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**Information:**

Statistisches Bundesamt  
General Information Service  
D-65180 Wiesbaden

- Phone: + 49 - 611 / 75 24 05
- Fax: + 49 - 611 / 75 33 30
- E-Mail: [auskunftsdienst@stba.bund400.de](mailto:auskunftsdienst@stba.bund400.de)
- Internet: <http://www.statistik-bund.de>

Further information on this publication may be obtained from:

Division I B

Phone: + 49 - 611 / 75 20 77

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## The catchword

### Methodology of the 1995 structure of earnings survey

The function of structure of earnings surveys is to represent the distribution of earnings and to show the gradation of earnings by means of numerous variables and thus to provide data material with a detailed breakdown for in-depth analyses. To this end, the surveys cover individual data on earnings, working hours, characteristics of the workplace, and personal conditions relevant for earnings. Within the overall system of wage/salary statistics, they are the counterpart to the quarterly and yearly surveys of earnings and the four-yearly labour cost surveys, which collect aggregate data and, due to the survey method, can provide just average figures.

Because of high cost and the time required, structural surveys can be performed only with multiannual periodicities. In the former territory of the Federal Republic, such surveys have been conducted since 1951; in 1966, 1972, and 1978, they were conducted as Community surveys of the EC or EU member states. The latest survey, conducted for 1990 in the former territory of the Federal Republic, was carried through for reference month May 1992 in the new Länder (with a reduced list of characteristics).

To reduce the burdens on local units and statistical offices, the survey was conducted as a random sample with an average sampling fraction of 6% of the employees in the former territory of the Federal Republic and 9.2% in the new Länder. What was collected were the data of some 900,000 persons, representing a total of 11.5 mn employees. Those persons were determined through a two-stage procedure which selected first the sample local units from the population of units in the survey scope and then the employees to be included from among the total staff of the sample units.

The allocation of the sample size to the federal Länder was specifically designed so that the relative standard error to be expected for the results of the smallest Land would be not more than twice as large as for the data of the biggest Land. Consequently, the sampling fractions obtained for the individual Länder ranged from about 6% (North Rhine-Westphalia) to about 13% (Berlin-East).

Employees were selected by the sample local units themselves by means of the payroll register using given starting numbers and sampling intervals. The resulting sampling fraction varied between 50% (for local units with 20 to 99 employees) and 6.25% (for local units with 1,000 employees and over). Small units with 10 to 19 employees had to report data for all employees.

To give the user an impression of the magnitude of the expected estimation errors caused by random sampling, the relative standard error for the most important variable of any table is indicated in the publications.

Employees included were only those that are subject to pension insurance contributions. This means that, for instance, persons exempted from compulsory contributions to pension insurance funds because of marginal part-time work or short-term work were excluded; other persons excluded were employees whose employment serves mainly for vocational training, such as apprentices, employees whose activity was performed outside the "normal" operations, such as homeworkers, and executive employees such as members of the managing board of a public limited company.

The following characteristics that are linked to the workplace were included: branch of economic activity, size of the enterprise, fixed-term or open-end contract, time rate/piece rate/premium system, and actual job. The actual job was covered by two types of information: the allocation to a specific occupation as well as the agreed wage and salary grade - where remuneration was based on a collective agreement - or the performance group of the statistics of earnings, which the local units had to enter into the forms according to the definitions provided. The pattern of performance groups distinguishes - for wage earners - between jobs to be performed by skilled, semi-skilled, or unskilled workers and - for salaried employees - between five job groups whose definitions are based on the following criteria: expert knowledge, independence, responsibility, and managerial powers.

Covering the agreed wage and salary grades has two purposes: The cell frequencies for the wage and salary grades of any individual sector covered by a collective agreement are the basis for the weighting pattern for the indices of agreed wages and salaries. Also, they serve to determine how wage and salary grades are allocated to performance groups. For this purpose, allocation tables are set up at the Federal Statistical Office for every collective agreement; in such tables, the agreed wage and salary grades are allocated to performance groups. On that basis, wage and salary grades are converted to performance groups by electronic means. Setting up allocation tables is highly time-consuming. To make data processing faster, the sample units were asked already as part of advance information to indicate the collective agreements they apply.

While in the national surveys, the occupational allocation was used above all to determine the performance group, it is a major classification pattern for EU evaluations. Specifically indicating the actual job would have meant a considerable burden for the respondents and, consequently, would have made data processing at the statistical offices much more expensive, at the same time delaying it. This is why that information was replaced by the 3-digit

activity code number which is contained in the social insurance confirmation documents submitted by the local units to the health insurance institutions. However, such data are based on the national classification of occupations (1975 edition), whereas the data requested by the EU should be broken down according to the International Standard Classification of Occupations, 1988 edition. Therefore, the data determined in the above procedure had to be converted to the ISCO 88 (Com), using any relevant information.

Employees' personal characteristics covered are sex, age, length of service in the enterprise, tax class, number of tax-free amounts for dependent children (replacing the characteristic "marital status" covered in former surveys), and training level attained. To simplify the survey procedure, education and training data, too, are taken from the activity code number in the social insurance confirmation documents.

Time data covered are the weekly working hours fixed in the employment contract and those actually paid, excess hours, and - for wage earners, in special cases - the time credit at the beginning and at the end of the accounting period. The latter data served to calculate straight-time earnings where, due to flexibilization measures, actual earnings could not be regarded as based on the period. For salaried employees, paid working hours had to be indicated only where they differed from those fixed in the employment contract. The comparison between paid working hours and those fixed in the employment contract served to detect any reduction of earnings during the accounting period; employees whose earnings were reduced by more than 10% generally were not included in the results presented in order to keep the structure of earnings free from random factors (including cyclical factors such as short-time work).

Earnings data covered for October 1995 were gross monthly earnings (excl. irregular payments), earnings from excess hours, bonuses for night, shift, and Sunday work, as well as statutory deductions (to determine net earnings); earnings data covered for the year 1995 were gross and net annual earnings as well as annual extra payments. Although net earnings generally are a rather doubtful item (the term is unknown in fiscal law), the values covered here are more precise than the frequently used results of model calculations because they include the registered tax-free amounts of employees and the social insurance contributions actually paid.

Numerous measures were taken to facilitate electronic data supply, for instance providing advance information, adjusting the characteristics to data stored in the business accounting system, and establishing contacts with software firms to provide suitable programmes. Although many local units did provide their data on electronic data carriers, this did not make data processing faster - as had been intended - , which was due to the poor quality of the data provided.

In the publications, the results for the old and the new Länder are presented separately because there are considerable differences in the level and structure of earnings, and also in the other survey characteristics, in particular with regard to women. Combining the different structures by presenting aggregate data would considerably impair the data's informative value.

The material of the structure of earnings survey has been used for various scientific analyses. It is currently being checked at the Federal Statistical Office how that material can be made available to a wider group of users. Disseminating anonymized microdata is made more difficult by the fact that the data were provided by local units and some of those units have specific features of remuneration which make it virtually impossible to anonymize the microdata.

*Peter Kaukewitsch, tel. + 49 - 611 / 75 - 26 88*

## **Methods of federal statistics – Further development**

### **Scientific use files based on the Sample Survey of Income and Expenditure, the European Community Household Panel and the Time Budget Survey**

The Federal Ministry of Education, Science, Research and Technology has funded a current project aimed at facilitating (particularly in financial terms) the use of anonymised microdata by the academic community and at developing long-term solutions. The project has been prepared by the Federal Statistical Office in cooperation with the *Gesellschaft Sozialwissenschaftlicher Infrastruktureinrichtungen* (Association of Social Science Infrastructural Facilities - GESIS). The project focuses on microdata relating to households and individuals which are of special interest to empirical economic and social research.

In the context of this pilot project since the beginning of this year, academic staff have had the opportunity to receive against payment of DM 130 from the Federal Statistical Office factually anonymised microdata of the 1995 microcensus, which are of relevance to their research projects. At the end of October 1997, further administrative agreements were signed with the Federal Ministry of Education, Science, Research and Technology with the aim to produce scientific use files of the 1993 Sample Survey of Income and Expenditure, the 1994 to 1996 German sample survey as part of the European Community Household Panel and the 1991/92 Time Budget Survey.

The rules for transmitting so-called factually anonymised microdata to academic institutions have been stipulated by the Federal Statistics Law since 1987. Pursuant to Article 16 (6) of that Law, the Federal Statistical Office and the Statistical Offices of the Länder may transmit individual data to institutions of higher education or other institutions entrusted with independent scientific research provided that the allocation of those individual data to respondents or other persons surveyed would require an excessive amount of time, expenses and manpower. The microdata may only be used for the purposes for which they were transmitted and will have to be deleted as soon as the research project is completed (Article 16 (8) of the Federal Statistics Law). The production of scientific use files, which requires a single anonymisation of the data material only, has turned out to be an efficient form of data supply. Producing those files gives the Federal Statistical Offices the opportunity to transmit variables required for specific research projects almost without delay. The described form of data provision has also been chosen for the pilot project funded by the Federal Ministry of Education, Science, Research and Technology. In this case, the Ministry bears the cost of anonymising the microdata and producing factually anonymised basic files.

The factually anonymised data of the 1993 Sample Survey of Income and Expenditure are available at the Federal Statistical Office. The related statistics compiled at five-year intervals since 1962/63 provide detailed data on the income and expenditure situation of households. In line with the survey structure, the microdata files available are based on various combinations of the individual survey components like *basic interview*, *final interview*, and *annual accounts*. In addition, a data file is offered which encompasses detailed data on the expenditure for food, beverages and tobacco supplemented by the quantities bought.

The factually anonymised data of the first two waves of the German sample survey as part of the European Community Household Panel may as well be obtained from the Federal Statistical Office. That European-wide survey supplies in particular information about employment, income trends (at both the household and the individual level), standard of living, social insurance systems, and poverty dynamisms. Portable and well-documented SPSS microdata files were produced for transmitting factually anonymised microdata. A subject-related detailed manual, which can be obtained from the Federal Statistical Office, is also accessible via the Internet (<http://www.statistikbund.de/download/panel/panel.htm>).

As regards factually anonymised data of the 1991/92 Time Budget Survey, they will be available at the Federal Statistical Office presumably from the end of 1998. The objective of the survey, which was funded by that time's Federal Ministry for Family Affairs and Senior Citizens, was among other things to produce data for computing the value of household production and answering questions related to women and family policies. The Time Budget Survey covered a wide range of questions so that detailed research on time use issues was possible based on the data collected in the survey. Examples are the time structures and profiles of individual groups of the population, an analysis of specific individual activities (use of media, continued education, voluntary and community work, sports incl. matches, long-term and nursing care, travel times, etc.), and explanations for individual uses of time.

To facilitate an efficient user access to the factually anonymised data, staff members of the Federal Statistical Office serve as contacts. They also provide detailed information material to the users interested. On the other hand, academic institutions such as the Mannheim *Zentrum für Umfragen, Methoden und Analysen* (Centre for Surveys, Methodology and Analyses - ZUMA) offer supplementary consultancy services. In addition, conferences and workshops are organised together by staff of academic institutions and the bodies of official statistics. As an example, an international conference relating to the time budget project was arranged together with the Lüneburg University in April 1998.

More information about factually anonymised microdata and the modalities of accessing them can be obtained from the following Divisions of the Federal Statistical Office:

- Sample Survey of Income and Expenditure: Division IX C, tel. + 49 - 30 / 23 24 - 67 63
- European Community Household Panel: Division I B, tel. + 49 - 611 / 75 - 33 31 and
- Time Budget Survey: Division I B, tel. + 49 - 611 / 75 - 29 03.

Sabine Köhler, tel. + 49 - 611 / 75 - 26 93

## Statistics worldwide

### Cooperation between the Federal Statistical Office and the reform countries in Central and Eastern Europe

The successful restructuring of the system of official statistics in the new federal Länder of Germany was mainly due to the cooperation between statistical experts from both the old and the new Länder. This aspect is also vital for the cooperation of the Federal Statistical Office with the National Statistical Institutes of the reform countries in Central and Eastern Europe (CEE) and the Newly Independent States (NIS). This cooperation is being organised by the Berlin-based "Centre for Central and Eastern Europe", which was established by the Federal Statistical Office (FSO).

Since 1992, the "Centre" in Berlin has been entrusted with statistical consulting and training for the restructuring of the statistical systems in the transformation countries. Commitments made in international treaties, European conventions and statistics agreements provide the legal framework for the functions assigned to the "Centre". The financial funds required for cooperation activities are supplied by the "Transform programme" of the Federal Government of Germany, international sources - mainly the European Union - and the Federal Statistical Office's own budget.

The experts of the FSO design, coordinate and implement workshops, expert missions, publications, translations and on-line services both in Germany and at the statistical offices of the reform countries. They also promote contacts to the national and regional statistical offices of the reform countries, the European Union, international organisations (UN, ECE, OECD, IMF, ILO), the statistical offices of the old and new federal Länder as well as to municipal statistical authorities in Germany.

The consulting and cooperation services of Germany's statisticians are focused on industrial statistics, foreign and domestic trade statistics, agricultural statistics, the institutional bases of statistics, public relations, business registers, classifications, national accounts, population statistics and regional statistics.

Between 1992 and 1997, about DM 2 million from the Federal Government's "Transform programme" were spent on financing statistical cooperation. This amount, however, constitutes only a small fraction of the DM 1.5 billion programme.

In cooperation with the United Nations and other international bodies, the FSO assists the reform countries in adapting their national statistical systems to international standards. The FSO is offering the experience and knowledge of its permanent staff and of experts who have served as consultants on the restructuring of statistics in the former GDR and in Central and Eastern Europe.

From 1992 to 1997, the FSO designed and implemented some 500 projects of technical cooperation with 27 reform countries. On 2,800 "man-days", some 5,000 statisticians from the reform countries were advised and trained by experts. Major support was provided by Germany during this period to the restructuring of the statistical systems in the Russian Federation, Poland, Ukraine and Belarus. Germany also maintains close bilateral relations with Kyrgyzstan, Georgia and Slovenia.

The successful restructuring of the administrative system in the new federal Länder was based on the decision to take over the institutions and the legal framework of the well-functioning social market economy and proven parliamentary democracy of Western Germany. However, some of the reform countries have not yet reached the necessary political consensus on redesigning their systems and on institutionalising both a social market economy and a parliamentary democracy. Nevertheless, an efficiently operating administration, a consensus-based political system, and an institutional and legal framework are preconditions for a well-functioning statistical system and for the provision and dissemination of reliable and internationally comparable data.

The former government-controlled and centrally structured national statistical systems in all the COMECON countries have been left behind meanwhile. New, more or less decentralised statistical systems have been created, which are committed to disseminating the data to all citizens and private institutions as well as to enterprises, etc.

The Federal Statistical Office of Germany does not have sufficient funds available to give full support to the reform countries. Cooperation, however, is both a challenge and an opportunity for the European Union and all statisticians in the East and West. Eurostat and the EU Commission assume a key role by implementing, through the Phare and Tacis programmes, joint projects, such as pilot surveys, with the National Statistical Offices of the reform countries.

The statistical budget of the Phare programme (Poland and Hungary Action for Restructuring the Economies) ran up to ECU 66 million (about DM 120 million) from 1991 to 1997. The Phare funds were also used to support reform countries other than the original recipients, Poland and Hungary. During the same period, the NIS statistical offices received ECU 30 million (about DM 50 million) of support from the Tacis programme (Technical Assistance to the Commonwealth of Independent States).

So far, the reform countries' statistical data have not met the common international standards of reliability and timeliness. Their statistical systems fail to collect and disseminate sufficient key data on enterprises, especially in industry and banking, but also in services and trade. Consumer goods are sold by millions of private households as part of "shadow economy activities" and thus bypass domestic trade corporations. The operating results reported by enterprises to the National Statistical Institutes frequently do not reflect the enterprises' business performance. Often, the decision-taking economic agents are not even interested in a high quality of their data. The "shadow economy's" share in the reform countries seems to be immense. Eurostat, the UN, the ECE and the World Bank will continue to focus their activities on this matter.

Future projects will be designed to improve the quality of the data supplied by the reform countries. Electronic data communication by on-line and Internet services will become the future technical basis of the cooperation between the Federal Statistical Office of Germany and the National Statistical Institutes of the reform countries. Germany's statistical cooperation priorities will be on strengthening contacts with the Russian Federation and the Ukraine, as

well as with the EU-accession candidates Poland, Hungary and the Czech Republic. Future technical cooperation will be focused on public relations and dissemination policy.

The restructuring of the national statistical systems in the reform countries will require more time and more funds than initially predicted and estimated. This is also a result of the changing international standards of the UN, the ECE and Eurostat. The harmonisation of the statistical systems has to be achieved parallel to their restructuring to achieve greater efficiency. Slow mental changes and the statisticians' need to adapt to new roles have to be taken into account as well.

*Zentrum Mittel- und Osteuropa, tel. + 49 - 030 / 23 24 - 63 50*

## Events

### **Scientific colloquium on "Income and wealth in Germany - Measuring and analysis"**

In cooperation with the Methodology of Statistical Surveys Committee of the German Statistical Society, the Federal Statistical Office has held annual scientific colloquia since 1992. These colloquia have been a platform for the scientific dialogue between official statistics and its major groups of users, in particular from science, economy, politics, administration and associations.

The colloquium held at the Federal Statistical Office in Wiesbaden on 13 and 14 November 1997 dealt with the theme "Income and Wealth in Germany - Measuring and Analysis". In considering a set of questions which were not only demanding from a statistical and methodological point of view, but also of special interest with regard to current policy issues, the colloquium maintained the tradition established by previous colloquia. The papers presented at the colloquium discussed theoretical issues, empirical-statistical questions as well as aspects concerning the supply of, and need for, statistical data. The colloquium was chaired by Professor Dr. Peter von der Lippe from Essen University, who also provided an introduction into the range of topics.

The first paper was delivered by Professor Dr. Wolfgang Scherf from Gießen University, who considered basic aspects of the theory on income and wealth. Empirical-statistical issues were addressed in the contributions by Professor Dr. Richard Hauser (Frankfurt/Main University) on "Polarisation tendencies in income distribution", by Dr. Hans Dietrich von Loeffelholz (Rhine-Westphalia Institute for Economic Research in Essen) on "Efficiency aspects of income from public sources - An analysis using the Rhine-Westphalia institute's tax transfer model", and by Dr. Mark Trede (Cologne University) on "Income mobility". The other contributions of the colloquium's first day discussed questions concerning the supply of, and need for, statistical data. Dr. Alfred Franz (Austrian Central Statistical Office, Vienna) furnished information about contributions to an integrated standardisation of income statistics in Europe, while Mr. Winfried Gruber from the Land Statistical Office of Baden-Württemberg described the official statistical data available for measuring poverty and wealth.

Following the paper read by Professor Dr. Peter Bareis (Hohenheim University) on "Information requirements for tax reform projects - Considering the example of the income tax commission", the colloquium's second day centred again on empirical-statistical issues. The latter topic was discussed in the contributions by Mr. Uwe Rehfeld (Association of German Pension Insurance Funds, Frankfurt/Main) on "Distributive effects of government activities, considering the example of pension insurance", by Professor Dr. Joachim Möller (Regensburg University) on "Wage disequilibrium", and by Professor Dr. Utz-Peter Reich (Fachhochschule Mainz) on "Servicing financial assets through the national product".

A volume containing all the papers of this scientific colloquium has just been published as part of the publication series "Forum der Bundesstatistik", which is issued by the Federal Statistical Office.

*Christian König, tel. + 49 - 611 / 75 - 20 77*

### **The importance of international comparability of statistics on the information society**

The Conference of the Directors-General and Presidents of the National Statistical Institutes of the European Union and the European Economic Area held a seminar on the theme "Information Society and Statistics" in Helsinki on 29 and 30 May 1997. The following contribution is a supplemented and updated version of a commentary paper presented at the conference by the Federal Statistical Office on the subject "The importance of international comparability of statistics on information society". The keynote paper on this subject was prepared by Statistics

Finland. The Statistical Office of the European Communities (Eurostat) has published an anthology containing all the contributions to the seminar.<sup>1)</sup>

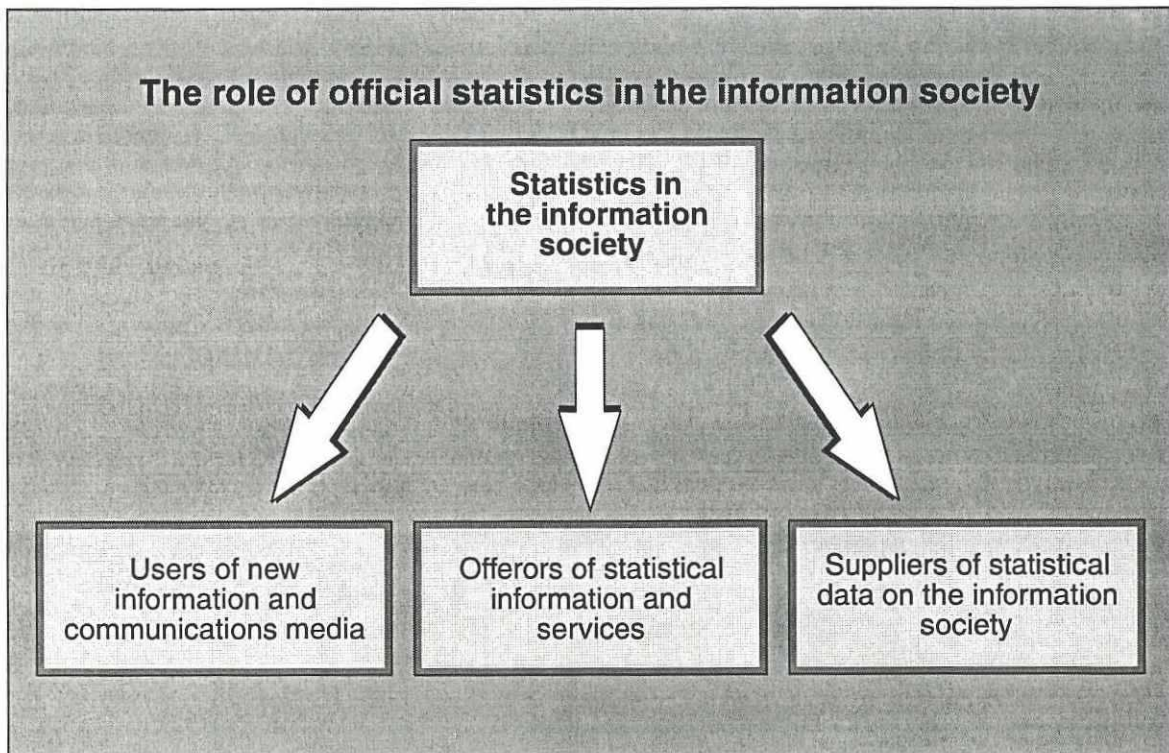
## 1 Introduction

Today, at the dawn of the 21st century, the industrial and services society is being replaced at breathtaking speed by the information society. Terms such as multimedia, data highways and the Internet have entered our language and are here to stay. All our working and everyday lives are being increasingly influenced by new information and communications technologies. There are new jobs such as "information broker" and new types of work such as "teleworking". The new media are also being put to work in fields such as education and training, medicine, environmental protection and traffic engineering.

In this age of knowledge, and in the sphere of economics in particular, rapid and up-to-date information is an essential prerequisite for success. It matters little whether new products are being developed or new markets opened up: the best possible working conditions and the best possible basis for decision-making depend on the right data being available at the right time, in the right place and in the right form - and as quickly as possible.

The information society touches official statistics in many ways so that the latter have to adapt continually to these new multimedia surroundings (see Chart 1). Firstly, statisticians are users of the new information and communications media. They use these media in all phases of statistical production, from data collection via analyses to dissemination. Secondly, statisticians themselves are important suppliers of information, who must hold their own on an enormous information market. Only if official statistics succeed in making their information so objective and of such high quality that it stands out from the mass of other information on offer, or perhaps establish their data as a standard against which to measure other information available, will official statistics be able to survive in this information market. Thirdly, the information society demands that the contents of information be adapted, since the tasks of official statistics include statistical representations of such significant phenomena as the information society itself, which is considered to be an important motor for growth and employment in modern economies.

Chart 1



The following comments on the need for statistical data on the information society to be internationally comparable deal with the problems of how to define the information society, the importance of harmonising statistical classifications and the development of a system of statistical indicators on the information society in Finland. Afterwards, the political and statistical activities in Germany will be considered, followed by some recommendations on how to move forward together at European and international levels.

1) See Eurostat: Information Society and Statistics - Proceedings of the 83rd DGINS Conference, Luxembourg, 1997



## 2 On the problems of defining the concept "information society"

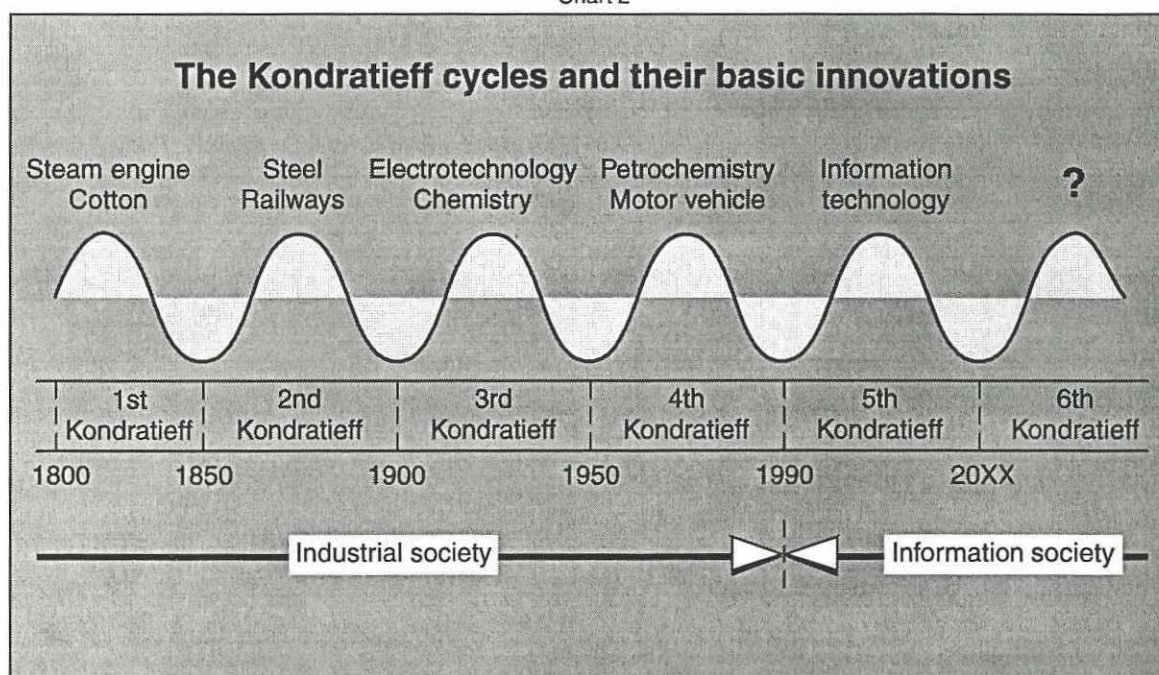
The continuous expansion of computer technology, telecommunications, electronic entertainment and audio-visual media (such as radio, television and video) has aroused worldwide discussions on the resulting transformation into an information society. Although the information society has been discussed among experts for years now, they have made very little progress in finding an exact and compound definition of the information society or society of knowledge.

To put it in simple terms, the information society is a social system where all human activities are influenced by information. But such a rough definition is not sufficient for measuring the information society in terms of statistics. The more elaborate approaches described in the literature do not all agree and still are generally rather vague. There are at least five different levels which would have to be taken into account by a statistical representation:

- (1) technical (focus on information technology);
- (2) economic (the information economy, with the emphasis on the production of goods in the field of information/communications and the dissemination of knowledge);
- (3) the labour market (focus on changes in jobs and employment);
- (4) time and space (data circulate throughout the world, undaunted by geographical distance), and
- (5) cultural/social (everyday life is swamped with data).

To illustrate the concept of the information society, people often refer to Kondratieff's "theory of the long waves".<sup>2)</sup> According to this theory, the economic development of Western Europe and the United States is characterised not only by short and medium-term cyclical fluctuations, but also by periodic long-term phases of prosperity and recession (alternating every 45 to 60 years). These long-term cycles are triggered by specific technical or economic innovations. Chart 2 shows the major innovations and the Kondratieff cycles they set off. The information society covers the current fifth wave and the sixth wave (post-2000). This model helps to explain interactions between technological, economic, social and cultural developments but cannot provide a complete definition of the information society.

Chart 2



Source: Nefiodow, L. A.: "Der sechste Kondratieff. Wege zur Produktivität und Vollbeschäftigung im Zeitalter der Information", Sankt Augustin 1996, p. 94.

As a starting point for statistical work, vague delimitations and definitions of the subject under investigation are extremely unsatisfactory. For an exact explanation of the "information society" phenomenon, with all its different facets, a lot of methodological work will have to be done and statisticians will need to cooperate closely with political, economic and scientific experts. Only then will it be possible to develop suitable statistical concepts and test them against practical and theoretical requirements.

2) See Nefiodow, L.A.: "Der sechste Kondratieff. Wege zur Produktivität und Vollbeschäftigung im Zeitalter der Information". Sankt Augustin, 1996.

Chart 3 lays out some major fields of application in the information society that will have to be examined statistically (please refer also to the comments on the work of Statistics Finland in section 4). The structure of the information economy, which is an essential sector of the information society, is outlined in Chart 4.

Chart 3

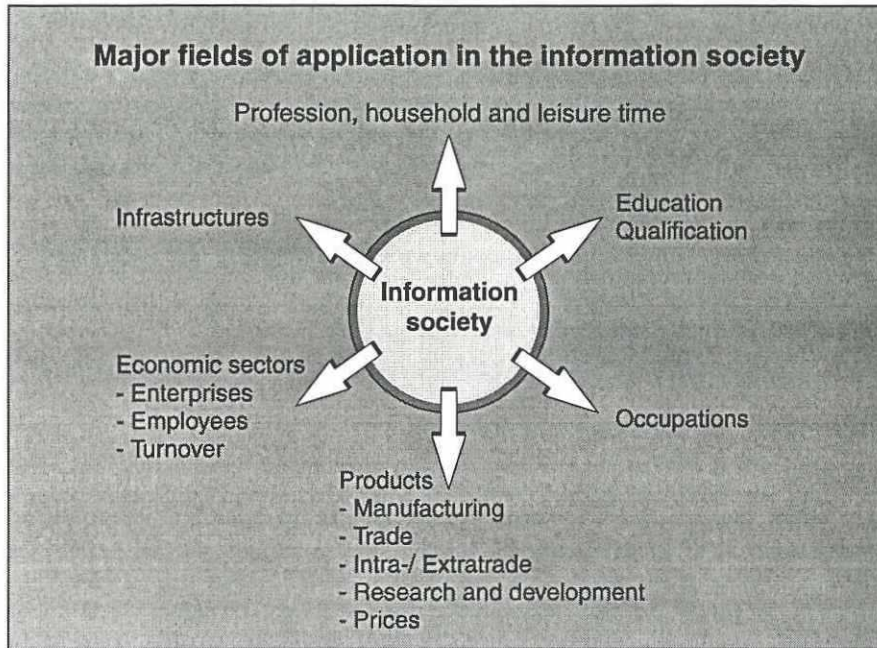
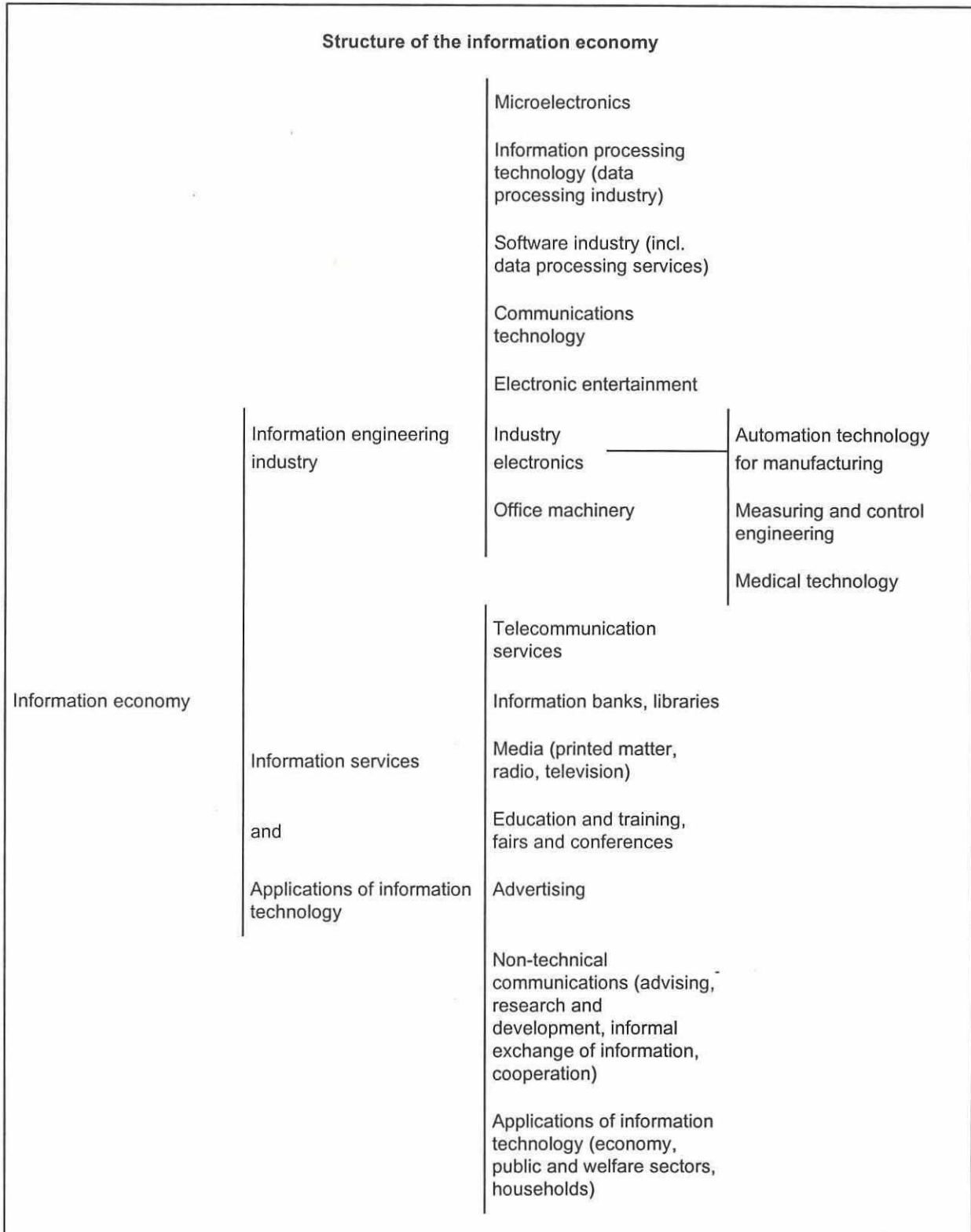


Chart 4



Source: Nefiodow, L.A.: "Der sechste Kondratieff. Wege zur Produktivität und Vollbeschäftigung im Zeitalter der Information". Sankt Augustin, 1996, p. 23

### 3 The need for international comparability

One of the keystones of modern information infrastructures is their international dimension. They are constructed in parallel with the internationalisation of economic activities and the globalisation of business strategies. This has to be taken into account when recording them statistically. The Statistical Commission of the United Nations, at its 29th session in February 1997, referred to the statistical monitoring of globalisation processes and of the worldwide development towards the information society as technical challenges for the coming years. In this connection, several expert groups were set up and the activities of others endorsed. All these joint activities are aimed at setting up standards to achieve internationally comparable results and avoid duplication of labour.

Reliable and comparable statistical data are an indispensable basis for political decisions. The individual Member States, as well as European and international bodies, are running programmes to develop the information society, some of which involve substantial sums of money.

At international level, there is the outcome of the G7 Ministerial Conference in Brussels in February 1995 on the "global information society", at which common basic principles were agreed. The OECD<sup>3)</sup> has held a number of workshops on the economic systems of the information society. Meetings to date in Toronto (June 1995), Istanbul (December 1995) and Tokyo (March 1996) focused on examining the effects of information and communications technologies and infrastructure on productivity and employment, on investigating networks and on "electronic trade". The work of the International Standardisation Organisation (ISO), the International Electrotechnical Commission (IEC) and the International Telecommunication Union (ITU) is also of importance for international harmonisation in the technical sphere.

The European Union (EU) has also introduced a multitude of measures and regulations on the information society. As long ago as 1994, the European Commission, in its White Paper on Growth, Competitiveness, Employment, referred to the information society as being "at the heart of the development model for the 21st century". The White Paper proposed the setting up of a task force on "European information infrastructures", which met under the chairmanship of EU-Commissioner Bangemann and drafted basic recommendations (The 1994 "Bangemann Report"). The Maastricht Treaty refers in Article 129 b to the objective of promoting the establishment and development of trans-European networks in the area of telecommunications, which play a key role in the present-day information society. Reference should also be made to the European Commission's Programme INFO 2000 which the Directorate-General XIII - Telecommunications, Information Market and Exploitation of Research-presented in June 1995. With a budget of ECU 65 million for 1996 to 1999, this programme is intended to promote the development of a European industry for the multimedia and to stimulate demand in this sphere. All the EU projects are coordinated by ISPO (Information Society Project Office), which was established jointly by the Directorates-General XIII and III (Industry).

In addition to the sphere of politics, enterprises, trade unions and business associations require EU-wide or internationally comparable data on the information society. A business can only remain competitive if it is continually kept up to date with economic trends in its own branch and with the most important worldwide research and development results. To cite an example: The field of telecommunications, which is an essential basis of the information society, will be liberalised in most of Europe in 1998 through the abolition of network and language monopolies. This will increase the need for data on various aspects of the telecommunication markets, mainly on the structure of telecommunication providers, the infrastructure of networks, the telecommunication services offered (volume, quality, prices, etc.) and on the use of telecommunication services.

### 4 System of indicators on the information society in Finland

Early in 1996, Statistics Finland started constructing, on behalf of the Finnish government, a system of statistical indicators for describing the information society. In this area, Statistics Finland is some way ahead of other countries in the European Union. In February 1997, Statistics Finland presented a comprehensive publication compiling important benchmark data - available in Finland as well as at European and international levels - on a variety of aspects concerning the information society.<sup>4)</sup>

In order to structure the information which flows from the various statistical sources into the system of indicators on the information society, Statistics Finland distinguishes between various levels at which the information society may be monitored and allocates appropriate indicators to these levels. The main building blocks are:

- a) the technical infrastructure;
- b) the producers of goods, services and information;
- c) products which are sold, traded or developed;
- d) occupations in the field of information;
- e) the level of qualification/training of employees (population), and

3) OECD = Organisation for Economic Co-operation and Development, Paris

4) See Statistics Finland: "On the Road to the Finnish Information Society", Helsinki 1997.

f) professional, household and leisure-time applications.

The Schedule below presents examples for the respective statistical indicators.

The systematic approach chosen by Statistics Finland could be a model for other statistical offices and further work to construct similar systems of indicators at both European and international levels. The experiences gained by Statistics Finland are of great value to the work of expert bodies, for instance at Eurostat.

**Schedule: Statistical indicators for describing the information society**

Major applications	Examples for statistical indicators
Infrastructure	<ul style="list-style-type: none"> <li>• Internet connections per 1000 inhabitants</li> <li>• Telephones per 100 inhabitants</li> <li>• Mobile telephones per 100 inhabitants</li> <li>• Personal computers per 100 inhabitants/ 100 employees</li> <li>• Cable TV or satellite TV access</li> <li>• Radios, TV sets, telefax connections per 100 inhabitants</li> <li>• Number of public libraries/ number of borrowers</li> <li>• Users of telebanking</li> <li>• Number of industrial robots per 1000 employees</li> <li>• Information technology spending as a proportion of gross domestic product</li> </ul>
Producers of goods, services, information	<ul style="list-style-type: none"> <li>• Enterprises in the information sector:               <ul style="list-style-type: none"> <li>- Number by economic activity</li> <li>- Turnover</li> <li>- Employees/persons engaged</li> <li>- Wages and salaries</li> <li>- Investment</li> </ul> </li> <li>• Value added in the sphere of telecommunications and software production</li> <li>• Value added in data processing services</li> <li>• Mass media turnover (newspapers, cable TV, cinemas, etc.)/ proportion of gross domestic product</li> </ul>
Goods	<ul style="list-style-type: none"> <li>• Goods and services in the sphere of information and communications               <ul style="list-style-type: none"> <li>- Production</li> <li>- Trade (market shares)</li> <li>- Export/import</li> <li>- Research and development</li> </ul> </li> </ul>
Occupations	<ul style="list-style-type: none"> <li>• Employees in "information occupations"</li> </ul>
Education/qualification	<ul style="list-style-type: none"> <li>• Educational structure of the population</li> <li>• Persons with qualifications in information technology/telecommunications</li> <li>• Students/ new students of information technology and new media studies</li> <li>• Degrees in information technology and new media studies</li> <li>• Persons speaking foreign languages</li> </ul>
Professional, household and leisure-time applications	<ul style="list-style-type: none"> <li>• Proportion of employees using information technology at work, by sex, age, status in employment, employer, region</li> <li>• Use of telefax and e-mail at work</li> <li>• Average working time spent on using information technology at work</li> <li>• Equipment of private households with colour TV sets, video recorders, mobile telephones, computers, etc.</li> <li>• Expenditure by private households on printed media, electronic goods, etc.</li> <li>• Proportion of persons (over 10 years of age) who read newspapers every day</li> <li>• Time spent on watching TV, reading newspapers, playing video games, etc.</li> </ul>

Source: Compiled on the basis of the publication by Statistics Finland: "On the Road to the Finnish Information Society", Helsinki, 1997.

## 5 Adapting statistical classifications

The experiences gathered in Finland show that it is not easy to be the advance guard and build up a complex system of indicators on the phenomenon known as the information society without generally valid definitions and classifications.

But appropriate, compatible classifications are a basic requirement for harmonised statistics at EU or international level. For this reason, the European Commission and international institutions have worked closely together with the national statistical offices to produce uniform statistical classifications such as those for economic activities and for goods. The legislation approved in this connection allows the Member States a certain amount of room for manoeuvre, so that they can introduce more detailed technical breakdowns for their own national statistical purposes.

The following European and international classifications will be important, among others, in setting up a statistical representation of the information society: classifications of economic activities (NACE Rev. 1 or ISIC Rev. 3)<sup>5)</sup> and of products (CPA or CPC)<sup>6)</sup>, classifications based on tariff nomenclatures (CN or HS)<sup>7)</sup>, the International Standard Classification of Occupations (ISCO)<sup>8)</sup>, and the International Standard Classification of Education (ISCED)<sup>9)</sup>.

In general, classifications lag behind innovative developments because they are updated only at fairly long intervals. Problems arise, for example, as a result of the swift changes in the products and services available on the information market, and this makes it very difficult to produce classifications which do not clash with one another and are going to remain valid for a long time. Cooperation at European and international levels is urgently required in this case. The technical work has already begun and must continue in close cooperation between statistical and classification experts at national, European and international levels. The Statistical Commission of the United Nations agreed at its meeting in February 1997 to take greater account of developments in modern information services when classifications are revised. In this connection, close cooperation was recommended between the group of experts working on economic and social statistics classifications and the Voorburg group working on services statistics. The Eurostat Working Group "Statistics for the Information Society", which was established in December 1996, will also deal with these issues.

## 6 A look at Germany

The Federal Government considers that organising the transformation of the Federal Republic of Germany into an information society will be one of the most important tasks for the future. At the beginning of 1996, therefore, it presented a comprehensive report entitled "Info 2000 - Deutschlands Weg in die Informations-gesellschaft", which had been spearheaded by the Federal Ministry of Economics. As both an inventory of the present and the government's action plan for the future, the report commented on moves in various policy spheres such as economics, education, health care, transport and the environment. Further liberalisation in the sphere of telecommunications is crucial in this connection, along with the creation of national, uniform basic legal conditions for the supply and use of new information and communications services. The Federal Government places particular emphasis on the importance of cooperation at European and international levels. In October 1997, a report on the current state of the implementation of the Programme Info 2000 was published<sup>10)</sup>.

Official statistics in Germany, too, consider the information society to be an enormous challenge and opportunity. The Federal Statistical Office and the statistical offices of the Länder have for many years been using modern information technology, with the specific objective of producing statistics more efficiently at all stages, from the collection of data to the dissemination of results. In this connection, the Federal Statistical Office initiated the forward programme "Statistik 2000" which is being implemented step by step<sup>11)</sup>.

In view of the growing flood of information, the user-oriented preparation of data and easy access to the information required are becoming increasingly important. The Federal Statistical Office is using the new media more and more for this purpose and has, for example, since March 1996 been on the Internet worldwide, offering comprehensive data. At present, the Office's site is accessed around 400 000 times a month.

In order to be an authoritative partner in the information society, official statistics attach particular importance to an ongoing exchange of information with clients and users. At the Industry Fair in Hanover on 15 April 1997, for example, the Federal Statistical Office hosted a panel discussion on the theme of "Statistics and economics - partners in the information society", in which national and European political representatives took part, along with

5) NACE = Statistical Classification of Economic Activities in the European Community; ISIC = International Standard Industrial Classification of All Economic Activities (ed.: United Nations).

6) CPA = Statistical Classification of Products by Activity in the EC; CPC = Central Product Classification (ed.: United Nations).

7) CN = Combined Nomenclature (ed.: EU); HS = Harmonised Commodity Description and Coding System (ed.: Customs Co-operation Council).

8) Ed.: International Labour Organisation, Geneva.

9) Ed.: UNESCO (United Nations Educational, Scientific and Cultural Organization).

10) See Presse- und Informationsamt der Bundesregierung: "Info 2000 - Deutschlands Weg in die Informationsgesellschaft, Fortschrittsbericht", published in "Aktuelle Beiträge zur Wirtschafts- und Finanzpolitik", No.16/1997, Bonn, 14 October 1997.

11) See also: Merk, H.G.: "Statistik auf dem Weg ins nächste Jahrtausend", published in: Merk, H.G./Bürgin, G. et al.: "Statistik 2000 - Zukunftsaufgaben der amtlichen Statistik", Volume 27 of the publication series "Forum der Bundesstatistik", published by the Federal Statistical Office, Wiesbaden, 1994, p. 13 ff.

statisticians. The STAT EXPO Fair presented novelties from the world of statistics in the age of information. It took place in May 1997 and was linked up with INFOBASE, an international fair on information systems and databases, held in Frankfurt on the Main.

As yet, German official statistics have not - unlike Finland - made any comprehensive attempt to describe the information society in statistical terms. On the whole, the stock of available data in this area is insufficient and requires improvement - not least because the supply of data on services is at present far from complete. Various national and international activities have been started to close the gaps. These activities comprise, for example, the setting up of a comprehensive business register, and the work done for implementing the EC Structural Regulation.

Even if, with the data currently available, no systematic overall picture can be painted of the information society, relevant information is available in almost all statistical spheres, and certain areas of the information market have been specifically analysed by official statistics for many years now. Official statistics in Germany have, for example, been producing a price index for postal and telecommunication services since the fifties. In recent years, various pilot projects have been run on individual areas of the information economy, in particular "telecommunications" and "parcel, express and courier services"<sup>12)</sup>.

After the Telecommunication Law (TKG) was passed on 25 July 1996, the supply of data on telecommunications has markedly improved. Article 72 of the law stipulates that the newly established regulating authority for telecommunications and postal services is entitled to request information from telecommunication suppliers so that it can meet its tasks (promoting competition, ensuring a nationwide, adequate and sufficient supply of telecommunication services to the population and the economy). The data to be covered for purposes of monitoring the market include information on the economic position of telecommunication suppliers, especially sales figures. Since July 1997, the Federal Office for Posts and Telecommunications has been conducting a primary survey on the basis of which statistical data will be disseminated in future.

In addition, the content of statistical surveys has continually been adjusted to take account of new developments in society. As of 1998, the five-yearly sample survey on income and expenditure thus includes key questions on the equipment of private households with consumer goods that are connected with the new media. Apart from the question relating to personal computers, there are, for example, questions on ISDN connections, modems for data transmission, satellite equipment or mobile telephones, as well as the use of Internet and on-line services.

All of these adjustments are made selectively. When it comes to a general extension of the statistical programme, the precarious financial situation of official statistics in Germany leads to bottlenecks, and, therefore, priorities have to be determined. With its "lean government" objective in mind, the Federal Government has decided, among other things, that the federal statistics programme should be stripped to the bare bones. In the forefront of the European requirements which have to be met at present are the Maastricht Treaty convergence criteria. For all other requirements, we must concentrate on key points, and this also applies to the data available on the information society.

## 7 Recommendations for the future

In order to arrive at internationally comparable data, official statistics should proceed in stages, paying attention to the following points:

### a) *Ascertaining common data requirements*

To achieve this, agreement has to be reached with data users from the worlds of politics, economics and science at national, European and international levels.

Bearing in mind the principles of subsidiarity, proportionality and the cost/benefit ratio, priorities should be laid down, and statistical key indicators (benchmark data) of international relevance should be determined. The data requirements should not be measured in terms of maximum desirability, but in view of what is necessary and feasible.

### b) *Analysing the present stock of data*

In order to meet European/international data requirements, it has to be checked whether the statistical information currently available to the Member States, or a harmonisation of these results, would suffice. The inventory of what is available should include data supplied by third parties (such as market research institutes and associations). New statistical projects should be avoided or, if they are necessary, rigorously checked from the point of view of the burden on respondents.

### c) *Checking existing classifications, definitions and methods*

These must be checked and ongoing adjustments made to take account of current developments. To this end, close cooperation is needed between statistical and classification experts at national, European and international levels.

<sup>12)</sup> See also Hake, L.: Piloterhebung im Bereich der Paket-, Expreß-, und Kurierdienste", published in: "Internationales Verkehrswesen", Number 11, 1996, p. 12 ff.

d) *Work-sharing with non-official statistics*

It may be logical to meet data requirements by sharing the work involved with non-official statistics. Market and opinion research institutes can make valuable contributions especially in the field of "soft" or subjective data.

e) *Need for the right metadata*

For a statistical description of a field so imprecisely defined as the information society, informative metadata on the underlying definitions and methods are indispensable.

f) *Publishing/disseminating*

Internationally comparable benchmark data should be published in the form of joint, thematic cross-sectional publications produced by the institutions involved.

In recent months, European and international cooperation has resulted in a whole series of publications in the field of information and communications. Mention should be made of the publication produced jointly by Eurostat, the OECD and the International Telecommunication Union (ITU) entitled "Communication indicators for major economies 1995", which gives a short, straightforward list of important indicators for the telecommunications sector, radio, television and computers, explaining differences in definitions of the characteristics shown from one Member State to another. The main German contribution to this publication was made by the Federal Office for Posts und Telecommunications. The annual Eurostat publication on communications services and a handbook on the audiovisual sector<sup>13)</sup> produced in 1995 in cooperation with the Member States show that many statistical data are available in these areas in the EU Member States and in EFTA<sup>14)</sup>, even if they are not always fully comparable. It is also planned to produce a compendium in the form of a joint publication by Eurostat and the Member States, which will cover existing projects such as the information systems COINS<sup>15)</sup> and AUVIS<sup>16)</sup>.

Finally, it has to be emphasised that the laying down of (international) standards and the chance to make statistical data comparable could strengthen the role played by official statistics as an authoritative partner in the information society at national, European and international levels. Statisticians should make common use of this opportunity.

*Sabine Köhler / Günter Kopsch, tel.: + 49 - 611 / 75 - 26 93 or 75 - 2110*

13) Eurostat (ed.): "Audiovisual Statistics Report 1995".

14) EFTA = European Free Trade Association, Geneva.

15) COINS = Communications and Information Statistics

16) AUVIS = Audio Visual Statistics