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The catchword

A new perspective on official statistics: integration into geoportals

Official statistics provide background information and facts on nearly all issues of the society. In particular, all data have some reference to an area in the Federal Republic of Germany. Every citizen and every business thus have free access to comprehensive information on the place of residence, administrative district, business headquarters or marketing area. Considering the enormous potential of spatial reference, there is a need to network all geo-referenced data and to set up national and international geodata infrastructures (GDIs). At the beginning of this century, the European Environment Agency, together with the European Commission, started the initiative INSPIRE (Infrastructure for Spatial Information in the European Community)¹. In 2007, a relevant framework directive was adopted and subsequently implementing rules were set up. Consequently, even though INSPIRE is legally binding only for 34 explicitly listed themes, the initiative today has an influence on the main



GDI activities in Europe in terms of organisation, contents and technology. In Germany, the GDI-DE coordinates the national contributions. Also, the GDI-DE applies the structures created by INSPIRE to themes not addressed by INSPIRE, with the exception of theme-specific data modelling. Not only the Federation is involved in the GDI-DE but also the Länder, administrative districts, municipalities and businesses.² The main purpose of a GDI is to make it easy to find, access and use existing geodata. As regards using geodata, the focus is mainly on an automated dissemination via web services. This definitely requires strict standardisation of the metadata, data sets and network services. The technical standards are based on the standards of the Open Geospatial Consortium (OGC)³. Geoportal.de⁴ has been enhanced to become the central national portal. In technological and organisational terms, it is operated by the Federal Agency for Cartography and Geodesy in Frankfurt/Main. The main components of the portal include Geodata Catalogue.de for the geodata search and the map viewer for the cartographic preview in the portal.

In most cases, official statistics involve only indirect spatial reference, usually by indicating the administrative unit to which the data refer. This, however, meets the criteria of the term "geodata", according to the usual definitions applied to geodata infrastructures.⁵ To make things consistent, the statistical offices of the Federation and the Länder have decided that all results released through the online information databases will also be made available for GDI-DE. More concretely, this means that the data stocks from <u>GENESIS-Online</u> and the <u>Regional Database for Germany</u> can be researched (through discovery service), can be visualised by maps (through view service) and are available (through discovery service) via network services compatible with INSPIRE or OGC where this is meaningful⁶. It is not clear yet whether other publication channels will (have to) be included in the GDI activities of official statistics.

The two online publication databases mentioned above are based on the GENESIS system which has been developed by the statistical offices. Thanks to system extensions developed by the Federal Statistical Office, official statistics can be linked to Geoportal.de in accordance with the standards. The vast amount of metadata can be covered and processed through a specifically developed interface, using the harvesting methods of Geodata Catalogue.de, so that they are

- ⁵ See for example <u>Geodatenzugangsgesetz des Bundes (Spatial Data Access Act)</u>, Part 2, Section 3 (1)
- ⁶ For example, federal results are not processed to be shown as maps.

¹ See <u>http://inspire.ec.europa.eu/index.cfm</u>

² See <u>http://www.geoportal.de/EN/GDI-DE/gdi-de.html</u>

³ See <u>http://www.opengeospatial.org/</u>

⁴ See <u>http://www.geoportal.de/EN/Geoportal</u>

available to the *discovery service* of Geoportal.de. For some years, the function "interactive maps" has been available for many tables in GENESIS-Online. Based on the underlying map server technology, extensions have been set up to create the *view services*. As regards the availability of the *download services*, there is still some work to be finished. Although the service has formally been implemented on the data page, the data cannot be retrieved yet from Geoportal.de.

Chart 1 below shows a search result in Geoportal.de obtained when searching for "Arbeitslose" (unemployed). The little map image on top left in the metadata display is a symbol indicating a hit from the Regional Database for Germany. For this hit, a variety of content-related and technical metadata are offered to the user. For the sake of readability, only part of the information is shown in the chart. The button "In Karte anzeigen >" (Show on map) tells us at once that the search result refers to a view service. When the user clicks on the button, this service will display a cartographic preview of the data in the portal's geoviewer. However, only a preset combination of variables can be visualised here. For further maps, the user will be directed to the map viewer of the Federal Statistical Office (link not visible in the chart). If the search result refers to a data set, the relevant link to the table in the database is displayed.

	Arbeitslose Arbeitslosenqu krfr. Städte 2014-05-14 Stati Arbeitslose nach regionale Tiefe: H	nach ausgewählten Personengruppen sowie oten - Jahresdurchschnitt - regionale Tiefe: Kreise und istische Ämter des Bundes und der Länder ★ ★ ★ ★ (0) komm nausgewählten Personengruppen sowie Arbeitslosenquoten - Jahresdu Greise und krfr. Städte	rte anzeigen ≻ tentieren urchschnitt -
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Schlüsselwörte	ər:	Population distribution — demography, Verteilung der Bevölkerung — infoMapAccessService, Ausländer, schwerbehindert, 15 bis unter 20 unter 25 Jahre, 55 bis unter 65 Jahre, langzeitarbeitslos	- Demografie, Jahre, 15 bis
Durchschnittlic Anbieter:	he Bewertung:	***** Statistische Ämter des Bundes und der Länder	

Chart 1 Section of the metadata on the geodata set in the hit list of the search function of Geoportal.de.

In the system of official statistics, many results are produced at the level of the Land offices which go beyond the range of data offered by the Federal Statistical Office. These data are needed especially in the geoportals of the Länder. These geoportals, too, are adequately fed by the two online information systems. For this purpose, suitable filter functions have been created, so that only the data of the relevant Land are provided and the metadata are supplied by the relevant Land Statistical Office. This can be seen, for example, in the geoportal of Niedersachsen¹.

In addition to the generic linkage of the information databases, official statistics are represented in Geoportal.de by means of <u>thematic maps</u>, which are offered on selected themes.

It should also be mentioned that geoportals are just a new dissemination channel for official statistical results. For some time, they have also been available by searching on <u>GovData.de</u>.

Dr. Holger Heidrich-Riske, tel: +49 (0) 611 / 75 27 46, e-mail: <u>holger.heidrich-riske@destatis.de</u> Dirk Hollmann, tel: +49 (0) 611 / 75 34 03, e-mail: <u>dirk.hollmann@destatis.de</u>

¹ <u>http://geoportal.geodaten.niedersachsen.de/harvest/srv/de/main.home</u>

Methods of federal statistics – Further development

The sampling plan of representative electoral statistics for the 2013 Bundestag and the 2014 European elections

Representative electoral statistics for Bundestag and European elections provide a statistical analysis of the voter turnout and the votes cast in the elections to the German Bundestag and of members of the European Parliament. The statistics are based on a sample survey whose selection and expansion procedures will be explained in the present text.

Sampling frame and sampling units

The sampling frame used for drawing the sample are the polling district statistics of a previous election; the sampling units are all polling districts for ballot box and postal voting listed therein. In accordance with Section 3, third sentence, of the Law on Electoral Statistics,¹ all polling districts for ballot box voting with at least 400 persons entitled to vote and polling districts for postal voting with at least 400 voters (in the previous election) have a chance of being selected.

Polling district boundaries may change between two elections. As a consequence, the sample and the respective polling district boundaries have to be adjusted. The following principle is used for that purpose: a polling district with redefined boundaries is part of the sample if the majority of those entitled to vote (in districts for ballot box voting) or of the voters (in postal voting districts) can be allocated to a polling district which was originally part of the sample.

Sample design

To enhance the precision of the estimated results, the sampling frame is stratified by Land, type of district (ballot box voting or postal voting) and voter behaviour before the sample is drawn. This means that the polling districts of the sampling frame are subdivided into non-overlapping groups (=strata) in separate breakdowns by Land and by district type. They are broken down on the basis of a cluster analysis to form groups whose voter behaviour is as homogeneous as possible. To reflect the voter behaviour, the number of valid votes² cast for CDU/CSU, SPD, GRÜNE, FDP and DIE LINKE is drawn upon. Based on the values determined for these parties, the clusters are formed using the k-means approach. The number of clusters to be formed is specified in each case by taking into consideration a minimum size in each stratum, with the expected increase in precision being as great as possible.

Section 3, second sentence, of the Law on Electoral Statistics provides that the sample size for all of Germany must not exceed 5% of the polling districts for ballot box voting and postal voting, respectively. When the sample size for a Land is specified, the 10% limit has to be observed for each type of district. Within a Land and district type, the sample size is subdivided proportionally among the strata determined by cluster analysis. The actual sample sizes of the Länder are contained in the annex to the publication of the Federal Returning Officer entitled "Wahlbeteiligung und Stimmabgabe der Männer und Frauen nach Altersgruppen" (Electoral participation of and votes cast by men and women by age groups) (no 4 of the series on the respective election).

The sample is drawn centrally at the Federal Statistical Office. For each stratum, the sampling districts are determined by simple random sampling.

Expansion

By appropriate weighting, the figures collected for the sampling districts may be expanded to create a result for the universe of all polling districts. A calibration procedure is used to this end

¹ Law on the General and the Representative Electoral Statistics at the Elections to the German Bundestag and at the Election of the Members of the European Parliament from the Federal Republic of Germany (Law on Electoral Statistics – WStatG)

² At the Bundestag election: second votes.

which is based on regression estimation (GREG estimation). That procedure draws upon various figures from the official final result of the respective election to be used as additional information (see below). On the one hand, this ensures that the estimates from the representative electoral statistics are coherent with the corresponding official final result. On the other, this procedure has a positive influence on the precision of the estimates and counters the fact that polling districts with fewer than 400 persons entitled to vote (ballot box voting) or voters (postal voting) must not be eligible for selection on account of the legal framework conditions.

The results of representative electoral statistics are expanded separately by Länder, hence detailed information can be provided in each Land on the following topics:

- (1) persons entitled to vote, voters and voter turnout by sex and ten age groups
- (2) votes cast by sex and six age groups
- (3) type of invalid votes by sex

A separate estimation is made for each of the above presentations of results. The following figures of the official final result are used for expansion:

- (1) number of persons entitled to vote with, and without, polling card note, number of voters without a polling card
- (2) number of valid votes¹ cast for selected parties (including CDU/CSU, SPD, GRÜNE, FDP and DIE LINKE), number of invalid votes
- (3) number of invalid votes

Software

The SAS[®] software is used in sampling and extrapolation. The SAS procedures PROC FASTCLUS and PROC SURVEYSELECT are available for conducting the cluster analysis to stratify the sampling frame and for drawing the sample; the specification of the expansion weights is based on an implementation of the calibration procedure.

Literature

Election to the 18th German Bundestag on 22 September 2013, no 4: "Wahlbeteiligung und Stimmabgabe der Männer und Frauen nach Altersgruppen", publications of the Federal Returning Officer, Wiesbaden 2014.

Election of the members of the European Parliament from the Federal Republic of Germany on 25 May 2014, no 4: "Wahlbeteiligung und Stimmabgabe der Männer und Frauen nach Altersgruppen", publications of the Federal Returning Officer, Wiesbaden 2014.

Dr. Alina Maurer, tel: +49-(0)611/75 25 66, e-mail: <u>alina.maurer@destatis.de</u>

¹ At the Bundestag election: first and second votes.

The Index of Services Production

The Index of Services Production (ISP) has been planned and designed by Eurostat as a statistical indicator for the services sector and will be calculated for the first time in the next few years in the context of a far-reaching reform of business statistics. So far, however, no concrete date has been set for implementing the concept. The indicator will be used for the price-adjusted development of gross value added. Gross value added is calculated as turnover plus own-account production of fixed assets plus other operating income, taking account of changes in stocks, less consumption of goods and services.

The idea behind the ISP can most easily be illustrated by a question.

By what percentage would gross value added have changed if both the prices of the produced services and the prices of the goods used for production had remained constant?

The purpose of the ISP is to show the influence that the volumes produced and consumed have on the gross value added. Consequently, the index formula is as follows:

$$ISP = \frac{\sum_{i=1}^{n} p_{i0} \times q_{it} - \sum_{j=1}^{m} c_{j0} \times v_{jt}}{\sum_{i=1}^{n} p_{i0} \times q_{i0} - \sum_{j=1}^{m} c_{j0} \times v_{j0}}$$

 $p_{i0} = price \ of \ service \ i \ produced \ in \ base \ period \ 0$ $q_{i0} = volume \ of \ service \ i \ produced \ in \ base \ period \ 0$ $q_{it} = volume \ of \ service \ i \ produced \ in \ reference \ period \ t$ $c_{j0} = price \ of \ intermediate \ product \ j \ used \ for \ production \ in \ the \ services \ sector$ $v_{j0} = volume \ of \ intermediate \ product \ j \ used \ for \ production \ in \ the \ services \ sector$ $n = number \ of \ intermediate \ products \ used \ for \ production \ in \ the \ services \ sector$

Similar indicators have been calculated for industry, construction and national accounts.¹ The ISP is to support policy makers and researchers by completing the picture of European economic performance.

The main problem of the ISP is that only approximate results can be calculated as the data available are not sufficient for exact mathematical calculations. This is why the Index of Services Production will be calculated as a volume index. Generally, this can be done in two ways.

- 1. An overall index is obtained from a volume index by aggregating volume indices for individual products.
- 2. Turnover information for individual products or economic branches is divided (deflated) by a suitable price index.

For each of the two basic variants, there are several possible data sources. The list below is a recommendation on what sequence the sources should be used in:²

- Deflating turnover indices from short-term statistics by producer price indices at a detailed level of economic activity; then aggregating them by gross value added information from structural statistics to obtain higher levels of economic activity.
- Volume indices for individual services produced in an economic branch, aggregated by gross value added information, alternatively aggregated by turnover share.
- Deflating turnover indices from short-term statistics by approximate price indices (e.g. from consumer price statistics or using the development of earnings in the relevant

¹ (European Communities, 2006), (European Union, 2011), (European Communities, 2001)

² (OECD, 2007)

service branch); then aggregating them by gross value added information from structural statistics;

• Using other volume information (e.g. input values), preferably aggregated by gross value added information, alternatively aggregated by turnover share.

However, approximation involves major disadvantages:

- When using turnover, what is measured is generally the services invoiced rather than the services produced.
- Producer price indices are best suited for deflation because they reflect rather well the price development for the turnover measured. However, these indices are not available for every service branch. When approximate deflators are used, prices may have some influence on the ISP.
- Through deflation, the volumes are weighted according to the Paasche formula. However, the ISP is compatible rather with the Laspeyres formula.
- Only in exceptional cases are real production volumes available for individual services because they have to refer to the output of German enterprises rather than to the service volume produced in Germany.

Conclusion: The Index of Services Production planned by Eurostat is a theoretically valuable tool to measure the real development of value added in the services sector. In practical implementation, however, it suffers from various qualitative shortcomings so that it is not recommended without reservation to use it as a short-term indicator without taking account of other indicators.

Literatur:

European Communities. (2001). Handbook on Price and Volume Measures. Luxembourg: Office for Official Publications of the European Communities.

European Communities. (2006). Methodology of Short-Term Business Statistics. Luxembourg: Office for Official Publications of the European Communities.

European Union. (2011). Guidelines for Compiling the Monthly Index of Production in Construction. Luxembourg: Publication Office of the European Union.

OECD. (2007). Compilation Manual for an Index of Service Production. Paris: OECD.

Dr. Sebastian Metzl, tel: +49 (0) 228 / 99 643 8541, e-mail: sebastian.metzl@destatis.de

Events

National accounting specialist committee: 2014 major national accounts revision

This year's meeting of the National accounting specialist committee, which was held in Wiesbaden on 29 and 30 October 2014, focused on the most recent 2014 major revision. The main purpose of the major revision was to implement a whole set of new international methodological rules, namely the European System of National and Regional Accounts (ESA) 2010 which, in turn, is based on the System of National Accounts (SNA) 2008 of the United Nations. On that occasion, both the relevant calculation methods and sources of the whole accounting system were under scrutiny in Germany. In the context of the 2014 major revision, the whole set of tables was therefore completely revised and, as a rule, revisions were made in all time series from 1991 to avoid statistics-related breaks.

During the committee's meeting, especially the conceptual changes and revised results were outlined in detail (based on a comparison of new and old figures) in six specialist talks and discussed with more than 50 external experts. To assess the quality of the revised results in an appropriate manner, a differentiation between conceptual and data-caused changes is necessary. Conceptual changes are exogenous changes of the framework conditions, whereas data-caused changes (incl. the calculation methods applied) are intended to further improve data quality. From the perspective of users, however, both aspects are important to interpret the results.

In quantitative terms, treating research and development (R & D) as fixed capital formation is by far the largest conceptual change of the 2014 major revision. Research and development are no longer regarded as current expenditure for production in the relevant period; they are rather considered as non-financial assets that are used for production purposes over several periods. The use of R & D services during the relevant period is now measured in terms of the proportional consumption of fixed capital. This conceptual modification refers to both purchased and own-account R & D. It applies to private economic entities and also to government sector units and non-profit institutions serving households. However, the effects of the above changes differ between market producers and non-market producers because different methods are used for determining the relevant value added.

Other conceptual changes with an impact on the gross domestic product are the following: recording of military weapon systems as capital formation (previously recorded as current expenditure (intermediate consumption) and government final consumption expenditure), improved reinsurance representation, new definition of inexpensive economic assets, and stricter criteria for delimiting the general government sector, which is of special importance to the European fiscal surveillance data.

Besides the conceptual changes, the so-called EU action points play a role, too. These are actions which result from reviewing the gross national income as an assessment basis for payments by the Member States to the EU budget (so-called GNI-based own resources). The current major revision incorporated results of the 2011 census of buildings and housing especially in the dwelling service calculations. To improve comparability between the Member States, the recording of illegal activities was harmonised, too. As far as Germany is concerned, estimates particularly for drug trafficking and tobacco smuggling were included in the relevant calculations. It should however be stressed that, basically, non-observed activities had been part of the gross domestic product before.

Other conceptual modifications do not affect the gross domestic product, but have an impact on individual national accounts aggregates. This refers in particular to changes in representing exports and imports in national accounts. Showing cross-border processing under contract in net terms and treating transit trade in a modified manner are changes of special quantitative importance. The revision of the national accounting rules coincided with a review and adjustment

of the international Balance of Payments Manual (BPM6). In that context, the approach of recording goods at the time they physically cross the frontier was replaced by recording them at the time ownership changes. A talk given by the Deutsche Bundesbank discussed in more detail the relevant changes to the balance of payments statistics.

In the context of the 2014 major revision, nearly all components of the system of national accounts were revised so that, finally, a completely new set of data was obtained, not least because of the large number of interdependencies. In particular, shifts occurred in the relevant levels, for instance, of the gross domestic product, capital formation and consumption of fixed capital, but also of persons in employment and compensation of employees. As a consequence, major economic indicators such as labour productivity, capital productivity and unit labour costs as well as key macroeconomic ratios like the government deficit ratio, debt ratio and wage share have changed, too. In many cases, however, the basic pattern of the relevant time series has remained largely unchanged over time so that economic assessments are not expected to change substantially.

Basically, the current worldwide major revision of national accounts (based on SNA 2008 and ESA 2010) has led to an improvement of international comparability of the results although there has been a long and historical tradition of international harmonisation in the area of national accounting. Especially within the EU, European harmonisation has been pushed in the last few years, the main reason being the growing administrative use of national accounting data. Consequently, a comprehensive national accounts revision took place in all EU Member States in 2014, implementing the new ESA 2010 methodology. In most European countries, first results of the 2014 revision were released in September 2014, in some Member States even slightly earlier. Eurostat presented the first EU results including a comparison between the Member States during the meeting of the National accounting specialist committee.

Finally, the challenges to be faced in the future were indicated by the specialist committee, too. These include in particular the following: implementing the major revision at the regional level slightly later on (presentation by the Working group on the national accounts of the Länder), providing a detailed methodological documentation (Member States) and subsequent verification (Eurostat), abolishing temporary national exemptions, and continuing the international work on issues that have not yet been appropriately resolved. The specialist committee's discussions time and again revealed the tense relationship between methodological changes and political implications.

Detailed documents on the 2014 major national accounts revision are available from the <u>website</u> of the Federal Statistical Office.

Dr. Norbert Räth, tel: +49 (0) 611 / 75 25 21, e-mail: norbert.raeth@destatis.de

23rd scientific colloquium on "Small-Area Data - Selected Aspects"

On 20 and 21 November 2014, the 23rd scientific colloquium on "Small-Area Data - Selected Aspects", organised by the Federal Statistical Office together with the German Statistical Society (DStatG), took place in the Wiesbaden Museum.

It was important for the Federal Statistical Office and the German Statistical Society as the hosts of the colloquium that talks were given by representatives from ministries, academic research and applied research institutes and also official statistics. Dieter Sarreither, Vice-President of the Federal Statistical Office, introduced the topic of the colloquium and moderated the event. Talks were given by scientists from the Federal Ministry of Transport and Digital Infrastructure and the Federal Ministry for the Environment, Nature Conservation, Building and Nuclear Safety as well as Eurostat, institutions of higher education and research institutes, the Federal Statistical Office and the statistical offices of the Länder. In his welcome address, President Roderich Egeler emphasised the particular importance of the topic of small-area data for Destatis. This was again underlined in three specialist talks given by the Federal Statistical Office. The three papers focused on the interactive census map, the delimitation of constituency boundaries, accident density maps and the online agricultural statistics atlas as examples of how small-area data are used in official statistics.

The <u>conference documentation</u> comprising the accompanying presentations and abstracts of the contributions is now available from the website of the Federal Statistical Office.

Christian König, tel: +49 (0) 611 / 75 20 77, e-mail: <u>christian.koenig@destatis.de</u>

Federal Statistical Office presents the 2014 Gerhard Fürst Awards

Two outstanding scientific contributions were honoured this year with the Federal Statistical Office's Gerhard Fürst Awards, which were granted for the 16th time.

In the "doctoral thesis" category, the Award was given to Dr. Christian Dudel for his thesis on "Nonparametric Forecasts of Kin Counts", which was supervised by Professor Dr. Notburga Ott of Ruhr University Bochum. In the "Master's/Bachelor's thesis" category, the diploma thesis by Timo Lepper on "Temporary Agency Work in Hessen: A Stepping Stone to Regular Employment?" was found worthy of the Award. The diploma thesis was written under the supervision of Professor Dr. Markus Gangl at Goethe University Frankfurt. The Gerhard Fürst Award money is 5,000 euros in the "doctoral thesis" category and 2,500 euros in the "Master's/Bachelor's thesis" category.

The Federal Statistical Office gives the Awards on the basis of recommendations by an independent expert jury. The Gerhard Fürst Awards were presented by President Egeler at the 23rd scientific colloquium on "Small-Area Data", which was held by the Federal Statistical Office together with the German Statistical Society in Wiesbaden on 20 and 21 November 2014.

The laudatory speeches on the award-winning papers were delivered by the chairman of the expert jury, Professor Dr. Walter Krämer (TU Dortmund University). They will be published in the December issue of the "Wirtschaft und Statistik" journal. Early next year, the award winners will publish detailed articles on their papers in that journal.

Short versions of the award-winning papers and more detailed information on the presentation of the Gerhard Fürst Awards can be found on the Federal Statistical Office's website at www.destatis.de/gerhard_fuerst_preis.

Holger Birkigt, tel: +49 (0) 611 / 75 25 56, e-mail: holger.birkigt@destatis.de