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A NOTE ON DUTCH NATIONAL ACCOUNTING DATA 1900-1984

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Abstract

This note provides an 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 1900-1948 may contain a systematic bias.

1. Introduction

In the mid-nineteen thirties the Dutch Central Bureau of Statistics began to compile national accounting data. At first it concentrated on national income, later on a system of national accounts was designed and gradually expanded; definitions were altered repeatedly in response to changes in international guidelines; methods of compilation were greatly improved in the course of time. As a consequence, there now are official national accounting data from 1900 onwards scattered over a number of different publications and containing a considerable number of discontinuities. This has caused some confusion among users of long-term series. The purpose of the present note is to indicate briefly where the long-term data can be found, how they have been constructed and what the major discontinuities are. Thus this note is just a guide to and a cursory explanation of the published data; no attempt has been made to construct new series. Yet even this simple factual summary gives rise to some interesting conclusions on the accuracy of long-term data and the points on which further research may be fruitful.

The most convenient way to discuss the long-term data is to start at the present and work backwards. Section 2 discusses the postwar data, section 3 the pre-1946 data. In this note we concentrate on the national income series since a complete discussion of all more disaggregated national accounts series is beyond the scope of a brief note. Section 4 presents some conclusions.

2. Postwar data

Current method of compilation

Basically, there are three methods to compile national income data: the income method, which relies on income data deriving from, e.g. tax records; the expenditure method, based on data on consumption, investment, exports, etc., collected from various sources; and the production method, based, by and large, on production surveys. In theory the three should yield the same result, as a consequence of the basic national income identities. In practice, the estimates obtained differ, since each of the three methods has its own practical drawbacks. Consequently, the most reliable estimates would be obtained by combining the three methods and integrating the data resulting from them at the most disaggregated level feasible. Current practice in The Netherlands goes a long way towards achieving this goal.

The basic approach is the 'commodity flow method', which is a combination of the production and expenditure methods. Studenski (1958), in his as yet unsurpassed survey of national accounting and its history, judges this to be the most reliable method but is pessimistic about its practicality, because of its laboriousness. As a consequence of the latter, the method is applied in a few countries only (The Netherlands, Canada, Norway, Denmark and France). For the sake of presentation we may think of this method as amounting to constructing an input and an output table first and integrating these two into an input-output table. The input table provides the inputs of industries, broken down by products/commodities and categories of primary costs, and the value of the categories of final expenditure, broken down by products/commodities. The output table contains the production of each industry, broken down byproducts/commodities, and the composition of imports. From these two tables an industry x industry input-output table can be constructed that shows inter-industry flows, primary costs of each industry broken down into a number of categories, and the industrial origin of the categories of final expenditure. Thus the table also displays national vaue added and its components, and the national aggregates of the categories of final expenditure. In this scheme,

the construction of the input table can be thought of as an application of the expenditure method, that of the output table as an application of the production method. The construction of the input-output table then represents the combination of the two methods on a disaggregated level; since total output and total expenditure on each product/commodity have to be the same, this represents a possibility for integrating production and expenditure information on a disaggregated level. The strength of the method derives from a number of sources:

- on a disaggregated level a lot of variables are measured in two different ways.
- plausibility checks can be derived from a priori information on both input structure and output structure.
- the method provides a rigorous system-wide framework for statistical integration, facilitating consistency checks and the like.

Naturally, the above is a stylized representation. In The Netherlands the input and output tables are not yet constructed explicitly because not all information is available that would be necessary for their independent compilation and because there is no uniform classification of products/commodities used in production surveys as yet. Instead, the input-output table is constructed directly from the available input and output data, and some limited income- information is used in the process as well.

No independent estimate of national income is calculated annually by the income method. Instead, national income is derived from the value added estimated in the input-output table. Income information is then used in the drawing up of the accounts for the institutional sectors and in estimating the share of a number of components in total national income. In the future more income information will be integrated in the construction of the input-output table.

The basic information underlying the input-output table derives from many sources. The most important of these are the 'Production Statistics'. These are based on annual surveys of, mainly, establishment-type units and enterprises consisting of one establishment or of a number of establishments with the same economic activity. The surveys inquire as to outputs, detailed by product/commodity, inputs, and so on. The coverage is complete above a certain

treshold (mostly 10 employees in manufacturing). In addition to this there are, e.g., direct crop estimates for agriculture, wage data for services, surveys of enterprises in services and other industries and of enterprises above the treshold, monthly and quarterly surveys, complete counts once every few years, and so on.

The second revision

From the beginning of the century onwards, the comprehensiveness and quality of the basic data the CBS collected on the economic process steadily improved. This process accelerated since the early 1970's, due to the gradual development of a well-coördinated system of economic statistics. An important example of this process was the introduction of production statistics for industries not previously covered by them, not only in manufacturing but also for, e.g., service industries. As a consequence, the basic information available for the compilation of the input-output table and the other national accounts data greatly increased and improved methods of estimation became feasible as well. However, introducing the improved estimates piecemeal would have hurt the continuity of the time series. Therefore this temptation was resisted. Instead, all improvements were introduced simultaneously, in the second large scale revision in post-war history. For 1977 two sets of National accounts data were published (CBS, 1981), one including the revision changes, the other excluding them. Subsequently the revision has been carried out for 1969-1976 too (CBS, 1985a).

It is interesting to consider briefly some of the major consequences of the revision for the national accounts data. The estimate of the value of net national income at market prices was, for 1977, raised by 5,6%. However, this does not imply that its growth rate was altered drastrically: the value for 1969 was raised by 6,5%, so that the change in the growth rate of the value of national income for 1969-1977 is negligeable. The same applies to real national income. The increase in the value of national income cannot be attributed exclusively to any group of industries, because the commodity flow method implies that a change in the data for any particular industry has consequences elsewhere. However, the major contribution to the increase has been made by a few industries, where the estimate of gross value added was raised substantially: construction and installation (+9.3% in 1977);

wholesale and retail trade (+13.5%); hotels, restaurants, café's etc. (+86.7%) owner occupied dwellings (+16.6%); business services (+44.7%).

As a consequence of the revision of the 1969-1976 data there now is a set of continuous time series for 1969-1984. The most important ones are published in CBS (1985a) and CBS (1985b), whereas detailed data and input-output tables are either available upon request (1969-1977) or to be found in the annual issues of 'Nationale rekeningen' and 'De Produktiestructuur van de Nederlandse Volkshuishouding'.

The next discontinuity in the published time series is in 1959/1960. The data for 1960-1968 are published - excepting the input-output tables - in CBS (1973). There is only one source of discontinuity between the 1960-'68 series and the 1969-1984 ones: the former have not been revised. But the basic method of compilation is the commodity flow method and definitions and classifications are the same.

The latter is not true for the 1948-1960 data. These, too, are compiled according to the commodity flow method: there is continuity in method of compilation with the 1960-1968 data. However, definitions and classifications differ. The 1948-1960 data by and large satisfy the guidelines of the 1953 System of National Accounts (SNA) of the United Nations, whereas those from 1960 onward follow the 1968 SNA. The major differences between these systems need not be spelled out here. We mention just the two that were most important for the national aggregates:

- befor 1960 part of the banking imputation is attributed to final expenditure, after 1960 it is wholly recorded as intermediate cost.
- before 1960 there was an imputed rent of civil government buildings, which was dropped thereafter.

The total impact of the 1968 SNA conventions on national income was to lower it by 1.2% in 1960 and by 1.6% in 1968. Thus this change was, just like that induced by the revision, of very minor importance to the growth rate of national income.

The next and major discontinuity in the long-term series is pre-1948 to post 1948. The data for 1948-1959 have been published in CBS (1958), CBS (1959a) and subsequent issues of 'Nationale Rekeningen'. The data for 1948-1954 were based on a revision of earlier calculations. Thus this is the first revision; it was even more drastic than the second one described above. The revision consisted of two major elements. The first of these was a change in definitions. Previously, the Dutch national accounts were presented according to a system developed at the CBS after consultations with the Central Planning Bureau, in the first revision the 1953 SNA definitions were introduced. This led to changes in the structure of the system, detailing and so on. However, there were only two changes that significantly influenced national income. Curiously, they related to the same two issues that caused a discontinuity when the 1968 SNA was introduced: a change in the treatment of the banking imputation and one in imputed rents for civil government buildings. The latter imputation was newly introduced in the first revision, and abandoned again at the introduction of the 1968 SNA. The former was treated differently: both before and after the first revision part of the banking imputation was attributed to final consumption, thus adding to national income; but before the first revision this attribution was made in proportion to sectoral debts with banks, after the revision in proportion to their balances.

The second major element of the first revision was an improvement in the compilation of the accounting data. The system remained the same: before the revision the commodity flow method had already been employed. Thus, in this respect the first and second revisions are similar. But, just as in case of the second revision, many new basic statistical data were now used, and a major improvement in the quality of the data was achieved by constructing time series using basic data available for one year to improve the data for other years and by applying intertemporal checks.

For 1948 the impact of the revision was to lower the value of national income by 5% of which 1-2% was due to conceptual changes. Thus the effect of the first revision for 1948 was the reverse of that of the second one for 1977 (an increase with about 5%). However, unlike the second revision, the first one also altered the rate of growth: for 1956 revision national income was 2.6% higher than originally, raising its growth rate by an average one percent. In constant prices the result was

similar.

It is very interesting to note which industries were most affected by the first revision: wholesale and retail trade, owner occupied dwellings, other services (including business services). All three were also strongly affected by the second revision, as noted above. Thus the conclusion emerges that the inaccuracy in the national accounts has been concentrated in a few industries.

A second conclusion is that, with respect to the macro-aggregates, the national accounting series from 1948 onward contain two discontinuities (1959-1960 and 1968-1969) as far as the levels of the variables are concerned, but that the growth rates, even at current prices, have not been seriously affected by this; thus a set of growth rates for 1948-1984 can be safely employed using published CBS data.

The latter is not true for the years immendiately preceding 1948. Immediately after the second world war national accounts were compiled by the commodity flow method for the first time, particularly for 1938, 1946 and 1947, cf. CBS (1950a) and Van Bochove and Zijlmans (1984). These series were then carried on into the 1950's, until the first revision; however, as indicated above, the first revision was not carried back beyond 1948. Moreover, since the first revision affected the growth rates of the macro aggregates as well as their level, it would seem unwise to link the 1938, 1946 and 1947 data to the later series employing unrevised data. This means, in effect, that there are at present no official national accounting data for 1946 and 1947 that may be considered as reliable in the context of long-term time series.

3. The period before 1946

As indicated above, the commodity flow method was introduced immediately after the war in Dutch national accounting. For the period before 1946 the CBS has not compiled a set of national accounts, but only estimates of national income, and some breakdowns of the latter. The national income definitions employed differed only slightly from those for the post-war series. To compile the data, the CBS has employed two methods: the income method (referred to as 'subjectieve methode') and the production method ('objectieve methode'). For the years 1921-1939 both methods have been employed to calculate national income, cf. CBS (1948). The final estimate of national income was the arithmetic average of both estimates. On balance, the sum of the differences between the two estimates for the period as a whole was negligeable. The estimates obtained this way were converted into a real national income series by means of an index of the cost of living, the weights based on budget surveys in the mid 1920's and mid 1930's in Amsterdam. Next, similar calculations were made for 1940-1945, but for these years only the production method yielded acceptable results (CBS, 1950b).

After the war, in the nineteen fifties, the new Central Planning Bureau aimed to construct a macro-econometric model for The Netherlands in order to improve on Tinbergen's earlier models. Consequently, time series were necessary for other aggregates than just national income. To this end, financed by the foundation for pure scientific research (Zuiver Wetenschappelijk Onderzoek) a joint research project of the Central Planning Bureau and the CBS was carried out. It led to the construction of time series 1921-1938 for a number of series. The results of the project have never been published as such, but they have been employed by the Central Planning Bureau ever since and a number of series were published in CBS (1959b). Two remarks on these data are in order.

- the national income estimate referred to above has not altered; nor has a different price series been employed for deflating the series.
- for the other series Fisher-chain price indices were calculated.
- these indices were linked to post-war series by calculating indices for 1948 on the basis of 1938=100.

The first point implies that the real national income series as published in CBS (1959b) and in subsequent issues of 'X Jaar Statistiek in Tijdreeksen' is not strictly comparable to the post-war series: after the war a proper 'implicit deflator' has been employed, before the war a cost of living index[1)]. It would be useful to remedy this discrepancy between pre- and post-war deflators, because the price series for the other aggregates in the national income identities differ substantially from those for consumption; however, to calculate a true national income deflator for 1921-1938 is fairly laborious: the Fisher indices employed as deflators for the aggregates do not satisfy the aggregation property, implying that an implicit national income deflator can only be calculated on the basis of more detailed series than the ones published in CBS (1959b).

The pre- 1921 data are based mainly on the income method (CBS, 1941): for 1900-1920 not enough production data were available to apply the production method. They are, for this reason alone, less accurate then those for 1921-1938. Moreover, they, too, were deflated by means of a cost of living index. The data were adapted to a definitional change in CBS (1948).

4. Some conclusions

Our brief survey of Dutch national accounting data 1900–1984 leads to conclusions on three points: the accuracy of the levels of aggregates, the reliability of (real and nominal) growth rates and the need for further research .

The levels of national aggregates

In the post-war period there have been two major revisions of Dutch national accounting data. These were due to greater availability and quality of basic data and improvement of methods. They led, first, to a downward revision of the value of national income for 1948, and, next, to an upward revision for 1969-1977, both in the order of magnitude of 5%. These substantial changes were necessary in spite of the fact that (i) the basic method of compilation was not altered and (ii) this basic method is the commodity flow method, generally recognized to be the most reliable one for the compilation of national income.

Thus, if anything is to be inferred from post-war Dutch experience in national accounting, it is that the levels of national aggregates have been afflicted with a considerable degree of inaccuracy. As a consequence, international comparisons of per capita income levels have to be approached with more scepsis than is evident from many cross-section studies, particularly in case of countries whose per capita incomes do not differ too much. One wonders whether refined methods such as, e.g., employed in the International Comparison Project, do not overtax the statistical reliability of the national income data.

However, we have also seen that, in The Netherlands, the unreliability of value added data was concentrated in a few industries. If the same could be demonstrated for more countries, this would point towards a different approach to international comparisons. Instead of comparing aggregates like national income and final expenditure categories, comparisons should concentrate on production and value added of the industries for which the greatest statistical accuracy is achieved[2)].

The growth rates of national aggregates

The second post-war revision affected neither the nominal nor the real growth rates of national income. The first one did. This may be due to the fact that, prior to it, experience with the commodity flow method was limited. Thus it seems safe to conclude that, after an initial period, the estimates of the growth rates of national aggregates are fairly reliable as long as the same basic method is employed. Strictly speaking, however, the latter conclusion can only be confirmed by calculations based on input-output tables in constant prices; the latter have been constructed for the first time in 1981.

The growth rates for the pre-war period must be approached with greater caution. First, the basic method of estimation differed not only from the later one but also differs between 1900-1920 and 1921-1938. Second, there was much less basic statistical information than after 1945, while, moreover, it was less systematic from an intertemporal point of view. As a consequence of these two factors, the growth rates of the aggregates, particularly of national income, at current prices for 1900-1948 are less reliable than after 1948. However, there is an indication that average nominal growth rates from 1920 onward, e.g. decennial ones, can be approached with more confidence: for 1921-1939 the value of national income was calculated by two independent methods; though there were occasionally substantial differences between the two resulting estimates for individual years, these differences are negligeable for the period as a whole. However, the basic production data for the period lacked a lot of the information essential to national accounting, mainly because enterprises were unwilling to provide information on, e.g., wages, details of output, and so on.

The accuracy of the real growth rate of national income for 1900-1948 is in much greater doubt, due to the fact that the deflator employed is the cost of living index instead of the implicit deflator. This is all the more true because necessities have a greater weight in the cost of living index than in national aggregates; since relative prices of necessities have risen vis à vis e.g. those of 'luxuries' and, probably, investment goods, a systematic bias in the long-run real growth rate cannot be precluded.

Possibilities for further research

Our survey clearly indicates that a reconsideration of long-run official Dutch national accounting data may be fruitful. At this stage it is premature to

provide either an exhaustive list of the possibilities or even a set of priorities, but a few points may be mentioned which could be included in a systematic reconsideration, and appear to be feasible.

- a more appropriate deflation of pre-war national income.
- an analysis of the differences between the estimates based on the various basic methods that have been employed to estimate the value of national income, particularly for a number of years where discontinuities in methods are concentrated.
- development of a set of aggregate national accounts (e.g. the accounts of the nation and some accounts for the institutional sectors) for the 1920's and 1930's.
- construction of reasonably consistent time series 1921-1984 for production, value added, etc. of e.g. ten to twenty industries. For some benchmark years input-output tables could be constructed in order to achieve this.

Notes

1. It should be noted that the latter differs from the deflator employed in the calculation of real household consumption, since weights differ.

2. This reinforces the view of our host, professor Maddison, that international 'real' comparison should not only be carried out for categories of final expenditure but also for value added/production, industry by industry.

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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 Acccounting Matrix including Environmental Accounts (NAMEA) is proposed. This is illustrated with an example.

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