CENTRAL BUREAU OF STATISTICS
The Netherlands
National Accounts Research Division

ORIGIN AND DEVELOPMENT OF THE DUTCH NATIONAL ACCOUNTS*)

Gert P. den Bakker**)

*) An earlier draft of this paper was presented at 22th General Conference of the International Association for Research in Income and Wealth, Flims, Switzerland, August 30 - September 5 1992.

**) The author would like to thank Frits Bos for his stimulating comments.

Nr. NA-56
1992

CENTRAL BUREAU OF STATISTICS
National Accounts Research Division
P.O. Box 959, 2270 AZ Voorburg
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Gert P. den Bakker*)

INTERNATIONAL ASSOCIATION FOR RESEARCH IN INCOME AND WEALTH
Twenty-second General Conference
Flims, Switzerland
August 30-September 5, 1992

Session 8A: History of National Accounts and the
Development of National Accounting Concepts

*) The author would like to thank Frits Bos for his stimulating comments.

July 1992
Notanr.: 235-92-STD.E8/Intern
BPA nr.: 10064-92-STD.E8/Intern

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Summary

The paper describes the history of Dutch national accounting. 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.

Contents

1. Introduction

This paper deals with the origin and development of the Dutch national accounts. In the past, part of this history was written in Nooteboom (1978) and Oomens (1985). Both articles have been written in Dutch. For the non-Dutch readers, there is of course Studenski (1958). In Studenski's study the developments in the Netherlands were not fully represented (perhaps as a result of language difficulties). For instance, Studenski only deals with the official estimates prepared during the 1930s. The developments between 1940 and 1955 are cursorily. This is not to say that the present paper gives an exhaustive description of the history of national accounting in the Netherlands. Its purpose is to provide more details about the early developments in the Netherlands and to extend this description to the present.

In the Netherlands, the first known national income estimates go back to 1803 and 1804. The purpose was to compare the economic power of the Netherlands with other countries. Strangely enough, these estimators were not followed by any others in the nineteenth century, whereas in nineteenth century England and France the development of both the theory of national income and the estimation methods continued. In the first decade of the twentieth century, the thread was resumed with national income estimates on the basis of tax statistics.

National income estimates on a regular basis started in the second half of the 1930s. A project was set up to improve the estimates which played an important role in the Tinbergen econometric model of the Dutch economy. During and after World War II, the Dutch Central Bureau of Statistics (CBS) undertook the compilation of a system of national accounts for the purpose of planning economic recovery. This development accelerated in the early 1950s. Countries which wished to qualify for the Marshall aid were obliged to submit requests and to provide macro-economic data cast in a national accounts framework that followed the OEEC guidelines (OEEC, 1951, 1952).

In the 1970s, the CBS improved and extended the basic statistics for the

national accounts and this led to a substantial qualitative and quantitative expansion of the Dutch national accounts.

The paper is organized as follows: sections 2-4 contain a chronology of Dutch national accounting work. Section 2 presents two early national income estimates. Section 3 describes the developments that started with isolated national income estimates in the beginning of the twentieth century and led to a true system of national accounts in 1950. Section 4 deals with the period from 1950 up to the present. In section 5 a summary and conclusions are presented.

2. Early Estimates

2.1. Introduction

A description of the history of national accounting in the Netherlands should start in the early 1800s with studies by Keuchenius (1803) and Metelerkamp (1804). Up to now, these studies are virtually unknown in the international literature on the history of national accounting[1]. For instance, Studenski's dates the first national income estimate in the Netherlands back to 1910. The 'discovery' of these two Dutch studies seems to imply that the Netherlands were the fourth country in which national income estimates were made[2]. As is well known, the very first estimates were made for England by Petty in 1665 and King in 1696. They made their estimates to compare the wealth and power of England with other countries. Therefore King (1936) estimated national income for France and Holland as well (for the reference year 1688).

Like Petty and King in England more than a century earlier, Keuchenius and especially Metelerkamp were concerned with determining the resources of their country in relation to other countries and its capability to survive from an economic and military viewpoint.

2.2. The First Dutch Estimator: Keuchenius

Dr. W.M. Keuchenius, member of the city council of Schiedam, was the first Dutchman who estimated national income for the Netherlands. He developed a hypothetical national income estimate, based on a situation that might become reality if war-stricken Europe were to conclude peace. Very little is known of Keuchenius except that he wrote his book just before his departure to the Dutch East Indies. He made a 'national balance' for the Batavian Republic (1795-1806) which in modern terms ammounts to a review of the supply and disposition of goods and services.

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1. These studies have been mentioned before in articles in the Dutch language (e.g. Oomens, 1985).
2. This implies that Studenski's tables 9-2 and 10-5, on p. 141 and 156 respectively, have to be modified. Studenski already mentioned that it was likely that Dutch national income estimates were made before 1910 (p. 145, 537).

In estimating national income, Keuchenius distinguished four economic activities which yielded income: agriculture, fishing, international trade and industrial activities. Besides, he estimated income from foreign properties and interest on national debt. In Keuchenius' view domestic trade was not a productive activity. Besides, he did not distinguish construction, government and other services. However, interest on government debt was part of national income. Elements of Keuchenius view can be found in the Material Product System which has been adopted by the (former) centrally planned countries as the basis for their national accounting figures.

Keuchenius estimated national income at 221 million guilders, see table 1. His population estimate was 1,882,891 persons, so that he arrived at a per capita income of 117 guilders. The contribution of agriculture and fishery to the national income was 45% while 27% of national income was property income from abroad (including colonies). Keuchenius was rather vague about the expenditure side of his balance. Final consumption expenditure and government expenditure were 166 (that is per capita 88 guilders) and 55 million guilders respectively. Keuchenius did not mention fixed capital formation and did not present explicit estimates for exports. He only stated that imports (71 million guilders) should not exceed exports.

Table 1. National income according to Keuchenius, circa 1800 (mln gld)

Agriculture	84
Fishery	15
International trade, cargo trade, insurances	30
Income from properties in the Dutch East Indies	11
Income from properties in the Dutch West Indies	9
Factories and processing industries	3
Income from foreign property	40
Interest on government debt	29
National income	221

Keuchenius also presented an multi-industry analysis, which resembled an input-output analysis in some respects. He estimated the contribution of all industries to national income and employment and calculated the effects on the national economy if the relative significance of a certain industry was to change (as a result of government policy). In addition, he discussed the advantages and disadvantages of the presence of foreign workers in the

Netherlands and he presented regional figures and estimates of the government debt and tax revenues.

2.3. The Estimates of Metelerkamp

Shortly after Keuchenius study, a second one on national income and wealth was published by R. Metelerkamp (1804). Metelerkamp, a jurist, was a member of a society for art and science. He was a man of importance who, because of his political views, was not allowed to hold a position in the government of the Batavian Republic. Instead, he set to study and travel, collecting information for his book. Later on, after the French period, he became chairman of the Lower House of the States General (the Dutch parliament of the time) and member of the Council of State.

Metelerkamp, as his predecessors, aimed to study the relative power of his country. His estimation method resembled that of W. Pitt and H. Beeke for England. He mentioned the work of Keuchenius and he corrected some of his figures.

In addition to national income estimates for the Netherlands, Metelerkamp presented figures for France, England and Saxony. Besides, he gave figures for national wealth, imports and exports, income and outlay of the government and size and composition of the military force for eight European countries. For the Netherlands, Metelerkamp arrived at a national income estimate of 250 million guilders in 1792. He estimated the population at two million people, which implies a per capita income of 125 guilders. This is only slightly higher than Keuchenius estimate. Metelerkamp's estimate of national wealth was 3,500 million guilders[3].

On the basis of his estimates, Metelerkamp concluded that the economic position of the Netherlands was quite good, relatively speaking. However, he judged the militairy situation as very bad.

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3. Remarkably, Metelerkamp estimated national wealth fourteen times as high as national income. This is much higher than, for instance, in the 1940s (the former being five times as high as the latter). Probably, different definitions and estimation methods play a role here.

3. Towards a System of National Accounts

3.1. The start: Bonger and Bakker

Systematic national income estimates in the Netherlands were introduced by Prof. W.A. Bonger. Bonger, by training a jurist, based his estimates on tax statistics. In his first publication (Bonger, 1910) he presented figures for 1908. Afterwards, he extended these estimates up to 1920. The first official national income estimate (for 1929) was published by the CBS in 1933 (CBS, 1933). This estimate was also based on the income method and was prepared under the direction of the CBS's accountant, Dr. O. Bakker (see also Bakker, 1939). The estimate was part of a study on the influence of wages on the cost price of products, carried out by the CBS on request of the Supreme Labour Council (dd. 4 July 1931). The 1929 figures are given in table 2. Afterwards, Bakker made estimates for 1914, 1919 and 1929-36.

Table 2. National income according to Bakker, 1929 (mln gld)

Income (income tax figure)	4367
Undeclared income (10%)	437
Income not taxed	
Professionals	686
Small rentiers	40
Persons abroad liable to Dutch income tax	37
Net-income to abroad	-400
Retained profits	200
Social contributions	100
National income	5467
of which	
Wages and salaries	4000
Profits	1450

3.2. The First System of National Bookkeeping: Van Cleeff's 1938 Estimates

The very first 'system of national accounts' for the Netherlands was compiled by Van Cleeff (1941). He published his system in the monthly 'De Economist' and called it a 'national book-keeping system'[4]. Van Cleeff's intention was to demonstrate that, in principle, a national bookkeeping could be compiled in analogy with the methods used in ordinary bookkeeping.

4. Van Cleeff (not employed at the CBS) deserves the credit of having introduced this term.

centrally planned economy. In 1945, he published an article (Van Cleeff, 1945) on this subject (written in 1942) and joined the newly established Central Planning Bureau (as many other Dutch national income pioneers).

Van Cleeff distinguished four sectors (trade, enterprises, government and consumers) and five main groups of transactions (accounts) (commodity flow, financing etc.). He assumed that total income equals total expenditure in every sector and that all transactions were paid in cash. The results of Van Cleeff's study are presented in table 3.

Although Van Cleeff used crude figures, his national income estimate (5100 million guilders) was virtually the same as Derksen's later estimate: 5153 million guilders (Derksen, 1946). Van Cleeff made various recommendations which were carried out later, such as an industry breakdown and volume figures. He also emphasized the need of a central register which should link the existing (non-CBS) registers. Besides, he wrote: '... of course, a national balance sheet has to be added, or better, two of them, one for the beginning and one for the end of the year.' The Dutch CBS has indeed compiled balance sheets (for instance for 1938), but in the course of time the balance sheets disappeared. Recently, the CBS started again with the compilation of balance sheets.

Table 3. A summary annual survey for the Netherlands, 1938 (mln gld)

	Trade		Production		Government		Consumers	
	D	C	D	C	D	C	D	C
I. PURCHASING POWER FLOW								
Cash								
Receipts and payments	6550	6550	4950	4950	700	700	5100	5100
II. COMMODITY FLOW								
Goods								
Purchase and sale	5750	6550	-	4350	-	-	-	-
Manufacture	-	-	2850	-	-	-	-	-
Profit	800	-	1500	-	-	-	-	-
Capital goods								
Purchase and use	-	-	1150	1150	-	-	-	-
Capital stock								
Investment	-	-	400	-	-	-	-	-
III. FINANCING								
Share holding, etc.								
Issued	-	-	-	-	-	-	200	-
Share capital, etc.								
Subscribed	-	-	-	200	-	-	-	-
Undistributed profits	-	-	-	200	-	-	-	-
IV. INCOMES AND OUTLAYS								
Paid incomes								
Various income components	450	-	2100	-	700	-	-	-
Surplus to profit account	-	450	-	-	-	-	-	-
Surplus to commodity account	-	-	-	2100	-	-	-	-
Received incomes								
Various income components	-	-	-	-	-	700	-	5100
Outlays								
Purchase of goods	-	-	-	-	-	-	4200	-
Taxes	-	-	-	-	-	-	700	-
V. CALCULATION OF PROFIT								
Profit account								
Surplus paid incomes	450	-	-	-	-	-	-	-
Surplus commodity account	-	800	-	1500	-	-	-	-
Distributed profits	350	-	1300	-	-	-	-	-
Retained earnings	-	-	200	-	-	-	-	-
Total	14350	14350	14450	14450	1400	1400	10200	10200

3.3. Derksen and Tinbergen in the 1930s and 1940s

In the second half of the 1920s, the CBS started with business cycle research. After Prof. dr. J. Tinbergen had joined the CBS in 1927, econometric research accelerated and in 1936 Tinbergen presented his famous macro-econometric model for the Dutch economy (Tinbergen, 1936). The Tinbergen model gave the construction of models and the development of national accounting in the Netherlands a head start. In 1937, a project was set up to improve the national income estimates to serve as a better statistical basis for econometric studies. Prof. dr. J.B.D. Derksen, later chief of the National Income Unit of the United Nations, was responsible

for these estimates. The first results refer to 1921-1936 and are the first official national income estimates for the Netherlands (CBS, 1939). This publication also contained a detailed description of definitions and methods.

The figures were estimated on the basis of both the income and the production method. However, the former method was preferred: '... for the time being, a better method to arrive at a fairly reliable national income estimate is not available ...' (CBS, 1939, p. 8). The (improved) production method was used for plausibility checks on the results of the income method. In the latter method a fraud of 10% was assumed. In the production method thirty-one industries were distinguished. The Dutch approach to national income measurement was quite advanced. For example, services of owner-occupied dwellings were included in national income[5].

The results of both methods for the years 1921-36 show about the same annual growth rates of national income. The differences between both methods, expressed as a percentage of their average results, ranged from 1.4% in 1931 to 11.3% in 1923. The estimates according to the production method were always lower than those according to the income method. In the 1930s, the gap between the outcomes of both methods narrowed substantially. For these years more and better information (e.g. production statistics) became available.

In the following years, estimates for the late 1930s were added, the estimates according to the production method were improved (Derksen, 1940b, 1940c) and research on definitions and methods continued (Derksen 1940a). In 1941 (Derksen, 1941), national income estimates for 1900-20 were published which were based on the income method and consistent with the one from 1921 onwards. The fraud for these years was assumed to be 20% (copied from Bonger). This is twice as high as for 1921-39. In the latter years, the verification of the tax declarations was much improved.

In 1948 (CBS, 1948), the first revision of national accounting data

5. In, for instance, the United States these services were excluded (CBS, 1939, p. 50 and Carson, 1975, p. 158).

(referring to the years 1921-39) was published. This publication replaced the first official national income estimates (CBS, 1939). Both the estimates by the income and the production method were corrected.

It goes without saying that the outbreak of World War II and the successive occupation of the Netherlands greatly influenced work on national income. During the war, there was hardly any contact with statisticians in other countries. At CBS, research went on and in September 1945, very shortly after the end of the war, Derksen visited the National Institute of Economic and Social Research in London to exchange ideas with leading foreign national accountants. It turned out that during the war research in the Netherlands had been focused on the statistical aspects, whereas in the English-speaking countries research was more theoretically oriented. Derksen had various discussions with Stone who in 1946 prepared his famous monograph on social accounting for the United Nations (Stone, 1947). In order to make available to English-speaking readers the results of the investigations that had been carried out in the Netherlands during the war, Derksen prepared a paper 'A System of National Book-keeping - Illustrated by the experience of the Netherlands Economy' (Derksen, 1946). In the paper he presented tables for 1938 and national income estimates for 1900-1938.

In addition, Derksen used the national bookkeeping system to show the impact of the war and the German occupation on the Dutch economy. The figures roughly show which part of the national output of goods and services had to be put at the disposal of the Germans and which part was left to the Dutch people and how production and government expenditure were financed.

Derksen wrote in his concluding remarks: 'The method of the national bookkeeping system also has the advantage that it offers in a concise form a programme of research. By studying the tables and figures it is easy to see where statistical information is still unsatisfactory and further research is needed. It is possible to organise a detailed research programme, using the national book-keeping system as a general guide' (Derksen, 1946, p. 31). At the CBS, this train of thought has been further

worked out. The development of the system of national accounts has had a great influence on both the statistical programme and the organization of the CBS (see e.g. Van Bochove, 1987).

Derksen stated as well: 'Much statistical work remains to be done before it can be said that the national book-keeping system constitutes a valuable tool in economic analysis' (Derksen, 1946, p. 31). Indeed, this work has been done and the first results were published in 1950 (CBS, 1950). This publication is briefly discussed below, in section 3.5. The next section elaborates the developments at the CBS during the war (on which Derksen reported in London) and immediately after the war.

3.4. Progress at the CBS: The Commission on National Bookkeeping.

On 19 January 1943, a 'Commission for the National Bookkeeping' was established. This Commission was in charge of the research which should result in a 'National bookkeeping'[6]. The establisment of this Commission should be considered as the starting point for the development of a regular system of national accounts at the CBS. For the first time, the construction of a national bookkeeping was explicitly formulated as a purpose on its own. The background of the members of the Commission, their job description and the sequence of work done by the Commission all indicated that the concepts co-ordination[7] and integration should play a key role in the compilation of national accounts.

The Commission was made up of 6 members, the chairman was Idenburg, Director-General of the CBS, and amongst the members were Tinbergen and Derksen (secretary). The Commission met irregularly, and this is probably owing to the state of occupation. In her first meeting, the Commission formulated the importance of studies on national bookkeeping. Especially after the war, there would be an urgent need of such general statistical surveys. In the first place, on behalf of the necessary reconstruction of the country. In the second place, for economic policy purposes whereby an

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6. The term 'National accounts' was only used at a later stage.
7. A deep discussion 'avant la lettre' on the theory and need of co-ordination on behalf of a statistical description of the 'economic blood circulation' was already given in Roet (1936).

indicative economic planning system would be necessary for some years to come. In addition to an extension and deepening of detailed sytatistical information, an overall view of the economy would be required. Such overviews would also serve to inform the business world and the educated people in general, as their support for the many radical changes required would be indispensable.

The Commission's starting point was the working paper 'Schema's voor een nationale boekhouding' (Outlines for a national bookkeeping). This paper (CBS, 1942), which was never published, has been written in the Division for Business Cycle Research and Mathematical Statistics. The paper discussed the purpose and usefulness of a national bookkeeping and as well the theoretical and statistical problems in compiling these figures presented examples of tables and a research programme that encompassed the whole statistical office.

Some passages in the minutes of the first meeting of the Commission are worth mentioning. The Commission underlined the importance of the work on national accounting. However, one of the members noticed that the national accounts should be considered as a 'luxury statistic' and that the ordinary statistics not should be discriminated against. The Commission concluded that those statistics which the CBS was obliged to compile (e.g. statistics on food supply) or which would be necessary for the national bookkeeping should have priority. But with regard to less important statistics (also in view of the paper shortage at the time!), persons could be transferred to work on national accounts.

In April 1949, the Commission presented an outline to estimate national wealth. At the beginning, national balance sheets were an integral part of the Dutch system on national accounts. In the 1950s, the importance of national wealth estimates for plausibility checks of national accounting data was mentioned in a memorandum of the Division of National Accounts and Statistical Analysis. Experiences had shown that separate estimates of changes in assets and liabilities, adjusted for the effects of price changes, provide useful internal checks of the national accounting estimates. However, in due time, national wealth disappeared from the

statistical programme. The lack of separate data on the stock of capital goods by type and by major branches of economic activity was an important reason for this. Until now, no overall estimates of national wealth are available[8]. Capital stock figures are used in the perpetual inventory method to estimate fixed capital consumption.

The Commission mentioned two methods to estimate national wealth. The first one estimated national wealth as the total value of all physical capital (e.g. buildings and equipment). This value should be equal to the replacement value less fixed capital consumption. The second method used the total value of claims on national wealth (e.g. money, shares and bonds). The first estimates for 1938 arrived at 28,500 million guilders.

The Commission organized the research as follows. Working groups were set up to study different aspects. The groups were supposed to survey available data sources, such as production statistics, foreign trade statistics and accident statistics. A very useful data source were the figures gathered by 'rijksbureaus' (government offices). These data became available as a consequence of the war as they were necessary for rationing purposes. They concerned stocks, production, intermediate consumption, primary costs and imports and exports. The lack of statistical information in those days forced the statisticians to develop methods to make up for these gaps when compiling national accounts. Gradually the idea of an input-output approach arose.

This means that for every industry information was needed about:
- The value of gross production, intermediate consumption and value added components;
- Which goods were produced and which goods were used up (commodity flow!).

In addition, specific problems were studied: e.g. imputations for owner-occupied dwellings, government production, sector classification, military expenditures, the treatment of banking services, gains and losses on stocks, valuation of gross production (inclusive or exclusive of transport margins). All estimates related to the year 1938.

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8. However, in this field work is in progress at CBS (Frenken, 1992).

In 1944, CBS was informed that in England important work had also been done in the field of national accounting, and that this was published in a Budget White Paper 'An Analysis of the Sources of War Finance and estimates of the National Income and Expenditure in the years 1938 to 1944'. A Commission of the Dutch government in exile in London recommended similar studies for the Netherlands after the liberation. The 1944 Annual Report of the CBS proudly mentiones that much work had in fact already been done. This was evidenced by the paper 'Nationale boekhouding, doeleinden, problemen en resultaten' (National Bookkeeping, objectives, problems and results) (Derksen, 1944)[9].

After the liberation, the work on national accounting was swiftly resumed, but the effects of the final war years on the statistical organisation had been so devastating that it was only until the end of 1948 before a reliable set of national accounts for a post-war year (1946) could be completed. A brief survey of these results was published in April 1949 (CBS, 1949). Detailed figures, together with revised accounts for 1938 were published in 1950. The latter publication is the subject of the next section.

3.5. A True System of National Accounts (1938, 1946 and 1947)

The first phase in the development of the Dutch national accounts ended in 1950 when accounts for 1938, 1946 and 1947 were published. This publication (CBS, 1950) was the crown of a development of about fifteen years. In addition to detailed figures, a description was presented of data sources, the theoretical framework and the estimation methods.

For the first time, the estimates were fully based on the net-production method. A complete system of national accounts was presented. In this system six sectors were distinguished: enterprises, credit institutions, insurance companies and pension funds, government, households and the rest of the world. Notably, in the present national accounts the same sectors are distinguished; only the sector social security funds is now also

9. This paper was not published until 1978 (CBS, 1978).

distinguished separately. The accounts of the sectors were presented as T-accounts.

The enterprise sector was the heart of the system. For twenty-five industries value added had been calculated by subtracting intermediate consumption from gross production. This was carried out within an input-output tables framework. The input-output table for 1938 was the first one ever compiled for the Netherlands. With this, the foundation was laid for the Dutch 'input-output tradition': complete input-output tables are compiled on an annual basis and even the quarterly accounts and the quarterly flash are based on the input-output method. The 1938 input-output table was not published until 1984 (Van Bochove en Zijlmans, 1984)[10].

Remarkably, the publication presents clear indications of the reliability of the estimates. This was one of the rare occasions that such indication have been presented. For every item of the sector accounts the uncertainty margin was given. This margin ranged from 2-5% (reliable estimate) to > 20% (crude estimate).

The CBS reporting policy concerning the reliability of national accounting figures changed substantially in the course of time. The start was very promising: in the first national accounts publication (CBS, 1950), for every item of the sector accounts an uncertainty margin was indicated. Later on, the information became vaguer and qualitative and at present hardly any information in this respect is given. It is self-evident, that this does not mean that the reliabily as such has been worsened.

At the end of the 1940s, the statistics underlying the national accounting figures were a rather chaotic collection of uncoordinated individual statistics (cf. Van Bochove, 1987). There was no system of economic statistics. On the other hand, there existed no national accounting system to provide the basic conceptual framework. The emergence of the latter provided, for the first time, a systematic framework that could be used to judge the consistency, comprehensiveness and co-ordination

10. In the recent revision of the national accounts for the interwar period this table has been revised (see section 4.1).

of the economic statistics. In the Netherlands, the national accounts have had a strong impact on economic statistics because almost all statistical work was and still is organized in a single, centralized office whereby the national accounts are compiled in that same office.

4. Elaborations and Improvement of the System

4.1. A Review of the Developments after 1950

After the breath-taking development of national accounts in the 1930s and 1940s, an era of elaboration and quality improvement followed. Besides, Dutch national accountants actively participated in the development of the international guidelines on national accounting (see section 5.2). This era bears the stamp of Dr. C.A. Oomens, who, was head of the National accounts division, director of Co-ordination and director of Economic Statistics successively. More than anyone else he has long been the driving force behind the Dutch national accounts and their influence on the development of the system of economic statistics. Oomens joined the CBS in 1936 where Tinbergen and Derksen were his masters. Under the guidance of Oomens, progress was made in the field of: input-output systems, financial accounts, regionalization of national accounts, calculation of real national income and product, estimation of national wealth, integration and co-ordination, realisation of the central business register and modernization of the European System of Integrated Economic Accounts.

As often, history repeats itself: as in the 1930s, in the 1950s model-building asked again for adequate data which were not available. In 1953, Tinbergen (at that time director of the Central Planning Bureau) and Idenburg (Director-General of the CBS) took the initiative for a large-scale project: An Econometric Analysis of the Netherlands Economy. The Netherlands Economic Institute in Rotterdam and the Mathematical Center in Amsterdam participated. The project was financed by 'ZWO', the Dutch acronym for 'Zuiver Wetenschappelijk Onderzoek' (Pure Scientific Research). A first stage of the project was the construction of an adequate data base for the interwar period. A considerable number of series were compiled which have been used in the construction of the econometric models of the Central Planning Bureau until the mid 1970s. Informally, the Central Planning Bureau also provided a part of the series to academic researchers. But the data set was not published as such. Only recently, in the revision of the interwar period, national accounting data for the interwar period have been published.

At the Dutch CBS, statistical co-ordination was considerd to be a sine qua non for integration of basic statistics into a national accounts framework. This is illustrated in a publication about the organization and activities of the CBS (CBS, 1969). The part about the work of the statistical departments starts with the subject statistical co-ordination. The following citation tells its own story:

'The need for basic statistics which - even if collected from separate enquiries and with unequal frequencies - are comparable so that they can be integrated in a system and used together in various forms of analysis, is steadily growing. This requires more attention to this subject from the statisticians.
Co-ordination in this sense concerns the choice of definitions, of statistical units, of statistical classifications and the contents of questionnaires.
As for definitions, international recommendations are to be followed as far as possible, in particular those of the United Nations System of National accounts and its Common-Market version 'Système Européen de Comptes Economiques Intégrés'. The fact that international recommendations are made by more than one international agency and that they are not always compatible, poses some problems. Another difficulty is that the broad definitions of the international agencies must be converted into more specific texts which, if applied in many departments of the Bureau, result in full comparability of the data obtained on that basis.
As to the choice of statistical units it must be considered essential to limit the number of units to be used in statistical enquiries. In certain cases this may mean a less ideal adaptation to specific purposes, but in general this loss can be accepted in exchange for greater comparability of the statistics.
Here the main problem is the choice of units in the business sector of the economy. The Bureau has chosen two basic units:

a) the kind-of-activity-unit, to be used is statistics relating to the production process and to investment;
b) the institutional unit, viz. the unit which receives and disposes of income, owns and accumulates property, lends or borrows, for financial

statistics.

For the first of these units a regional classification is added. Also for classifications (of activities, of functions, of goods and services) international recommendations exist and sometimes differ. In setting up its classifications the Bureau tries to construct them in such a way that they fit into international classifications, serve national needs and are still feasible.

Co-ordination as described here requires three phases that can be described as: definition, execution and maintenance. In the first phase the ultimate goal must be described. In the second phase the existing statistics are adapted or amplified in order to become part of the co-ordinated system. The third phase starts immediately after that: the organization of the work must be such, that the system, with all the changes that characterize the economic process, remains a co-ordinated one.

Mainly in view of the third phase it is considered essential that the way in which decisions about the delineation of the statistical units and about the classification of these units are made, is recorded in registers for each of the two units.'

After the first modern national accounts publication in April 1950, national accounting figures for 1948 (including an input-output table) and provisional ones for 1949 and 1950 were published in the quarterly journal 'Statistische en Econometrische Onderzoekingen' (Statistical and Econometric Studies) (CBS, 1951). Owing to a lack of space only the most important tables were presented! Partly as a follow-up discussions between the CBS and the Central Planning Bureau aimed at harmonizing the definitions, there were some changes compared with the preceding publication, such as:

- The state and subsidized education was transferred from the enterprises to the sector government;
- Expenditure on maintenance (to maintain the assets in their original condition) by enterprises was booked as fixed capital formation.

National accounting figures for subsequent years were published in various volumes of 'Statistical and Econometric Studies'.

A regular, yearly publication of national accounts started in September 1953 (CBS, 1953) with figures for 1938 and 1946-50 and provisional ones for 1951 and 1952[11].

In the next publication (CBS, 1954), provisional 1953 figures were published, together with revised ones for 1938 and 1946-52. This revision encompassed both new estimates (for instance, for the sector insurance companies better basic data were available) and changes in definitions. For example, taxes were no longer measured on the basis of tax assessments but on by government recovered amounts. In the introduction to the publication it was mentioned that the development of the system of national accounts had reached a phase, both nationally and internationally, in which no great changes were to be expected in the coming years. Explicitly, the CBS revision policy was mentioned: comparability over time of the figures has a higher priority than the accuracy of the level estimates. The system was not fully in accordance with the 1953 SNA, but the intention to adapt to the SNA was stated.

In the National Accounts 1954 (CBS, 1955), a revision of the figures from 1948 onwards was announced. The purpose was to improve both the comparability over time and the usefulness of the data. In this publication, for the first time data at constant prices (of 1949) for the macro-economic aggregates were given. Also for the first time, long time series of national accounting figures, from 1900 onwards, were published. The number of variables was limited: volume index numbers of national income and per capita national income.

In CBS (1955), corrections of earlier published figures were carried out. These corrections concerned, amongst others, recalculations of fixed capital formation and the change in stocks. In this publication, the royalties etc. received from the rest of the world were booked as exports of services (so far, they had been booked as income from abroad).

In 1958 (CBS, 1958) a complete revision of the national accounts for the

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11. This pattern continues up to the present times: final estimates are published two and a half year after the end of the reference year.

years 1948-57 was published. The years 1946 and 1947 were left aside because they were too much influenced by the war. Therefore it was considered that these years should be deleted from a time-series for use in economic model-building. The explicit purpose of the revisison was to obtain time-series which were completely comparable as regards accuracy, definitions and classifications. New basic statistics made it possible to improve upon the estimates. The international definitions as given in the publications of the United Nations (United Nations, 1953) and the OEEC (OEEC, 1952) were now completely implemented. Finally, new and more detailed classifications were worked out. These were needed for purposes of domestic economic policy and for submission to international agencies.

The most important changes in definitions were:

- general government expenditure was broken down into consumption and fixed capital formation for civilian purposes. Government expenditures for military purposes were considered as consumption expenditure. Corresponding estimates were made for fixed capital consumption and imputed rent on civil government buildings;
- the increase of work in progress in construction was regarded as fixed capital formation instead of as an increase in stocks. On the other hand changes in the value of livestock were included in the increase in stocks;
- before the revision all social security funds, pension funds and life-insurance companies were treated as one sector. In the revision, a separate sector 'social insurance' was introduced as part of the general government. A new sector was created for life insurance and pension funds;
- the interest on public debt was not anymore added to national income;
- a seperate sector credit institutions was distinguished.

The 1948-57 revision resulted in higher growth rates of national income and final private consumption expenditure.

In the National Accounts 1959 more figures on deflators and volume indices were presented and employment figures were given too. Unrequited transfers to and from abroad were moved from the primary to the secondary

income distribution account.

In the National Accounts 1961, unemployment figures were presented for the first time. They were, together with employment figures estimated within a national accounts framework and were fully consistent with the national accounting data. The publication of these data stopped after the National Accounts 1979; from that year on, only aggregate employment figures by industry were estimated within a national accounts framework. The reason for this is that in 1980 the adequacy of the data sources was doubted and moreover the assumption of a simple dichotomy of the labour force, into working and non-working participants, was no longer considered sufficiently realistic, due to emergence of many part-time jobs.

In the National Accounts 1971 the Dutch Standard Classification of all Industrial Activities was introduced. In the National Accounts 1972, the 1968 SNA (UN, 1968) definitions were adopted. In the National Accounts 1974 the input-output table for 1972 was published as an annex to the publication[12]. From the National Accounts 1977 on, regional figures were published. Earlier, regional accounts for the provinces and a few other regions were prepared
for the year 1960 by splitting up the totals of the national input-output table into regional input-output tables. For this purpose an intensive use was made of the available basic statistics, supplemented by additional information and special estimates. Five-yearly regional input-output tables were published between 1960 and 1975. The compilation stopped because it took too much capacity.

The National Accounts 1980 presented the 1977 revision. This revision was needed because the years prior to 1977 were ones of major extensions and improvements to the statistics on which the national accounts are based. The extensions primarily involved a number of new statistics in services (e.g. medical services, business services, hotels, cafés and restaurants), while improvements particularly concerned a far better co-ordination of existing statistics (for instance, the general implementation

12. In addition, input-ouput tables and input-output coefficients are published in a separate publication 'The production structure of the Netherlands' economy'.

of the Dutch Standard Classification of all Industrial Activities). The 1977 base year revision involved:

- a revision of the data in the light of the availability of many new sources;
- improvement of a number of methods, including a more consistent treatment of a number of goods and services transactions;
- a revision of data in the light of changes in the classification of statistical units by economic class.

The 1977 revision resulted in an increase of gross domestic product at market prices by 13,500 million guilders, or 3.5%. The most extensive adjustments were services. In 1985 (CBS, 1985), revised time series for 1969-76 were published, fully comparable with the revised estimates for 1977.

In the National Accounts 1981 the number of published industries expanded from 35 to 57. In the National Accounts 1983 the publication of an experimental input-output table for 1981 in prices of 1980 was mentioned.

In the National Accounts 1984 consistent figures were given from 1970 onwards. The revised input-output tables for these years then also became available on machine-readible tape. From this publication on, price and volume mutations are published in the forms of chain indices. In 1990, an extensive description of methods in English language became available (Gorter et al., 1990).

From the very beginning, input-output tables played an important role in the Dutch national income estimates. The Netherlands were one of the first countries in the world in which routinely, yearly input-output tables were compiled as an integral part of the national accounts. In the early 1980s, the method of compiling input-output tables was changed such 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 gathered and analyzed simultaneously. This leads to a substantial improvement of both the figures in current prices and the volume and price developments.

Several years ago, the CBS embarked on a project dealing with the compilation of long, consistent time series of national accounting data. In this project, each period is tackled separately, the results being published whenever they become available. The first period to be revised was the interwar period. One of the reasons to choose this period was that in the second half of the 1980s the CBS still employed people who, many years ago, had compiled the original figures for that period.

In the revision of the 1921-39 data, the concepts and methods that are in current use have been used as far as possible. Moreover, additional series have been compiled in order to be able to draw-up the SNA 'Consolidated accounts for the nation'. One example of a change in method is that the national income is fully compiled by means of the net production method. Two examples of conceptual changes are: a recalculation of consumption of fixed capital by means of the perpetual inventory method and a recalculation of yearly price and volume indices by means of a Paasche-Laspeyres pair. For 1938, relatively much statistical information is available, which made it possible to compile a Social Accounting Matrix (Den Bakker, De Gijt and Keuning, 1992). The first results of this revision have already been published (see for instance Den Bakker, Huitker and Van Bochove, 1990).

In 1992, the results of the most recent revision have been published. This revision with 1987 as benchmark year is characterized by a greater emphasis on the institutional aspects of the system, particularly in the recording of goods and service transactions and in the generation of income. Starting with this revision, aggregation and integration of the basic data will be based on the supply and use matrices, estimated both in constant prices and in current prices. For example, this allows for a better link to basic statistics and for a more sophisticated comparison and mutual balancing of data from different sources. Over the period 1978-1987 a number of new sources have become available and some existing sources have become more complete. For instance, in this revision for the first time direct use is made of data from CBS surveys on household consumption expenditure and gross fixed capital formation. It is also the first occasion in which the production statistics for trade have been utilized.

With respect to income transactions, considerably more information has become available since the previous revision. This particularly concerns the Business Finance Statistics compiled over the years 1977-1985. This statistic provides detailed data on the profit and loss accounts and the balance sheets of non-financial enterprises. Independent income estimates were arrived at by combining these data with information on sole proprietorships and partnerships obtained from production statistics. In fact, this meant a partial rehabilitation of the income method in compiling the Dutch national accounts. The 1987 revision has been the occasion for a critical examination of all kinds of existing and recording methods which led to a range of adjustments.

In the course of time, several major revisions (see table 4 for some quantitative results) have been carried out in the Netherlands. These revisions are, in chronological order of publication:
- Revision 1948-57, comparable data for 1948-57, published in 1958;
- Revision 1968 SNA, comparable data for 1960-72, published in 1973;
- Revision 1977, comparable data for 1977-80, published in 1981;
- Revision 1921-39, comparable data for 1921-39, published in 1987[13];
- Revision 1987, comparable data for 1987-91, published in 1992.

Table 4. The effect of revisions of national accounting figures

	Gross Domestic Product at market prices			Net National Income at market prices		
	Before revision	After revison		Before revision	After revison	
	mln gld		%	mln gld		%
Revision 1948-1954						
1948	15440	15013	-2.8	14240	13535	-5.0
1954	26030	26738	+2.7	24310	24657	+1.4
1968 SNA revision						
1969	103359	101715	-1.6	95289	93797	-1.6
Revision 1977						
1977	261410	274930	+5.2	237760	251100	+5.6
Revision interwar period						
1921	6236	5679	-9.0	5780	5777	-0.1
1938	5624	5446	-3.2	5395	5399	+0.1
Revision 1987						
1987	430170	440580	+2.4	383960	390890	+1.8

13. This concerns macro-economic data. Detailed figures may be published in 1993.

In the course of time, several studies have been carried out to the magnitude of the hidden economy. For instance, Begeer and Van Tuinen (1985) reported that the black economy is 10 to 15% of the national product. However, more than half of it is covered by the official national accounting figures.

4.2. The 1980s: Towards a Flexible and Institutional Approach

In the Netherlands, the idea that a system of national accounts serves various purposes has a long tradition. Already in the working paper in which the framework for the Dutch national accounts was formulated (written in 1942, see section 3.4), the need for flexibiltiy was emphasized (p. 7): the structure of the national bookkeeping will entirely be determined by the needs. It is to be expected that in such a system continuous changes have to be made continually.

In the Netherlands, much attention has been paid to the structure of the next, 1993 SNA. Since the first proposal in this field (Van Eck, Gorter and Van Tuinen, 1983) many studies[14] have been published, which led gradually into a line of thought, sometimes referred to as the Dutch school (Reich, 1989, p. 419). The theoretical foundation of the Dutch view is presented in Van Bochove and Van Tuinen (1986). They stated that the many purposes of the SNA frequently conflict with one another and concluded that an alternative structure of the system is necessary in order to achieve greater flexibility. They recommend a SNA with a general purpose core supplemented by special purpose modules.

The core is to be a complete, consistent, integrated and detailed system of national accounts with a greater institutional content than the 1968 SNA and a more elaborate description of the economy at the meso-level. The autors mentioned three principles the core has to fulfil (Van Bochove and Van Tuinen, p. 140-143):

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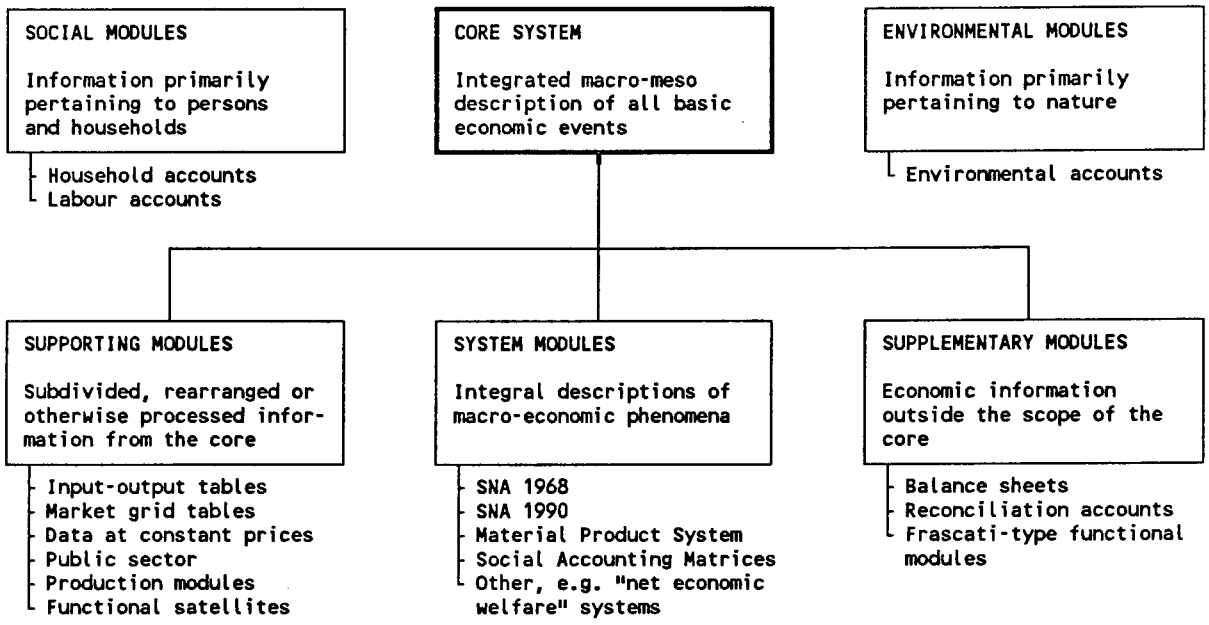
14. See e.g.: Al (1985), Van Bochove and Bloem (1985), Al and Van Bochove (1986), Bloem (1988), Van Bochove (1987), Van den Bos (1988), Gorter (1988), Bloem (1990), Keuning (1991), De Boo, Bosch, Gorter and Keuning (1991), Gorter and Van der Laan (1992), Bos, Hollanders and Keuning (1992), Kazemier and Exel (1992).

- the intersection principle. This principle consists of two part. In the first place the core should contain as few special purpose elements as possible. Secondly, the core should contain the essential structural components that are the basis for the construction of major alternative descriptions of the economy as a whole;
- The parsimony principle: The core should, as far as possible, reflect the economic agents' perceptions of themselves and of their transactions. Its concepts should be free of the influence of hypotheses that are based on theoretical analysis instead of sunjective experience;
- The consistency principle: The core has to provide a consistent, self-contained system of national accounts, just as the 1968 SNA is.

The modules are more analytic and reflect special purposes (e.g. imputations, attributions and re-classifications) and specific theoretical views, while maintaining an explicit link with the core. Unlike the 1968 SNA, the core is not an attempt to meet all demands on national accounting, but the core opts for a number of clear-cut choices, e.g. with respect to the production boundary, consumption by the payee and so on. This means that the core as such is insufficient to satisfy all major purposes of national accounts. In turn, this implies that some of the modules are not optional: a number of modules should be a standard part of the system, in addition to the core.

In Gorter (1988) a systematic review of imputations to be removed from the core system was presented. The idea of a core-module system is further given shape in Gorter and Van der Laan (1992). In addition to the core they distinguished five types of modules. Some of the tables mentioned under the supporting modules are mandatory (e.g. data at constant prices). Their system is shown in figure 1.

Figure 1. A System of Economy-related Statistics



Source: Gorter and Van der Laan (1992; Table 4).

Nowadays, environmental issues are in the limelight[15]. In order to analyse the environmental problems and to formulate policies there is an urgent need on statistical information in this field, especially concerning the impact of environmental phenomena on the economic system and vice versa. At a very early stage, Dr. R. Hueting, working on environmental statistics in the CBS, stressed the importance of connecting these statistics with the national accounts (Hueting, 1974, 1980). An alternative approach consists of an environmental module in physical terms which is linked to the core national accounts, so that a complete and systematic account of all changes caused by production and consumption processes can be given. This module is therefore not the outcome of a model, but a statistic (see De Boo, Bosch, Gorter and Keuning, 1991 and Keuning, 1992). Recently, the CBS has started a pilot project to fill in such an environmmental module with actual data.

15. However, years ago, national accountants were already aware of these issues. For instance, Derksen (1973) wrote: 'As in other countries, a discussion has developed on the need for changing the concept of national income by making allowances for the decline in 'social welfare' caused by air pollution, noise caused by motor vehicles and airplanes, etc. The Bureau shares the views of those who claim that national income is not and never was intended to be a comprehensive measure of social wellbeing and social welfare, though it is closely related to these concepts.'

Kazemier and Exel (1992) present a supplementary module on non-market production, thus incorporating non-market production within the concepts of the SNA. The relation between market and non-market production is shown in the framework of a Social Accounting Matrix. They add the informal sector to a SAM of the formal economy. This extended SAM can be considered as a prototype of a SNA-module on total production. The module on total production can serve many purposes. For example, it can be used to study the effects of increased female labour force participation on consumption and national income. A study on theoretical and statistical problems with respect to a research and development module (see Bos, Hollanders and Keuning, 1992) and a human capital module is carried out too.

Anticipating on the realization of a full-fledged core and module system, the 1987 revision stressed the institutional aspects of the system. Before the revision trade was described from a functional viewpoint. This means that the data related to all trade activities (main activities and side activities), no matter in which (major)group the units were classified. After the revision, the trade estimates relate to units which are classified according to their main activity.

In the publication 'National accounts 1991' (CBS, 1992), a detailed National Accounting Matrix for 1989 and aggregated ones for 1987-89 are presented. This can be seen as the first step towards the publication of a complete Social Accounting Matrix (SAM) and to the use of a SAM as a framework in which finally all three methods to compile national accounts, the income method, the production method and the expenditure method, are integrated at a meso-level.

5. Summary and Conclusions

5.1. Development of Dutch National Accounts closely related to Economic Policy and Model-building

In the course of time, the development of national accounts has been stimulated enormously by model-building. The Dutch national accounts originated from the need to provide data for the Tinbergen model. In the 1950s, the model-building efforts of the Central Planning Bureau again required new national accounting data.

National accounts are now widely used in economic analysis and for the formulation of economic policy. The Central Planning Bureau uses national accounts as a basis for its work and the preparation of the annual 'Central Economic Plan'(the official economic forecasts for the Netherlands). Therefore, a close co-operation is maintained between the Central Planning Bureau and the CBS, e.g. to ensure consistency in the definitions used by the two Bureaus. The national accounts are also used by the Ministry of Finance. For instance, in the government budget national accounts classifications are used.

In the Netherlands, national accounting figures play an important role to set norms for and to evaluate the outcomes of economic policy. For instance, the magnitude of Dutch foreign aid is tied to net national income. The target government deficit is expressed as a percentage of national income.

As mentioned before, the national accounts are now being developed into an institutional system. In this way, the national accounts serve as an organizing framework for a system of basic statistics. This system of economic statistics provides data on production, income distribution, financing and expenditure and their international and intertemporal relations.

In the course of time, the national accounts have also served as a framework to structure the division of work among basic statistics. The

organization of the work at the CBS and the division of the Directorate of Economic Statistics in departments is modelled to the types of basic statistics used in the National accounts.

In the Netherlands, the national accounts have had a strong impact on economic statistics because almost all statistical work was and is still organized in a single, centralized office whereby the national accounts are compiled in that same office.

In compiling the national accounts figures, detailed confrontations are carried out in an input-output framework. This means that the final national income estimate is not just an average of two or three methods. At a low level of aggregation data are compared and plausibility checks are carried out, which lead to corrections.

The national accounts and its figures, compiled by the Dutch CBS are very authoritative. It happens very rarely that competitive estimates are made (Van Tuinen, 1985).

5.2. The Dutch Contribution to National Accounting

The development of the Dutch national accounting system started in the 1930s and 1940s. From that time on, Dutch statisticians have contributed to the international development of national accounting systems.

Rostow (1990, p. 209) mentions the importance of the Dutch contribution to the development of national accounting. In the chapter on the emergence of national income accounting he states: 'In the course of the 1920s the statisticians, conscious of their growing skills and the proliferation of government statistical series, conscious also that new and puzzling problems were shaking the complacency of the mainstream economists, unfurled their flags and asserted with confidence a major role in the further development of the social sciences. One could quote various Americans and Britons to this effect (as well as Norwegian, Dutch, and other econometricians)...' This might be seen as an underestimation of the

contribution of Tinbergen and Derksen in those years. For example, Arvay (1992) notices: '... the economic theory of Keynes and Tinbergen developed in the 1930s which served as a fundamental basis for the SNA-type national accounting system.'

In December 1945, Derksen represented the Netherlands at a meeting (Princeton, NJ.) of the subcommission on national income of the League of Nations Commission of statistical experts. There was much discussion on international guidelines. The national bookkeeping system, as had been developed in the Netherlands, basically complied with these guidelines.

In 1952, the OEEC 'Standardised System of National Accounts' (OEEC, 1952) was published. Dr. G. Stuvel was closely involved in drafting this report. Stuvel was one of Tinbergen's assistants and was later in charge of the national accounts work at the OEEC in Paris. The 1953 SNA reflects the development of the national income accounting framework in a number of countries during and after World War II. Ruggles and Ruggles (1970, p. 16) mention four countries: the United Kingdom, the United States, Norway and the Netherlands.

Prof. dr. D.B.J. Derksen and Dr. C.A. Oomens played an important role in the realization of international standard conventions. The former became head of the national income unit of the United Nations. In the mid 1960s, Dr. C.A. Oomens was member of the Expert Group, convened by the United Nations Secretary-General to assist and advise in drafting the 1968 SNA. Derksen and Oomens also advised other countries on the development of national accounts, the former, for instance, advised together with Kuznets and Stone the Indian National Income Committee (Tiwari, 1992, p. 8) and the latter contributed to the development of the Mexican national acounts.

In the forthcoming revised SNA, several ideas which were promoted by Dutch national accountants, will be incorporated (setting aside imputations, three-dimensional value-added table, applying chain indices, matrix presentation, institutional sector classification, meso approach, etc.). In addition, the chapter on Social Accounting Matrices (UN, 1992) has been written by a Dutch national accountant. These matrices fit well in

the flexible approach to national accounting as advocated by the Dutch school.

The CBS is also closely involved in the realization of the ongoing revision of the European System of Integrated Economic Accounts. For this purpose, one of its staff members is seconded at Eurostat.

Appendix I. Development of Short Term Statistics

Alongside with the development of the definitive national accounts short term statistics have played an important role in the Dutch national accounts. In general, short term statistics are less reliable, more aggregated but faster available than long term statistics (see Algera and Janssen, 1991). In the national accounting framework, short term statistics cover annual (provisional and revised provisional), quarterly and monthly figures.

Already in the interwar period, CBS presented short term statistics. At the end of 1926, an economic barometer was published: short-term series concerning, for instance, interest rates, wholesale price indices, the circulation of money and imports and exports. In the same year, the CBS wrote a letter to the Central Committee of Statistics (this Committee determines the statistical programm of the CBS) stressing the desirability to compile monthly production indices (concerning goods produced by the most important manufacturing industries).

In 1929, the young physicist Dr. J. Tinbergen engaged in business cycle research. The results of his research were published in the quarterly 'De Nederlandsche Conjunctuur' (The Dutch Business Cycle). In 1932, two persons were engaged in business cycle research. On November 15th, 1935, a project to construct a model for the Dutch economy was started. The purpose was to gain insight into the causes and consequences of the business cycle. During this research it became clear that there was a lack of relevant data. Therefore, the CCS wrote to the Minister of Economic Affairs that new figures concerning the origin and use of national income should be estimated in order of keeping a 'Tableau Economique'. In 1936, eight persons (four of them researchers) were added to the staff of Tinbergen, who presented his world-famous model for the Dutch economy in this year.

In 1938, the CBS was not publicity-shy[16]. Every Wednesday, 'Economische Weekcijfers' (Economic Weekly Figures) were published in the Dutch national newspapers: stock prices, labour market figures etc. Since September 1, 1938, research on business cycle was concentrated in the division

'Conjunctuuronderzoek en wiskundige statistiek' (Business cycle research and mathematical statistics). As mentioned in section 3.3, the research on business cycles gave the impetus to the development of the Dutch national accounts.

During and after World War II, the development of a system of national accounts required a great deal of effort, but there still remained much attention for short term statistics. Besides, annual estimates were partly based on short term information. In the quarterly 'Statistische en Econometrische Onderzoekingen' (Statistical and Econometric Studies) (CBS, 1950) the first quarterly national income figures for the Netherlands were presented together with a description of the theoretical and statistical problems inherent to a quarterly evaluation in line with the CBS tradition. These quarterly figures were estimated within an input-output framework. The quarterly input-output tables were even published, the first one for 1948 and the last one for the second quarter of 1953. After that, the compilation of quarterly figures was abandoned because all staff was needed to compile the annual data. At that time the annual estimates, which were partly based on quarterly figures, had to be revised. Unfortunately, the quarterly accounts were never revised.

In the early 1980s, a project was started to integrate short term statistical information within a system of quarterly accounts. To this end, complete quarterly input-output tables are compiled. Figure A1 represents the compilation process of the quarterly accounts in the Netherlands. The essential element of this compilation process is the balancing of the input-output table by adjusting the indicators and/or the hypotheses. As far as we know this is a fairly unique method.[17] From 1986 on, quarterly accounts were published, starting from the reference year 1977. At present, the timeliness of the quarterly accounts is about seventeen weeks.

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16. CBS employees were confronted with business cycle movements every day. In the big central hall of the CBS building huge graphs were drawn on the wall. These graphs, representing the developments of some business cycle variables, were regularly updated. At present, every CBS employee has access to the most up-to-date values of a series of economic variables through his or her PC-connection to the CBS computer-network (one of the largest computer networks in Europe).
17. A detailed description of the methodology of the quarterly accounts is presented in Janssen and Algera (1988).

Table A1. A view on the structure of the Dutch system of economic statistics

Integration / Thoroughness	Not Integrated Statistics	Partially Integrated Statistics	Fully Integrated Statistics
Expectations and leading indicators	Business and consumer surveys	Composite leading indicators[1]	-
Monthly indicators	Statistics on . products . prices . foreign trade . consumption	Index of industrial production	-
Quarterly indicators	Quarterly statistics on manufacturing industries (sales and employment)	Deflated quarterly statistics on manufacturing industries (sales and employment)	Quarterly accounts
Annual statistics	Production statistics	p.m.[2]	National Accounts

1) Composite Leading Indicators are not compiled by the CBS, but see e.g. De Nederlandsche Bank (1988) and OECD (1987).
2) Partially integrated annual statistics are of a very specific nature; an example in this table would require too much explanation.

Source: Ouddeken and Zijlmans (1991)

The quarterly input-output table, which is at present not published, is used as an integrating framework. Roughly, the method is as follows. First the structure of the input-output table for the previous quarter is extrapolated to the quarter under review by means of indicators on changes in various cells of the table. Besides, expert information is used and some assumptions are made. The resulting table is then balanced in an integration process. The use of the input-output approach for the quarterly accounts fits very well in the long CBS tradition in this field. An additional advantage of the compilation of quarterly figures by means of input-output tables is that comparisons with the annual tables can be made. The very first quarterly input-output table was obtained as a quarterly breakdown of the 1977 table. Due to the 1977 revision very detailed information became available and besides that 1977 was rather long ago so the estimation method could be tested.

In order to reduce the timeliness of seventeen weeks, the fast quarterly accounts project (Ouddeken and Zijlmans, 1991) was set up in 1987. The aim was to arrive at a timeliness of less than two months. Of course, this

implies that less information is available than for the regular quarterly accounts. Time-series analysis and other techniques are used to compensate this lack of data. For the rest, the fast quarterly estimates are compiled with the same method as is used for the regular quarterly accounts. The loss in quality of the fast quarterly accounts compared to the regular ones appears to be fairly small, in any case for the gross domestic product (Reininga, Zijlmans and Janssen, 1992). Since September 1991, fast quarterly estimates are published.

The first national accounting estimates are the monthly figures which are published four to six weeks after the end of the reporting month. Contrary to (fast) quarterly and annual estimates, monthly indicators are not reconciled within an input-output framework. They describe parts of the economic process, for instance the growth of production in manufacturing and of private consumption expenditure.

Since 1985, fifty-five years after the first CBS business cycle report (published up to 1954) a monthly business cycle report is published (CBS, 1988). In this publication recent economic developments are presented in a systematic way (e.g. data on consumption, foreign trade and prices). In the Netherlands, this report attracts a great deal of attention. Among other things, it is published in the leading Dutch economic weekly 'Economisch Statistische Berichten' (Economic Statistical Reports).

Appendix II. Price and Volume Measurement in the National Accounts

Dutch national accountants have always been interested in the deflation of national accounting figures. Derksen and Oomens studied this problem (e.g. Oomens, 1949). In CBS (1948) constant price data for national income 1900-39 were presented[18]. The choice of the base year (1925/1934=100) was based on Clark (1940).

In the 1980s, an in-depth study has been carried out related to the objective to compile a complete input-output table in prices of the previous year. An input-output table for 1981 in 1980 prices was published in 1984 and theoretical and practical considerations concerning the deflation of national accounts and input-output tables have been published in Al, Balk, De Boer and Den Bakker (1986). The authors are in favour of using chain indices with the Laspeyres index for volume developments and the Paasche one for price movements. This approach is now also advocated in the next SNA's Chapter on Price and Volume Measurement.

In 1985, the Dutch CBS, under a contract with Eurostat, has conducted a survey among the Statistical Offices of the Member States of the European Community to find out the extent to which chain indices were used for deflation of national accounts data. In a study by Den Bakker (1991) the sensitivity of long term growth rates to variations in index number formulae and weights was analysed. It appeared, that the use of different formulae and weights yields large differences in growth rates (up to about 10% over a period of about twenty years). This means that comparisons of gross domestic growth rates among countries are obscured by the use of different deflation methods. As a consequence, there exists an urgent need for standardization of deflation methods at the international level.

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18. It was not until 1955 that constant price data were published again.

References

Al, P.G., 1985, Dual sectoring in National Accounts. National Accounts Occasional Paper Nr.NA-10 (Netherlands Central Bureau of Statistics, Voorburg).

Al, P.G., B.M. Balk, S. de Boer and G.P. den Bakker, 1986, The use of chain indices for deflating the national accounts. Statistical Journal of the United Nations ECE 4, pp. 347-368.

Al, P.G. and C.A. van Bochove, 1986, A proposal for the synoptic structure of the next SNA. National Accounts Occasional Paper, Nr. NA-14 (Netherlands Central Bureau of Statistics, Voorburg).

Algera, S.B. and R.J.A. Janssen, 1991, The development of short-term macro-economic statistics. In: CBS Select 7 - Statistical Essays (SDU/Publishers / CBS-publications, The Hague), pp. 99-118.

Arvay, J., 1992, The Material Product System (MPS) - A Retrospection. Paper to be presented at the Twenty-Second General Conference, August 30 - September 5, 1992, Flims, Switzerland.

Bakker, O., 1939, Het nationale inkomen en de berekening ervan (National Income and its Estimation). Economist, 1939, aflevering 3, p.220-234.

Bakker, Gert P. den, 1991, The Choice of Index Number Formulae and Weights in the National Accounts - A sensitivity analysis based on macro-economic data for the interwar period. National Accounts Occasional Papers Nr. NA-044 (Netherlands Central Bureau of Statistics, Voorburg).

Bakker, Gert P. den, Jan de Gijt and Steven J. Keuning, 1992, A Historical Social Accounting Matrix for the Netherlands (1938) - including a comparison with the 1987 distributions of income and outlay. Paper to be presented at the Twenty-Second General Conference, August 30 - September 5, 1992, Flims, Switzerland.

Bakker, Gert P. den, Theo A. Huitker and Cornelis A. van Bochove, 1990, The Dutch Economy 1921-39: Revised Macroeconomic Data for the Interwar Period. Review of Income and Wealth, Series 36, Number 2, pp. 187-206.

Begeer, W. and H.K. van Tuinen, 1985, Statistische operationalisering van het begrip informele economie (The concept unofficial economy put into statistical operation). Statistisch Magazine, jaargang 5, nr. 1, pp.5-16).

Bloem, A.M., 1988, Micro-macro link for Government. Review of Income and Wealth, Series 34, Number 3, September, pp. 289-311.

Bloem, A.M., 1990, Units in National Accounts and the Basic System of Economic Statistics. Review of Income and Wealth, Series 36, Number 3, pp. 275-288.

Bochove, C.A. van, 1987, The Micro-Meso-Macro Linkage for Business in an SNA-Compatible System of Economic Statistics. National Accounts occasional Paper Nr. NA-020 (Central Bureau of Statistics, Voorburg).

Bochove, C.A. and A.M. Bloem, 1985, The structure of the next SNA: review of the basic options. National Accounts Occasional Paper Nr.NA-09 (Netherlands Central Bureau of Statistics, Voorburg).

Bochove, C.A. and Th.A. Huitker, 1987, Main National Accounting Series, 1900-1986.

Bochove, C.A. and H.K. van Tuinen, 1986, Flexibility in the next SNA: the case for an institutional core. The Review of Income and Wealth, Series 32, nr. 2, pp.127-54.

Bochove, C.A. van and G.M. Zijlmans, 1984, De Nederlandse produktiestructuur in 1938 en 1981 (The production structure of the Netherlands' economy in 1938 and 1981). De produktie-structuur van de Nederlandse volkshuishouding, deel XII, p.39-63 (Staatsuitgeverij/CBS-publikaties, 's-Gravenhage).

Bonger, W.A., 1910, Vermogen en inkomen in Nederland (Wealth and income in the Netherlands). De Nieuwe Tijd, vol. XV, March.

Boo, A.J. de, P.R. Bosch, C.N. Gorter and S.J. Keuning, 1991, An Environmental Module and the Complete System of National Accounts. National Accounts Occasional Papers, Nr. NA-046 (Central Bureau of Statistics, Voorburg).

Bos, F., 1992, The History of National Accounting. National Accounts Occasional Papers Nr. NA-48 (Netherlands Central Bureau of Statistics, Voorburg) (Forthcoming).

Bos, F., H.J.G.M. Hollanders and S.J. Keuning 1992, A Research and Development Module Supplementing the National Accounts. Paper to be presented at the Twenty-second General Conference of the International Association for Research in Income and Wealth, August 30-September 5, 1992, Flims, Switzerland.

Bos, C. van den, 1988, The institutional sector classification. National Accounts Occasional Papers,

Nr. NA-28 (Central Bureau of Statistics, Voorburg).

Carson, C.S., 1975, The History of the United States National Income and Product Accounts: the Development of an Analytical Tool. Review of Income and Wealth, June, pp. 153-181.

CBS, 1933, Onderzoek naar den invloed van het arbeidsloon op den kostprijs der producten (An inquiry to the influence of wages on the cost price of products), Part II (Algemeene Landsdrukkerij, 's-Gravenhage).

CBS, 1939, Enkele berekeningen over het nationale inkomen van Nederland (Some Computations of the National Income of the Netherlands). Speciale Onderzoekingen van de Nederlandsche Conjunctuur, no. 2 (Centraal Bureau voor de Statistiek, 's-Gravenhage).

CBS, 1942, Schema's voor een nationale boekhouding (Outlines for a National Bookkeeping) (Centraal Bureau voor de Statistiek, 's-Gravenhage). Unpublished.

CBS, 1948, Het nationale inkomen van Nederland 1921-1939 (National income for the Netherlands 1921-1939). No. 7 der Monografieën van de Nederlandse Conjunctuur (Uitgeversmaatschappij W. de Haan N.V., Utrecht).

CBS, 1949, National Accounts of the Netherlands, 1946 and 1947. Special Statistical Communications, No. 4001 (Netherlands central Bureau of Statistics, 's-Gravenhage).

CBS, 1950, De Nationale Jaarrekeningen: doeleinden, problemen, resultaten (The National accounts: objectives, problems, results). No. 8 der Monografieën van de Nederlandse Conjunctuur (Uitgevers-maatschappij W. de Haan N.V., Utrecht).

CBS, 1951, De Nationale Jaarrekeningen 1948 (National Accounts 1948). Statistische en econometrische onderzoekingen, Nieuwe reeks, Jaargang 6, No. 1, pp. 38-43).

CBS, 1953, Nationale Jaarrekeningen 1948-1950 (National Accounts 1948-1950) (Uitgeversmaatschappij W. de Haan N.V., Utrecht).

CBS, 1954, Nationale rekeningen voor Nederland 1938 en 1946-1953 (National Accounts for the Netherlands 1938 and 1946-1953). Statistische en econometrische onderzoekingen, 2e kwartaal (Uitgevers-maatschappij W. de Haan N.V., Utrecht).

CBS, 1955, Nationale rekeningen voor Nederland 1938 en 1947-1954 (National Accounts for the Netherlands 1938 and 1947-1954). Statistische en econometrische onderzoekingen, 2e kwartaal (Uitgevers-maatschappij W. de Haan N.V., Utrecht).

CBS, 1958, Nationale rekeningen 1948-1957 (National accounts of the Netherlands 1948-1957). Statistische en Econometrische Onderzoekingen, 2e en 3e kwartaal 1958, p. 101-118 (Uitgeversmaatschappij W. de Haan N.V., Zeist).

CBS, 1969, The Netherlands Central Bureau of Statistics - Organization, function and activities (Netherlands Central Bureau of Statistics, The Hague).

CBS, 1978, Denken en meten - statistische opstellen (Statistical Essays) (Staatsuitgeverij, 's-Gravenhage).

CBS, 1985, Nationale rekeningen 1969-1981 met herziene reeksen voor de jaren 1969-1976 (National accounts 1969-1981 with revised series for the years 1969-1976 (Staatsuitgeverij / CBS-publikaties, 's-Gravenhage).

CBS, 1988, Business Cycle Report. Netherlands Official Statistics, vol. 3, no. 2, pp. 5-26 (Netherlands Central Bureau of Statistics, Voorburg/Heerlen).

CBS, 1992, Nationale rekeningen 1991 (National Accounts 1991) (SDU/Uitgeverij / CBS-publikaties, 's-Gravenhage).

CBS, National accounts, different issues.

Clark, C., 1940, The Conditions of Economic Progress (MacMillan and Co. Ltd, London).

Cleeff, Ed. van, 1941, Nationale boekhouding: Proeve van een jaaroverzicht Nederland 1938 (National bookkeeping: an Attempt at an Annual Survey for the Netherlands, 1938). Economist, jaargang 1941, aflevering 7-8, p. 415-424.

Cleeff, Ed. van, 1941, Beteekenis en inrichting eener nationale boekhouding. (On the Significance and the Organization of a National Book-keeping System). De Economist, pp. 608-623.

Cleeff, Ed. van, 1945, Theoretische planhuishoudkunde - Hoofdlijnen en problemen van een leer der planmatig geleide economische orde (Theoretical Planeconomy). De Economist, November/December.

De Nederlandsche Bank, Quarterly Bulletin 1988, nr. 3 (Kluwer, Dordrecht).

Derksen, J.B.D., 1940a, Het onderzoek van het Nationale inkomen (An Inquiry to National Income). De Economist, 1940, aflevering 9, p.571-594.

Derksen, J.B.D., 1940b, Eenige recente gegevens over het nationale inkomen van Nederland (Some recent estimates of Dutch national income). Maandschrift Centraal Bureau voor de Statistiek, 1940, jaargang 35, nr.5/6, p.701-707.

Derksen, J.B.D., 1940c, Berekening van het nationaal inkomen volgens de objectieve methode (Estimation of national income according to the production method). Maandschrift Centraal Bureau voor de Statistiek, 1940, jaargang 35, p. 837-838.

Derksen, J.B.D., 1941, Berekeningen over het nationale inkomen van Nederland voor de periode 1900-1920 (Computations of the National Income of the Netherlands for the period 1900-1920). Speciale Onderzoekingen van de Nederlandse Conjunctuur, 1941, no. 4.

Derksen, J.B.D., 1944, Nationale boekhouding, doeleinden, problemen en resultaten (National bookkeeping, purposes, problems and results). In: CBS, 1978, Denken en meten - statistische opstellen (Staatsuitgeverij, 's-Gravenhage), pp.XIX-XXVI.

Derksen, J.B.D., 1946, A System of National Book-keeping, illustrated by the experience of the Netherlands economy, Occasional Paper X, National Institute of Economic and Social Rescearch (Cambridge University Press, London).

Derksen, J.B.D., 1973, Problems of determining and measuring the reliability of the national accounts: Netherlands experiences. Paper presented at the Thirteenth Conference of the International Association for Research in Income and Wealth, 31 August-5 September 1973, Balatonfured, Hungary.

Eck, R. van, C.N. Gorter and H.K. van Tuinen, 1983, Flexibility in the system of National Accounts. National Accounts Occasional Paper, Nr.NA-001 (Netherlands Central Bureau of Statistics, Voorburg).

Frenken, J., 1992, How to Measure Tangible Capital Stock?. Paper to be presented at the Twenty-Second General Conference, August 30 - September 5, 1992, Flims, Switzerland.

Gorter, C.N., 1988, Imputations and re-routeings in the National Accounts. National Accounts Occasional Paper, Nr. NA-001 (Netherlands Central Bureau of Statistics, Voorburg).

Gorter, C. and P. van der Laan, 1992, An Economic Core System and the Socio-economic Accounts Module for the Netherlands. Review of Income and Wealth, Series 38, Number 2, June, pp. 199-223.

Gorter, C.N. et al., 1990, Methodological Description of the calculation of the National Income (gross, at market prices) of the Netherlands for 1986. BPA-no.: 9904-90-STD.E8/Intern (Central Bureau of Statistics, Voorburg).

Hueting, R., 1974, Nieuwe schaarste en economische groei - Meer welvaart door minder produktie? (New Scarcity and Economic Growth - more Welfare through less Production?) (Agon Elsevier, Amsterdam/Brussel).

Hueting, R., 1980, New Scarcity and Economic Growth: more Welfare through less Production? (North-Holland Publishing Company, Amsterdam).

Janssen, R.J.A. and S.B. Algera, 1988, The methodology of the Dutch system of quarterly accounts. National Accounts Occasional Papers, Nr. NA-025 (Central Bureau of Statistics, Voorburg).

Kazemier, B. and J. Exel, 1992, The Allocation of Time in the Netherlands on the Context of the SNA - A Module. Paper to be presented at the Twenty-second Genaral Conference of the International Associaltion for Research in Income and Wealth, August 30-September 5, 1992, Flims, Switzerland.

Keuchenius, W.M., 1803, De Inkomsten en Uitgaven der Bataafsche Republiek, voorgesteld in eene Nationaale Balans (Income and Outlay of the Batavian Republic) (W. Holtrop, Amsterdam).

Keuning, S.J., 1991, Proposal for a Social Accounting Matrix which Fits into the Next System of National Accounts. Economic Systems Research, Vol. 3, No. 3, pp. 233-248.

Keuning, S.J., 1992, National Accounts and the Environment: The case for a System's Approach. BPA nr. 9111-92-STD.E8/Intern (Central Bureau of Statistics, Voorburg).

King, G., 1936, Two tracts (The John Hopkins Press, Baltimore).

Metelerkamp, R., 1804, De toestand van Nederland in vergelijking gebragt met die van eenige andere landen van Europa (The state of the Netherlands in comparison with other European countries) (Cornel en Van Baalen, Rotterdam).

Nooteboom, L., 1978, Veertig jaren Nationale rekeningen (Forty years of National Accounting). In: Denken en meten - statistische opstellen, p. 1-17 (Staatsuitgeverij, 's-Gravenhage).

OECD, 1987, OECD Leading Indicators and Business Cycles, Sources and Methods, No. 39 (OECD, Paris).

OEEC, 1951, A simplified system of national accounts (OEEC, Paris).

OEEC, 1952, A standardized system of national accounts (OEEC, Paris).

Oomens, C.A., 1949, Het reele nationale inkomen van Nederland (The evaluation of real national income in

the Netherlands. Statistische en econometrische onderzoekingen, jaargang 4, no. 1, March, pp.14-25.

Oomens, C.A., 1985, De ontwikkelingvan de Nationale Rekeningen in Nederland (The development of the National Accounts in the Netherlands). Statistisch Magazine 1985, Volume 5, nr.2 (Staatsuitgeverij/CBS-publikaties, 's-Gravenhage), pp. 5-15.

Ouddeken, F.E.M. and G.M. Zijlmans, 1991, The Use of Tendency Surveys in Extrapolating National Accounts. Review of Income and Wealth, Series 37, Number 3, September, pp. 301-312.

Reich, U.-P., 1989, Essence and Appearance: Reflections on Input-Output Methodology in Terms of a Classical Paradigm. Economic Systems Research, Volume 1, Number 4, pp. 417-428.

Reininga, T., G. Zijlmans and R. Janssen, 1992, Quality Assessment of Macroeconomic Figures: The Dutch Quarterly Flash. National Accounts Occasional Paper, Nr.NA-49 (Netherlands Central Bureau of Statistics, Voorburg) (forthcoming).

Roet, I., 1936, Coördinatie van statistieken (Co-ordination of statistics). De Economist, pp. 377-399.

Rostow, W.W., 1990, Theorists of Economic Growth from David Hume to the Present - With a Perspective on the Next Century (Oxford University Press, New York/Oxford).

Ruggles, N. and R. Ruggles, 1970, The Design of Economic Accounts. National Bureau of Economic Research, Number 89, General Series (Columbia University Press, New York/London).

Sandee, J., 1949, Independent Applications of National Accounts. Economica, August, pp. 249-254.

Stone, R., 1947, Definition and Measurement of the National Income and Related Totals. Memorandum to the Sub-committee on National Income Statistics of the League of Nations Committee of Statistical Experts. In: Measurement of National Income and the Construction of Social Accounts. Studies and Reports on Statistical Methods, No. 7 (United Nations, Geneva).

Studenski, P., 1958, The income of Nations (New York University Press, New York).

Tinbergen, J., 1936, Kan hier te lande, al dan niet na Overheidsingrijpen, een verbetering van de binnenlandse conjunctuur intreden, ook zonder verbetering van onze exportpositie? Welke lering kan ten aanzien van dit vraagstuk worden getrokken uit de ervaringen van andere landen? (Is a Recovery in the Domestic Economic Situation of this Country Possible, with or without Action on the Part of the Government, even without an Improvement in our Export Position? What Can Be Learned about this Problem from the Experience of other Countries?). Pre-adviezen voor de Vereeniging voor de Staathuishoudkunde en de Statistiek (Martinus Nijhoff, 's-Gravenhage), pp. 62-108.

Tiwari, S.G., 1992, Development of National Accounts in India. Paper to be presented at the Twenty-Second General Conference, August 30 - September 5, 1992, Flims, Switzerland.

Tuinen, H.K. van, 1985, Heden en toekomst van de Nationale Rekeningen (Present and Future of National accounts). Statistisch Magazine, Vol. 5, no. 2 (Staatsuitgeverij / CBS-publikaties, 's-Gravenhage), pp. 17-22.

United Nations (UN), 1953, A Sytem of National Accounts and Supporting Tables. Studies in Methods, Series F, No. 2, Rev. 1 (United Nations Publications, New York).

UN, 1968, A Sytem of National Accounts. Studies in Methods, Series F, No. 2, Rev. 3 (United Nations Publications, New York).

UN, 1992, Draft Revised SNA, No. ST/ESA/STAT/SER.F/2/Rev.4, Chapter XX (United Nations, New York).

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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 compilating 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 then 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**, Oudde-ken, 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 make and use tables and input-output tables**, Bloem, Adriaan M., Sake De Boer and Pieter Wind (1990, forthcoming).
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.

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 employ-- ment 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-UN-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 ofthe 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 modified national accounting system tailored to a description of the role of Research and Development (R&D) in the national economy. The main differences with the standard National Accounts are some changes in basic concepts (e.g. own-account production of R&D is considered as capital formation) and the introducton of additional, more detailed, classifications (e.g. new subsectors).

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 constists 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, forthcoming).
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 concomittant 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.

NA/58 **Major changes and results of the revision of the Dutch National Accounts in 1992**, Department of National Accounts (1992, forthcoming).
The revision 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.

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