

# Compilation method of the time series



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## Explanation of symbols

.	= data not available
*	= provisional figure
x	= publication prohibited (confidential figure)
—	= nil or less than half of unit concerned
—	= (between two figures) inclusive
0 (0,0)	= less than half of unit concerned
blank	= not applicable
2005-2006	= 2005 to 2006 inclusive
2005/2006	= average of 2005 up to and including 2006
2005/'06	= crop year, financial year, school year etc. beginning in 2005 and ending in 2006
2003/'04–2005/'06	= crop year, financial year, etc. 2003/'04 to 2005/'06 inclusive

Due to rounding, some totals may not correspond with the sum of the separate figures.

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## 1. Introduction

The time series published here are revisions of the series available before the 2001 revision. The explanatory notes to that revision (*Nationale rekeningen – Revisie 2001*, CBS, 2005) described how the revision comprised numerous changes in concepts, definitions and sources. These changes are referred to as revision projects. As a result of the revision existing data for the period before 2001 were no longer comparable with the revised figures for 2001 and later. To repair this break the existing 1969-2000 series was adjusted to the definitions, classifications and new insights which were the core of the 2001 revision.

This chapter gives an overview of the method used in that process. The first step was to determine - for each revision project separately - what changes compared with the pre-revision data would result in the various items of the national accounts 2001. For each change an extrapolation was applied to the preceding years, using a method appropriate for the nature of each revision project. For each year, the total of these changes resulted in a revised, but not balanced (i.e. plausible and consistent) set of data. Subsequently, starting with the year 2000, year by year previous years were balanced according to the usual methods used at Statistics Netherlands. During the balancing process the plausibility of the data was continually analysed, among other things by examining the consistency of the results in time at meso- and macroeconomic level. The analysis examined both the results of the post-revision series and the pattern of changes compared with the pre-revision data. The various steps in the process are explained further below.

## 2. Used pre-revision data

The post-revision time series was compiled by applying revision adjustments to the complete set of balanced pre-revision data.

A complete set of current (from 1980 onwards) and financial (from 1990 onwards) accounts was compiled at the targeted level of detail to serve as a pre-revision data set for the sector accounts. For the period before 1980, data on current transactions were only available for the sector general government.

For the supply and use tables, the available pre-revision tables for the period 1995-2000 could be converted to the desired level of detail - i.e. about 100 industries and 120 product groups - with relatively few adjustments. The available pre-revision figures for the period 1987-1995 required more drastic preparations: sometimes industries or product groups had to be broken down or redistributed to obtain the same classifications. For the period 1969-1986, input-output tables were only available in current prices. A set of supply and use tables was derived from this, also in current prices only, by working back year by year from the structure of the economy in 1987. The available level of detail is about 40 industries and 40 product groups.

For the labour accounts a complete set of variables was available from 1987 (labour accounts have existed only since 1987 and were integrated in the national accounts in 1995). For the period before 1987 a new series was constructed as accurately as possible based on other available figures in this area.

## 3. Retropolating revision adjustments 2001

### 3.1 Starting points

Every revision project in revision year 2001 resulted in changes in a number of cells in the supply and use table, in a number of items in the sector accounts and/or in figures in the labour accounts. These changes were applied in retrospect; i.e. for each year in the time series an estimate was made of the size of the corresponding changes in that year. Various starting points were used for this retropolation process, depending on the nature of the revision project.

As described in more detail in the above-mentioned explanatory notes on the 2001 revision, there are two types of revision projects: conceptual and statistical revision projects.

Conceptual revision adjustments are adjustments prompted by a fundamentally different way of recording an economic phenomenon in the national accounts. Two far-reaching con-

ceptual revision projects are the registration of financial activities by banking (Financial Intermediation Services Indirectly Measured, FISIM) and the special purpose entities (SPEs). In addition, there are various smaller revision projects with a conceptual character, such as the registration of livestock losses through animal diseases and the registration of military pensions; for a description of these see the explanatory notes. Because of the conceptual nature of these adjustments, they are in principle applied to the whole period of the time series.

Statistical revision projects comprise adjustments to figures as a result of new statistical source information and revised estimation methods. They do not result in a different method of registration, but in other absolute levels of various items in the national accounts. One important example are the changes in the compilation process of production statistics introduced in 2001. The absolute levels concerned were all carefully calibrated in earlier revisions (reporting years 1995, 1987 and 1977), however. As generally speaking there is no reason to review this calibration, statistical revision adjustments in 2001 on the basis of new sources were gradually diminished to zero in an earlier revision year. In many cases the year 1995 was chosen for this purpose, but in some specific cases the adjustments were reduced to zero in 1987 or earlier. Statistical revision adjustments based on a completely new estimation method, such as fixed capital formation, were again applied to the whole series.

### **3.2 Conceptual revision projects**

#### **Financial activities by banking (FISIM)**

The calculation of FISIM is based on interest flows of loans and deposits, which are allocated to institutional sectors on the basis of corresponding balance sheet totals. For the period 1995-2000, for which a complete system of current and financial accounts including allocation to so-called counter sectors was drawn up, FISIM are calculated with the standard procedures. For the period 1990-1994 indirect information on balance sheet positions was used. For the years 1980-1989, for which the current but not the financial accounts were drawn up, because of the lack of information on balance sheet totals, the total value of FISIM was calculated on the basis of the production of the interest margin before the revision of 2001. This was then allocated to institutional sectors. For the period 1969-1979 sector accounts were made only for the sector general government. For this period, the value of FISIM was estimated in the same way as for the period 1980-1989.

Once estimated for the institutional sectors, FISIM was further allocated to the industries in the supply and use table. In doing so, for the whole time series the same method was used as in the regular process, i.e. the allocation to industries was done on the basis of the output value of industries.

#### **Special purpose entities**

To an important extent, the figures on the special purpose entities (SPEs) were calculated from balance of payments figures. Corresponding figures were also mostly available up to and including 1989. Before 1989, information on the SPEs was very limited. On the basis of these limited figures and supplementary indirect estimations, the time series was calculated further back.

#### **Other conceptual revision adjustments**

The changes in the registration of livestock losses as a result of animal diseases led to adjustments for the second half of the 1990s in particular; these were the years of large-scale outbreaks of livestock disease.

Mutual income and capital transfers between households were calculated back until 1980. For 1995-2001 this was done on the basis of the Socio-economic Panel (SEP), for earlier years a model-wise estimation method was used.

For the sector general government, too, the various conceptual revision adjustments for the whole time series are incorporated in the sector accounts, and thus consistent adjustments are implemented in the supply and use tables. In this case a number of conceptual adjustments had effects on net lending/net borrowing of general government.

Because of a number of classification changes in care (reclassification of industries and product groups), and education (reclassification of industries), these post-revision figures are autonomous – i.e. they are not changes compared with the pre-revision figures.

In the supply and use tables new deflators were applied for computers (exports and fixed capital formation figures from the United States) in the whole series back to 1987 inclusive. Similarly, for the output of insurance corporations for years back to 1987, volume change based on the number of policies sold is assumed to be leading; here the price index is a secondary variable.

Moreover, for the period 1987-1995 a more detailed set of price data was used than for the series after the 1995 revision.

The other conceptual adjustments reported in the revision publication 2001 are also incorporated in the time series, but are not discussed separately here.

### **3.3 Statistical revision adjustments**

As mentioned above, one important change in the revision year was the transition to new production statistics. The level changes in output and intermediate consumption for a large number of industries and product groups that resulted from this in 2001 were reduced to zero over a number of years. In many cases this was done to fit the existing level in the previous revision year 1995. On the basis of specific information calculations were done further back - often to 1987, but sometimes to 1969 – among other things for agriculture, forestry and fishing, manufacture of food products, construction, manufacture of metals, research and development, care (to fit in with the care accounts), management of company buildings, or industries of which energy production and intermediate consumption were harmonised with the Dutch energy balance sheet.

For the time series on general government, the data subject to statistical adjustments for the period 1995-2000 were largely recompiled. These statistical adjustments were then reduced to zero in 1987 according to a model. The sector accounts were consistently used as a basis for this, and the changes in the supply and use tables were made to fit them.

For international trade the figures for the period 1995-2000 were adjusted to fit the international trade statistics better. In the years before 1993 the goods figures were harmonised with the customs statistics, especially the trade balance based on these, and with original estimates of foreign trade in services. For the period 1993-1995, the balancing process aimed at a plausible fit with surrounding periods.

For financial and current transactions between the Netherlands and the rest of the world in the time series, a fit was sought with the source data from the Dutch Central Bank on the balance of payments which were revised in 2001. These figures were calculated back on the basis of the ratio between the new and the old balance of payments figures of the Dutch Central Bank.

For the labour accounts component, the substantial level adjustments in 2001 as a result of harmonisation with the Social Statistics Database (SSD) were calculated back in time. To this end, changes in 2001 were reduced to zero in 1995 or 1987, depending on what was considered most plausible for the industry concerned. This was done using a model-wise method based on pre-revision developments. This method was applied to wages and salaries, employers' social contributions, labour input and number of employed persons.

Lastly, for the whole period 1969-2000 a revised series for fixed capital formation and the consumption of fixed capital was calculated.

## **4. Balancing**

As the revision adjustments generally did not constitute a consistent whole, the above procedures resulted in a set of data that did comply with post-revision definitions and levels, but was not internally consistent. Therefore, the data were balanced year by year back in time, starting in 2000 and ending in 1969.

### **4.1 Supply and use tables**

For the period 1987-2000 the usual procedure was followed to balance current and constant prices simultaneously, and thus for each cell in the table to check price and volume changes simultaneously. The procedure did deviate from standard procedure in one respect: the revision year 2001 was only compiled in current prices, and subsequently calculations were done back in time. As a result, for the first year in the time series the current prices of 2000 were balanced simultaneously with the constant prices of 2001 and so on year by year into the past. During the balancing process every effort was made to leave alone the price changes in each cell of the table as much as possible, with the obvious exception of industries/product groups where prices had been revised as a result of the revision. After the table had been balanced the various macroeconomic figures were calculated in the usual way, both in current and constant prices. Also, input-output tables were compiled.

For the 'break' in the level of detail for the transition 1986/87, the detailed figures for 1987 were first aggregated and subsequently used as a basis to balance 1986 and earlier year by year. A different method was used for this period, as in the first instance only figures in current prices were available. These were balanced first, and in doing so an effort was made to make the value changes of the various cells in the table comply with the pre-revision figures as much as possible. Only in the second instance was a set of detailed price index numbers collected and used to deflate the tables concerned. In the balancing of the tables in constant prices it turned out that in a few places it was not possible to give a

plausible and balanced picture of the economy, so in these places the figures in current prices were adjusted. In the end, here too input-output tables and macroeconomic figures were compiled.

## **4.2 Sector accounts**

The sector accounts (financial and current transactions), too, were largely balanced according to the standard procedures: fitting with the balanced supply and use tables, balancing of transaction matrices and, for the reporting years for which financial accounts were also compiled, consistency in statistical differences. Balancing decisions were mostly taken in conformity with the method used in 2001. In balancing the transactions use could often be made of the nature of the various revision adjustments, as this often determined the counter sector in which a change on the pre-revision data had to be booked.

To derive the output transactions (output, intermediate consumption and value added categories) from the supply and use tables - the dual classification- in the period 1995-2000, use was made of distributions corresponding for general government with the pre-revision keys, and for other sectors fitting the new keys for 2001. Further back in time the distribution of 1995 was processed year by year and where necessary adjusted to fit the data optimally.

## **4.3 Labour**

The post-revision labour accounts data were incorporated in the sector accounts and in the supply and use tables and subsequently subjected to confrontations and plausibility analyses as described below.

## **5. Plausibility checks**

The balancing process was based on a number of starting points for balancing decisions which were also used to establish the final plausibility of the result.

### **5.1 Supply and use tables**

For the period 1987-2001, the basic principle was that (especially the volume changes of) a number of derived meso- and macroeconomic variables should not deviate too much from the corresponding values before revision.

For the production approach, a comparison was made between before and after revision of the year-on-year volume changes of output, intermediate consumption and value added, as well as labour input, the ratio between wages and value added and labour productivity. The comparison was conducted both at the detailed level of industry at which the balancing took place, and at the more aggregated publication level of ten industries. For all mentioned variables the outcome of the balancing process was considered to be plausible if the differences in values and time pattern of these variables between pre- and post-revision were small, or if - for an observed difference - there was an explanation related to a specific revision project. Analysis of the development of labour productivity and the ratio between wages and value added constituted the plausibility check for figures in the field of labour accounts. For final expenditure the pre-revision price development was used for consumption expenditure of households (thus the volume development is the dependent variable) and the trade balance was used as a check for foreign trade. The changes in inventories were assessed using the criterion that the cumulative building-up of stocks may not deviate from zero too much over a series of years.

An analysis was also done of the absolute differences between the pre- and post-revision figures for the total of each of the final expenditures. To do this, a number of conceptual revision projects - which often have an effect on a specific product group - were analysed to see how large these effects were, and to what extent they explained the observed total change of the final expenditure concerned. Often FISIM, SPEs, new computer prices or other specific revision projects could be identified as the main cause for a change in value or in volume of, for example, consumption. In some years the revised fixed capital formation series resulted in adjustments in (the development of) the GDP.

For the period 1969-1986, for which pre-revision figures are only available in current prices, a similar analysis was done of the year-on-year value changes instead of volume changes. Within the post-revision data, moreover, the volume development of output and intermediate consumption were harmonised for each industry. At the level of ten industries changes with respect to pre-revision volume figures of value added and the (changes in) the labour productivity were also examined. Here, too, correspondence with pre-revision data were used as a plausibility criterion.

## **5.2 Sector accounts**

Analyses were conducted of time series of sixty key variables at meso- and macroeconomic level. Both the post-revision time series itself and the series of changes compared with pre-revision were assessed. Key variables include disposable income, final consumption expenditure and savings of households, net profit before taxes of financial corporations and non-financial corporations and net lending/net borrowing of general government. The general criterion for plausibility was that changes in these key variables should show a gradual pattern over time and that non-gradual or large changes can be explained by one or more specific revision projects. This meant that in some cases the detailed data had to be re-examined.

## **5.3 Labour**

In addition to the above-mentioned confrontation of wages and salaries and employers' social contributions with the supply and use tables, these variables were also confronted with other labour variables. In doing this the pre- and post-revision developments of wages and the compensation of employees per full-time equivalent job were compared to check plausibility, and figures on labour input, number of jobs and number of employed persons were also compared with each other.