European Data Watch

This section will offer descriptions as well as discussions of data sources that may be of interest to social scientists engaged in empirical research or teaching courses that include empirical investigations performed by students. The purpose is to describe the information in the data source, to give examples of questions tackled with the data and to tell how to access the data for research and teaching. We will start with data from German speaking countries that allow international comparative research. While most of the data will be at the micro level (individuals, households, or firms), more aggregate data and meta data (for regions, industries, or nations) will be included, too. Suggestions for data sources to be described in future columns (or comments on past columns) should be send to: Joachim Wagner, University of Lueneburg, Institute of Economics, Campus 4.210, 21332 Lueneburg, Germany, or e-mailed to ⟨wagner@leuphana.de⟩.

Micro Data at the Ifo Institute for Economic Research – The "Ifo Business Survey" Usage and Access

By Sascha O. Becker and Klaus Wohlrabe

1. Introduction

The Ifo Institute has regularly been conducting business surveys since 1949. The *Ifo Business Climate* is calculated from the survey results. This is regarded as one of the most important indicators for economic activity in Germany.[1] The Ifo Business Climate is based on about 7000 monthly replies given by the surveyed. These replies are stored as micro data of the Ifo Business Survey (IBS). Whereas the time series for a variety of industries and sectors has been available in the so-called *ifo DataBase,* access to the underlying micro data was only limited for research purposes.

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[1] The Ifo Business Climate is a mean of accumulated responses on the current business situation and business expectations. For further information on its calculation see http: // www.ifo-geschaeftsklima.info.

Since 2004, the Ifo Institute has continuously been converting its micro data stock into the Stata format and now makes these data available in the *Ifo Data-Pool.* This enables external researchers to conduct scientific analysis at the Ifo Institute using anonymously rendered micro data of the four standard Ifo surveys, namely the Ifo Business Survey, the Ifo Investment Survey, the Ifo Innovation Survey and the Ifo World Economic Survey. Because the Ifo Institute has ensured the participating companies confidentiality, the dataset has been made anonymous and is usable only under strict access criteria at an Ifo-based single-user PC.

All of the four standard Ifo surveys have been conducted for years, some even for decades. For applied empirical research, these micro data provide the possibility for detailed panel analysis. As regards content, standard Ifo surveys offer aspects that are not available in other data sources, for example single enterprises' assessments of their current business situation and expectations on a monthly basis (in the Ifo Business Survey), the investment volume (in the Ifo Investment Survey), detailed information about innovation activity over 25 years (in the Ifo Innovation Survey) and assessments of the international economic cycle by experts in 90 countries (in the Ifo World Economic Survey) are only some examples. A notable advantage of the Ifo data is that they contain information about the plans and expectations of the survey participants.

This article describes a portion of the actual stock of business micro data in the *Ifo DataPool,* namely the Ifo Business Survey. In the following, the data quantity, documentation and the availability of the Ifo Business Survey will be described. Moreover, a brief overview of the previous scientific usage of these data will be given. The overview shows that the *Ifo DataPool* information can be applied for exploring several relevant economic issues.

In section 2 the *Ifo DataPool* and its components are described in more detailed. An overview of the previous scientific usage of the data follows in section 3. Section 4 describes the access to the data.

2. The *Ifo DataPool*

The *Ifo DataPool* contains economically relevant micro- and macro information. Besides the Ifo micro data, also external data, for example, the European Social Survey (SOEP), British Household Survey, EconWin, Penn World Table and others are covered. These can be used after approval from the corresponding institute. This article describes the Ifo Business Survey (IBS). Data from the Ifo Business Survey are available for the following four sectors: manufacturing (*Verarbeitendes Gewerbe,* IBS VG), construction (*Bauhaupt-gewerbe,* IBS BAU), wholesaling and retailing (*Groß- and Einzelhandel,* IBS HAN) and IT services (*Datenverarbeitungs-Dienstleistungen,* IBS DVDL).

Table 1 lists the current stock of Ifo Business Survey data, supplemented by the first survey and the survey frequency.

In addition to the data in Stata format, the *Ifo DataPool* also contains documentations of the variables as well as exemplary questionnaires.

Table 1

***Ifo DataPool:* Stock**

Ifo Survey	**Stock**	**Survey since**	**Frequency**
IBS VG	01 / 1980 – 07 / 2006 (east since 01 / 1991)	1950 (east 1991)	
IBS BAU	01 / 1991 – 7 / 2006 (east since 01 / 1991)	1956 (east 1990)	monthly
IBS HAN	01 / 1990 – 7 / 2006 (east since 01 / 1991)	1950* (east 1990)	
IBS DVDL	03 / 1995 – 06 / 2004	1995	quarterly

*1950 retail, 1951 wholesale.

2.1 Ifo Business Survey (IBS)

Some of the surveyed enterprises give particulars on more than one product group or different building or trade sectors. From the responses of these firms to single sectors, there result around 7,000 replies that are used to calculated the Ifo Business Climate. Thus, the quantity of responses is not equal to the number of surveyed enterprises. For a detailed description of the methodology and calculation of the Ifo Business Climate, see Goldrian (2007).

2.2 Ifo Business Cycle Test – Standard Queries

The (standard) questions asked monthly in the Ifo Business Survey refer to both the current and expected economic situation of the enterprises, differentiated into several segments. The enterprises can give one of three categorical answers ("1" positive, "2" neutral, "3" negative) per standard question. This allows the replying enterprises to evaluate the general thrust of their economic situation. Table 2 lists the variables contained in the IBS's micro data. These are surveyed monthly, as a rule. Only the Business Survey of IT service providers is conducted quarterly. All variables in Table 2 are categorical. In addition to the ordinally scaled answers to the standard questions, there are questions to be answered with "yes" or "no", indicated in Table 2 as *"binary"*.

Table 2

Business Survey variables (standard questions only)

IBS VG	IBS HAN
Current situation: Business situation Manufactured goods Volume of orders (inland and abroad) **Tendencies in the past month:** Demand Volume of orders (inland and abroad) Output, inland sales prices **Expectations for the next 3 months:** Output, inland sales prices Exports, employment **Expectations for the next 6 months:** Business situation	**Current business situation:** Business situation Turnover Stock of inventory Sales prices **Plans and expectations f. t. next 3 months:** Sales prices Orders Employment **Expectations for the next 6 months:** Business development
IBS BAU	**IBS DVDL**
Building activity: Change compared to previous month Obstructions (*binary*) Expectations for the next 3 months **Works contracts:** Change compared to the previous month Assessment (in months) **Building prices:** Change compared to the previous month Covering the production costs Expectations for the next 3 months **Business situation:** Assessment Expectations for the next 6 months **Equipment utilization:** in per cent **Employment:** Expectations for the next 3 – 4 months Sickness ratio	**Current situation:** Business situation Business situation change compared to previous 3 months Turnover change compared to previous 2 – 3 months Turnover development compared to the same month in the prior year Volume of orders, employment Obstacles to business activity *(binary)* **Expectations:** Expected turnover for the next 2 – 3 months Employment expectations for the next 2 – 3 months, Business outlook for the next 6 months Prices in the next 3 months

2.3 Business Survey – Special Questions

Besides the variables contained in Table 2 on the IBS standard questions, additional questions are asked in all survey sectors. Table 3 lists the special questions, structured according to sectors, with scaling as well as periodicity. As in Table 2, most data are ordinal with three response categories; others are binary.

Table 3

Business Survey – special questions

IBS VG	Capacity utilization: volume of orders in months, machines' utilization in percent, technical capacity (*ordinal*)	4 × annual 4 × annual
	Obstacles to production (*binary*)	4 × annual
	Competitive position inland (*ordinal*)	4 × annual
	Competitive position abroad, EU and non-EU (*ordinal*)	4 × annual
	Raw material and primary material stock / manufactured goods stock, in weeks	4 × annual
	Overtime / short-time work / workforce (*binary*)	4 × annual
	Banks' lending willingness (*ordinal*)	2 × annual
	Assessment of the profit situation (*ordinal*)	2 × annual
	Innovation activity (*binary*)	1 × annual
IBS BAU	Construction backlog (*ordinal*)	1 × annual
	Work of subcontractors, non-included buildings, area of activity (*in percent*[1])	1 × annual
	Winter construction (*binary*)	2 × annual
	Special difficulties (binary), e.g. order cancellation	2 × annual
	Expected change in order processing (*ordinal*)	1 × annual
	Change of construction volume (*ordinal* and *in percent*[2])	1 × annual
	Rental machines / subcontractors (*binary, ordinal* or in *percent*[2])	1 × annual
	Mid-term business expectations (*ordinal*)	1 × annual
	Overtime / prefabricated material (*binary* & *in percent*[3])	1 × annual
	Winter closures (*binary* and *in months*)	1 × annual
	Construction orders abroad (*binary*)	1 × annual
IBS HAN	Trading obstacles (*ordinal*)	4 × annual
	Banks' lending willingness (*ordinal*)	2 × annual
IBS DVDL	Investment compared to previous year (*ordinal*)	1 × annual
	Investment expectations (*ordinal*)	1 × annual
	Hiring of new employees: part-, full-time (*binary*)	1 × annual
	Availability of trained employees (*ordinal*)	1 × annual
	Assessment of inland competition (*ordinal*)	1 × annual
	Assessment of EU-wide competition (*ordinal*)	1 × annual
	Expansion in business activity: inland, EU, abroad (*binary*)	1 × annual
	Turnover distribution within the firm (*in percent*[4])	1 × annual

[1] Of annual turnover, [2] Compared to the previous year, [3] Of total working hours, [4] Turnover breakdown.

2.4 Observation Numbers and Classification Variables

For linking the anonymous enterprise reports over time, the data contain firm-specific observation numbers. The data of the Ifo Business Surveys in the *Ifo DataPool* include different classification variables, for example – depending on the industry branch – the size category according to employees, turnover and the federal state where the company is based. Table 4 provides an overview.

Table 4

Variables for a classification of single enterprise responses

Variable	**IBS VG**	**IBS HAN**	**IBS BAU**	**IBS DVDL**
Size	since 06 / 1980	O	to 12 / 1995 and west only	X
Federal state	X	X	X	X
Industry branch classification	X	X	X	X
Turnover size	O	since 1998 and east only	O	O

X: surveyed / available. – O: not surveyed / available.

For the groups BAU, HAN and DVDL the Ifo Institute allocates identification numbers for the building, trade and service branches, respectively. Micro data for manufacturing has the Ifo branch classification as well as the branch classifications of the German Federal Statistical Office (WZ 93).

3. Ifo Business Survey Data in Economic Research

In the following, a selection of scholarly publications that apply Ifo survey data is presented. *Ifo DataLit,* the online literature database collecting all publications using Ifo data, is available on the Ifo website.[2] Many publications are based on aggregated time series that were available before the creation of the *Ifo DataPool.* This provides an overview of research based on Ifo Business Survey data, which can assist future research. Where micro data have been used, this is mentioned. Non-listed articles have been published primarily in Ifo studies or monographs (Oppenländer / Posen, 1989, Goldrian, 2004, 2007 and Sturm / Wollmershäuser, 2005). These publications mainly deal with methodological aspects of the surveys.

3.1 Ifo Business Cycle Test (IBS)

Early Research

Early descriptions of the Ifo Business Surveys were made by Langelütke / Marquardt (1951). Anderson (1952) was the first to Ifo data for scientific analysis, who applied time series (January 1950 – February 1952) for testing the relationship between IBS data and the official statistics. Using a correlation analysis Anderson showed that partial aggregates of the Business Survey (e.g. nutrition) display a very good approximation of the official statistics. Indivi-

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2 See http: // portal.ifo.de / link / 70IfoDataLit.

dual components of Ifo Business Surveys are also available at the *Ifo Data-Pool*. Moreover, he forecasted macro time series using Ifo data. A similar approach was applied by Theil (1955), who discussed in particular the use of balances as an aggregation method. He was also the first to use micro data for manufacturing (leather and shoe industry) in his analysis. Thonstad / Jochems (1961) modelled production plans in dependency on companies' expectations and assessments of the business situation. As with Theil (1955) they used data for the leather and shoe industry (1956 – 1958). This was the first study to explore links between variables contained in the Business Survey.

Studies on the Expectation Formation

König / Nerlove / Ouodiz (1981) showed how price expectations can be described dependent on current or past periods. They tested these links at the micro level (micro data from January 1977 – December 1978) based on log-linear probability models. Nerlove (1983) proceeded similarly, estimating different models of expectation formation using a conditional Logit approach. The article of Kawasaki / McMillan / Zimmermann (1982) shows how Ifo micro data can be used for analysing disequilibrium dynamics within firms. The authors modelled, by means of IBS manufacturing micro data for the period from February 1977 – December 1978, the price and production changes dependent on the inventory and order volumes of the previous month. The empirical implementation occurred via multivariate Logit models. Kawasaki / McMillan / Zimmermann (1983) followed a similar approach for analyzing profit maximizing strategies for the maintenance of stock inventory. Using the same micro data as Kawasaki / McMillan / Zimmermann (1982), they showed how enterprises react to demand changes. A survey of Wolters (1984) illustrated how autoregressive approaches as well as hypothesises of rational expectation formation could be useful for econometric analysis of inflation expectations. Moreover, by means of bivariate autoregressive models research was conducted to see whether Ifo tendency data concerning price expectations were appropriate for measuring inflation expectations in investment goods. Madsen (1993) conducted a similar analysis concerning production expectations in newly industrialised countries by employing Ifo production expectations from 1971 to 1990. Madsen (1996) similarly used Ifo expectation data (March 1978 – February 1992) for testing several hypothesises of expectation formation. Another theoretical model of "interactive expectation formation", has been tested by Flieth / Feaster (2002) using Ifo data. Hohnisch et al. (2005) examined whether herding behaviour played a role in how companies replied to surveys. Fahrmeir / Nase (1994) showed (micro data for non-metallic mineral products, 1980 – 1990) by using cumulative dynamic Logit models that survey responses are seasonally influenced. The theoretical model and a shorter investigation using the micro data was presented by Fahrmeir (1992).

Special Question on Innovation at the IBS

As shown in Table 3, once a year the enterprises are queried about their innovation behaviour. The analysis of this special question on innovation was a component of several studies. These studies dealt mainly with the determinants and effects of innovations, e.g. if innovations lead to a higher level of employment within the company or lead to a change of the market structure. The change of innovation behaviour over time has also been analysed. The following studies all used micro data of the Business Surveys, especially the above-mentioned special question on firms' innovation behaviour. As econometric methods, mainly static and dynamic probit and logit models were used (cross section and panel analysis). Lachenmaier (2007) presents an overview and a summary of the following studies: Zimmermann (1989), Entorf / Pohlmeier (1990), Zimmermann (1991), Ross / Zimmermann (1993), König et al. (1994), Laisney et al. (1992), Pohlmeier (1992), Flaig / Stadler (1993, 1994, 1998), Flaig / Rottmann (1994, 1999), Rottmann (1995), Bertscheck (1995), Rottmann / Ruschinski (1997, 1998) and Smolny (1998).

Business Cycle Analysis

Ifo Business Climate has been the subject of numerous business-cycle studies. For introductory aspects, see Oppenländer / Poser (1989), Oppenländer (1995) and Goldrian (2004, 2007). Döpke / Krämer / Langfeldt (1994) explored the Ifo time series as well as other leading indicators with regard to their forecasting performance of industrial production turning points in Germany. The authors used simple regression models and Granger causality tests. In a similarly structured article, Breitung / Jagodzinski (2001) discussed several measures for the goodness of fit for model assessments. Hüfner / Schröder (2002) compared the forecast quality of Ifo business expectations and the ZEW business cycle expectations via autoregressive models and Granger causality tests, examining especially the indicators' lead. Goldrian (2003) replied to this article, comparing the leads' variances. Other authors used Markov-Switching models, Probit and Logit estimations in conjunction with Ifo data, see e.g. Fritsche (1999), Döpke (1999), Funke (1997), Fritsche / Stephan (2002), Fritsche / Kouzine (2001, 2004), Bandholz / Funke (2003), Benner / Meier (2004, 2005), Hinze (2003), Flaig (2003), Flaig / Plötscher (2001), Schuhmacher / Dreger (2004), Knetsch (2004), Dreger / Schumacher (2005), Kholodilin / Siliverstovs (2006), as well as Abberger (2004, 2005, 2006, 2007a, b, c). An overview and a survey of the forecasting properties of different Ifo Business Survey time series is provided by Abberger / Wohlrabe (2006).

4. Access to the *Ifo DataPool*

The Ifo Institute for Economic Research has obligated itself vis-à-vis the firms participating in its surveys to treat the survey data as strictly confidential. The confidentiality applies both to the identity of the participating firms as well as to the survey responses. The strict confidentiality of data is the basic prerequisite for the Ifo Institute able to conduct its surveys and to ensure the stability of the survey panels. Thus, as a matter of principle, the Ifo Institute does not allow access to the survey data to outside persons. A limited usage for research purposes is only allowed if it is guaranteed that a publication will not allow conclusions to be drawn on the identity of individual firms. The use, evaluation and calculations with the data must not be driven by commercial purposes.

Upon request in written form, the Ifo Institute forwards by e-mail a user-oriented information package on the micro data. The package contains a sample dataset in Stata format (with fictitious data), the documentation and a sample questionnaire. Interested researchers must send a written application to the management of the Ifo Institute containing the intention and details of the planned research, detailed wishes on what data is to be provided and the preferred time for the visit. In case of acceptance, the researcher must sign a data-protection agreement specific to the project.

The data will be provided at the Ifo Institute on a special PC without internet access with access control specific to the researcher. Data cannot be stored on external media and cannot be printed out. The research data will be checked by Ifo staff to ensure that conclusions as to individual survey participants cannot be drawn. If this is the case, the data will be forwarded to the researcher. Data that does not fulfil this criterion will be erased.

In the case of publication or presentations, the researcher must state that the data origin is from the Ifo Institute. All research results must be submitted to the Ifo Institute prior to publication or to access by third parties. The Ifo Institute will again check to see that no conclusions as to individual firms have been drawn. If such have been made, they will be deleted.

Access to data at the Ifo Institute is generally free of charge. Living expenses in Munich must be born by the visiting researchers. Data access is dependent on the availability of work stations at the Ifo Institute on the desired day.

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