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The catchword

Design and drawing of the household sample of the 2011 Census

After nearly a quarter of a century, a census will be conducted again in Germany (www.zensus2011.de). It will be conducted as a register-based census based on a new methodology. Contrary to the previous approach, no complete enumeration will be conducted, but data from various registers will be used as a basis for the next census. To identify the errors in the registers (undercoverage and overcoverage) for statistical correction and to obtain information on issues which, although relevant for the census, are not contained in registers, an additional household sample survey will be conducted. Some 9.3% of the inhabitants of Germany will be asked to provide information for that sample survey in May 2011. By combining registers with a sample, the staff members of the statistical offices in Germany break new ground in methodology. This applies in particular to drawing the household sample.

Framework conditions

When developing the sample design, legal provisions had to be taken into account (2011 Census Act, sample ordinance relating to the Census Act). Pursuant to the sample ordinance, the total sample size permitted is 9.6% of the official number of inhabitants on 31 December 2009. That figure was chosen to meet a provision of the Census Act specifying that, to a high degree of probability, the number of persons actually included in the sample should not exceed 10%. Also, the sample design had to be tailored to the precise targets defined in the Census Act for various regional levels (municipalities from 10,000 inhabitants, city districts, associations of municipalities in Rheinland-Pfalz, *Kreise* (administrative districts)). To identify outdated entries and missing entries in the population registers, complete addresses must be selected and all people living at those addresses must be covered. The sample design is based on recommendations of a sample research project steered by the University of Trier and GESIS Mannheim.

Sampling frame and sampling units

The sampling frame used is the register of addresses and buildings (*Anschriften- und Gebäuderegister - AGR*) as at 1 September 2010, which was set up for the census. Addresses eligible for sampling are only those that are contained in the AGR as an address with housing space, with the exception of sensitive special-facility addresses (for example, prisons, hospitals). 19,930,373 addresses with a total of 84,188,246 people registered to have their main or second residence there have been classified as relevant for the sample.

Stratification

At the first stage, the entire territory of the Federal Republic of Germany was subdivided into non-overlapping sampling points. With regard to the precise targets laid down in the Census Act, the following subdivision has been chosen:

- Districts of cities with a minimum of 400,000 inhabitants (sampling point type 0),
- Municipalities with a minimum of 10,000 inhabitants, unless belonging to type 0 (sampling point type 1),
- Group of smaller municipalities with less than 10,000 inhabitants within an association of municipalities if the total of the group has a minimum of 10,000 inhabitants (sampling point type 2),
- Group of all remaining municipalities of a *Kreis* (administrative district) (sampling point type 3).

This resulted in a total of 2,365 sampling points.

According to traditional sampling theory, intelligent stratification – involving a highly homogeneous population within any stratum and rather heterogeneous qualities between strata – should lead to a marked reduction of sampling errors. By using the address size – measured by the number of persons registered –, a central and highly correlated variable has been chosen as a stratification variable. At the second stage, eight classes of equal size in terms of number of persons from the AGR were created within each sampling point, in an ascending order by address size class. This means that the address size class intervals are not predefined for each sampling point; they rather vary according to the individual structure of the address size classes within the sampling point. For example, in sampling point A, the third class may contain between 3 and 4 persons, while in another sampling point B the third class contains addresses with 2 to 3 persons.

Actually, a stratum consists of the cross combination of the sampling point and the address size class as defined above.

Allocating the sample size to the strata

Part of the sample size – that is 10% for the non-sensitive special-facility addresses – were not included in the allocation procedure described below because non-sensitive special-facility addresses are not relevant for identifying the register errors from the sample. The number of sample-relevant persons remaining after deduction from the permitted total sample size should now be allocated in an optimal way to obtain an effective sample.

A method used for stratification in traditional statistics is “optimum allocation” as it is called. That method minimises the variance of a target variable. When applying it, the sample size needed to obtain a good estimate is smaller in very homogeneous strata – depending on the contribution to the total variance in those strata – than in relatively heterogeneous strata. However, to meet the sample requirements of the census, the method had to be modified as follows:

First of all, the total sample size was defined for persons, although the items actually sampled were addresses.

Precise targets in terms of determining the official number of inhabitants were set only for municipalities of types 0 and 1 and for associations of municipalities in Rheinland-Pfalz, but not for the other municipalities. Consequently, optimisation was required only for the sampling points involving precise targets. The strata of all the other sampling points were given a standard sampling fraction of 5%.

Also, there were requirements regarding minimum and maximum sampling fractions in the strata. Those requirements had been set with a view to the expected application of small area methods because, in case of extremely disproportional sampling, important assumptions regarding the quality of those estimation methods can no longer be met. The bodies involved agreed on the following lower and upper limits based on the official numbers of inhabitants:

- Sampling points with numbers of inhabitants $> 100,000$ or sampling point type 0 \Rightarrow sampling fraction per stratum between 2 and 40%,
- Sampling points with numbers of inhabitants between 30,000 and under 100,000 \Rightarrow sampling fraction per stratum between 4 and 40%
- Sampling points with numbers of inhabitants between 10,000 and under 30,000 \Rightarrow sampling fraction per stratum between 5 and 50%.

Those commissioned to carry out the sample research project supplied Destatis with an algorithm that had been developed in the software package R and is a version of the traditional

optimum allocation method that has been generalised with regard to the above secondary condition.

Sampling

After the sample sizes had been allocated to the strata, sampling was performed by means of the *proc surveyselect* procedure of the SAS statistical software package. For non-special-facility addresses, simple random sampling was chosen within the strata. For the whole of Germany, 1,950,420 addresses with 7,856,037 registered persons were selected for the survey. This is a total person-related sampling fraction of 9.33%.

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Methods of federal statistics – Further development

Usability tests of online questionnaires

1. Background

The number of internet users in the Federal Republic of Germany has increased sharply over the last few years (while 52% of all households used the internet in 2003, the percentage was 73% in 2009).¹ Parallel to that, the number of online surveys rose continuously. The Federal Statistical Office follows that development and makes increasing use of online data collection methods, also for household surveys. This involves a number of advantages, such as lower cost in the long term, high availability of specific samples, and the respondents are able to organise their time themselves when completing the questionnaire. However, there are also a number of disadvantages, such as sampling problems (representativeness of the sample), non-controllability of situational influences, technical problems, and problems of understanding how to handle the system, which subsequently may lead to high abandon rates.² To avoid abandon rates and poor data quality, online questionnaires must systematically be tested for high user-friendliness before they are used in the field.

Generally, a variety of test methods are available to evaluate questionnaires. Depending on what is to be examined, the methods can be used individually or in combination. A distinction is often made between qualitative and quantitative test methods. In qualitative test methods, a rather small number of probands (10-20 people) are questioned using methods of qualitative and cognitive psychological research, which may provide information on problems in understanding the handling of a tool, the layout, or individual terms and questions. In quantitative test methods, a large number of probands (> 100) are questioned, so that the frequency of problems can be assessed.³

1 <http://www.destatis.de/jetspeed/portal/cms/Sites/destatis/Internet/DE/Content/Statistiken/Informationsgesellschaft/PrivateHaushalte/Tabellen/Content75/ZeitvergleichComputernutzung,templateId=renderPrint.psml>. Download: 11 May 2010.

2 Häder, Michael (2006). *Empirische Sozialforschung. Eine Einführung*. VS, Wiesbaden 2006: 237.

3 Blanke, Karen/Tries, Simone (2009): Implementation of a pretest laboratory and questionnaire testing in official statistics. In: *Methods – Approaches – Developments*. Information of the German Federal Statistical Office. Edition 1: 6-9. http://www.destatis.de/jetspeed/portal/cms/Sites/destatis/Internet/EN/Content/Wissenschaftsforum/MethodsApproaches/Infos/mad1__2009,property=file.pdf Download: 19 April, 2010.

The methods mentioned are applied to test both paper and online questionnaires. Generally, however, online questionnaires differ from paper questionnaires in terms of various criteria: For example, computer technology has an impact on the questionnaire design; filters can automatically be programmed and, consequently, need not be understood by the respondents, explanations can be clicked on so that they can directly be assigned to specific questions. In addition, when reading a text on a computer screen, people “scan” the text for key words rather than reading it completely. So, in online questionnaires, the wording of questions has to be rather short and concise. This is why, in the pretest laboratory of the Federal Statistical Office, usability tests are performed to test online questionnaires for their user-friendliness. Following a definition of the International Standardization Organization (ISO), “usability means people who use the product can do so quickly and easily to accomplish their tasks.”¹

In usability tests, the Federal Statistical Office applies a three-element method consisting of observation, cognitive interview, and eye tracking. The results obtained are compared with each other (method triangulation²).

This article describes in detail the methodological test steps and explains why comparing the individual methods with each other can enhance the quality of qualitative pretest results. As is also shown, such a combination of methods is a major form of further development regarding tests for user-friendliness, especially in the context of online questionnaire pretests.

2. Performing a usability test

2.1. Observing the self-completion of the questionnaire

While the test person (TP) is completing the online questionnaire, his/her facial expressions and gestures, what happens on the screen, and eye movements (eye tracking) are observed and recorded audio-visually. Anything unusual observed for the following items is noted down:

The process of completion gives a concrete impression of how respondents cope with a questionnaire. For example, clicking forward and back indicates that the TP does not remember relevant information from a previous page. It also reveals for which questions the TP uses the online help or whether he/she omits specific questions.

Another source of information is the TP’s eye movement (eye tracking). It is observed here what elements the respondent’s look is directed at and how long it stays on individual elements, such as on specific terms or symbols. An eye movement criss-crossing across a questionnaire page indicates that the TP is not coping with the page. The impression is that the TP is looking for a specific piece of information.

Facial expressions, gestures, and verbal comments give an idea of which parts of the questionnaire pose problems to a TP. Frowning or shaking his/her head indicate that the TP is under stress. Clearing his/her throat or looking out of the window show that the TP has to think hard, for example, because he/she has difficulty remembering something.

An advantage of observation is that interviewers get a first impression of how respondents cope with the questionnaire when they are on their own and free from influence. However, behaviour and eye movement often occur very rapidly and are not always clear to understand. For example,

1 ISO norm DIN EN ISO 9241, 11: 2006.

2 In the triangulation technique, conclusions drawn from qualitative data are tested and verified. A method’s weak points should be offset by another method’s strong points and subjective interpretation should be avoided: “...a plan of action that will raise sociologists above personalistic bias that stem from single methodologies. By combining methods and investigators in the same study, observers can partially overcome the deficiencies that flow from one investigator and/or method”. (Denzin 1970: 300). Flick further defines triangulation as “[...] assuming various perspectives when examining the item concerned or, more generally: when answering questions of research. [...] Those perspectives should be treated and implemented in a way ensuring maximum equality and equal consistency. Triangulation (e.g. of various methods or various data types) should generally allow gaining more findings, for example, at various levels, which consequently go beyond what could be achieved by one approach.” (Flick 2008: 12) [Translation of original German quotation]

frowning may mean that the TP does not remember something or that he/she does not understand the wording of a question. In addition, the intensity of facial expressions and gestures differ between TPs, so that in some cases interpretation is impossible. Also, by observation alone one cannot understand cognitive processes. For those reasons, it is indispensable to combine the method of observation with other methods.

2.2. Cognitive interview

Subsequent to questionnaire completion, a cognitive interview is conducted. The purpose of the method is to render transparent cognitive processes that run during the completion of a questionnaire and to collect proposals for improvement. It is particularly important to find out how respondents get from a question to an answer, whether the questionnaire layout and navigation are clear and helpful to respondents, whether questions or wordings are unclear, whether applicable answer categories are available, and whether respondents read explanatory notes on the questions.¹ Cognitive interviews are conducted in a structured and (partially) standardised way, using an interview guide, to ensure comparability between probands. For example, TPs are requested in usability tests to think aloud when completing the questionnaire. Probes are used by the interviewers to exactly identify reasons why TPs approach the questionnaire in a specific way.²

By applying cognitive interviewing techniques, many reasons for missing or incorrect questionnaire entries can be identified in a neutral way. Nevertheless, the following sources of error may occur, which qualitative social research is often reproached with:

- a) Biases through interviewer effects, such as the impact of social desirability or acquiescence, caused by leading questions asked by the interviewer.
- b) Subjective interpretation of the test person's statements by the interviewer.

To avoid subjective interpretation, it is necessary to compare the information from the interview with information from observation and with data from eye tracking.

2.3. Eye-tracking data

Eye-tracking data can subsequently be used for detailed analysis of what part of the questionnaire the respondent paid attention to. This allows drawing conclusions on what information is used by respondents to answer a question (e.g. whether, and for how long, they read pre-defined answer categories or explanatory notes) and what parts of a question cause problems of understanding (for example, individual terms, negations, etc.).

In a pretest, the following individual data from gaze data analysis are used:

- a) Sinn Builder (Heatmap and Attention Map): This is a visualisation of gaze data for a questionnaire page to get an overview of what a respondent mainly paid attention to on that page of the questionnaire.
- b) Scan Path: The chronological sequence of fixations (points exactly viewed by test persons) and saccades (eye movement from one fixation to the next), which together represent the scan path. The length of any fixation is indicated in milliseconds.
- c) Areas of Interest (AOIs): Examining the AOIs is the central element of eye-tracking data analysis. The key figures examined for the pre-defined AOIs include the following:

1 For the use of cognitive interviews in pretests see Prüfer, P./Rexrodt, M. (2005): *Kognitive Interviews*. In: ZUMA How-to-Series No 15, Mannheim. http://www.gesis.org/fileadmin/upload/forschung/publikationen/gesis_reihen/howto/How_to15PP_MR.pdf. Download 11 May 2010.

2 For the techniques and the conduct of cognitive interviews see in particular Willis, G. B. (2005): "Cognitive Interviewing – A Tool for Improving Questionnaire Design", Thousand Oaks (CA): Sage Publications.

Fixation Count, Gaze Duration and Mean Fixation Duration. It is thus possible to identify the elements on the questionnaire page that were viewed for a particular long time and the items on the page to which the test person paid no attention at all. Also, questions can be compared with each other in terms of different viewing lengths. Conclusions can be drawn as to whether the test persons understood the questions.

Contrary to cognitive interviews, eye tracking provides data that are not subject to any interviewer influence. In addition, eye movements reflect the (in part unconscious) behaviour of respondents, which sometimes cannot be expressed by words.

It must be criticised, however, that eye movements can be interpreted in different ways. Looking long at a specific spot of the questionnaire may either mean that the test person has problems with that questionnaire item or that the respondent is just interested in that item. Also, the reasons for problems occurring in a questionnaire cannot be explained by eye tracking alone. And the method as such does not provide any neutral proposals for optimisation. This is why eye tracking alone is not sufficient when testing a questionnaire.

2.4. Method triangulation

To achieve high-quality results in the pretest, it is necessary to compare the individual results obtained from the methods described. They illustrate problems from various aspects and can complement each other. For example, cognitive interviews may provide information on why a test person looked at a specific question for an above-average time. In turn, eye tracking can be used to verify an assumption from the observation or a statement from the cognitive interview. An example is a question from the cognitive interview, such as: "Did you read the instructions on how to complete the questionnaire?" While a test person may confirm the question in the interview because social desirability plays a role here, eye tracking can confirm whether the statement is true. Another example of the necessity of combining the methods is this situation from a pretest: During observation, the interviewers notice that the respondent's gaze moves several times from the top of a questionnaire page to the bottom and back up again. This observation suggests that the respondent is looking for something and is not coping with the questionnaire page. In a subsequent cognitive interview, the respondent can directly be asked why he/she looked about in a searching way and what he/she was looking for.

3. Outlook

Eye tracking has been applied in the commercial field for some years. The user-friendliness of homepages, the impact of advertising, and the reader-friendliness of online magazines are just a few examples of eye tracking studies.

Applying the rather new technique to the analysis of online questionnaires has so far been rare and has mainly been limited to individual research issues such as examining response orders, the use of explanatory notes¹ or the study of question wordings.²

The Federal Statistical Office uses eye tracking in a method triangulation to critically compare with each other the results from eye tracking, observation and cognitive interviews and to arrive at a consistent overall result. Further online questionnaire pretests will have to show whether that mix of methods has become established.

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1 Galesic, M., Tourangeau, R., Couper, M., & Conrad, F. (2008). Eye-Tracking Data: New insights on response order effects and other signs of cognitive shortcuts in survey responding. *Public Opinion Quarterly*, 72, 892-913.

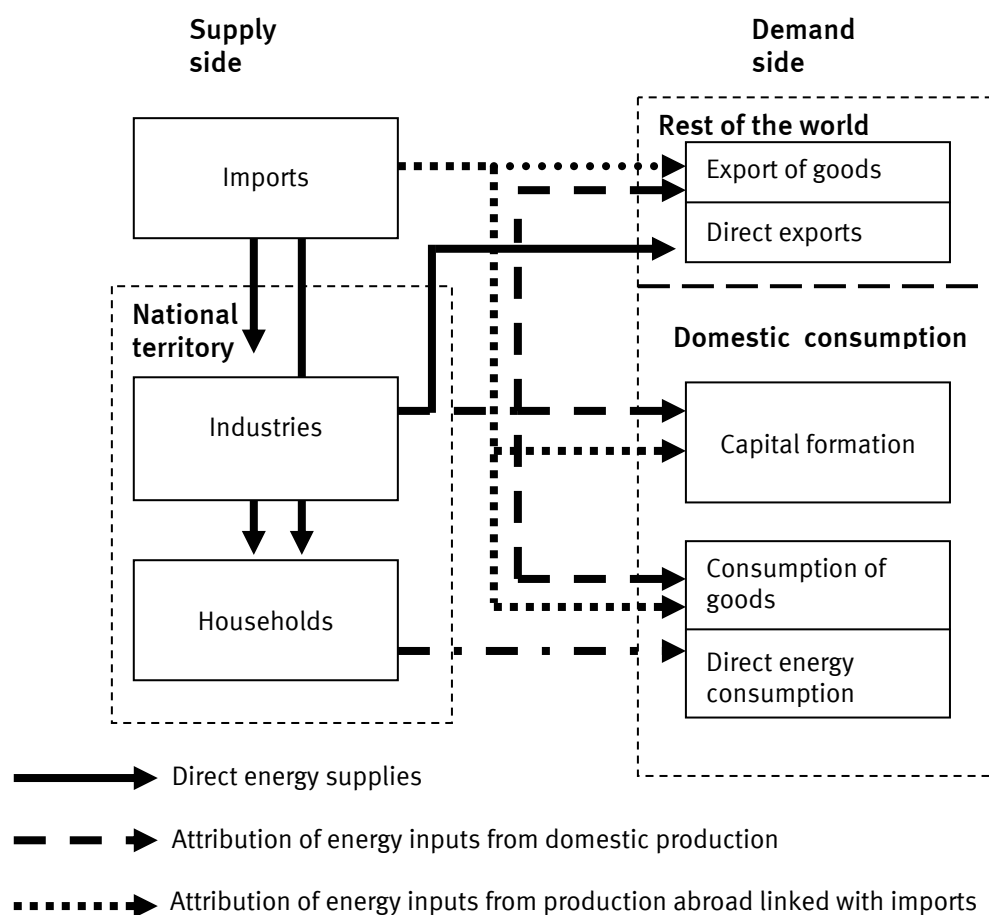
2 Lenzner, T., Kaczmirek, L. & Galesic, M. (2010). Seeing through the Eyes of a Respondent: An Eye-Tracking Study on Survey Question Comprehension. Manuscript under review.

Calculating the energy and carbon dioxide content of goods

At a press conference in 2007, the Federal Statistical Office for the first time released results of environmental-economic accounting regarding the energy and carbon dioxide (CO₂) content of goods¹. The presentation focused on a comparison of the energy and CO₂ content of import and export goods. At another press conference in 2008, more data were presented on the energy and CO₂ content of consumer goods².

The purpose of the given computations is to completely cover and present energy consumption and emissions of CO₂ as the major greenhouse gas in relation to the consumption of goods. Typically, energy consumption and CO₂ emissions are shown for a given territory in terms of origin, broken down by sectors which directly exploit energy sources and cause emissions. This perspective is to be extended by a consumption-oriented approach to cover the total input of energy (and associated CO₂ emissions) in producing goods for certain consumption categories (individual consumption, capital formation, exports). In this context both the domestic input of energy and the energy input abroad that is associated with the manufacture of goods to be imported are taken into consideration.

Diagram 1: Energy consumption based on the production-oriented and the consumption-oriented approach



Federal Statistical Office of Germany / Environmental Economic Accounting 2010

1 Press conference on Environmental-economic aspects of globalisation in Berlin on 13 November 2007. Documents of the press conference (statement, accompanying information) are available as a download at www.destatis.de (path: Environment – Environmental-economic accounting – Publications – Press conferences on environmental-economic accounting).

2 Press conference on Energy consumption of households – housing, mobility, consumption and environment in Berlin on 5 November 2008. The associated results are also available as a download.

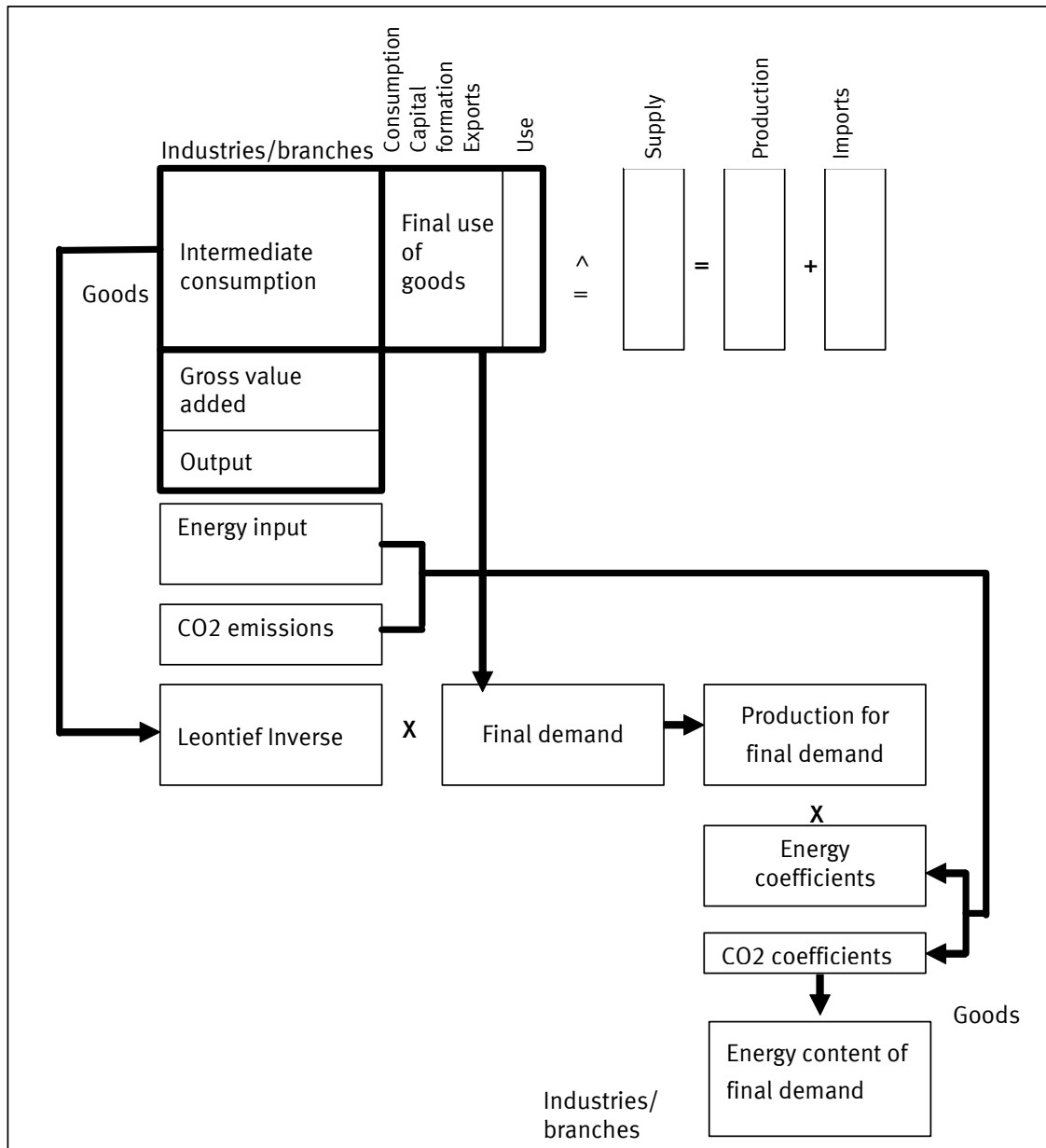
The results permit a more detailed analysis of the determinants of energy consumption and CO₂ emissions on the demand side. Thus, for instance, the following questions can be answered (here – as an example – regarding the energy content, though the same could be done for CO₂ emissions):

- The demand for what goods is associated with a high specific energy input?
- How has the ratio of energy input to monetary demand (energy intensity) changed over time?
- What are the individual shares of production abroad and domestic production in the total energy content of consumer goods?
- What energy content is created in producing goods to be exported?
- What energy content is created in producing goods to be imported?
- What countries of origin have what shares in the total energy content?

The calculation model

The model used to calculate the energy and CO₂ content of goods is based on an extended input-output analysis. By means of the input-output analysis, both production and primary inputs (e.g. persons employed, energy) can be assigned to (final) demand categories and goods. The input-output table presents, with a sectoral breakdown, links between production factors and final demand (final use of goods) by demand categories and groups of goods.

Diagram 2: Schematic overview of calculating the energy and CO₂ content of goods



Federal Statistical Office, Environmental-Economic Accounting, 2010

In addition to input-output tables, the calculation model requires coefficients of the energy input and the CO₂ emissions of the different domestic branches and the branches in countries abroad. Energy coefficients reflect the energy consumption of branches in relation to their output. As for the domestic branches, the coefficients can be determined by means of the energy flow accounts of environmental-economic accounting. In the energy flow accounts, the energy balance data on the energy consumption of different transformation and consumption sectors are assigned to the consumption areas broken down by branches (and households)¹. Using the data on energy consumption, the CO₂ coefficients of branches can be calculated for different energy sources. During the burning of both heating and motor fuels, the embodied carbon is completely released. Therefore, fixed emission coefficients for fossil energy sources can be used in determining the

¹ Data on energy supply and use are published every year in part 2 "Energy – raw materials", chapter 3 "Energy" of a volume of tables on environmental-economic accounting which is released as an online publication at www.destatis.de (path: Topics – Further topics – Environment – Environmental-economic accounting – Publications – Tables on EEA).

CO₂ emissions of the different branches. Those coefficients depend on the calorific value of the energy sources concerned.

Model extensions

Production conditions in the countries of origin of German imports

Both recording the extent of environmental involvement associated with imports (energy input, CO₂ emissions) and adding it to the domestic consumption categories pose a particular challenge. In the calculation models, the production structures and energy input situation in the supplier countries are often assumed to be the same as in the domestic territory instead of considering the conditions actually prevailing there.¹ In the course of a project, the relevant model has therefore been extended and an attempt been made to reflect the actual energy input and emission situation in the main countries of origin of German imports².

For the above purpose, imports from the 14 major supplier countries were broken down by about 70 groups of goods and then studied separately. The energy input and CO₂ emissions of the relevant branches of the 14 supplier countries were examined based on energy statistics, in particular the energy balances for those countries, and on detailed CO₂ emission data from the national greenhouse gas inventories³. As regards the European countries, information on CO₂ emissions by branches could be derived from a new survey of greenhouse gases and air pollutants⁴.

A special focus was put on the detailed recording of energy inputs of the energy transforming branches (electricity generation, heating plants, refineries) and also of selected energy-intensive branches. Electricity generation alone accounts for about 42% of the total CO₂ emissions caused by branches in producing goods to be imported. However, emissions differ widely between the individual supplier countries depending on the energy sources used in electricity generation.

As far as the energy-intensive branches are concerned, steel production, the aluminium industry and pulp manufacture were studied in greater detail both in the supplier countries and in Germany. Energy consumption in steel production was identified using data from the process chain analysis and energy balances. The emissions of the steel sector could be adequately determined based on those data and on information from the greenhouse gas inventories.

Although the aluminium industry does not directly cause large CO₂ emissions, it consumes high amounts of electricity and therefore causes significant emissions during the preceding process of electricity generation. As mentioned above, however, the extent depends on the specific production structures in the individual countries. Regarding aluminium, the production and also importation and processing of aluminium were studied in depth in the countries concerned. The energy and CO₂ content of imported aluminium products and of products with a considerable aluminium content depend significantly on the type of aluminium production – whether primary or secondary aluminium – and on the volume of raw aluminium imports by the given supplier countries. Both factors were considered in the calculations made for the individual countries.

However, the current status of the calculation model does not permit to cover all production relations in the countries from which goods are imported. To this end, sufficiently disaggregated

1 In the context of environmental-economic accounting, calculations of energy input and a number of air pollutants are standardly based on that simplified method. The results are also published in the volume of tables.

2 The project on an Extended input-output model for energy and greenhouse gases has been financially supported by the Statistical Office of the European Union (Eurostat). The project will be completed in March 2011. The project interim report including first results is available in the German language as a download on the internet (here: *Startseite* > *Publikationen* > *Fachveröffentlichungen* > *Umwelt > Umweltökonomische Gesamtrechnungen – Energie*).

3 Greenhouse gas inventories for data reporting in the context of the United Nations Framework Convention on Climate Change (Kyoto Protocol).

4 Eurostat website: Environment sector, database: Physical and hybrid flow accounts (env_ac_ainacehh), <http://epp.eurostat.ec.europa.eu/portal/page/portal/environment/data/database>

input-output tables would have to be in place for all supplier countries and the links between those countries and Germany and also among the countries themselves would have to be reflected in the model. This would require another substantial effort.

In advancing the calculation model, the focus has rather been on a sufficient breakdown of the input-output tables and an improvement of the accuracy of calculations by reflecting energy consumption in physical units. Using a so-called hybrid calculation model - including a mixture of value and quantity units – has led to a significant improvement of the results. The results regarding the energy and CO₂ content of goods will be published at the end of 2010.¹

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Including seasonal products in the Harmonised Index of Consumer Prices from January 2011

European Commission Regulation No 330/2009 on the Harmonised Index of Consumer Prices (HICP) requires including seasonal products in the HICP from January 2011 in a way that is relevant for the index. This article will briefly describe the content of that Regulation and its implementation in Germany. A more detailed presentation of the treatment of seasonal products in German consumer price statistics is contained in an article in the November issue of *Wirtschaft und Statistik*.

Content of the HICP Regulation as regards minimum standards for the treatment of seasonal products

Seasonal products are defined in that Regulation as “goods and services that are not available for purchase, or purchased in small or negligible volumes, for certain periods in a typical annual cyclical pattern.”² Contrary to the colloquial use of the term, seasonal price changes alone are not sufficient to meet the criterion of “seasonal product”. In the German publications on consumer price statistics, too, the term of seasonal product is defined in a broader way and includes goods involving seasonal price changes.

The Regulation is binding for the COICOP/HICP³ classes and groups 01.1.3 Fish, 01.1.6 Fruit, 01.1.7 Vegetables, 03.1 Clothing, and 03.2 Footwear. For any other seasonal goods, the Regulation may be applied as a guideline but is not binding.

¹ Examples of publications issued so far:

Specialised publication, energy domain, on the internet:

CO₂-content of German imports and exports,

<http://www.destatis.de/jetspeed/portal/cms/Sites/destatis/Internet/EN/Content/Publikationen/SpecializedPublications/EnvironmentEconomicAccounting/ImExResults,property=file.pdf>, and

STATmagazin article on the internet, January 2011:

Households emitting less carbon dioxide,

http://www.destatis.de/jetspeed/portal/cms/Sites/destatis/Internet/EN/Content/Publikationen/STATmagazin/Environment/2011_01/2011_01CarbonDioxide,templateId=renderPrint.psm

Author: Helmut Mayer, Federal Statistical Office

² Commission Regulation (EC) No 330/2009 of 22 April 2009 laying down detailed rules for the implementation of Council Regulation (EC) No 2494/95 as regards minimum standards for the treatment of seasonal products in the Harmonised Indices of Consumer Prices (HICP), Article 2 (1).

³ Classification of Individual Consumption by Purpose in a version for the HICP. That internationally agreed classification largely corresponds to the German *Systematik der Einnahmen und Ausgaben der privaten Haushalte* (Classification of Income and

If, in a typical seasonal period (which must comprise at least one month), a seasonal product reaches a share of at least 0.2 percent in total consumption expenditure, the product must be included in the HICP calculation. Due to the short reference period, that selection criterion is stricter than the general rule specifying that a good or service must be included in the HICP if it reaches a share of 0.1 percent on an annual average.

Two different methods may be applied to include seasonal products in the HICP calculation. Either the prices of those seasonal products must be estimated in the out-of-season period, using price changes collected for similar products, or class-specific seasonal weights must be calculated. For both options, further requirements are laid down in the Regulation.

For the estimation method it must be taken into account that in the first month of the out-of-season period the price last collected is put on (generally raised to) a level which is equal to the typical price of the last season. In the following months, the estimation must be based on the price development of similar products which are available only on seasonal basis, too. In such cases, the Regulation uses the term “counter-seasonal estimation”. Only when this is not possible is it allowed to use goods that are available over the entire year. This is referred to as “all-seasonal estimation” in the Regulation.

The term “class-confined seasonal weights index” is used in the Regulation for an index which contains a fixed weight during the entire year for the next higher product group, but allows using differing monthly weights for the seasonal variants below that product group. Outside the season, product variants not offered get a weight of zero. However, changing the monthly weights is allowed only where changes in the composition of the commodity basket have to be taken into account. Shifts in demand between seasonal products offered at the same time must not be shown.

Impact on practical HICP calculation for Germany

The food products mentioned in the Regulation have limited importance for consumption in Germany. Fish, including product variants available all year round, frozen or otherwise processed, account for just slightly over 0.3 percent of consumption expenditure, while fruit and vegetables account for about one percent each. However, due to the relatively broad definition of the individual survey items, especially those goods variants are selected that are available all year round, for example, cod or salmon instead of plaice or carp. Here the survey programme of German consumer price statistics had to be extended, so that additional prices will be collected for about 20 seasonal food products as from January. Prices missing in specific seasons are estimated. Due to the small importance for consumption, an impact on results might be observed only in subindices.

The level of importance of clothing and footwear in Germany for consumption amounts to about five percent of total consumption expenditure. In many cases, similar products are offered in a summer and a winter variant. In German consumer price statistics, such seasonal products are included in price collection and index calculation already now. Two alternative calculation methods are currently allowed here. For some big trade chains in the clothing sector, seasonal samples are applied already now with prices not available in specific seasons being estimated. This is entirely in line with the new provisions of the HICP Regulation. For smaller reporting units, summer and winter variants are combined in a continuous all-year sample and are replaced without performing a quality adjustment at the time when the seasons change. That approach will have to be modified for the HICP. Again, just a slight impact on the calculated results is expected here.

Expenditure of Households). That national classification is more comprehensive – it includes, for example, income and social contributions of households – and has a more detailed breakdown than the COICOP.

For the German national consumer price index (CPI), the provisions of the HICP Regulation will not be implemented until the index is put on base year 2010. However, at that time, the results obtained by then will be recalculated as from January 2010. The advantage for the CPI is that the inflation rates currently shown are genuine price changes which are not impaired by methodological changes. As, in the product groups mentioned (fish, fruit, vegetables, clothing, footwear), the difference in treatment of seasonal products between the CPI and the HICP is the only methodological difference that has an impact on the results, it is possible to directly identify the influence of that methodological change by comparing the current results of the CPI with those of the HICP.

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Administrative cost measurement according to the Standard Cost Model: Look back and current developments

Background, measurement methodology and parties involved

In April 2006, the Federal Government of the time adopted a programme entitled *Bürokratieabbau und bessere Rechtsetzung* (Reduction of Bureaucracy and Better Regulation). A major goal of the programme is to apply a standardised procedure, measuring administrative burdens on the economy, citizens and the administration which arise from fulfilling information obligations and to reduce administrative costs by a net 25 percent by the end of 2011. Measurement is done by means of the Standard Cost Model (SCM), which has widely been used for several years at the European level.

Information obligations are government information requirements based on legal norms, such as applications, forms, statistics, and supporting documentation. This includes not only direct information transfer but also storing data for expected information requirements. A basic assumption of the Standard Cost Model is that the information obligations imposed by the government are fulfilled by the norm addressees (economy, citizens, administration) in a “normally efficient” way. It is also assumed that the work needed to fulfil an obligation can be broken down into so-called standard activities. The total of the standard activities required to fulfil information obligations is the standard process. Those standard activities are the basis for measuring the time needed.

The model applied to calculate the administrative costs arising from fulfilling an information obligation is based on a “price multiplied by quantity” approach. The wage rate of the person fulfilling the information obligation, the time needed to fulfil the duty, the number of norm addressees affected, and the periodicity of information transmission are the parameters of cost calculation.¹

Administrative burdens have been measured by the Federal Statistical Office since January 2007. Overall steering of the “Reduction of Bureaucracy and Better Regulation” programme is a task of the Committee of State Secretaries on Bureaucracy Reduction, in which all federal ministries are represented. The Minister of State to the Federal Chancellor, Eckart von Klæden, chairs the Committee. He is supported in technical and organisational terms by the Better Regulation Unit at

¹ Vgl. hierzu: Statistisches Bundesamt: Einführung des Standardkosten-Modells auf Bundesebene. Handbuch der Bundesregierung zur Ermittlung und Reduzierung der durch bundesstaatliche Informationspflichten verursachten Bürokratielasten. Wiesbaden 2006, sowie Jürgen Chlumsky et al: das Standardkosten-Modell und seine Anwendung auf Bundesebene, in: Wirtschaft und Statistik, Heft 10, 2006, S. 993-1002.

the Federal Chancellery. In each ministry, a ministry contact co-ordinates the implementation of the government programme. The National Council for the Review of Legal Norms plays a central role in particular regarding better regulation. The legal basis of that Council is the *Gesetz zur Einsetzung eines Nationalen Normenkontrollrates* (Act to Institute a National Council for the Review of Legal Norms – NKRK) of 14 August 2006.¹ According to Section 1 of the NKRK, the task of the National Council for the Review of Legal Norms as an independent body is to support the Federal Government in reducing the administrative costs caused by laws, by applying the SCM.

A look back – what has been achieved so far

In a first step, the Federal Statistical Office comprehensively collected the administrative costs borne by the economy. The result of that baseline measurement, with reference date 30 September 2006, is the figure taken as a reference for the 25% reduction target. To assess target achievement, administrative cost monitoring was introduced (recording of changes in burden over time).

As part of the baseline measurement, the costs of some 10,000 information obligations were covered between 2007 and 2008. Various collection tools were used. For less complex but frequent obligations, written and telephone surveys were most often conducted, while for complex information obligations, personal on-the-spot interviews were also performed. In addition, expert panels were organised for highly demanding information obligations – such as accounting obligations of enterprises. As a result, the burden on the norm addressee of the “economy” for the reference day amounted to about Euro 50 billion. The results of measuring all information obligations can be viewed in a database.

The surveys collected not only administrative costs but also a variety of simplification proposals, which have been submitted to the federal ministries.

The baseline measurement is just a snapshot. To meet the goal of a lasting reduction of administrative burdens, the baseline measurement must regularly be updated. For the purpose, the Federal Statistical Office will introduce administrative cost monitoring. That monitoring will cover any changes in administrative costs caused by federal legal provisions. Based on that information, administrative costs can regularly be assessed.

Following the coverage of administrative costs borne by the economy, selected information obligations of citizens and the corresponding burden caused in the administration have been measured, too. That was done in individual projects. What should be mentioned here are the projects *Einfacher zum Elterngeld* (Getting parental allowance more easily)², *Einfacher zum Wohngeld* (Getting housing allowance more easily)³ and *Einfacher zum Studierenden-BaföG* (Getting student assistance more easily under the Federal Training Assistance Act).⁴ The goal of those projects was to examine things across levels, that is, it was examined how federal laws are implemented by the Länder and municipalities. The basis used here was the overall process from a federal information obligation through existing Land provisions to the implementation by the responsible authorities. Therefore, the focus of those projects was more on the entire handling process – starting with a citizen making a request up to the responsible authority notifying the citizen of its decision – than it was in the baseline measurement regarding the economy. Consequently, the burden on all parties involved in the process could be examined.

1 BGBl 1, 2006, S. 1866

2 Cf. Sacher, Matthias, Trusheim, Kristina and Wankerl, Carola, 2009: *Ermittlung bürokratischer Lasten am Beispiel der Beantragung von Elterngeld*. In: *Wirtschaft und Statistik* no. 12/2009, pp. 1183-1190

3 Cf. Bens, Arno, Krämer, Stefanie and Scheerer, Georg, 2010: *“Einfacher zum Wohngeld” – ein Mehrebenen-Projekt zum Bürokratieabbau*. In: *Wirtschaft und Statistik* no. 5/2010, pp. 435-442

4 Bundeskanzleramt, Nationaler Normenkontrollrat, 2010: *Einfacher zum Studierenden-BAföG. Abschlussbericht*. Download: <http://www.normenkontrollrat.bund.de/Webs/NKR/DE/Publikationen/publikationen.html>

A look ahead – extending the model to cover the compliance burden

In January 2010, the Federal Cabinet adopted an extension of the examination of administrative costs. It is intended to include in the studies all direct burdens in terms of time and finance that are caused for the economy, the citizens or the administration when complying with a federal norm (compliance burden). This means that aspects of burdens will become relevant which have not been included according to the traditional Standard Cost Model as it focuses on information obligations. Items to be considered here are in particular content-related duties, such as the costs of installing an exhaust filter to meet specific legal limits. The administrative costs arising from information obligations are part of the compliance burden. For the economy, they will be shown separately until the end of 2011, which is due to the 25% reduction target. That extension of measuring administrative costs will be accompanied by a wider control mandate of the National Council for the Review of Legal Norms. For the purpose, the NKRK will be amended.

Implementing the extended model has not been finished yet. As the compliance burden model is more complex than the measurement of information obligations according to the original Standard Cost Model, various pilot projects were carried out to develop the methodology. Currently the Better Regulation Unit, the federal ministries, the National Council for the Review of Legal Norms, and the Federal Statistical Office are jointly developing a manual on estimating the compliance costs of new regulation.

Information on the further developments will be given here again in due time.

Further information

Federal Statistical Office:

<http://www.destatis.de/jetspeed/portal/cms/Sites/destatis/Internet/EN/Navigation/Projekte/SKM/Standardkostenmodell.psmi>

Federal Government: <http://www.bundesregierung.de/buerokratieabbau>

National Council for the Review of Legal Norms:

<http://www.normenkontrollrat.bund.de/Webs/NKR/DE/Homepage/home.html>

International SCM Network: <http://www.administrative-burdens.com/>

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OECD Global Project on “Measuring the Progress of Societies”

Measuring the societal, i.e. the social and economic, progress is an important task which official statistics will increasingly have to tackle in the 21st century, also considering the growing complexity in a globalised world.

Some time ago, the Organisation for Economic Co-operation and Development (OECD) initiated a project whose goal is to improve the coverage of the progress of societies worldwide. It organised world forums at regular intervals, last time in Busan/Korea in 2009. The objective of those forums was to bring together a large number of representatives of the political, economic and societal spheres and data producers especially from official statistics. In that way, a broad basis has been created for the shaping of the Global Project in terms of content, organisation and technology.

The starting point for the project was the awareness that indicator systems for complex political issues – as a kind of monitoring tool accompanying the strategy – were increasingly demanded and provided by official statistics at the national and supranational levels such as the European Union, whereas there was no relevant project at the OECD level. To bridge that gap, the OECD organised a first World Forum in Palermo/Italy from 10 to 13 November 2004. Under the title “Key Indicators”, the content-related frame of the Global Project was set first of all. At the second World Forum held in Istanbul/Turkey from 27 to 30 June 2007 on “Measuring and Fostering the Progress of the Societies”, worldwide agreement on that project was reached. The OECD, the European Commission, the Organisation of the Islamic Conference, the United Nations and the UNDP (United Nations Development Programme) as well as the World Bank and others adopted the Istanbul Declaration (<http://www.oecd.org/dataoecd/14/46/38883774.pdf>). In that document, regular statistical monitoring and an enhanced role of official statistics, among other things, were laid down for the Global Project.

As another important step, the organisational preconditions for the permanent implementation of the project at the OECD were created in early 2008. The project is led by a Global Project Board at the OECD, consisting of 16 representatives of international and supranational institutions and six Technical Advisors (three of them from national statistical offices). Also, a Co-ordination Group has been set up, consisting of specific representatives of governments, statistical offices and non-government organisations (for Germany, Dr. M. Bruch of the Federal Ministry of Economics and Technology, Mr E. Hohmann of the Council for Social and Economic Data, and Dr. S. Schnorr-Bäcker of the Federal Statistical Office). The main task of the Co-ordination Group is to give advice to the OECD secretariat regarding the OECD role to be envisaged in the Global Project.

In technological terms, too, relevant tools have been created for a modern exchange of information. This includes a regular online newsletter, wikis (www.Wikiprocess.org) and blogging. The 7th issue of the newsletter of July 2010 (<http://www.oecd.org/dataoecd/55/34/45577065.pdf>) reports, among other things, on linking the Global Project to other initiatives such as the recommendations of the Stiglitz Commission, the “Europe 2020” strategy as a successor to the European Lisbon Strategy of 2000 or the United Nations Millennium Development Goals.

The 3rd World Forum held in Busan/Korea from 27 to 30 October 2009, where the above Co-ordination Group met for the first time to prepare strategic issues, focused on three questions:

- 1st What does societal progress mean?
- 2nd What are the new concepts for measuring it?
- 3rd How can societal progress be achieved through new political strategies?

Those different questions were illustrated at the World Forum from various aspects by means of many concrete examples. They serve as a basis for best practices.¹

The goal of the Global Project is to combine all initiatives aimed at improving societal progress and its coverage. This includes providing suitable indicators. All levels of aggregation should be covered here, reaching from national accounts to sector-specific monitoring at industry and activity levels.

Another focus is on how the recommendations of the Stiglitz Commission², a working group set up by the French President and headed by Nobel prize winners Joseph Stiglitz and Amartya Sen, might be implemented. The objective here is to extend national accounts in a way that is

1 See also OECD: Measuring the Progress of Societies, an Introduction and Practical Guide, Paris 2009

2 See also Stiglitz, J.E./ Sen, A./ Fitoussi, J.P.: Report by the Commission on the Measurement of Economic Performance and Social Progress, Paris 2009

compatible with the system to include data on material well-being, on the quality of life, and on sustainability. Also, existing national approaches – both cross-sector approaches such as the sustainability initiative of the German Federal Government and sector-specific approaches on improving health and education standards – should be examined for general recommendations.

The goals of the Stiglitz Commission are, first, to contribute to strengthening the credibility of (official) statistics by giving its recommendations regarding real-life data and, second, to broaden the information basis for important policy fields.¹ Another focus of the Global Project, in addition to the above content-related issues, is the provision of best practices for user-oriented processing and dissemination of statistical results. In that context, the OECD has taken a variety of measures ranging from a handbook on composite indicators² and training measures to the user-oriented dissemination of statistical information.

In summary, the OECD project on measuring societal progress is varied and complex. It remains to be seen whether the various components can smoothly be interlocked with each other and, if so, at what level.

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The new automated sample rotation in the statistics of domestic trade and accommodation and food services

1st Introduction

In official statistics of domestic trade and accommodation and food services, monthly short-term economic data and annual structural data are provided on the basis of a representative sample. In view of the considerable fluctuation among the enterprises of domestic trade and accommodation and food services, it is highly important to take adequate account of new enterprises in the sample. By setting up the business register, the framework conditions for periodic updating of the sample have considerably been improved. The Federal Statistical Office therefore developed an automated sample rotation procedure, which was successfully implemented by the statistical offices of the Länder in spring 2010.

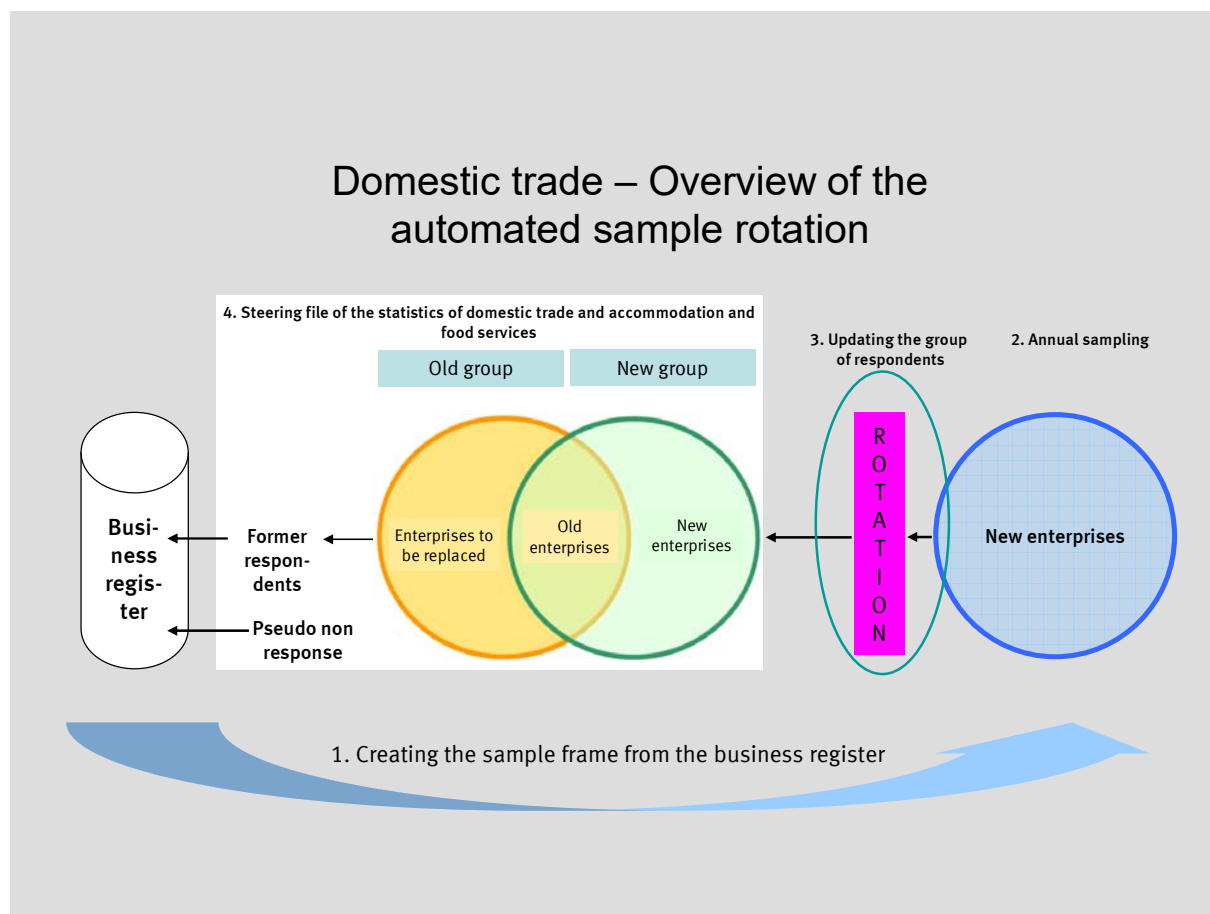
This article gives an overview of the process of automated sample rotation and deals with first experience acquired in applying the new method and with the benefits involved.

2nd Process of sample rotation

The sample rotation is characterised by the process shown below:

¹ See also Braakmann, A.: Wie lässt sich Wohlstand messen?, in Wirtschaftsdienst, issue 12, 2009, pp. 783ff; Haß, H.-J.: Stiglitz, Sen und „GDP and Beyond“, in Wirtschaft und Statistik, issue 7, 2010, pp.694ff

² OECD: Handbook on Constructing Composite Indicators: Methodology and User Guide, Paris 2008



1. Creating the sampling frame from the business register

Every year, all active trade enterprises, including their addresses, economic activity codes and turnover data, are compiled from the up-to-date business register.

2. Annual sampling

The sample used for the statistics of domestic trade and accommodation and food services consists of overall strata comprising the enterprises with the largest turnover, and representative strata comprising smaller enterprises. The sample is stratified by Land, group of economic activities, and turnover size class. For the statistics of domestic trade and accommodation and food services, new enterprises in the register – such as internet traders – are highly important because often they initiate new trends. New enterprises are therefore marked before sampling, so that they have a good chance of being selected. Based on a sample design that is updated annually, a stratified random sample is drawn from the sampling frame and the expansion factors for the sampled enterprises are calculated. Every six years, the sample design is entirely reviewed and, when necessary, the strata are redefined. In the years between revisions, only the stratum-specific sampling intervals are recalculated, taking account of the updated register.

3. Updating the group of respondents

After sampling, the actual sample rotation takes place in the representative strata, following specific rules. First of all, discharging old enterprises or planning the inclusion of new enterprises ensures that the target sample size per stratum is achieved. Then, depending on availability and extent of the rotation intended, old enterprises of the old group of respondents are replaced by new enterprises from the sample. In a third step, the new expansion factors from the sample are transferred to the new group of respondents. During rotation, new enterprises – identified by

their marks – are arranged in a way that they are included in the new group of respondents. Enterprises to be replaced and new enterprises needed are selected at random.

4. Steering file of the statistics of domestic trade and accommodation and food services

New group of respondents

The new enterprises in the new group of respondents are first questioned in the upcoming annual survey. On that occasion, they are checked for economic activity classification and for response to short-term economic statistics, i. e. the current annual survey is conducted exclusively on the basis of the new group of respondents. When the annual survey is finished, the group of monthly respondents is selected from the new group of respondents.

Old group of respondents

After rotation, only the monthly respondents are needed from the old group of respondents for the monthly short-term economic statistics. The annual respondents, i. e. small enterprises reporting only to the annual surveys, are discharged if they are not part of the new group of respondents. When the group of monthly respondents has been defined, those enterprises for which replacement enterprises have been found as part of the rotation can also be discharged from the old group of respondents. Discharged enterprises get the status of former respondents and will pause for a minimum of 3 years, although they generally pause for 6 years.

Feedback to the business register

At the end of the rotation process, information on new, dissolved and replaced enterprises is fed back to the business register.

3rd First experience acquired in sample rotation

The statistical offices of the Länder performed the automated sample rotation in February 2010. Prior to that, six complex computer programmes had been developed over 11 months and two one-day training courses were held for all offices. Three Land statistical offices started performing the rotation, so that minor errors in the new programmes could be corrected. Subsequently, all statistical offices successfully performed the sample rotation.

In March 2010, the Federal Statistical Office did follow-up work on the automated sample rotation together with the statistical offices of the Länder. It turned out that there was a need for optimisation regarding existing interfaces with other statistical processes and regarding the handling of new enterprises. The Federal Statistical Office has now optimised sample rotation.

Automated sample rotation will lead to the following improvements in the statistics of domestic trade and accommodation and food services:

- The representativeness of the statistics of domestic trade and accommodation and food services will be maintained at a permanently high level by annual updating of the sample.
- By sample rotation over six years, the burden on enterprises in the representative strata will be reduced.
- The consistency between short-term economic statistics and structural statistics will considerably be improved as, within the scope of structural statistics, new enterprises will first of all be checked in detail for the economic activity they should be classified under. Revisions will be reduced for short-term economic statistics as changing over to the new group of respondents and defining the new monthly respondents will be done in one step.
- Additional work that has so far been caused by sampling new enterprises will no longer be required as that step has been integrated into sample rotation.

- Activities in the context of replacing a group of respondents will be distributed more evenly over several years. This will lead to routine work, involving good preconditions for efficient implementation and balanced capacity utilisation of the specialised units.
- Also, annual feedback to the business register will make a better contribution to improving the register's quality in the areas of domestic trade and accommodation and food services.

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Quality of alternative estimation procedures in intra-Community trade statistics

Since the European single market was created and customs barriers were abolished in 1993, businesses have been required to submit information on their trade with other EU Member States (intra-Community trade) directly to the Federal Statistical Office. While trade operations with third countries (extra-Community trade) are still recorded by the customs authorities and, as a result, are covered almost completely, a certain proportion of the Intrastat declarations is submitted too late to be included in the first publication of monthly foreign trade results.

Article 25, 3, of the Intrastat implementing regulation (Regulation (EC) No 1982/2004)¹ provides for an estimation of missing values with at least a breakdown by *partner country* and *commodity chapter* (two-digit level of the Commodity Classification for Foreign Trade Statistics).

In Germany, the advance turnover tax return of the businesses responsible for providing information serves as an orientation for the total estimate. The total amount missing is distributed separately for each direction of trade and proportionately depending on the structure² of the variables *partner country* and *commodity chapter* of the previous year.³ However, several EU Member States include in their preliminary foreign trade results estimates in a breakdown by *partner country* and eight-digit *commodity code* of the commodity classification.

The advantages of estimation at the aggregated chapter level include above all the fact that estimation problems due to irregular frequencies of partner country and commodity code combinations or to frequently changing commodity codes can be avoided.⁴ However, there are also disadvantages of estimation at the chapter level which cannot be neglected: At the level of commodity codes, the preliminary intra-Community trade results are comparable with the final values to a limited extent only. And, in terms of time, they are not consistent with the extra-Community trade results. At the European level, the heterogeneity of estimation levels and

1 Commission Regulation (EC) No 1982/2004 of 18 November 2004 implementing Regulation (EC) No 638/2004 of the European Parliament and of the Council on Community statistics relating to the trading of goods between Member States and repealing Commission Regulations (EC) No 1901/2000 and (EEC) No 3590/92, in the version applicable.

2 Businesses with a foreign trade turnover of more than Euro 10 million are not considered in determining the relevant structure. They are rather reliable in submitting their declarations as they are paid close attention to in checking the declarations received. Additional estimates for variables on which large businesses have a significant impact would distort the picture.

3 In the national results, the estimated amount is additionally distributed according to the variable *Land (Federal State)*.

4 Instead of making estimates for only 26 partner countries in combination with chapters 1 to 97, results would otherwise have to be estimated for partner countries in combination with about 9,000 commodity codes.

procedures additionally leads to methodological discrepancies between the results of the Member States.

Not only the level of distribution, but also the estimation procedure selected is subject to criticism, which is definitely justified. On the one hand, seasonal effects are not considered sufficiently and, on the other, the distribution of estimates for missing declarations is made proportionately to the declarations available instead of the missing declarations which still have to be submitted.

In the context of an EU project, well-established alternative procedures were therefore simulated for estimation at the eight-digit commodity code level with the aim of subsequently studying their impact on the quality of the intra-Community trade results and drawing conclusions for a “best practice” regarding estimates for delayed intra-Community trade declarations.

Simulation of alternative estimation procedures

Four alternative procedures were applied to simulate preliminary and final results separately for each direction of trade for all months of the period 2005 to 2008.¹ The results obtained with the current method, which does not include substituting estimates for missing information at the commodity code level, were used as a yardstick to measure the quality achieved with the alternative procedures.

As a first alternative, the method currently used was simply extended. The total amount missing was distributed proportionately depending on the structure² of the variables *partner country* and *commodity code* of the previous year.

As regards alternatives two and three, the relevant amounts were estimated based on the total trade volume of the corresponding month of the preceding year to which a trend was applied. The underlying growth rate was determined separately for each direction of trade using the data of respondents who had submitted their declarations of intra-Community trade in goods in due time both for the current month and the corresponding month of the previous year. However, the two procedures differed with respect to the subsequent distribution of estimates. In alternative two, the estimates were distributed depending on the relevant structure of the previous year (as in alternative one), while the structure observed for the current month formed the basis for distribution in alternative three.

Alternative four was what is called a bottom-up approach characterised by estimation at the business level. In that context, a trade value was imputed for each business which had submitted an intra-Community trade declaration for the corresponding month of the previous year, while it had not for the current month. The trade volume of the corresponding month of the preceding year and a proportion of growth depending on the branch of economic activity and the size of the business served as a basis for determining that value.³ The underlying growth rates per stratum were calculated separately for each direction of trade based on the information provided by respondents who had reported their intra-Community trade in due time both for the current month and the corresponding month of the previous year.

Quality criteria

A major quality criterion of foreign trade statistics is the ability to anticipate as adequately as possible the final results in the preliminary data published. Based on the discrepancies between preliminary and final values, a total of eleven indicators were calculated for each of the aforementioned estimation procedures.

1 In that context, intra-Community trade within the EU25 countries was covered for commodity codes in chapters 1 to 97.

2 Cf. footnote 4.

3 Businesses responsible for providing information were stratified according to the branch of economic activity (two-digit level) and their size (up to Euro 800,000, up to Euro 5 million and above Euro 5 million).

Depending on their needs, users may perceive data quality differently. In using annual results without any further breakdown, even more significant variations between the individual months or individual commodity codes would remain largely undetected. However, estimation procedures which, at the commodity code level, produce rather good results although generating a slight systematic bias in the values may lead to much larger deviations at the global level because the related effects do not cancel each other out.

Attempts were made to meet the different needs by using a set of quality indicators for different aggregation levels:

- discrepancies regarding annual results without a breakdown in terms of time or by partner country and commodity code
- discrepancies regarding annual results in a breakdown by partner country and commodity code
- discrepancies regarding monthly results in a breakdown by partner country and commodity code

The four alternative estimation procedures were assessed on the basis of the above quality criteria.

Results

The central finding of the project is that none of the simulated procedures for estimating the data of missing declarations in foreign trade statistics can be convincingly considered a “best practice”. Depending on the breakdown or level of aggregation, other procedures produced the best results.

In the practical test, the results of the most ambitious and, in theoretical terms, most attractive bottom-up approach were unexpectedly weak in particular with regard to the monthly indicators. One of the reasons was certainly the absence of data from businesses responsible for providing information when trade transactions had not taken place in the reference month.¹ If German statisticians, like those of other EU Member States, could employ the information required for that purpose, too, the effects of that method on data quality would have to be studied again.

Assuming that users show greater interest in the monthly results, the associated indicators are to be regarded as slightly more important. It was a bit of a surprise that here the reference procedure stood out, which means that an estimation at the level of *partner country* and *commodity code* cannot be preferred to the other tested estimation procedures. Nonetheless, a weakness of the procedure is its global approach. In the current circumstances, however, it is actually not absolutely necessary to replace the conventional system for quality reasons.

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¹ In the context of the simulation process, a so-called ‘zero declaration’ was assumed in those cases where a declaration was not available for 90% of all months of the previous year. An estimation was however made for all remaining businesses which had not submitted a declaration.

Events

19th Scientific Colloquium: “Measuring well-being - presentations from the scientific community and official statistics on the Stiglitz-Sen-Fitoussi report”

On 11 and 12 November 2010, the 19th Scientific Colloquium was held jointly with the German Statistical Society at the Wiesbaden museum. The issue was “Measuring well-being - presentations from the scientific community and official statistics on the Stiglitz-Sen-Fitoussi report”. The report of the Stiglitz-Sen-Fitoussi Commission illustrates the limits of the gross domestic product as an indicator of economic performance and social progress. It also gives recommendations on the further development of statistics. The goal is to achieve sustainable, credible and reliable statistical reporting on societal progress.

The Commission’s recommendations refer to three areas:

The first part deals with the methods and aggregates of GDP calculation within the existing system. Those explanations alone illustrate that an increase in macroeconomic production as covered by the GDP will not necessarily be accompanied by the same increase in societal well-being. Many aspects which, in the Commission’s opinion, are of major relevance for the quality of life of those living in a society are not covered by the gross domestic product. Additional indicators complementing the GDP are required here.

This is why, in the second part of its report, the Commission gives a number of recommendations on how the various dimensions of the quality of life can be covered by means of indicators and be represented in terms of statistics.

The third part deals with the aspects of sustainability of economic development and, in particular, the problems of the environment and the climate.

The colloquium was moderated by Mr Albert Braakmann, Head of the Division on “National Income, Sector Accounts” at the Federal Statistical Office, who also gave an introduction to the topic.

The series of speeches held at the colloquium was structured according to the three areas of the report of the Stiglitz-Sen-Fitoussi Commission. The series was opened by two presentations on the methods of GDP calculation. Mr Norbert Schwarz and Mr Florian Schwahn of the Federal Statistical Office provided information on the income concepts applied in official statistics. The income distribution in Germany was the topic of the presentation given by Dr. Irene Becker, an empirical distribution researcher.

Another two speeches were dedicated to the quality of life. Mr Thomas Körner of the Federal Statistical Office presented indicators on the quality of employment. Prof. Axel Börsch-Supan of Mannheim University informed the participants on demographic change, ageing and the quality of life.

At the end of the first day, the Gerhard Fürst Award 2010 was presented by the President of the Federal Statistical Office, Mr Roderich Egeler, in a ceremony as part of the scientific colloquium. This year, three scientific papers with close relations to official statistics were awarded prizes. The laudatory speeches for the award winners were delivered by the new chairman of the expert jury, Prof. Dr. Ullrich Heilemann of Leipzig University. For further information on granting the Gerhard Fürst Award 2010 please refer to the relevant article in this issue. Detailed information on the Gerhard Fürst Award of the Federal Statistical Office is also available under “Wissenschaftsforum” on the website of the Federal Statistical Office at <http://www.destatis.de/>.

Regarding the third area of the Commission report – environment and sustainability –, three speeches were delivered on the second day. Mr Michael Kuhn of the Federal Statistical Office reported about German sustainability indicators and environmental-economic accounting. Mr Frank Hönerbach of the Federal Ministry for the Environment, Nature Conservation and Nuclear Safety then presented the progress report on the sustainability strategy of the Federal Government. In his speech on Environmental Accounting, Prof. Dr. Georg Müller-Fürstenberger of Trier University treated especially the role of computable general equilibrium models.

At the end of the event, Mr Walter J. Radermacher, Director-General of the European statistical office (Eurostat) presented the European perspective of the recommendations of the Stiglitz-Sen-Fitoussi Commission under the title “GDP and beyond”.

About 200 participants from the spheres of science, research, teaching, politics, administration and statistics attended the event. As a documentation of the conference, the presentations and the programme leaflet including the short versions of the speeches are available for free download at [“http://www.destatis.de/](http://www.destatis.de/) -> Wissenschaftsforum -> Kolloquien”.

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Federal Statistical Office granting the Gerhard Fürst Award 2010

This year the Federal Statistical Office for the twelfth time granted the Gerhard Fürst Award to an outstanding scientific paper. Two other papers were awarded Promotion Prizes for Young Researchers.

In the category of doctoral theses, the paper written by Dr. Jörg Drechsler on “Generating Multiply Imputed Synthetic Datasets: Theory and Implementation” was assessed as an outstanding achievement and was awarded the Gerhard Fürst Award 2010 including a prize money of Euro 5,000. The thesis was written under the supervision of Professor Dr. Susanne Rässler at Otto Friedrich University Bamberg.

In the category of diploma/master’s dissertations, Promotion Prizes of the Federal Statistical Office, including a prize money of Euro 1,000 each, were awarded to the master’s dissertation on “Determinants of in-company continuing education in a branch-specific context. Multi-level analyses based on CVTS3 data” written by Ms Ulrike Rudolphi at Johannes Gutenberg University Mainz and to the diploma dissertation written by Mr Daniel Kemptner at the University of Mannheim on “Non-monetary returns to education – estimating the causal effect of education on health and health-related behavior”.

The Federal Statistical Office grants the awards on the basis of recommendations given by an independent expert jury. The prizes were presented by President Egeler at the 19th Scientific Colloquium on “Measuring well-being – presentations from the scientific community and official statistics on the Stiglitz-Sen-Fitoussi report” held jointly by the Federal Statistical Office and the German Statistical Society in Wiesbaden on 11 and 12 November 2010.

The laudatory speeches for the prize-winning papers were delivered by the new chairman of the expert jury, Professor Dr. Ullrich Heilemann of Universität Leipzig and are contained in the December issue of the periodical “Wirtschaft und Statistik”. The prize winners will give a detailed presentation of their papers in that periodical early next year.

The short versions of the prize-winning papers and further information on the Gerhard Fürst Award, in particular on the eligibility conditions, are available on the website of the Federal Statistical Office under "[Wissenschaftsforum](#)".

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