

## **The ZEW Foundation Panels and the Mannheim Enterprise Panel (MUP) of the Centre for European Economic Research (ZEW)**

By Matthias Almus\*, Dirk Engel\* and Susanne Prantl\*\*

### **1. Introduction**

The Centre for European Economic Research (ZEW)<sup>1</sup> has been working in cooperation with CREDITREFORM<sup>2</sup> on setting up several panel data sets regarding German and Austrian firms since its foundation.<sup>3</sup> The main objective of setting up these panels is the examination of start-up activities since there is no official statistics that covers the start-up dynamics completely.

Since July 1989, CREDITREFORM has been provided information on a sample of 12,000 West German firms, stratified according to branches and employment size classes, to set up the Mannheim Enterprise Panel (MUP). Biannual data deliveries (waves) by CREDITREFORM, which contain updated information on the selected firms, build up the required panel structure. Within a short time period, further plans to cooperate with CREDITREFORM were added. Starting in May 1990, CREDITREFORM made the data records of all firms in West Germany available to the ZEW that have firstly been recorded since January 1<sup>st</sup>, 1989. The data records of these West German firms constitute the initial stock of firms in the ZEW Foundation Panel West. Updated information concerning these firms and all firms recorded in the meantime are transferred to the ZEW at the same time as for the MUP: usually every six months.

Immediately after the beginning of the reunification process in the former German Democratic Republic in November 1989, CREDITREFORM extended its activity to East Germany. All recorded information regarding

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\* ZEW Mannheim

\*\* University of Mannheim

<sup>1</sup> For further information see <http://www.zew.de>.

<sup>2</sup> CREDITREFORM is Germany's largest German credit rating agency (for further information see <http://www.creditreform.de>).

<sup>3</sup> See Stahl (1991), Harhoff and Steil (1997) and Almus et al. (2000) for a comprehensive survey.

newly founded and existing firms in East Germany have been transferred to the ZEW for scientific purposes since September 1991 and constitute the ZEW Foundation Panel East. This data set has to be classified as a comprehensive firm panel in contrast to the Foundation Panel West since start-ups as well as a large number of firms, which existed already before November 1989, are included in the database.

The same applies to the ZEW Foundation Panel Austria. Beginning in 1996 CREDITREFORM delivered information of all recorded Austrian firms to the ZEW. These data form the ZEW Foundation Panel Austria which actually comprises information of 7 waves (data deliveries).

In February 2000, the ZEW Foundation Panel East comprised details on almost one million start-ups and established firms in East Germany. The ZEW Foundation Panel West currently has information on about 1.9 million firms founded since 1989 and in the ZEW Foundation Panel Austria information on about 280,000 firms can be found. Depending on the timing of updating firm records by CREDITREFORM, details on each firm at one or more points in time are available.

## 2. Information in the Data

CREDITREFORM collects its data in a decentralised way, currently by 142 independent offices (8 of them in Austria), but in accordance with a standard procedure. The main business objectives of CREDITREFORM are to provide information regarding a firm's financial situation, and to handle collection orders. CREDITREFORM also provides its firm data for marketing purposes by supplying firm addresses or additional firm data on payment of a fee. For this reason, it is obvious that CREDITREFORM strives to build up a comprehensive firm database, which is always up-to-date. However, given the huge number of firms recorded, CREDITREFORM has to make strategic choices which records are updated frequently.

In contrast to voluntary surveys for scientific purposes, firms rarely refuse to give information to CREDITREFORM, which is an important advantage of its database. In those few cases of refusal, CREDITREFORM tries to collect information about the firm under observation by interviewing its business partners and competitors or additional ownership persons. Systematic distortions of information on the part of the firm is unlikely. Moreover, CREDITREFORM uses a special checking programme and compares interview data to information that is publicly available in order to check the consistency of the collected information (Prantl 1995). This process improves the reliability of the information provided by CREDITREFORM.

Enquiries about firms answered by CREDITREFORM concern large active firms with numerous business connections rather than small and less active firms.<sup>4</sup> Furthermore, CREDITREFORM often collects information about firms facing financial problems or already insolvency, since the business partners will ask for more details about a firm, if they get the impression that the financial situation is deteriorating. Moreover, information collection may frequently concern growing firms, enlarging their supplier networks. Finally, official information sources and newspapers report more often on firms, which are registered in the trade register, are of public interest, realise above-average growth, or face any kind of problems (Prantl 1995). Therefore, one can expect a particularly high level of data quality for these types of firms. In the end, a below average degree of coverage mainly concerns micro firms, farm units and freelancers.

Usually all the information about every observation unit in a typical panel data set is updated at the same points in time. The data structure of the ZEW Foundation Panels East, West and Austria deviates from this typical panel structure. The frequency of enquiries about a firm can vary substantially and the interviews are conducted at different points in time. Moreover, CREDITREFORM usually does not check and eventually update all the already recorded information about a firm in the case of a new enquiry. Therefore, each piece of information in a data record may be recorded at a different point in time, which impedes direct comparisons with information about other firms.

An official statistics for Germany and Austria that covers firm foundations in a reliable and complete way does not exist yet. For this reason, statements regarding the degree of coverage of new firms on part of CREDITREFORM are not possible. As a consequence of the below average coverage of firms not mandatory to register in the trade register a reliable projection of the absolute number of firm foundations for different economic sectors using the ZEW Foundation Panels is not possible at present. However, start-up dynamics for Germany and Austria can be described without any regional or temporal distortions based on the panels since the independent CREDITREFORM offices collect their data without any observable local office specific bias. This allows to carry out regional comparisons regarding the number of firm foundations and temporal analyses with respect to foundation dynamics.

The statistical unit of the CREDITREFORM database, and thus the object under examination, is the legally independent firm. A firm can have one or more plants, whereby a plant represents a local, legally dependent firm unit.

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<sup>4</sup> Harhoff et al. (1998) showed that the size of a firm and its legal form are significantly correlated with the updating frequency of the firm's data record.

In most cases, however, firms consist of just one plant.<sup>5</sup> The data recorded on the firm level are well suited to analyse the entrepreneurial decision to set up a new firm and to evaluate the determinants of this decision. Moreover, investigations of the growth and survival of these new firms can be carried out using firm data.

CREDITREFORM assigns a new previously unused identification number to each firm and adds it to its database. This number, together with the number of the wave (data delivery), represents the primary firm identifier in the ZEW Foundation Panels. The available information includes:

- name and address of the firm,
- legal form,
- industry classification,
- information regarding changes of legal form and industry classification,
- number of employees,
- the three most recent foundation dates,
- date of entry into the trade register for all firms that registered compulsory or voluntarily,
- sales,
- data regarding insolvency proceedings,
- date of last enquiry,
- information regarding the actuality of the data in the firm record and problems in keeping the record up-to-date and
- free flow text with additional information about the firm, among other things a detailed description of the firm's business activities.

Additionally, information regarding owner persons and managers of the firm are recorded in the database. However, the availability of each of the mentioned variables varies considerably.

### 3. Selected Studies with the Data

A lot of empirical analyses exist that use the ZEW Foundation Panels West, East and Austria as well as the MUP. Among them are some dissertations of ZEW research fellows. Moreover, researchers of the ZEW published several books, articles and research reports. Regularly, all these studies

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<sup>5</sup> According to the census on places of work conducted in 1987 (Arbeitsstättenzählung 1987), 95 per cent of the firms have only one plant (Harhoff and Steil 1997).

deal with the growth or survival of young firms or analyse regional patterns of firm dynamics (foundation activities, growth, liquidations) for any kind of regional aggregate. About it, the studies separate in two broad categories. On the one side, there are studies which use individual firm data to gain a better insight into survival and growth processes at the firm level. On the other side, aggregated data are used to learn more about start-up activities in different regional areas (federal states, counties, postcode areas). A few studies of these two categories should be mentioned here briefly.

Harhoff et al. (1998) use about 12,000 observations of the MUP from the manufacturing, building, trade and service sector and assess the influence of different exogenous variables on the survival probabilities of West German firms founded before 1989. Within the analyses firms may stay or leave the market voluntary or involuntary. Harhoff et al. (1998) show that various firms characteristics have a different influence on the two exit choices. Moreover, they analyse the growth performance of the firms contained in the MUP.

Almus et al. (1999) analyse differences in the employment growth of start-ups from the manufacturing sector based on information of the ZEW Foundation Panels East and West. As a result, the influence of various exogenous variables on employment growth varies between East and West German firms on the one side and firms operating in technology intensive branches and those belonging to non-technology intensive branches on the other. The results of this study point to the fact that firms operating in technology intensive manufacturing sectors exhibit higher average annual employment growth rates and a higher variance.

Steil and Wolf (1999) use the ZEW Foundation Panel East and examine the growth dynamics of East German manufacturing firms after reunification. They find that initial size, age, legal form as well as other determinants have an influence on the average employment growth rate. The results confirm the findings of many empirical studies dealing with the growth patterns of firms operating in the manufacturing sector.

Nerlinger (1998) and Steil (1999) use the ZEW Foundation Panels West and East respectively in their dissertations and analyse the foundation activities in West respectively East Germany. While Nerlinger concentrates on foundations in high-tech industries in the West German manufacturing and service sector, Steil (1999) includes different East German economic sectors in his analyses and searches for regional differences in East German foundation dynamics. Egelner et al. (1999) use aggregated data from the ZEW foundation Panel Austria to assess the Austrian foundation performance. Last but not least, the ZEW Foundation Panels East and West are used to

assess dynamics of high-tech industries with respect to “Germany’s Technological Performance” (Legler et al. 2000).

Another function of the panels is their use as parent population for random samples used in various research projects and questionings. For example, the random samples building up the Mannheim Innovation Panel (MIP) have been drawn from the ZEW Foundation Panels West and East as well as from the MUP. Moreover, the CREDITREFORM databases can be matched with other data sources on the level of firm or person.

#### 4. Data Access and Teachers Corner

The data processing at the ZEW to create the ZEW Foundation Panels is very time consuming and costly. CREDITREFORM transfers the data files in ASCII format to the ZEW. Here, a database manager converts the file into a ORACLE database and carries out data checking routines to eliminate invalid records and double entries. To train researchers not familiar with the data would take up a long time. But also other reasons rule out an external use of firm specific data. Due to the data protection regulations, the firm level data from the ZEW Foundation Panels have to be treated strictly confidential. Moreover, the scientific use of the data is restricted to ZEW researchers due to several sensible firm information contained in the database and, therefore, restrictions are put forward by CREDITREFORM.

Nevertheless, there are possibilities for external researchers to work with data from the ZEW Foundation Panels. The ZEW puts foundation intensities (absolute number of foundation per 10,000 persons able to work) at interested persons disposal. These data are disaggregated with respect to regional units (federal states or counties) as well as industry classifications (see Engel and Fryges 2000 for a more detailed description). These data can be used to test hypotheses with respect to the temporal development of the number of firm foundations for various regional units. Moreover, regional comparisons due to the regional distribution of firm foundations can be carried out. The ZEW has to charge a fee owing to the efforts to prepare the data, though it should be noted that the ZEW grants universities and research institutes special conditions.

People who teach applied courses at universities do not use the data from the ZEW Foundation Panel to our knowledge yet. Only researchers used the information for their scientific projects until now. A increased use of the data, however, also in applied university courses could emerge owing to the improved data supply to external people (Engel and Fryges 2000). For example, teachers of applied courses can link the data from the ZEW Foundation

Panels with information from other data sources by regional or industry codes. These information can be used to examine the influence of various determinants on the foundations dynamics in different regions using econometric models (see Nerlinger 1998 or Steil 1999 as examples).

## 5. Preview

By means of the ZEW Foundation Panels a large number of firms can be observed over time. Information recorded at different points in time allows for the investigation of firm growth and survival. Furthermore, the regional pattern of firm dynamics (foundations, growth, liquidations) can be analysed for any kind of regional aggregate. Using data of a credit rating agency for the construction of the ZEW Foundation Panels is advantageous since almost only active firms enter the database. Moreover, a comparison between CREDITREFORM's database and data sets from the National Office of Statistics reveals an almost full coverage for all West German firms with more than 20 employees (Harhoff and Licht 1994).

The studies and projects completed as well as the great number of publications in national and international books and journals indicate the potential and the high quality of the ZEW Foundation Panels. An increased use and dispersal of the data will arise owing to the supply of information from the panels to external users at the start of this year. Finally, the data alone or in conjunction with other sources open up new possibilities to applied econometric courses at universities.

The quality of the data improves steadily due to the good contact to CREDITREFORM. Results from working with the data which indicate an action on part of CREDITREFORM can be realised immediately. A further point to mention is that changes in CREDITREFORM's data delivery format in 1999 may improve the quality of the data.

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