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Methods ... Approaches ... Developments

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The catchword

Production indices

In keeping with international practice, the production indices computed by the Federal Statistical Office are based on the Laspeyres concept. This means that the quantities and (price-adjusted) values of production are related to the base period average. The term "net" production index is defined by the rule for weighting the branches and groups of economic activity: In order to eliminate double counts from intermediate consumption, the structure of value added (that is a "net variable" such as the census value added) determines the share of the individual branch of economic activity in the relevant higher section. Assuming that the input quota remains almost stable, at least for the period of one base year (in general about seven to nine years), the value added (which is not available for periods of less than a year) can monthly be updated by means of gross output data as a makeshift solution. The net production of the economic branches, and thus their contribution to the overall business development, can be evaluated by way of approximation.

The central point of the construction principle of the production indices, however, is the establishment of an enterprise index using indices for kind-of-activity units. The value added of an enterprise is created both in the field of its main economic activity and other fields of production. The enterprise index is constructed according to this distribution of the value added among the individual kind-of-activity units (in the base year).

The individual indices for kind-of-activity units are the starting point; their development is shown through continuous production measurement (quantities or deflated values). The range of technical units allocated to an (enterprise) branch of economic activity can be determined by combining the (institutionally classified) cost structure survey with production statistics broken down by types of commodities. This is the basis for an estimate of the distribution structure of the enterprise's value added in terms of the various economic activities. The use of the census value added ensures that the total value added of the technical units corresponds to the enterprise result. By means of the weighting structure of the (estimated) value added distribution, the individual indices of the technical units are aggregated to form the enterprise index. The enterprise concept underlying the overall system of production industries is thus reflected also in the methodology of calculating production indices.

The indices are presented as original values for the calendar month and as working-day adjusted results. The influence of the varying number of working days on the production in the individual months is determined by means of a regression estimation on the basis of time series analysis. By a seasonal adjustment procedure, the irregular component is separated from the original values, but the former still contains a certain systematic influence determined by the number of working days. A regression on the basis of the residual component as a dependent and of the working days as an explicatory variable then measures the change in production which is due to the differing number of working days.

A weak point of this type of working-day adjustment is the fact that the workdays are included a priori in the calculation in a purely formal manner, i.e. according to the calendar. No statistical information is available so far on the days where there actually has been production. There may have been reduced production activity or no production at all on a working day between two free days, which certainly differs between enterprises and branches. The method of working-day adjustment can be improved considerably if it is known which days have effectively been worked in the enterprises. It is therefore being considered to check some time by means of a pilot survey how such a characteristic can be defined and delimited exactly in order to make up this information deficit within the scope of continuous monthly statistics.

Further development of concepts

Environmental-Economic Comprehensive Accounting

Over the last few years, the public discussion of questions relating to environmental pollution has been increasing considerably. This has also strongly influenced the scientific discussion in the field of environmental accounting. The work on this subject has produced numerous draft concepts of environment models in the form of environmental satellite systems of national accounts and "eco-balances" as well as proposals on how to determine magnitudes of the ecological national product and calculations of the costs resulting from damage to the environment. This was supplemented by various specific individual analyses and cost-benefit calculations for selected environmental fields.

In July 1990 the Federal Statistical Office presented first conceptual ideas concerning the Environmental-Economic Comprehensive Accounting (Umweltökonomische Gesamtrechnung – UGR) and the draft version of a set of tables as a basic programme, which were published in Volume 16 of the publication series "Forum der Bundesstatistik". As a comprehensive open information system, the UGR shall attempt according to the criteria of the most uniform concept possible to absorb as much as possible from the above approaches and accumulate it in an integrated data system. The Federal Minister for the Environment has appointed a Scientific Advisory Council to monitor this conceptual work scientifically.

Concerning the structure of the UGR, the Federal Statistical Office suggested that the system be subdivided into a reporting and an analytic part. In principle, the same concepts and classifications are to be used for both parts. The reporting part collects appropriate available data and data still to be obtained on the environmental situation (mainly information in the form of physical quantities), processes them statistically according to uniform concepts within the framework of harmonized classifications, and introduces the valuation in German marks as far as this is possible and required. The Statistical Reporting System on the Environment (STUBS) thus is to serve several objectives at a time, i.e. as

– a conceptual framework for the collection and processing of information relevant to the environment,

– a system for continuous environmental reporting, and

– a basis for analyses in the field of environmental economics.

The UGR should in principle be open in all directions; for this reason a modular structure was chosen. This provides the opportunity

– to supplement the system by further elements and modules and to use parallel concepts,

– to introduce further classifications and – which is of great importance –

– to carry out research, processing and publication activities at different times and institutions.

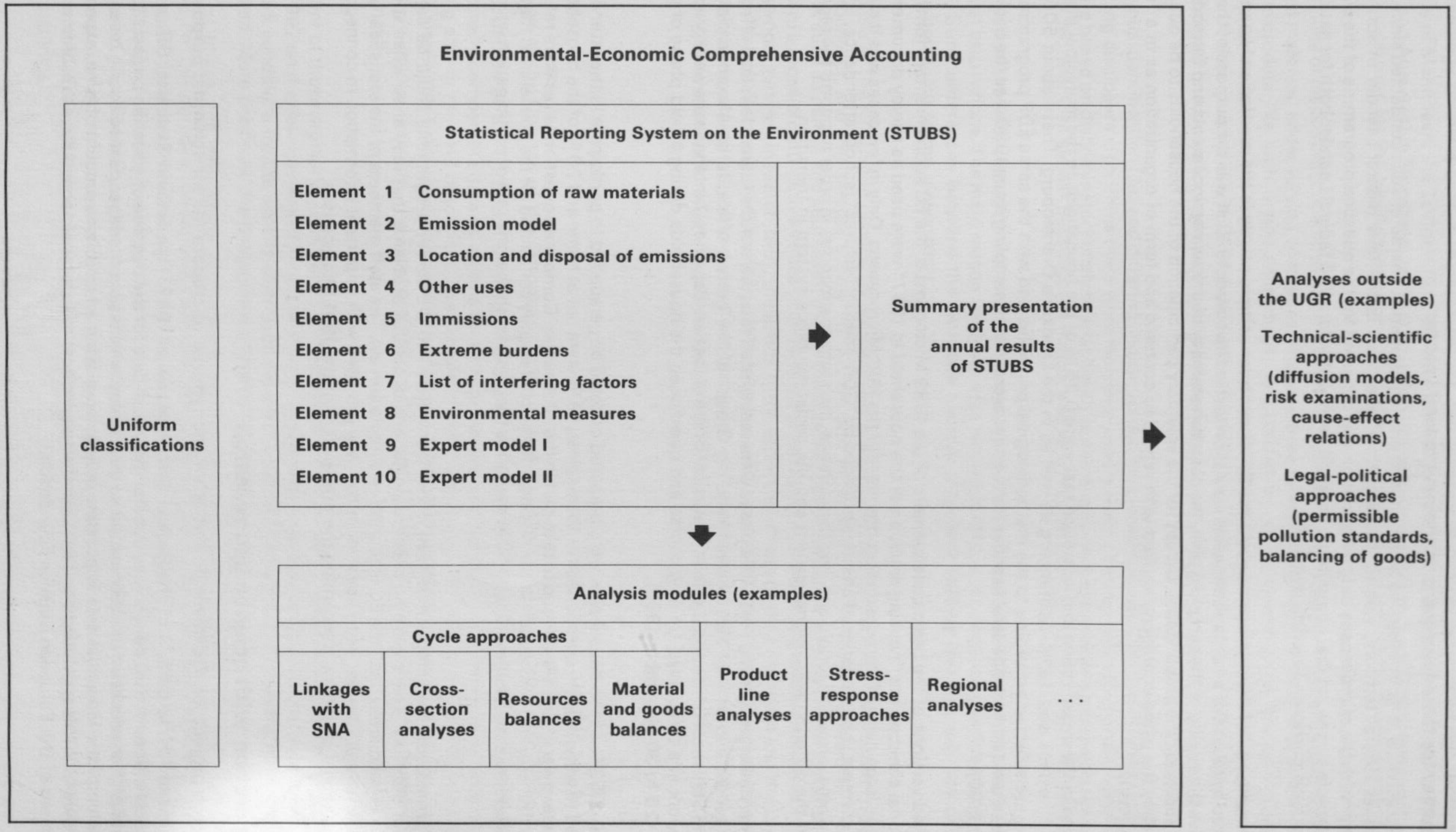
It is obvious that a large number of theoretical and practical problems still remain to be solved. This concerns on the one hand the problems of gaps in scientific knowledge and the monetary valuation of environmental phenomena. An important theoretical starting point for the concept of a UGR is the analogy existing with regard to the cycle presentation of national accounts: Although the transmission processes in the environmental field can in part be traced only with great difficulty, it is e.g. necessary to provide for a statistical classification of environmental information broken down by origin and subsequent location of pollutants. Another idea which can be taken over from national accounts is the uniform monetary valuation. Initial activities in this respect have shown, however, that considerable obstacles have first to be overcome both with regard to cyclical presentation and in monetary terms, and that it is still difficult to implement these two basic ideas.

On the other hand, there are difficulties due to the fact that data are not easily accessible, that there are gaps in the data material, and many figures still have to be processed statistically and condensed. As a rule, the information required need not be obtained through new surveys; it rather is largely available, though partly scattered, or has to be collected for other reasons in the near future anyway. Data are already available from official statistics on population, land use, agriculture and forestry, production industries, transport, tourism and public budgets and of course the existing environmental statistics. These include in particular the surveys on waste disposal, water supply and waste water disposal as well as on investments for environmental protection in production industries. Data are thus available on the amounts of waste produced with a high degree of detail by types of waste and their disposal as well as on investments for environmental measures. Moreover, the amendment to the Law on Environmental Statistics expected for this legislative period will make further important information accessible in the environmental field. For a UGR, data from external sources of information are however also of great significance, as for instance statistics of government departments and information on emissions and immissions from land registers, measuring networks and samples of measurement available at the environmental monitoring stations, results of scientific investigations and information from environmental data banks (among others, data banks covering bibliographical, research and factual data).

Meaningful overall results can be obtained only by the harmonization and matching of information. This task is very complex and requires a close coordination between official statistics and other institutions collecting data relevant to the environment. The UGR is thus also an instrument for coordination and classification in the information process.

Chart

Structure of the Environmental-Economic Comprehensive Accounting



Further development of the collection, processing and presentation of data

Pilot survey for the microcensus in the new federal Laender

The microcensus, a sample survey on population and labour market characteristics conducted since 1957 in the former federal territory, was for the first time taken also in the new federal Laender in spring 1991. Together with the microcensus data, information was collected for the question programme of the EC labour force sample survey, so that comparable data will be available for all 16 federal Laender both for national and international purposes towards mid-1992.

The introduction of the microcensus and the EC labour force sample survey in the new federal Laender was prepared by means of an organization and operation test in November 1990. It was the purpose of this survey to check the quality of the sampling plan, the comprehensibility of the survey documents and the acceptance of the survey by the respondents. Except for the voluntary participation of the households to be questioned, essentially the same conditions applied with regard to contents and form of organization as in a "normal" microcensus.

Included in the organization and operation test were 0.25 % of the households in the municipal districts of Berlin-Köpenick and Berlin-Lichtenberg as well as in the Landkreis Oranienburg. These about 500 households were selected according to the methodological principles and with the same EDP programme which had been used in the old federal Laender for the new microcensus sampling since 1990 (see the contribution in No. 2/90).

Modified versions of the basic questionnaire of the 1989 Microcensus, the EC supplementary form and the additional sheet on the "housing situation of the household in 1987" were used as survey documents, thus covering large parts of the question programme for the 1991 Microcensus. Only in few cases was it necessary to supplement the categories of answers provided by "GDR-specific features" (school attendance, education and training, provision for old age, health insurance, maintenance/income) in order to permit the representation of the differing educational system and the social insurance system in transition.

The interviewers employed in the field phase were mainly staff members of the future statistical offices in the new Laender and of the "Microcensus Working Group" of the branch office Berlin-Alexanderplatz of the Federal Statistical Office and the Joint Statistical Office of the Laender. The 27 interviewers were prepared for their work in a three days' training course and questioned the households during a field phase of only one week (26 to 30 November 1990).

A total of 52 % of the households were prepared or could be persuaded to participate in the interview, 9 % wanted to complete the questionnaires themselves, 19 % were not at home and 20 % of the households told the interviewers that they refused to take part in the pilot survey. Completed questionnaires were returned by an additional 5 % of the households in response to the mail enquiry conducted for the households that had not been at home and those wanting to fill in the forms themselves, so that the rate of participation was 57 % in all.

As it turned out, the sample had been drawn accurately and the survey programme could be carried out without difficulty. There were no specific indications of serious problems that may arise when the microcensus is conducted (incl. the EC labour force sample survey). The staff members of the statistical offices in the new federal Laender were however in this way provided with important information in connection with organizational questions concerning the preparation of the 1991 Microcensus.

Cooperation with science and research

Research project for the development of an anonymized microdata file for scientific purposes

Pursuant to Art. 16 para. 6 of the Federal Statistics Law of 1987, "the Federal Statistical Office and the statistical offices of the Laender may transfer individual data for the purpose of scientific projects to institutions of higher education or other institutions entrusted with tasks of independent scientific research if an allocation of the individual data is possible only by employing an excessive amount of time, expenses and manpower ..." This regulation complies with the requirement of "practical anonymity" as recommended in a statement of the European Science Foundation.

In order to make this practical anonymity operational for practical purposes, the Federal Minister for Research and Technology commissioned a research project. The purpose of this project carried out jointly by the University of Mannheim, the Zentrum für Methoden, Umfragen und Analysen (ZUMA – Centre for Methods, Surveys and Analyses) in Mannheim and the Federal Statistical Office was to prepare recommendations for concrete measures for the practical anonymization of individual data records from official statistics.

The feasibility of disclosure procedures and the effort involved were examined by means of empirical data and simulated matching under varying conditions. This was done by simulating the comparison of an anonymous official microdata file with a non-anonymous, non-official so-called identification file with a view to conformity or similarity of the variables shown in the two sources and therefore also referred to as coinciding variables. A data trustee of official statistics then checked the simulated matching so that the number of successful and unsuccessful attempts could be determined.

Both various identification files and differing anonymization measures were used for the simulated matching. As differing disclosure algorithms there were moreover used a simple sorting procedure and a complicated procedure based on discriminatory analysis which with certain framework assumptions computes the probability that more or less similar data records match, and which consequently may make certain allocations.

The simulation showed, among others, that the success rates are much lower than those often derived from theoretical calculations. The main reason for this are the incompatibilities of coinciding variables observed in practice. Such differences between the two data sources may have various reasons, e.g. the differing response behaviour of the respondents.

On the basis of the simulation results, recommendations were prepared for the practical anonymization for the microcensus and the sample survey on income and expenditure. Apart from the removal of direct identifiers such as names and addresses, they provide as additional measures for substantial simplifications with regard to possible attributive values of certain characteristics and the drawing of subsamples from these official sample surveys. In March 1991, the heads of the statistical offices of the Federation and the Laender agreed to these recommendations. As a first step towards implementation, it is intended to use the anonymization measures for pilot projects. The publication of the final project report as a volume of the series "Forum der Bundesstatistik" is envisaged for the end of 1991.

Bodies

Resolution of the Council of the European Communities to develop joint tourism statistics

As the countries of the European Communities are in the process of growing together, the demand for internationally comparable data as a basis for entrepreneurial and tourism policy planning and decisions is increasing also in the field of tourism. The completion of the European Single Market in 1992 makes new demands also in this field, which the existing systems of official tourism statistics of the member states are increasingly unable to satisfy. The European Year of Tourism 1990 has once again brought these problems back to mind.

On account of these problems, the Council of the European Communities passed a two-year programme for 1991 – 1992 on the development of joint tourism statistics. It is the purpose of this programme to improve the framework conditions for the activity of enterprises in tourist trade through an improved base of statistical information. More precisely, the programme provides for four phases of work:

In the first phase, the information requirements of the users of tourism statistics will be analyzed and evaluated. For this purpose, the national statistical offices were to get in touch with the respective interested parties in their countries. In the Federal Republic of Germany, this was part of the work of the Working Party on Tourism Statistics at the Federal Statistical Office. As a second measure, the programme provides for the collection and dissemination of already available tourism statistics. This will be followed by an investigation of the systems existing in the member states and those used by the international World Tourism Organization (WTO) and the OECD. It is the purpose of the overall programme to prepare a methodology for producing joint tourism statistics.

Events

Whitsuntide Conference of the German Statistical Society

The traditional Whitsuntide Conference of the German Statistical Society was in 1991 for the first time held jointly with the Austrian Statistical Society. It was convened in Innsbruck from 22 to 24 May and provided for meetings of the committees for "New Statistical Methods", "Empirical Economic Research and Econometrics", "Statistics in Natural Sciences and Technology", of the Conference of University Teachers for Mathematical Statistics as well as the Austrian Statistical Society. With some 100 participants – mainly university teachers from the German-speaking area, among others also from the new federal Laender – attendance at the conference was rather high.

The programme of contributions presented was characterized by a great variety of methodological subjects, most of which were theory-oriented. Especially the development of formalisms for the description and processing of vague data was treated in greater detail. The robustness of statistical procedures also played an important part in several papers. Among others, research results were presented on the sensitivity of statistical methods to deviations from model postulates such as distribution assumptions, variance homogeneity or independence of the model errors.

Of special interest among the application-oriented contributions was the paper by Prof. Schäffer on a new procedure for adjusting life tables in official statistics as the Federal Statistical Office had just published the Complete Life Table 1986/88 for the Federal Republic of Germany. The main methodological problem is finding an adjustment procedure for the crude death rates which offers an adequate compromise between the smoothness of the adjustment curve and the adaptation to the crude figures. The speaker presented an adjustment procedure which differs from the official method insofar as the selection of the knots for the spline adjustment and the smoothness of the adjustment curve are determined according to the optimum criterion of the generalized cross validation. Infant mortality (excl. newborn children) is also included in the adjustment procedure and a somewhat different extrapolation approach is chosen for old age mortality. Unfortunately, no results of adjustment calculations according to the new method were available as yet, so that the practical suitability of the procedure presented could not yet be assessed.

National product computation for the territory of the former GDR, second half-year of 1990

1 Introductory note

On 23 April 1991, the Federal Statistical Office issued a press release containing results of the **national product computation** for the territory of the former GDR (incl. former Berlin (East)). This computation was performed according to the national accounts concepts used in the Federal Republic of Germany. The data related to the second half-year of 1990, i.e. the period beginning with the introduction of the D-Mark in that area.

These results **cannot be compared** with the data on the former GDR that were published in July 1990 in No. 12 of the publication series "Ausgewählte Arbeitsunterlagen zur Bundesstatistik". First, there were a number of conceptual differences between the new and the old data on the former GDR[1]). Second – a major reason for the lack of comparability of the data – the old data on the GDR were valuated in Marks of the GDR, while the more recent data were valuated in D-Marks. Because of the lacking comparability of the two currencies and conversion problems, the national product computations for the new federal Laender had to be limited to the second half-year of 1990, i.e. the period after the monetary union was accomplished. Thus it was not possible either to provide any rates of change as against previous periods.

The national product data published in spring 1991 as well as other aggregates of national accounts presented for the territory of the former GDR were first **preliminary results.** When federal statistics were introduced in the new federal Laender, temporary informational gaps occurred. This happened, for instance, where data were no longer available in their previous form and the results of federal statistics could be provided only later. In such cases, it was necessary in particular to employ estimates. For updating figures of previous years, changes had to be taken into account that were occurring in the economy of the new federal Laender, which was a major difficulty in performing the estimates. Due to the resulting inaccuracies, there are inevitably wider margins of error than in the publications on the old Laender. The data availability is quite differing for the individual fields of national accounts.

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1) Cf. "Zur Sozialproduktsberechnung der Deutschen Demokratischen Republik", No. 12 of the publication series "Ausgewählte Arbeitsunterlagen zur Bundesstatistik" (Selected Working Papers on Federal Statistics), p. 25 ff.

For a number of aggregates, **basic statistical data** of the last months of 1990 were already included. This refers in particular to the turnover of production industries which accounted for more than half of the gross value added of the enterprises. Further basic data could be obtained from the balance of receipts and expenditure of the government budget with regard to the new Laender and from the monthly accounts of the social security carriers. The estimates of the number of economically active persons and of the total gross wages and salaries could be based on the data of the labour force reports up to December 1990. The first results available from a cost structure survey carried out in the third quarter of 1990 for all sectors served as an important basic data source for the computation of the gross value added of enterprises. It was however difficult to assess the reliability of the results of that survey. A clearer picture of the situation is provided only by the data of the cost structure survey for the second half-year of 1990 which permit to evaluate a "reduced financial year" starting with the effective date of the monetary, economic and social union.

Examining exports and imports of commodities and services with regard to the territory of the former GDR also includes the supply of commodities and services to and their purchase from the territory of the Federal Republic of Germany as up to 3 October 1990. Covering such **intra-German transactions** is difficult because statistical sources used so far are no longer available at all or only in a modified form. This is true not only of the new federal Laender but also of the former territory of the Federal Republic of Germany; but this inaccuracy in coverage is many times as serious for the territory of the former GDR as it is in the case of the old federal Laender. Difficulties of a similar kind arise when cross-frontier transactions between the Federal Republic of Germany and foreign countries are to be allocated within the framework of foreign trade statistics to the old or the new federal Laender. In order to obtain a credible picture of the situation, available data were combined and coordinated with considerations on the assumed economic flows in the two parts of Germany in the second half-year of 1990 [2]).

In spite of the uncertainties, the results of the national product computations were presented because it seemed improbable that future calculations would provide a substantially different picture of the economic situation on the territory of the former GDR in the second half-year of 1990. It was also necessary to satisfy the great public demand for data on the national economy with regard to the new federal Laender. One had to take into account, however, that future new calculations would lead to much more comprehensive corrections than was previously common in national accounts.

In the following, the foundations and methodology of the national product computation for the second half-year of 1990 shall be presented.

2 Data sources and methodology of national product computation

The following explanations on the data sources and computation methods are to provide the reader with information on the reliability of the figures concerning the national product of the new federal Laender in the second half-year of 1990 as published in spring 1991. With the help of the cost structure survey conducted in the third quarter of 1990, the monthly household budget survey covering about 5 000 households and some monthly statistics it has been possible to very quickly provide important basic data for the national product computation. The remaining gaps, however, had in many cases to be closed by rough estimates. This had a negative impact on the accuracy of the computations.

2.1 The origin of the domestic product by economic sectors

The gross value added of the economic sector of **agriculture, forestry, fisheries** of the new federal Laender was largely taken over from calculations made by the Institute for Agricultural Policy, Market Research and Economic Sociology at Bonn University. The output and the intermediate consumption of deep-sea fisheries were estimated at the Federal Statistical Office on the basis of the monthly turnover and the results of the cost structure survey for the third quarter of 1990. For inland water fisheries, private animal keeping and commercial horticulture, data of 1989 and the first half-year of 1990 were updated.

For ascertaining the output and intermediate consumption of **production industries** in the second half-year of 1990, the data available were monthly data on the turnover of enterprises up to and including December and the results of a representative cost structure survey for the third quarter of 1990. The turnover was collected monthly for all enterprises – excluding handicraft establishments – of power and water supply, in mining and manufacturing and in the building industry; in the latter case, however, only for enterprises with 20 persons engaged or more, i.e. also excluding handicraft establishments. Turnover figures not covered were estimated.

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2) Cf. Strohm, W. and colleagues: "Sozialprodukt im bisherigen Gebiet der Bundesrepublik Deutschland im Jahr 1990" in Wirtschaft und Statistik, No. 1/1991, p. 17 ff.

The **cost structure survey** conducted in the third quarter of 1990 covered entirely the turnover of enterprises of power and water supply, 79 % of the turnover in mining and manufacturing and 71 % in the building industry. The quotas obtained from the cost structure survey for the third quarter of 1990 and the turnover covered monthly with the enterprises for the second half-year of 1990 were used for computing the changes in stocks of finished and unfinished products as well as the value of own-account construction and thus the overall output. For computing the intermediate consumption of enterprises, the intermediate consumption quotas obtained from the cost structure survey for the third quarter of 1990 were drawn upon. It has to be pointed out again that the cost structure available in spring 1991 had not been ascertained for a whole financial year, but just for one quarter and that the relevant survey had been conducted for the first time. The results therefore have to be interpreted very cautiously and with reservations. Only the cost structure survey for a "reduced financial year" beginning with the monetary, economic and social union and covering the second half-year of 1990 promised better results and permits a better assessment of the survey results for the third quarter of 1990. Using these more recent data for the computation of the output of production industries does however not lead to substantial changes because, for instance, in mining, manufacturing and power and water supply the overall turnover covered monthly for the third quarter of 1990 accounted already for 99 % of the output as ascertained by means of the cost structure survey. For determining the intermediate consumption of enterprises, however, the cost structure for the second half-year of 1990 has a higher informational value and reduces the margins of uncertainty for the ascertainment of the intermediate consumption quotas for the economic branches of production industries.

With regard to the **handicraft establishments** in production industries, the share of the overall output of handicraft establishments in 1989 and the first half-year of 1990 in the output of all enterprises in the same periods was ascertained. This share was imputed also for the second half-year of 1990. In manufacturing, this share was about 2 %, while in the building industry it amounted to about 12 %.

Data on the turnover of enterprises in **commerce** and the **hotel and restaurant industry** were available for the third quarter of 1990. For the fourth quarter, the turnover of trading enterprises and restaurants was estimated. For determining the output and the intermediate consumption in the second half-year, the required quotas were derived from the cost structure survey of the third quarter; these quotas were 36 % in wholesale trade and 45 % in retail trade, referring to the overall turnover of these branches.

In the field of **transport and communications**, data of the cost structure survey for the third quarter of 1990 were available for all enterprises. The gross value added for the fourth quarter of 1990 was estimated on the basis of indicators (quantity of goods transported, goods transport performance) for the individual modes of transport, taking into account the upward revisions of the tariffs that had occurred. The share of the gross value added of transport and communications in the gross value added of all economic branches was about 7 %.

The data sources available for computing the gross value added of **credit institutions** were the "balance sheet of the credit system of the GDR", data of the Deutsche Bundesbank on the development of the stocks of assets and liabilities of the credit institutions in the new federal Laender, including former Berlin (East), as well as information on the development of interest rates in the second half-year of 1990. The interest receivable and payable, whose difference are the imputed bank charges, were ascertained by applying to the data available on stocks the rates of interest receivable and payable. The stock data and the interest rates were blown up for the second half-year on the basis of the data available up to October 1990. The output including the imputed bank charges and the intermediate consumption of the credit institutions for the second half-year were derived by means of the respective quotas of the years 1985 to 1989.

For the **insurance enterprises** in the new federal Laender, no survey results were available yet for the second half-year of 1990. The aggregates needed for computing the gross value added were ascertained for the years up to and including 1989 on the basis of the "accounts of expenditure and results" of the GDR credit institutions; for the second half-year of 1990, they were provisionally updated on the basis of the development of the credit institutions.

For the **field of housing**, covering not only the commercial renting of dwellings but also the owner occupancy of dwellings, the material drawn upon consisted in particular of the accounts of results of local authorities for dwellings and of the residential building cooperatives; these data were available for the period up to and including the first half-year of 1990. For updating the results for the second half-year, the changes in prices for intermediate consumption that occurred in the second half-year were taken into account; it was assumed that no changes in rents had occurred up to then. The output was valuated by the amount of the actual rent receipts (minus the apportioned charges for the costs of heating and hot water). The purchases of intermediate consumption included only those costs that are related to the renting of dwellings. The gross value added resulting from other commercial activities such as the performance of building repair work and hot water supply was shown as part of production industries. For the publicly financed authorities for dwellings and for the dwellings rented by private owners, the rent receipts for the second half-year of 1990 were derived from the accounts of the government budget and from the balance of the monetary receipts and expenditures of the population of the former GDR in 1989. The rents for owner-occupied dwellings were estimated at the amount of average rents for rented dwellings of the same type. The estimation of the purchases of intermediate consumption for the renting or the imputed renting of these dwellings was based on intermediate consumption quotas of comparable dwellings, taking into account the price development in the second half-year.

The basic data for ascertaining the gross value added of the **other service enterprises** were derived from the cost structure statistics for the third quarter of 1990, i.e. concerning dry cleaners, enterprises for domestic and personal services, municipal enterprises and audit enterprises. The figures for the last three months were estimated. For the enterprises not interviewed for cost structure statistics, the results of the previous years were updated. This refers, for instance, to the publishing trade, public health and veterinary activities as well as other service enterprises including the handicraft establishments of the service sector. It was assumed that despite the great number of registrations of businesses recorded in the reference period no substantial increase in performance had occurred so far.

The gross value added in the **government** sector was determined as the sum total of the income from employment (total gross wages and salaries and employers' contributions to social security) and depreciation. Up to that point, no production taxes had been registered as expenditure in the government sector. In order to obtain the required data on the income from employment of central and local government and of social security institutions, there were evaluated for the new federal Laender the balance of receipts and expenditure of the government budget, the monthly accounts of the central social security administration and the balance of receipts and expenditure of the unemployment insurance of the second half-year of 1990. Estimates were made for the branches not covered by the above sources (military, police, customs and the like). They were based on data of previous periods obtained from documents of the Ministry of Finance of the former GDR. Also the development of the figures of economically active persons and of the tariffs in these fields were taken into account. The income from employment also includes the government expenditure for food and clothing of the soldiers.

Depreciation in the government sector was determined on the basis of data on fixed assets and by using the depreciation rates obtained from long-term series for the period from 1975 to 1989. The estimation of fixed assets for the second half-year of 1990 included the investment activity in the first half-year of 1990 and the fixed assets as of 30 June 1990. It was reduced by the estimated share of civil engineering construction, since roads, bridges, waterways and other government goods whose useful economic life is hard do determine are not depreciated, which is in accordance with international practice. For the branches not covered (military, police, customs and the like), the fixed assets were estimated, taking into account the development of the number of economically active persons and the capital intensity of comparable branches. It was taken into consideration that some institutions had already been transferred from the government sector to other sectors and that the fixed assets of dissolved institutions continued to be used largely in the government sector.

For ascertaining the negligible quantity of the gross value added of **private households,** the data on the employment income of household personnel of previous years were updated.

Estimations of the gross value added of **private non-profit organizations** were performed on the basis of the number of persons employed in this field and of the personnel expenses and depreciation per employee in comparable economic branches. The share of the gross value added of private non-profit organizations in the overall gross value added is negligible.

The **gross domestic product** is obtained by adding to the total of gross value added of the economic sectors (from which the imputed remunerations for bank services are subtracted) the **nondeductible turnover tax** and the **import charges.** With regard to the cash volume of turnover tax and import charges and the turnover tax statistics, no results of official statistics were available at that point of time for the new federal Laender. Therefore the nondeductible turnover tax was estimated on the basis of the structure of the commodities and services produced and imported, taking into account the goods consumed as intermediate consumption in the course of the production process; the estimate corresponded to the amount that would occur when applying the normal regulation as defined in the Turnover Tax Law. The import charges, too, were estimated, taking into consideration the structure of the imported commodities, by calculating the nominal values of the customs duties and excise duties on imports.

2.2 Use of the national product

The **final consumption** of domestic households was estimated by blowing up data from the continuous family budget surveys, i.e. the monthly household budget survey conducted with some 5 000 households. Then it was harmonized with calculations and estimates of the domestic purchases of private households by branches of supply and with estimates of purchases made on the former territory of the Federal Republic of Germany and abroad by households of the territory of the former GDR, and purchases made in the new Laender by foreign households and households of the former territory of the Federal Republic. The own consumption in agriculture, forestry and fisheries and the direct sales to private households in 1989 and in the first half-year of 1990 were updated for the second half-year of 1990 by the Federal Ministry of Food, Agriculture and Forestry. For the branches of supply of energy, transport and communications, data were available for the period up to and including the third quarter of 1990. The values for the fourth quarter of 1990 were estimated, taking into consideration the development of tariffs for transport and communication services and for energy consumption. The purchases in retail trade and in the hotel and restaurant industry which accounted for 70 % of the domestic purchases of private households were calculated on the basis of the turnover ascertained for retail trade and the hotel and restaurant industry. For purchases from manufacturing, building industry and the service sector, there were updated mainly the results of the first half-year of 1990; here the changes in expenditure made by households, as determined by the family budget surveys, were taken into account. The amount of expenses made for education, culture, sports, entertainment, health services and purchases of other services from the public sector were derived from the balance of the receipts of the government budget for the second half-year of 1990.

In the new Laender, the commodities and services (incl. subsidies granted to establishment canteens) provided free of charge by the employers to the employees within the scope of in-plant child care or health, cultural and social care were also in the second half-year of 1990 included in the income from employment and in the final consumption of households (not in the purchases of intermediate consumption in the enterprise sector). Such **fringe benefits** for the employees did not serve primarily the purpose of the business – as is usually the case in free-market oriented enterprises – but served primarily the employees. Another argument for that allocation is the fact that before the currency reform had been accomplished the establishment funds intended for such purposes were in many cases paid to the employees as special payments. Since no statistical data on their amount have been available as from the second half-year of 1990, the overall amount was estimated. It was assumed that these payments still had a certain importance in the third quarter, but that they presumably decreased sharply in the last quarter of 1990. As was practiced in the government sector, these goods provided free of charge were recorded in the enterprise sector as output, the amount corresponding to the costs resulting from them; also an income from employment to the same amount was recorded.

The purchases made by private households of the new federal Laender in the rest of the world were mostly **purchases on the former territory of the Federal Republic** (purchase of food, industrial goods, motor vehicles and utilization of services). In particular the purchases of new and used motor vehicles and deliveries by mail order houses had a major importance. Basic statistical data provided just indications on these flows of commodities and services, so that in most cases estimates had to be employed. The purchases included in the final consumption of households in the new federal Laender were checked against the corresponding data shown as part of exports of commodities and services of the old federal Laender (i.e. delivered to the new Laender). The expenditure made by private households of the territory of the former GDR during travels abroad were estimated on the basis of information provided by households in the continuous family budget surveys.

The **government consumption** is ascertained by subtracting the sales and the value of own-account construction from the output of the government sector. The required data were obtained by evaluating the balance of receipts and expenditure of the government budget, the monthly accounts of the central institution of social security and the balance of receipts and expenditure of unemployment insurance. For the branches not covered by the above sources, estimates were employed on the basis of data from previous periods, taking into consideration the development of the number of economically active persons, tariffs and prices in these branches. This accounted for about 20 % of government consumption.

For calculating the **gross fixed capital formation,** the results of the survey conducted quarterly with the investors were available for the third quarter of 1990. All traditional investors or their successors, respectively, were interviewed. More than 90 % of gross fixed capital formation was ascertained in this way. The resulting value was supplemented by estimates on investments made for the construction of owner-occupied homes and for the modernization of dwellings and on some government sector investments not covered as well as on some investments made by private nonprofit organizations. For the fourth quarter of 1990, no basic statistical data were available at that point, so that estimates were performed for all investors.

The **balance of exports and imports of goods and services** (including the balance of incomes from employment and property) was determined in two stages. First the trade in commodities and services of the new Laender with foreign countries was covered. The data on the commodity trade were derived from foreign trade statistics. The costs for freight and insurance services contained in the imports of commodities were estimated and, in accordance with the concept of national accounts, transferred from the commodity trade to the trade in services. The volume of the trade in services in the second half-year of 1990 was estimated. It was taken into account, among other things, that the expenditures made by private households of the new Laender during travels abroad increased significantly in the second half-year. Then the trade in commodities and services of the new Laender with foreign countries was supplemented by the data on the intra-German trade in commodities and services. The relevant data were reversely derived from the national product computation for the old federal Laender. For the latter, the results of the statistics on the intra-German commodity trade of the enterprises on the former territory of the Federal Republic were an important data source. Substantial supplementary estimates were however required. A major factor determining the amount of the balance of exports and imports of goods and services for the new Laender were the deliveries of commodities from the former territory of the Federal Republic to the new Laender or the purchases made by households of the new Laender in the old Laender. The amount of service exports was considerably influenced by the growing number of employees living in the new Laender and commuting into the old Laender; this number also contributed to a positive balance of the incomes from employment and property.

2.3 Economically active persons

The data situation for calculating the number of economically active persons was different for the individual periods. The computation of the quarterly figures on economically active persons in 1989 was based on the 1988 and 1989 surveys of active persons. For one reference date per year, these surveys covered nearly the entire economy except for some special branches (army, police, customs, state security police, Wismut AG, political parties and organizations and others) and some partial groups (among others, mothers on maternity leave, employees pursuing a minor activity). Data for parts of the year and the entire year were provided by the monthly and quarterly labour force reports (state-owned establishments), the reports on handicrafts (producer cooperatives and private establishments) and the annual final report of agriculture (producer cooperatives). Part of the private sector which however was quantitatively negligible was covered only by the survey of active persons. Data for the special branches (the so-called X Sector) were updated on the basis of the 1981 population census and checked by means of the 1990 data on the individual institutions (voluntary information, budgets). There were no current data on the number of persons employed by political parties and organizations.

The important results of the survey of active persons (reference date 30 November 1990) were not available when the computations were made. Therefore, the figures for 1990 had to be ascertained on the basis of the other sources, in particular the labour force reports. Results of the reports on handicrafts (excluding private handicrafts) and of the annual final report of agriculture were available only for the first half-year of 1990. The development of the number of economically active persons in the branches not covered by primary sources was estimated by updating previous data with the help of trade registrations and cancellations. In the first half-year of 1990, still more than 90 % of all economically active persons were directly covered by statistics. In the second half-year, this percentage decreased to about three quarters of the total number. Since the results of the 1990 survey of active persons were not available, the data could not be broken down according to the Industrial Classification of Economic Activities of the Federal Statistical Office.

2.4 Total gross wages and salaries

The major source for calculating the wage incomes up to and including the first half-year of 1990 were the monthly data of the State Bank on the payments made (in a breakdown by types) from which the national total gross wages and salaries could be derived. These overall data were supplemented and checked by means of results of a second calculating method. The latter was based on information about the individual economic branches, such as the monthly and quarterly data on wages and salaries from the labour force reports, as well as some other sources which could be combined to obtain an overall picture, similarly to the procedure followed for determining the figures on employed persons. No data from the State Bank were available for the second half-year of 1990, so that the calculations for that period had to be based mainly on the results of the labour force reports which cover about three quarters of the total gross wages and salaries. These data were supplemented by information provided voluntarily by various institutions of the former X Sector concerning personnel expenses, budgets and evaluations of collective agreements.

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