures of Domestic Product, National Product and National Income are most often preferred to net figures. In this paper, this practice is challenged. Conceptual issues and the reliability of capital consumption estimates are discussed.
- NA/39 Concealed interest income of households in the Netherlands; 1977, 1979 and 1981**, Kazemier, Brugt (1990).
The major problem in estimating the size of hidden income is that total income, reported plus unreported, is unknown. However, this is not the case with total interest income of households in the Netherlands. This makes it possible to estimate at least the order of magnitude of this part of hidden income. In this paper it will be shown that in 1977, 1979 and 1981 almost 50% of total interest received by households was concealed.

- NA/40 Who came off worst: Structural change of Dutch value added and employment during the interwar period**, Den Bakker, Gert P. and Jan de Gijt (1990).
In this paper new data for the interwar period are presented. The distribution of value added over industries and a break-down of value added into components is given. Employment by industry is estimated as well. Moreover, structural changes during the interwar years and in the more recent past are juxtaposed.
- NA/41 The supply of hidden labour in the Netherlands: a model**, Kazemier, Brugt and Rob van Eck (1990).
This paper presents a model of the supply of hidden labour in the Netherlands. Model simulations show that the supply of hidden labour is not very sensitive to cyclical fluctuations. A tax exempt of 1500 guilders for second jobs and a higher probability of detection, however, may substantially decrease the magnitude of the hidden labour market.
- NA/42 Benefits from productivity growth and the distribution of income**, Keuning, Steven J. (1990).
This paper contains a discussion on the measurement of multifactor productivity and sketches a framework for analyzing the relation between productivity changes and changes in the average factor remuneration rate by industry. Subsequently, the effects on the average wage rate by labour category and the household primary income distribution are studied.
- NA/43 Valuation principles in supply and use tables and in the sectoral accounts**, Keuning, Steven J. (1991).
In many instances, the valuation of transactions in goods and services in the national accounts poses a problem. The main reason is that the price paid by the purchaser deviates from the price received by the producers. The paper discusses these problems and demonstrates that different valuations should be used in the supply and use tables and in the sectoral accounts.
- NA/44 The choice of index number formulae and weights in the National Accounts. A sensitivity analysis based on macro-economic data for the interwar period**, Bakker, Gert P. den (1991).
The sensitivity of growth estimates to variations in index number formulae and weighting procedures is discussed. The calculations concern the macro-economic variables for the interwar period in the Netherlands. It appears, that the use of different formulae and weights yields large differences in growth rates. Comparisons of Gross Domestic Product growth rates among countries are presently obscured by the use of different deflation methods. There exists an urgent need for standardization of deflation methods at the international level.
- NA/45 Volume measurement of government output in the Netherlands; some alternatives**, Kazemier, Brugt (1991).
This paper discusses three alternative methods for the measurement of the production volume of government. All methods yield almost similar results: the average annual increase in the last two decades of government labour productivity is about 0.7 percent per full-time worker equivalent. The implementation of either one of these methods would have led to circa 0.1 percentage points higher estimates of economic growth in the Netherlands.
- NA/46 An environmental module and the complete system of national accounts**, Boo, Abram J. De, Peter R. Bosch, Cor N. Gorter and Steven J. Keuning (1991).
A linkage between environmental data and the National Accounts is often limited to the production accounts. This paper argues that the consequences of economic actions on ecosystems and vice versa should be considered in terms of the complete System of National Accounts (SNA). One should begin with relating volume flows of environmental matter to the standard economic accounts. For this purpose, a so-called National Accounting Matrix including Environmental Accounts (NAMEA) is proposed. This is illustrated with an example.

- NA/47 Deregulation and economic statistics: Europe 1992**, Bos, Frits (1992). The consequences of deregulation for economic statistics are discussed with a view to Europe 1992. In particular, the effects of the introduction of the Intrastat-system for statistics on international trade are investigated. It is argued that if the Statistical Offices of the EC-countries do not respond adequately, Europe 1992 will lead to a deterioration of economic statistics: they will become less reliable, less cost effective and less balanced.
- NA/48 The history of national accounting**, Bos, Frits (1992). At present, the national accounts in most countries are compiled on the basis of concepts and classifications recommended in the 1968-United Nations guidelines. In this paper, we trace the historical roots of these guidelines (e.g. the work by King, Petty, Kuznets, Keynes, Leontief, Frisch, Tinbergen and Stone), compare the subsequent guidelines and discuss also alternative accounting systems like extended accounts and SAMs.
- NA/49 Quality assessment of macroeconomic figures: The Dutch Quarterly Flash**, Reininga, Ted, Gerrit Zijlmans and Ron Janssen (1992). Since 1989-IV, the Dutch Central Bureau of Statistics has made preliminary estimates of quarterly macroeconomic figures at about 8 weeks after the end of the reference quarter. Since 1991-II, a preliminary or "Flash" estimate of GDP has been published. The decision to do so was based on a study comparing the Flash estimates and the regular Quarterly Accounts figures, which have a 17-week delay. This paper reports on a similar study with figures through 1991-III.
- NA/50 Quality improvement of the Dutch Quarterly Flash: A Time Series Analysis of some Service Industries**, Reininga, Ted and Gerrit Zijlmans (1992). The Dutch Quarterly Flash (QF) is, just like the regular Quarterly Accounts (QA), a fully integrated statistic based on a quarterly updated input-output table. Not all short term statistics used to update the QA's IO-table are timely enough to be of use for the QF, so other sources have to be found or forecasts have to be made. In large parts of the service industry the latter is the only possibility. This paper reports on the use of econometric techniques (viz. series decomposition and ARIMA modelling) to improve the quality of the forecasts in five parts of the service industry.
- NA/51 A Research and Development Module supplementing the National Accounts**, Bos, Frits, Hugo Hollanders and Steven Keuning (1992). This paper presents a national accounts framework fully tailored to a description of the role of Research and Development (R&D) in the national economy. The framework facilitates to draw macro-economic conclusions from all kinds of data on R&D (also micro-data and qualitative information). Figures presented in this way can serve as a data base for modelling the role of R&D in the national economy.
- NA/52 The allocation of time in the Netherlands in the context of the SNA; a module**, Kazemier, Brugt and Jeanet Exel (1992). This paper presents a module on informal production, supplementing the National Accounts. Its purpose is to incorporate informal production into the concepts of the SNA. The relation between formal and informal production is shown in the framework of a Social Accounting Matrix (SAM). To avoid a controversial valuation of informal production, the module consists of two SAMs. One expressed in actual prices with informal labour valued zero, and one which expresses the embedded informal labour input measured in terms of hours worked.
- NA/53 National Accounts and the environment: the case for a system's approach**, Keuning, Steven J. (1992). The present set of main economic indicators should be extended with one or a few indicators on the state of the environment. This paper lists various reasons why a so-called Green Domestic Product is not suitable for this purpose. Instead, a system's approach should be followed. A National Accounting Matrix including Environmental Accounts (NAMEA) is presented and the way to derive one or more separate indicators on the environment from this information system is outlined.

- NA/54 How to treat multi-regional units and the extra-territorial region in the Regional Accounts?**, De Vet, Bas (1992).
This paper discusses the regionalization of production and capital formation by multi-regional kind-of-activity units. It also examines the circumstances in which a unit may be said to have a local kind-of-activity unit in the extra-territorial region and what should be attributed to this "region".
- NA/55 A historical Social Accounting Matrix for the Netherlands (1938)**, Den Bakker, Gert P., Jan de Gijt and Steven J. Keuning (1992).
This paper presents a Social Accounting Matrix (SAM) for the Netherlands in 1938, including related, non-monetary tables on demographic characteristics, employment, etc. The distribution of income and expenditure among household subgroups in the 1938 SAM is compared with concomitant data for 1987.
- NA/56 Origin and development of the Dutch National Accounts**, Den Bakker, Gert P. (1992).
This paper describes the history of national accounting in the Netherlands. After two early estimates in the beginning of the nineteenth century, modern national accounting started in the 1930s on behalf of the Tinbergen model for the Dutch economy. The development spurred up after World War II to provide data to the government for economic planning purposes. In the 1980s, the development was towards a flexible and institutional approach.
- NA/57 Compiling Dutch Gross National Product (GNP); summary report on the final estimates after the revision in 1992**, Bos, Frits (1992).
This summary report describes the sources and methods used for compiling the final estimate of Dutch Gross National Product after the revision of the Dutch National Accounts in 1992. Attention is focused on the estimation procedures for 1988. A more extensive report is also available (NA/57_Ext.).
- NA/57_Ext. Compiling Dutch Gross National Product (GNP); full report on the final estimates after the revision in 1992**, Bos, Frits and Cor N. Gorter (1993).
This report describes the compilation of the final estimate of Dutch Gross National Product after the revision of the Dutch National Accounts in 1992. Attention is focused on the estimation procedures for 1988. The description covers i.a. data sources, sampling features of the surveys, grossing up procedures, adjustments for underreporting and the integration process.
- NA/58 The 1987 revision of the Netherlands' National Accounts**, Van den Bos, C and P.G. Al (1994).
The 1987 revision that was completed in 1992 has improved the Dutch National Accounts in three ways. First, new and other data sources have been used, like Production statistics of service industries, the Budget Survey and Statistics on fixed capital formation. Secondly, the integration process has been improved by the use of detailed make- and use-tables instead of more aggregate input-output tables. Thirdly, several changes in bookkeeping conventions have been introduced, like a net instead of a gross registration of processing to order.
- NA/59 A National Accounting Matrix for the Netherlands**, Keuning, Steven and Jan de Gijt (1992).
Currently, the national accounts typically use two formats for presentation: matrices for the Input-Output tables and T-accounts for the transactions of institutional sectors. This paper demonstrates that presently available national accounts can easily be transformed into a National Accounting Matrix (NAM). This may improve both the transparency and analytic usefulness of the complete set of accounts.
- NA/60 Integrated indicators in a National Accounting Matrix including environmental accounts (NAMEA); an application to the Netherlands**, De Haan, Mark, Steven Keuning and Peter Bosch (1993).
In this paper, environmental indicators are integrated into a National Accounting Matrix including Environmental Accounts (NAMEA) and are put on a par with the major aggregates in the national accounts, like National Income. The environmental indicators reflect the goals of the environmental policy of the Dutch government. Concrete figures are presented for 1989. The NAMEA is optimally suited as a data base for modelling the interaction between the national economy and the environment.

- NA/61 Standard national accounting concepts, economic theory and data compilation issues; on constancy and change in the United Nations-Manuals on national accounting (1947, 1953, 1968 and 1993)**, Bos, Frits (1993).
In this paper, the four successive guidelines of the United Nations on national accounting are discussed in view of economic theory (Keynesian analysis, welfare, Hicksian income, input-output analysis, etc.) and data compilation issues (e.g. the link with concepts in administrative data sources). The new guidelines of the EC should complement those of the UN and be simpler and more cost-efficient. It should define a balanced set of operational concepts and tables that is attainable for most EC countries within 5 years.
- NA/62 Revision of the 1987 Dutch agricultural accounts**, Pauli, Peter and Nico van Stokrom (1994).
During the recent revision of the Dutch national accounts, new agricultural accounts have been compiled for the Netherlands. This paper presents the major methodological and practical improvements and results for 1987, the base year for this revision. In addition, this paper demonstrates that a linkage can be established between the E.C. agricultural accounting system and the agricultural part of the standard national accounts.
- NA/63 Implementing the revised SNA in the Dutch National Accounts**, Bos, Frits (1993).
This paper discusses the implementation of the new United Nations guidelines on national accounting (SNA) in the Netherlands. The changes in basic concepts and classifications in the SNA will be implemented during the forthcoming revision. The changes in scope will be introduced gradually. Important changes scheduled for the near future are the incorporation of balance sheets, an environmental module and a Social Accounting Matrix.
- NA/64 Damage and insurance compensations in the SNA, the business accounts and the Dutch national accounts**, Baris, Willem (1993).
This paper describes the recording of damages to inventories and produced fixed assets in general, including damages as a result of legal product liability and of the liability for damage to the environment. In this regard, the 1993 System of National Accounts and the practice of business accounting are compared with the Dutch national accounts.
- NA/65 Analyzing economic growth: a description of the basic data available for the Netherlands and an application**, Van Leeuwen, George, Hendrie van der Hoeven and Gerrit Zijlmans (1994).
This paper describes the STAN project of the OECD and the Dutch national accounts data supplied to the STAN database, which is designed for a structural analysis of the role of technology in economic performance. Following an OECD analysis for other industrial countries, the importance of international trade for a small open economy such as the Netherlands is investigated. The STAN database is also available on floppy disk at the costs of DFL. 25, and can be ordered by returning the order form below (Please mention: STAN floppy disk).
- NA/66 Comparability of the sector General Government in the National Accounts, a case study for the Netherlands and Germany**, Streppel, Irene and Dick Van Tongeren (1994).
This paper questions the international comparability of data concerning the sector General Government in the National Accounts. Two differences are distinguished: differences due to lack of compliance with international guidelines and institutional differences. Adjustments to National Accounts data are reflected in a separate module which compares Germany versus The Netherlands. The module shows that total General Government resources as well as uses are substantially higher in the Netherlands.
- NA/67 What would Net Domestic Product have been in an environmentally sustainable economy?, Preliminary views and results**, De Boer, Bart, Mark de Haan and Monique Voogt (1994).
Sustainable use of the environment is a pattern of use that can last forever, at least in theory. This pattern is likely to render a lower net domestic product than the present economy. The coherence between reductions in pressure on the environment and changes in net domestic product is investigated with the help of a simple multiplier model. This model is based on a National Accounting Matrix including Environmental Accounts (NAMEA).

- NA/68 A Social Accounting Matrix for the Netherlands, concepts and results**, Timmerman, Jolanda G. and Peter J.M. van de Ven (1994).
In this paper a Social Accounting Matrix (SAM) for the Netherlands is presented. Two years are covered: 1988 and 1990. The SAM is an integrated data framework based on national accounts extended with information on distribution of income, consumption and wealth among household. Furthermore, labour income and employment are subdivided into several labour categories. The tables of the SAMs of both 1988 and 1990 are available on separate floppy disks at the costs of DFL. 65 each.
- NA/69 Analyzing relative factor inputs of Dutch exports: An application of the 1990 Social Accounting Matrix for the Netherlands** (forthcoming), Reininga, Ted (1995).
In this paper the validity of neoclassical trade theory for explaining Dutch international trade patterns is studied. The analysis is carried out with the use of a Social Accounting Matrix for The Netherlands. This study corroborates the outcome of other recent analysis in this field: classical trade theory offers a better starting-point to understand Dutch trade patterns than neoclassical trade theory. Moreover, these recent studies point to the increasing relevance of insights derived from modern trade theory. The results presented here seem to support this point of view.
- NA/70 SESAME for the evaluation of economic development and social change**, Keuning, Steven J. (1994).
This paper elaborates on the concept of a System of Economic and Social Accounting Matrices and Extensions, or SESAME for short. The SESAME-concept serves to meet the criticism that conventional national accounts take a too limited view at social, environmental and economic development. SESAME details the monetary accounts and couples non-monetary information in an integral system approach. SESAME is meant as a synthesis of national accounts and the social indicators approach.
- NA/71 New revision policies for the Dutch National Accounts**, Den Bakker, Gert P., Jan de Gijt and Robert A.M. van Rooijen (1994).
This paper presents the (new) revision policy for the Dutch National Accounts. In the past, several major revisions of national accounting data have been carried out in the Netherlands. In the course of time, the policy has changed several times. Recently, the aim has become to publish relatively long time-series shortly after the publication of the revised benchmark year data.
- NA/72 Labour force data in a National Accounting framework**, Den Bakker, Gert P. and Jan de Gijt (1994).
This paper deals with the Dutch interwar labour force data. Starting with census data the estimation of the working and non-working labour force by industry and by occupational type is described and the results are discussed. The data have been estimated within the national accounts framework. It is the first time that labour market figures at a meso-level have been estimated which are linked to other national accounting figures.
- NA/73 Integrated estimates of productivity and terms-of-trade changes from a Social Accounting Matrix at constant prices**, Keuning, Steven J. (1994).
This paper demonstrates that measures of real income change for the total economy can best be derived from real income changes per subsector. For this purpose a Social Accounting Matrix (SAM) at constant prices has been compiled. By breaking down value added at constant prices into constant price estimates for each primary input category, productivity changes by industry can be estimated as an integral part of the regular national accounts compilation. The national total trading gain or loss from a change in the terms of trade is as well allocated to subsectors, thus embedding the estimation of this macro-measure into a meso-consistency framework. These ideas have been applied in a case-study for Indonesia.
- NA/74 Taking the environment into account: The Netherlands NAMEA's for 1989, 1990 and 1991**, De Haan, Mark and Steven Keuning (1995).
The National Accounting Matrix including Environmental Accounts (NAMEA) contains figures on environmental burdens in relation to economic developments as reflected in the National accounts. NAMEA's for the Netherlands in 1989, 1990 and 1991 have now been completed. They include a more detailed industrial classification and a series of environment taxes and levies, plus environmental protection expenditures by industry and households. Further, the depletion of two important mineral resources in the Netherlands is now incorporated in the NAMEA's.

- NA/75 Economic theory and national accounting**, Bos, Frits (1995).
This paper describes the relationship between economic theory and national accounting. This relationship is often misunderstood, by economic theorists and national accountants alike. Attention is drawn to the consistency required in a national accounting system, to national accounts figures as a transformation of primary data and to the fundamentally different valuation principles employed in economic theory and national accounting (forward looking and analytic versus backward looking and descriptive). The gap between economic theory and national accounting can only be bridged by satellite accounts, as in these accounts consistency with the overall system and valuation at current exchange value are not strictly required.
- NA/76 An information-system for economic, environmental and social statistics**, Keuning, Steven J. and Jolanda G. Timmerman (1995).
The 1993 SNA mentions that a SAM can also be extended to deal with environmental issues. This entails the integration of a SAM and a NAMEA into a SAMEA (Social Accounting Matrix including Environmental Accounts), a further extension into the direction of a so-called SESAME (System of Economic and Social Accounting Matrices and Extensions). This paper shows how environmental data and environmental indicators can be integrated into such a system. A Dutch case-study shows the interrelations between e.g. the employment of various types of workers (by sex/educational level) and the environmental problems caused by the activities in which they are employed. Moreover, this pollution is also allocated to the subsectors that receive value added. This enables a comparison with the consumption-based pollution by subsector. The SAMEA yields a framework for an integrated analysis and modelling of social, economic and environmental issues.
- NA/77 Material flows, energy use and the structure of the economy**, Konijn, Paul J.A., Sake de Boer and Jan van Dalen (1995).
Many environmental problems are connected to production and use of materials and energy. It would therefore be desirable to have an information system that gives consistent, complete and detailed information on material and energy flows. Such a system would even be more useful if it could be connected directly to economic data. This paper presents such a system. Based on the foundation laid by the national accounts the authors construct a system for the analysis of flows of materials and energy through the economy. In this paper the proposed system is illustrated with an application to the flows of iron/steel and energy. An input-output table is presented that describes the production processes in the ferrous metal branch entirely in physical units. Subsequently, steel contents of final products are calculated, and an analysis is made of the consequences of a new technology in the basic steel industry on total energy use in the economy.
- NA/78 Calendar effects on quarterly GDP-growth rates**, Reininga, Ted K. and Brugt Kazemier (1996).
Since 1986 Statistics Netherlands publishes Quarterly National Accounts. The earliest estimates of quarterly GDP, the so-called flash estimates, are published some seven weeks after the reference quarter. In this paper we examine a new, faster flash estimate, some three to four weeks earlier than its original counterpart. The gain is made by using a simple regression technique and incomplete data. To compensate for the lack of data, information on the number of working-days and shopping-days was added to the regression. It turns out that these calendar-aspects significantly affect GDP-growth: 0.30%-points extra GDP-growth for one extra working-day. One extra shopping-day accounts for about 0.17%-points extra GDP-growth.
- NA/79 The NAMEA experience. An interim evaluation of the Netherlands' integrated accounts and indicators for the environment and the economy**, Keuning, Steven J. (1996).
The national accounts publication in the Netherlands contains not only the conventional economic accounts and indicators, but also an integrated system of environmental and economic accounts, the NAMEA (National Accounting Matrix including Environmental Accounts). This paper reports on the present status of the NAMEA-approach and gives a concise summary of this approach. It reviews the present applications of this framework in the Netherlands and, finally, a comparison with the SEEA is made and various common misunderstandings regarding Green National Income are set out.

NA/80 What's in a NAMEA? Recent results of the NAMEA-approach to environmental accounting, Keuning, Steven J. and Mark de Haan (1996).

The National Accounting Matrix including Environmental Accounts (NAMEA) shows environmental pressures in physical units that are consistent with the monetary figures in the national accounts. This paper introduces the NAMEA-concept, provides some illustrative analyses of the recently completed NAMEA time-series, and demonstrates that social accounts and social indicators can easily be integrated. This results in a fairly broad, multi-purpose statistical information system.

NA/81 Balance sheet valuation: produced intangible assets and non-produced assets, Pommée, Marcel and Willem Baris (1996).

This paper deals with the estimation of opening and closing stocks of produced intangible assets such as mineral exploration, computer software and artistic originals and non-produced assets such as land, sub-soil assets, patented entities and purchased goodwill. The first section elaborates on the main conceptual issues related to the compilation of stock data such as the asset boundary, the relation between flows and stocks and principles of valuation. The following sections discuss each of the asset categories in detail.

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