METHODS – APPROACHES – DEVELOPMENTS
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The Catchword

Reforming the public budgets towards double-entry accounting – a revolution also for public finance statistics

Within the federal structure of the Federal Republic of Germany, where the various public administration levels enjoy far-reaching budgetary independence, the important function of public finance statistics is to cover the individual components and combine them to form a consistent overall picture of public finance (overall public budget). Thus they are an important basis both for crucial decision-making in general finance, economic and monetary policies and for the general government sector in national accounts. Data collection for public finance statistics is directly linked to the budgetary, cash and accounting documents of the public authorities, in which both the *expenditure* made to perform public functions and the *revenue* required for their funding are recorded (see "Methods … Approaches … Developments" 2/2001).

Through the current reform of communal budgets towards a new budgetary, cash and accounting system based on double-entry accounting, the reporting system of public finance statistics will radically change and, at the same time, opportunities will be opened up to bridge existing gaps without involving additional statistical burdens.

Current representation of public finance

Traditionally, public finance in Germany is represented on the basis of a *cameralistic budgetary, cash and accounting system* showing revenue (inflow of funds) and expenditure (outflow of funds) within a specific period. Based on uniform classifications for the cameralistic budgets at federal, Land, and local levels, public finance statistics can exactly show,

- what revenue (type of revenue) is received by the entire public sector in Germany,

- for what purposes (functions) and in what form (type of expenditure) the resources are used.

What can be shown in traditional accounting of public budgets is the impact on financial assets. However, the impact of public finance management on total assets, including tangible assets (total resources received and used), have so far been shown only for the few areas of communal budgets that are financed through user fees or other remuneration customary in the market. The existing cameralistic accounting system of the federal, Land and local authorities does not allow to get an overview of the total public financial and tangible assets. Consequently, public finance statistics can represent only part of the liabilities in the statistics of public debt.

Along with the reduction of room for financial manoeuvre, public authorities show a growing interest in giving economic independence to specific facilities and in funding them through revenues. As a result, increasing use has been made over the last few years of double-entry commercial accounting for those sub-areas (hospitals and university hospitals, facilities dealing with long-term nursing care, culture and leisure, waste and waste water disposal, land administration, and recently even construction and maintenance of Länder roads), thus *separating them out of the core budgets* of the federal, Land and local authorities. In some cases, using framework versions of double-entry accounting systems for all Länder has been required by law (hospitals, long-term nursing care facilities) or agreed upon (institutions of higher education). As it may become very difficult in practice to enforce such regulations, public finance statistics and national accounts face growing problems in their efforts to cover the finance of such government sector institutions and to develop an overall picture of all public finances (general government sector).

Reforming the communal accounting system towards double-entry accounting

At the beginning of the new century, an *all-encompassing and fundamental reform* of public budgets is emerging in Germany – as is in other European countries. A double-entry accounting system will be introduced that will be closely related to private-sector accounting systems and, at the same time, integrate the advantages of the existing cameralistic system. By revolutionising their accounting system in this manner, the communes in Germany are spearheading the international development of accounting standards.

The Standing Conference of the Ministers of the Interior of the Länder adopted the "Concept for reforming the communal budgetary law" on 11 June 1999. According to that concept, a *double-entry budgetary and accounting system* should be prepared parallel to the development of public accounting sytems in other European Union Member States.

The commercial accounting system used in private-sector businesses cannot be applied to communal authorities without modification. The objective of communal finance management is to ensure that the communes can fulfil their tasks by achieving a balance between the resources used and those received in a specific period. Achieving cost coverage or net income are auxiliary goals.

The new communal accounting system will allow to

- represent the budget estimate on the basis of resources used and resources received for administrative services,

- represent the total resources used and the total resources received on the basis of the relevant period,

- give an overall presentation of the assets and liabilities (full asset and liability account),

- represent the liquidity trend by covering all payments transactions,

- consolidate the commune's annual balance sheet with those of the facilities and businesses separated out (consolidated overall balance sheet of all economic areas of the commune).

The concepts developed so far contain the following components that are interlinked to form a whole system:

- *income account* instead of a profit and loss account, which corresponds to the existing administrative budget of current financial transactions,

- *asset and liability account* (communal balance sheet),

- *financial account* (liquidity account) as a third component, which covers all inpayments and outpayments, thus showing the changes in the stock of liquid funds, and through which the inpayments and outpayments for investments (asset management in the existing system) are performed in accounting terms.

These components will be supplemented by

- cost and results accounting tailored to specific needs,

- indicators of the costs and quality of administrative services as information for administration control,

- controlling on the basis of an infra-annual reporting system.

By integrating a financial account, the new communal accounting system will combine the advantages of the existing cameralistic system (liquidity account) with those of the double-entry commercial

system of the private sector. Thus it is going to spearhead the development in Germany, meeting international accounting standards.

Public finance statistics and budget reform

– Advantages of the new accounting system –

The communal budget reform adopted by the Ministers of the Interior will for the first time enable public finance statistics to give an *all-encompassing representation* of communal public finance and will provide a number of other *considerable improvements of their reporting system*:

1. Representing the assets

In an overall balance sheet, the new double-entry accounting system will include the communal assets, so that they can for the first time be covered and represented in statistical terms. On that basis, the current EU requirements regarding the representation of public financial assets can be met without further efforts becoming necessary.

2. Providing consistency with national accounts

Once public finance statistics will be based on the double-entry accounting system of the communes, it will be easier to calculate the aggregates of the general government sector in national accounts. The period-based delimitations of the European System of Accounts (ESA 95) are closer to the aspect of resources used and received than to that of liquidity inflow and outflow.

3. Reintegrating public facilities that have been separated out

Most of the large number of facilities that have been separated out of the public budgets maintain a double-entry accounting system of their own. Consequently, reforming the communal core budgets towards a double-entry budgetary, cash and accounting system will it make easier for public finance statistics to integrate the two areas to form an overall picture of public finance. For the facilities that, according to the ESA 95, belong to the general government sector, statistical reintegration of their finances is mandatory.

4. The town as a group of companies

Given the strong trend towards economic independence of many communal activities, their statistical reintegration with the communal core budgets is also important where the economic activities of public authorities are examined in addition to their sovereign functions (general government sector). Today, the financial situation of many towns can be compared with each other only on the basis of such an all-encompassing representation (the town as a group of companies).

– Procedure –

It is desirable from the point of view of public finance statistics that good progress be made in changing over to the double-entry accounting system, so that it can then serve as a general basis for a new statistical reporting system regarding communal finance. As the required assessment of communal assets is difficult to achieve especially for the smaller communes, the Ministers of the Interior of the Länder have agreed on an option model – i.e., within a period not limited so far, the communes may choose when to change over to the new accounting system. This means that provisional solutions will be required for public finance statistics.

For the federal and Länder budgets, it is hard to foresee at present what the development will be like. Therefore, the traditional cameralistic revenue/expenditure accounting will presumably prevail for the

time being as a system of presenting the entirety of all public budgets in terms of public finance statistics.

The Ministers of the Interior of the Länder have agreed to the proposal that developing the framework of accounts of the new communal accounting system should be led by the Federal Statistical Office and involve the statistical offices of the Länder. This would ensure a uniform basis of data collection for public finance statistics and in particular a reliable data basis for national accounts. The framework of accounts and the other parameters of the new commercial accounting system of the communes must be defined in a manner that allows the data to be converted back to the cameralistic system during the transition period. Agreeing on a uniform framework pattern with an integrated financial account regarding the liquidity status of the communes will provide what is necessary to perform that difficult task. Only with an integrated financial account (inpayments, outpayments) will it be possible to have an interface that is sufficiently detailed to combine the new double-entry based data with the traditional budgetary, cash and accounting data based on the principle of recording revenue and expenditure at the time of their entering or leaving the cash holdings.

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Methods of federal statistics – Further development

GENESIS – new forms of accessing statistical information

The modern information society requires problem-oriented and up-to-date statistics to assist planning, decision-making and controlling processes. In this context, the statistical offices see themselves as competent providers of information for both the private and the public sectors. Externally visible signs of the innovative capacities of official statistics and its citizen-oriented activities include the distribution of statistical information which is tailored to the needs of the target groups, the optimisation of the access to that information, and the provision of technical assistance by specialised information services.

To satisfy the demand for information, flexible statistical information systems are required to supply the requested information via different data distributing channels. The GENESIS system (Common New Statistical Information System of the Federation and the Länder), which has been developed together by the Federal Statistical Office and the statistical offices of the German Länder, is making a major contribution to this end. The system has also been developed with the aim to harmonise the conception and administration of statistical data which are provided by the statistical offices for internal and external use and to put them on a future-oriented client/server-based and database-supported technological basis.

Storing statistical figures without the related metadata, i.e. without the data providing information about the pertinent background and the relevant content, would be little useful particularly for external users. Data stocks can be fully utilised only if users also have access to complete, up-to-date and standardised descriptive information. GENESIS offers the opportunity to store and combine statistical data from most different sources. Its concept is based on the requirement to provide data of a largely varying subject-related structure without specifying primary order characteristics such as regional or temporal variables. Generally, this permits to supply both structural data in a detailed functional breakdown and regional data, functional and regional combinations, and also time series.

GENESIS offers comprehensive data description, storage and research functions. The scope of subject-related functions includes the following:

- functions for database administration and maintenance,

- efficient information retrieval components to support the navigation in metadata directories and term-based research,

- functions for dynamic metadata-assisted table description and online table retrieval, where assistance functions are offered for simply structured or standardised requests,

- functions to print and export data for further analysis using other software products, e.g. for spreadsheet analysis.

In the context of official statistics, variables are collected which refer to definite points or periods of time and are expressed in values which are delimited by specified functional and regional characteristics. For this purpose, GENESIS includes a metadata reference system with information on the underlying surveys, the collected variables including their individual items, and the units of measurement used to express the values. In addition, GENESIS specifies rules for deriving new variables from existing ones, e.g. via formulas for value variables or reference rules for transforming classifying variables into other classifying variables, and also for forming size classes. The values stored in GENESIS are necessarily connected with the metadata describing them, with a large number of completeness and consistency checks being carried out in the context of quality assurance during the stages of data import and all successive internal maintenance functions. The logical structure of data storage in GENESIS is based on n-dimensional data objects (cuboid model), which are described by the metadata reference system.

GENESIS has been designed for both internal use in the statistical offices and use by external customers. This approach entails a detailed and far-reaching admission and access protection system aimed at meeting the requirements of data safety and statistical confidentiality. Individual user profiles are specified to determine the data and functions users are given access to. Apart from these basic protective measures, interfaces which support adapted user interfaces and communication access channels are required to open the system to external access – and other software applications such as SAS. The progress made by the Federal Statistical Office in developing the system and planning its implementation can be briefly outlined as follows:

- The GENESIS system, which has been developed together by the statistical offices for operation on their productively used IT platforms, will be largely completed in 2002. In the context of an open test run, the Federal Statistical Office has for some time provided its internal users with access to the system.

- As an alternative to the existing character-oriented interface, the Federal Statistical Office is developing a graphical user interface (GENESIS client) using internet-abled technologies, which will be introduced in the Office this year.

- For external use, the Federal Statistical Office is developing information-oriented web access to GENESIS based on an XML interface (GENESIS online). To facilitate access to as many customers as possible, using this service will require not more than internet access, a browser and GENESIS registration. In this way, the Federal Statistical Office will offer a cross-section of federal statistics for research and online retrieval of data in the form of standard tables which may however be modified by the user. This offer will be available in a first stage of implementation from the second quarter of 2002.

GENESIS will replace the information and data organisation component of the information system STATIS-BUND currently provided by the Federal Statistical Office. As regards the statistical offices of the Länder, GENESIS and the related alternative user interfaces will be introduced there depending on their individual priorities and time schedules.

Apart from the proper technical implementation of the GENESIS system, an adequate conception and provision of data for GENESIS is a key precondition for the success of the overall project. The Federal Statistical Office and the statistical offices of the Länder cooperate closely with the aim to offer a harmonised basic range of data which the offices may enlarge by individually designed additional supplies. In this context, harmonised and standardised mechanisms will be used which, to the extent possible, permit current data generation from the operative processing operations of specialised statistics.

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Census X-12-ARIMA in the context of national accounts

To comply with the requests of major data users, the Federal Statistical Office about two years ago took the decision to calculate, in the context of national accounts, seasonally adjusted results based on Census X-12-ARIMA in addition to the "traditional" BV4 results. To obtain high-quality results of analysis, however, the Census procedure requires its users to determine a multitude of control parameters. Therefore, it was indispensable for the Federal Statistical Office to agree with the Deutsche Bundesbank on an identical control basis for the Census procedure in order to ensure corresponding results of analysis in the future. During the years 1999 and 2000, a working group consisting of representatives of the Federal Statistical Office, the Deutsche Bundesbank and the Federal Ministry of Finance agreed on a common approach regarding the compilation of results based on the Census procedure. The core of the agreement was the following: Every quarter of a year, the Federal Statistical Office and the Deutsche Bundesbank, on a mutual partnership basis, agree on the control parameters of the Census procedure to be set for the time series to be analysed, while both institutions continue to compute their own (identical) results of analysis. In addition, it was agreed that the Federal Statistical Office will – in the context of its national accounts – continue to apply the BV4 method to maintain methodological diversity and distribute the results obtained in this way to users who are interested in them.

The Berlin method (particularly its current version 4 - BV4), which was developed by several institutions, including the Federal Statistical Office, has been the Office's in-house method for seasonal adjustment. The major advantages of the method are the following: The results of analysis depend neither on the user's level of qualification nor on his subjective assessments (objective nature of the analysis results); the effects of irregularities on the seasonally adjusted values are relatively small compared to other methods; the trend components are largely plausible in economic terms; and BV4 is a very efficient method as regards the efforts it requires and the quality of its analyses. In the past, calendar adjustments were not made in BV4-based analyses of national accounts series. The method however ensures that the total of the individual aggregates fully equals the related overall total provided outliers do not have to be considered in the time series. The Federal Statistical Office publishes the results, which were adjusted for seasonality based on BV4, in Euro bn and indicates their change on the previous quarter in per cent.

The main advantage of Census X-12-ARIMA instead consists in the opportunity to consider in manifold ways series-specific phenomena in determining seasonally adjusted values. Besides, the method is used by Eurostat, the European Central Bank, and the Deutsche Bundesbank, too. Certainly, Census X-12-ARIMA is the method which, internationally, is most widely accepted and therefore widespread at the moment.

Compared to its predecessor Census X-11, the new Census X-12-ARIMA program encompasses a large number of additional modules so that it has become more comprehensive and efficient. For instance, the program now permits the use of ARIMA models for advance estimations a the end of a series, and for outlier identification and replacement. Apart from that, various new diagnostic instruments offer new ways of optimising seasonal adjustment by means of most different tests. Working with this

method requires the setting of series-specific options for each time series to be adjusted. The setting of series-specific options, in this context, refers to a large number of specifications which have to be made regarding the ARIMA model to be applied, the reference range, outlier identification and replacement, and many others. All those specifications must be made separately for each series so that, consequently, a control parameter cannot be simultaneously used for several series.

Calendar adjustment is made in advance based on monthly indicator series since related trial calculations have proved that the results obtained in this way are more informative than those of calendar adjustments based directly on the quarterly time series. All specifications of options are regularly checked and, if necessary, adjusted. In general, however, seasonal factors are estimated in advance for the period of one year, the advance estimates being checked at quarterly intervals and also changed in exceptional cases.

In seasonal adjustment based on Census X-12-ARIMA, equality of results is ensured both for the total of the quarterly results and the annual total, and for the total of the individual aggregates and the related overall total by adjusting the quarterly data by means of a uniform factor to the annual total and by applying a so-called derivation scheme to the individual aggregates, respectively. As regards indirectly derived time series, control files including series-specific options are not required, they rather serve the direct adjustment of time series based on Census X-12-ARIMA. The Federal Statistical Office together with the Deutsche Bundesbank developed a so-called derivation scheme for series to be indirectly derived, like the majority of nominal series which are formed by multiplication of real value and price.

The Census X-12-ARIMA method has been applied since 2000 (first publication of national accounts results for the first quarter 2000 in May 2000) for adjusting almost all quarterly time series in national accounting. In this context, the Federal Statistical Office and the Deutsche Bundesbank again cooperate closely and share the related work based on partnership principles. The adjusted results are released in Euro bn and changes on the previous quarter and the previous year are included in electronic and printed publications of the Federal Statistical Office and of the Deutsche Bundesbank. The national accounts data which are seasonally adjusted on the basis of Census X-12-ARIMA are part of the Office's compulsory data supplies to Eurostat in line with the European System of Accounts, ESA 95. Hence the results today obtained for Germany by seasonal adjustment based on Census X-12-ARIMA are absolutely identical in national and international publications.

In addition, the Federal Statistical Office publishes all major results based on both the Census X-12-ARIMA and the BV4 methods in a supplement on "Seasonally adjusted results of the domestic product computation" (to be obtained from the Federal Statistical Office, Division III A, 65180 Wiesbaden). Apart from tables and graphs, the supplement includes all components and factors of the gross domestic product and shows the household final consumption expenditure at 1995 prices in line with the two methods.

Upon request, the Federal Statistical Office and the Deutsche Bundesbank provide the users of their analyses with all information they require on the compilation of the related results. Regarding the Census X-12-ARIMA results, this may for instance concern the control files for the individual time series, the derivation schemes applied, and seasonal and calendar factors. In this way, it is ensured that the seasonally adjusted results are always understandable and completely transparent to the data users.

The Census X-12-ARIMA method is available as a free download from the US Bureau of the Census (http://ftp.census.gov/srd/www/x12a/). At that address, users who are interested in the method can access the program (DOS and Unix versions) and at the same time installation instructions and various methodological publications. At the Federal Statistical Office, the DOS program is presently run in an SAS environment and at the Deutsche Bundesbank, a version is run on the mainframe. As far as an occasional use of Census X-12-ARIMA is concerned, DEMETRA, a Eurostat program, may constitute a useful alternative though, however, DEMETRA, which still is at the development stage, does not offer

the whole scope of functionalities provided by Census X-12-ARIMA. Besides, the Federal Statistical Office offers BV4 PC programs free of charge on the internet. Unfortunately, the PC program designed for analysing quarterly series does not yet offer the opportunity to consider a calendar component. However, a user-friendly software adapted to that need will be available later.

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SAS at the Federal Statistical Office

A major goal of official statistics consists in producing and providing reliable information on all relevant areas of society based on the principles of objectivity, neutrality and scientific independence. Upon availability of the basic data – which are the result of processing procedures applied together with the Länder – it is the task of the statisticians of the Federal Statistical Office of Germany to aggregate those data, analyse them by means of up-to-date methodology, derive indicators, and publish the results in the form of tables or graphs. Modern tools are required to carry out those stages of work in an efficient manner.

For quite some time, the standard tools applied by statistical users have been Microsoft Office Professional and STATIS-BUND, the host-based Statistical Information System of the Federation. Some divisions of the Federal Statistical Office have used additional tools such as SPSS for statistical analyses and also specific software for layout preparation, graphical presentation and the GIS system. Based on detailed research, the SAS software was finally selected and introduced in 2000 as a standard tool for analysing data in the Office's specialised departments and publishing the results in the forms required. Together with GENESIS, the Office's data warehouse for aggregated data, and the StatSpez software designed for the production of complex tables, statisticians can hence rely on modern tools in generating information for the wider public.

Since early 2001, SAS has run as a client/server solution at the Federal Statistical Office. Via a graphical user interface, the Enterprise Guide client provides access to the network SAS server. The user interface permits immediate ad hoc analyses. The server used since mid-November 2001 is the SunFire 3800 system running under a Solaris (UNIX) operating system. The system currently made available to statistical users encompasses two processors, a 4 GB main memory and a disk storage space of 500 GB . The processing of SAS algorithms on the server is highly efficient and, owing to the client/server solution, the additional load on the network caused by analysing large amounts of data is negligible. On the whole, the present configuration ensures very good response time parameters.

The SAS Enterprise Guide provides users at the Federal Statistical Office with a universal user interface. Apart from direct data evaluations, the Enterprise Guide allows to structure a sequence of individual steps within a project and to generate project flows for updating the results of periodically recurrent activities. A particularly strong point of SAS consists in its capacity to permit a high degree of process automation by application of the SAS code, i.e. the SAS internal procedure and macro language. The graphical interface facilitates the generation of such procedure code for subsequent modification. As regards complex applications, the SAS code is systematically developed in a code window. The Enterprise Guide also allows a direct output of tables and charts in the HTML, RTF (Word) and PDF formats.

The server provides the staff of the Federal Statistical Office with various modules such as Base (basic module, transformations, descriptive statistics, tabulation), Stat (statistical procedures), Ets (time series analysis), Iml (matrices operations) and Graph (generation of graphs). The equipment gives the user the opportunity to read in data and to perform all preprocessing steps such as transforming, selecting and matching different data material. The data can be tabulated, detailed methods of statistical analysis be applied, and the results be presented in the form of tables and charts.

At present, about 200 users at the Federal Statistical Office are given authorised access to the SAS server. A systematic application of SAS in the Office's specialised departments has however started. Areas of application are, among others, the sample survey of household income and expenditure, crafts statistics, production industries, and the structure of earnings statistics. Larger projects, designed in cooperation with the IT Department, are in the preparation or planning stage. These are, for instance, the calculation of quarterly or monthly production indices and the compilation of income tax statistics. In the next two years, SAS will play an important role in replacing the applications on the host-based STATIS-BUND system. And SAS is equally important as a tool for data evaluation in the context of cooperation with the scientific community. Currently, so called guest scientists of the ZEW (Center for European Economic Research) and DIW (German Institute for Economic Research) are rendered assistance in the framework of joint research projects. Based on SAS, they are given access to specific material of official statistics. Besides, SAS is part of the basic infrastructure required in setting up a Research Data Centre at the Office.

Statistical users need adequate training and subsequent assistance to be in a position to use efficiently software such as SAS. The basic training given to statisticians includes a three-day introductory course which focuses on the use of SAS via the Enterprise Guide and a four-day course which trains the application of SAS procedures and the development of SAS codes in a systematic way. If required, matrices operations are additionally dealt with in a one-day advanced course. The courses were prepared in close cooperation with the SAS company.

The IT Department of the Federal Statistical Office provides assistance for SAS operation at the Office which includes consulting activities and, if required, the development of prototype applications or of integrated solutions – provided sufficient staff capacities are available. Procedures and macros are developed for users to support them in specific areas. Apart from that, all users have access to well-structured core information about SAS applications on the intranet of the Federal Statistical Office.

The IT Department uses the SAS development tools to implement specific applications in the form of Thin Clients. Such applications serve, for instance, the production of tables and charts to be published together with economic indicators on the internet (http://www.destatis.de/indicators/d/arbueb.htm).

In the framework of the current IT development tasks, the integration with GENESIS and StatSpez plays an important role. Access to GENESIS data objects is planned to be given via Java technology which will ensure immediate access to GENESIS views and direct processing of the data by SAS. Based on DatML and TabML, i.e. the future XML standard for official statistics which is currently under development, interfaces to StatSpez are to be developed. In this way the infrastructure for an efficient SAS application in the framework of official statistics is gradually being developed.

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Research project on price and volume measurement in the health care system

As a matter of fact, it is often difficult to fulfil the provisions regarding the calculation of aggregates at constant prices which were specified in the European system of integrated accounts (ESA) and defined more precisely in a Commission decision on the principles of price and volume measurement. One of the areas where the separation of price and volume components poses problems is the health care system. In 1998 and 2000, two Task Forces set up by Eurostat were dealing with questions of price and volume calculation in that area. They established criteria by which the methods used for a calculation at constant prices are classified into most appropriate, admissible and inadmissible methods (A, B and C methods). The recommended methods of calculation were output-oriented (deflation or volume extrapolation). Output in the health care system was defined as the quantity of health services received by patients, with qualitative changes being taken into consideration as well. Measuring quantity in this context is based on the number of complete treatments that are weighted by price and cost data of the individual types of treatment. In the framework of a research project, the Federal

Statistical Office has examined the approach currently taken in German national accounting and developed alternative methods, in particular for in-patient health care facilities.

Presently, the method of deflation is applied in German national accounting to calculate the output of in-patient health care facilities. In this context, different types of financing cases of treatment in German hospitals are taken into consideration, namely those based on case flat rates, special fees, and hospital accommodation and treatment charges.

- In accordance with a federal catalogue, case flat rates are applied to settle the cost of complete cases of treatment, which are made up of two components, i.e. nation-wide point numbers and point values negotiated at the Länder level.

- Special fees are calculated for specified stages of treatment (mainly operations) in a similar way as case flat rates. The price of a complete treatment includes a certain proportion of hospital accommodation and treatment charges, too .

- Hospital accommodation and treatment charges, which do not differ for different days, are raised in relation to all those cases for which case flat rates or special fees are not specified. Those charges are composed of hospital-specific basic charges and individual section charges. The price of a complete hospital treatment is obtained by multiplying the respective charges by the given duration of a hospital stay.

The deflators for hospital treatment are derived from different sources. As for case flat rates and special fees, a price index calculated for the purposes of consumer price statistics is used which is based on a selection of seven different case flat rates and six special fees. As regards cases for which hospital accommodation and treatment charges are raised, a model has been developed which considers the trends of hospital accommodation and treatment charges (broken down by basic and section-specific charges) for the 19 most common hospital sections. The sources used in this case are publications of health insurance associations. Apart from that, changes in the average duration of hospital stays in a breakdown by hospital sections, which are indicated in the official hospital statistics, are also taken into account.

In the context of the research project, an alternative method has been developed which permits the measuring of hospital output at constant prices on the basis of volume indices. The related calculations relied on case numbers published in the Federal Statistical Office's hospital statistics in a breakdown by 35 hospital sections for the period 1995 to 1999. For each section, the number of cases was further broken down by cases to which case flat rates/hospital accommodation and treatment charges (or special fees/hospital accommodation and treatment charges) were applied. The results of a sample survey of cases of treatment in 1,409 hospitals between 1996 and 1999, carried out by the Wissenschaftliches Institut der AOK (WIDO), were taken as a basis for that. As a first step, separate volume indices were calculated for the two types of cost settlement. Based on the WIDO sample survey, the number of cases in which case flat rates were applied were – in line with the effective catalogues – further broken down into individual types of treatment cases (e.g. 104 types of case flat rates in 1999). Here, the prices of each case flat rate served as cost weights. As regards all other cases, the cost weights for each hospital section were calculated from the basic and section-related hospital accommodation and treatment charges and the respective average duration of hospital stays. The two sub-indices were then combined to yield an overall index. The weights in all cases referred to the previous year. Finally, however, a chain link was established to the reference year 1995 = 100 to ensure an adequate presentation of the results.

Except for 1996, the following comparison shows that the results obtained by the two methods are largely the same.

Output of hospitals at 1995 prices
by different methods of calculation

	1995	1996	1997	1998	1999
Deflation					
Output at 1995 prices (DM bn)	123.3	122.2	125.7	133.0	137.3
Implicit volume index (1995=100)	100.0	99.2	102.0	107.9	111.4
Price index (1995=100)	100.0	101.4	97.7	96.4	94.8
Volume extrapolation					
Output at 1995 prices (DM bn)	123.3	127.7	125.9	132.3	137.0
Volume index (1995=100)	100.0	103.6	102.1	107.3	111.1
Implicit price index (1995=100)	100.0	97.1	97.6	96.9	95.0

In the nearer future, the Federal Statistical Office will continue to prefer the deflation method because, on the one hand, the effort it requires is much smaller compared to volume extrapolation and, on the other, the basic data needed for computation are available to a large extent. However, the situation might change from 2003 when a flat rate-based cost settlement system (based on Diagnosis Related Groups (DRG)) could be introduced throughout Germany.

A specific problem is the treatment of explicit quality changes whose consideration is a precondition for an A method. This has however been achieved neither for the deflation nor for the volume extrapolation method though the project has made an attempt to put the existing approaches in a systematic order and to evaluate international experience. The project has also described and evaluated in a critical manner the deflation methods currently applied in other fields of the health care system (incl. doctors' practices, dentists' practices, and other health care areas). As it has turned out, further research will be required for those areas.

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EGW commodity classification has taken on a new look

Breaking down data by the commodity groups and subgroups of the food industry and of trade and industry (EGW) has a long tradition in the publications on German foreign trade statistics. The EGW classification breaks down commodities by a total of eight commodity groups and about 200 subgroups of the food industry and of trade and industry. As the classification remained unchanged over a very long time, it has been of great value particularly in surveying long-time series. For this reason, the allocation of commodity codes of the Commodity Classification for Foreign Trade Statistics to the EGW subgroups was not revised in the past, though the commodity codes that were changed at the beginning of a year were adapted as required. Since the approach was taken over a long time, however, it finally had a negative effect on the informative value of the data. Besides, the EGW subgroups met current requirements to an ever smaller degree and their level of detail was by far not sufficient. For this reason, the commodity classification to which almost no changes had been made for more than sixty years, was now – i.e. as of 1 January 2002 – adapted to the current economic and technical situation in accordance with an agreement reached by the specialist committee on trade issues in 1999.

In line with the agreement, the breakdown by commodity groups which, in the food industry, is based on the origin of the products and, in trade and industry, on the degree of processing, has remained unchanged in order to maintain a certain degree of continuity in the commodity breakdown. This does however not apply equally to the content of those commodity groups. In this context, the revised allocation of commodity codes of the Commodity Classification for Foreign Trade Statistics to the respective commodity subgroups has been of special importance. In the past, for instance, sawn timber that was further processed by planing or grinding was no longer classified as sawn timer. Carpets – considered as flat products – belonged to woven fabrics in the past, while wall paper – regarded as a paper product – was classified as a final product. It was for that kind of borderline cases that allocations had to be reconsidered. Besides, changed manufacturing methods added new aspects to the whole matter. For this reason, the allocation of commodities took into account largely comparable commodity groupings as used in production statistics. Since frequently, however, the commodity subgroups can be ascribed to the commodity groups of the food industry and of trade and industry (EGW) depending on their main components only (e.g.: mineral building materials), the borderline between the commodity groups of the food industry and of trade and industry (EGW) cannot be defined precisely in every respect. In the course of revising the breakdown scheme for commodity subgroups, particularly subgroups showing a small trade volume were cancelled, while those recording a large trade volume were further broken down.

As regards the formation of commodity subgroups which allow a more precise distinction between semi-finished and intermediate products, some wishes certainly remain unfulfilled as the groups concerned still provide some room for interpretation. It should also be taken into consideration that the commodity subgroups had to be specified in a way which ensures short denominations that can be easily understood without additional explanations being required. The denominations were preferably taken from the production statistics with the aim to make the content of the commodity subgroups more easily understandable.

The application of the new EGW commodity classification started with reference month January 2002.

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Possibilities and limitations of presenting globalisation processes in foreign trade statistics

The elimination of trade barriers and the free movement of capital have boosted the integration of international markets in recent years. The increasing globalisation has had an ever greater influence on the worldwide trading of goods and services. This gives rise to the question in how far that development results in a growing proportion of goods and services being traded between affiliated enterprises.

Against the background of the increasing international interdependencies, representatives of the Statistical Office of the European Communities (Eurostat) and of the EU Member States discussed in the Committee for External Trade Statistics in how far the effects of globalisation could be incorporated into the data collection and presentation concepts of foreign trade statistics. To this end, the working group "Globalisation" was set up, whose activities have been supported and coordinated by Eurostat. The group's work is aimed at closely examining the extent to which information on trade flows between affiliated enterprises can be integrated into foreign trade statistics. The working group "Globalisation" comprises foreign trade statisticians from France, Greece, Italy, Great Britain, the Netherlands and Germany, as well as Eurostat representatives.

In accordance with the given objectives, a first inquiry was held in 1996 at authorities, industry and business associations, enterprises and research institutions in four participating Member States (France, Greece, Italy and Germany) to investigate the need for information. This inquiry revealed that all user groups queried already had, or expected to have in future, a substantial need for statistics on the trade flows between affiliated enterprises.

As a second step, a business survey was conducted in 1998 to determine to what extent transnationally linked enterprises were able in general to provide adequate data on the interrelations within their transnational group. Particular interest was attached to:

- the definition of the transnational group to which the enterprises belonged;

- whether the enterprises were informed about the ownership links within that group;

- whether the enterprises were able to distinguish between international goods transactions with enterprises within and outside that group.

The voluntary survey was based on a questionnaire drawn up in cooperation with Eurostat. That questionnaire was sent to the heads of transnational groups as well as to parent/subsidiary companies. In Germany, a total of 1,300 enterprises were selected for the survey. The first 1,000 companies were chosen mainly on the basis of the business register of intra-Community trade statistics, a Handbook of participation relationships in Germany and a variety of information material on German affiliated groups. Problems arose because it was impossible to differentiate between group heads and parent/subsidiary companies. As a result, both survey forms had to be sent to all selected companies, leaving it to them to decide which of the two categories they fitted into.

Still greater difficulties emerged in selecting companies from the business register. The register data available only permitted to make assumptions on whether the respective enterprises were part of a transnational group or not. Therefore, the companies were selected according to size classes, proceeding on the assumption that nowadays in particular large affiliated groups do not only form national links but also international ones.

The addresses of the remaining 300 enterprises were supplied by Eurostat, based on information by Dun&Bradstreet.

A very low response rate had already transpired in the inquiry on globalisation effects in the economy, which was conducted during the pilot phase, and was again confirmed in this survey. Of the 1,300 enterprises queried, just 372 reacted at all by contacting the Federal Statistical Office. 162 of these declined to participate, mainly because of staff shortages. 19 enterprises stated that they were not part of a transnational group and therefore could not participate in the survey. Ultimately, 165 enterprises were willing to fill in the questionnaire and return it. 34 of those considered themselves to be heads of transnational groups, while the remaining 131 enterprises identified themselves as parent/subsidiary companies.

Since relevant data were missing, it was not possible to determine the value of international trade or the share of intra-firm trade. In particular, more than 90% of the group heads were not in a position to supply relevant data.

On account of the low response rate, the results cannot be considered as representative. Yet, the information provided has revealed certain tendencies which will be useful, or even necessary, in designing a future periodic survey.

As a further step, starting in January 2001, voluntary data on the additional variable "company affiliation" have been collected from those companies which supply their Intrastat declarations on magnetic data carriers to the Federal Statistical Office. The results are expected to provide a better insight into the feasibility of collecting information on globalisation effects. The following six answer categories are given:

- The enterprises involved in a transaction are *not* affiliated with each other (code number 1).

- The enterprises involved in a transaction are *affiliated with each other* and

- the transaction was made between a parent and a subsidiary enterprise, with

    - the reporting enterprise being the *parent* company (code number 2),

    - the reporting enterprise being the *subsidiary* company (code number 3),

  - the enterprises involved are *rather at the same level* (code number 4),

  - *no information* can be provided on the exact type of affiliation as denoted by code numbers 2,3 and 4 (code number 5).

- *No information* can be provided on whether or not the transaction was made between affiliated companies (code number 6).

Since this variable is a voluntary survey item (in the meaning of Article 7, para. 2 of the Federal Statistics Law of 22 January 1987), the representativity of the results cannot be assessed until the survey data have been processed and the non-response rate has been evaluated (refusals and failures to respond). A final report on this survey will presumably be published in May 2002. Only then will it be possible to decide – in consultation with Eurostat and the other Member States – on any further action concerning the statistical description of globalisation processes.

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European Echo

CASC - A European research and development project on statistical confidentiality

Safeguarding statistical confidentiality has always been a pillar of official statistics. On the one hand, it is the task of official statistics to make the collected information available to users without any losses if possible. On the other, every respondent must be able to depend on the confidentiality of his/her personal data. In the age of information, the task of meeting these conflicting challenges is getting more and more complex.

While there is increasing demand for ever more detailed information down to the level of microdata files, the risk is growing that individual data which are contained in microdata files or in published statistical aggregates, may be re-identified or disclosed.

In the light of this development, statistical confidentiality has become an established international domain of research in recent years. Up-to-date methodologies and techniques for ensuring the statistical confidentiality of microdata and tabular data have been developed.

The EU-project CASC (Computational Aspects of Statistical Confidentiality) aims at giving the individual statistical institutes easier access to these modern techniques and to promote their widest possible use. To this end, the techniques are to be incorporated in a joint software package named ARGUS (μ-ARGUS for the protection of microdata files, τ-ARGUS for tabular data), which has been developed under an earlier project. Statistics Netherlands (CBS) is in charge of the project management. Apart from the Federal Statistical Office, the following German institutions are engaged in the project: University of Ilmenau, the Statistical Offices of North-Rhine Westphalia (LDS NRW) and Bavaria, and the Institute for Employment Research (IAB).

The primary objective of the CASC-project in the field of microdata protection is to complement the techniques available from μ-ARGUS. In general, these techniques can only be used for demographic data. The CASC-project aims at complementing them by methods which permit to compile anonymised

microdata files of economic-statistical data that can be used in research. The Federal Statistical Office's contribution will be a complex procedure for noise addition, which has been developed on the basis of a method suggested in the United States in the late 1980s.

The project's main objective in the field of protecting tabular data is to expand τ-ARGUS. Thus far, the program can only be used for simple, unstructured tables which do not contain subtotals. The aim is to create the possibility of processing hierarchical, multiple, overlapping tables. To this end, the method used in τ-ARGUS for selecting suppressions, which is based on a complex linear optimisation procedure, will be further developed. Additionally, as an alternative to this algorithm with high computing-time requirements, the LDS NRW's GHQUAR method will be integrated into τ-ARGUS. This method is based on a heuristic approach and is particularly suitable for processing large tables. The University of Ilmenau is developing and contributing supplementary methods for disclosure control of tabular data.

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Events

10th Scientific Colloquium "Enterprises in statistics – concepts, structures, dynamism"

In cooperation with the Committee on the Methodology of Statistical Surveys of the German Statistical Society, the Federal Statistical Office has organised a scientific colloquium every year since 1992 to offer a forum for the dialogue between official statisticians and the major users of statistics in science, business, politics, administration and associations.

While the 2000 colloquium on "Families and households in Germany" addressed issues representing an interface between statistics and social science, the theme of the 2001 colloquium "Enterprises in statistics – concepts, structures, dynamism" again focussed on purely economic-statistical questions.

The colloquium was chaired jointly by Prof. Dr. Walter Krug and Dr. Rolf Wiegert. In his opening paper, Dr. Wilhelm Rall of McKinsey&Company Inc. outlined the changes in the corporate sector and raised the question whether the term industry was past saving. Dr. Rall used a number of examples to illustrate the changed strategic dynamics for enterprises and the ensuing implications for industries.

After Prof. Dr. Peter von der Lippe of Essen University had given an overview of the status quo of official business statistics in Germany and the European Union, plenty of time was devoted to discussing the further developments in this field. Susanne Hagenkort of the Federal Statistical Office explained the structure of the business register in Germany and its uses. Using a concrete example, Robin Lorenz of the Federal Statistical Office analysed the chances and limitations of collecting register-based data. The speech by Klaus Voy of the Land Statistical Office of Berlin dealt with further developments of the enterprise concept which were aimed at painting an adequate picture of the corporate landscape in the light of macroeconomic structural changes. This set of topics was concluded with the contribution by Bettina Knauth of Eurostat who gave an account of the European Union's plans concerning business statistics. Jacob Ryten set out the problems involved with the statistical coverage of multinational companies in a world economy characterised by increasing globalisation.

The first day of the colloquium ended with a ceremony during which the President of the Federal Statistical Office presented a promotion prize as part of the Gerhard Fürst Award. This Promotion Prize for junior academic staff was granted to Christian Zischeck for his diploma dissertation entitled "Analyse der wirtschaftlichen Situation in kleinräumigen Regionen unter besonderer Berücksichtigung multivariater Verfahren – dargestellt für den Freistaat Sachsen" (Analysis of the economic situation in

small areas, making use especially of multivariate techniques and presented for the Free State of Saxony).

On the colloquium's second day, Ulrich Scheinost of the German Electrical and Electronic Manufacturers' Association talked about the business community's demands on business statistics. Dr. Georg Erber of the German Institute for Economic Research outlined the possibilities of presenting the New Economy statistically, and in doing so illustrated once again the principal challenges that the structural changes in the economy were raising for an adequate economic-statistical coverage.

Prof. Martin Hellwig of the German Monopolies Commission addressed the issue of measuring concentration by enterprise groups. He described the existing difficulties in recording the formation of enterprise groups in concentration statistics and pointed out new possibilities of covering groups of companies in official statistics.

Concluding the colloquium, Dr. Martin Albrecht of the German Council of Economic Experts outlined the supply, quality and uses of non-official data on enterprises.

A volume containing all the contributions presented at the scientific colloquium will be published in 2002 as part of the Federal Statistical Office's publication series "Forum der Bundesstatistik".

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