

Research Data Centre (FDZ)
of the German Federal
Employment Agency (BA)
at the Institute for
Employment Research (IAB)

FDZ

FDZ-Methodenreport

Methodological aspects of labour market data

10/2017

EN

Identifying bankruptcies in German social security data

Daniel Fackler,
Eva Hank,
Steffen Müller,
Jens Stegmaier



Bundesagentur für Arbeit

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Daniel Fackler (IWH), Eva Hank (IWH), Steffen Müller (University of Magdeburg & IWH) and Jens Stegmaier (IAB)

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Contents

Abstract	3
Zusammenfassung	3
1 Introduction	4
2 Data sources	4
2.1 <i>Insolvenzgeld</i> monitoring data	5
2.2 <i>Insolvenzgeld</i> application data	6
2.3 Social security notifications	6
2.4 Bankruptcy announcements	6
3 Contribution and overlap of the different data sources	7
4 Merge with the Establishment History Panel (BHP)	8
5 Validation with official statistics on bankruptcies	9
6 Data access	10

Abstract

Many empirical studies about firm exits point out that it is important to distinguish between different types of closures, e.g., voluntary and involuntary liquidations. This report describes how exits due to bankruptcies can be identified in the German Establishment History Panel (BHP). In contrast to other closures, bankruptcies can be unambiguously regarded as indication for economic failure and can therefore be interpreted as involuntary exits.

Zusammenfassung

In empirischen Studien über Firmenschließungen wird häufig die Notwendigkeit betont, zwischen verschiedenen Arten von Schließungen, z.B. freiwilligen und unfreiwilligen, zu unterscheiden. Dieser Methodenreport erläutert vor diesem Hintergrund, wie im Betriebs-Historik-Panel (BHP) Betriebsstillegungen aufgrund von Insolvenzen identifiziert werden können. Insolvenzen können im Gegensatz zu anderen Schließungen eindeutig als Ausdruck ökonomischen Scheiterns und somit als unfreiwillige Schließungen interpretiert werden.

Keywords: Bankruptcy, establishment exit, BHP

We thank the Data and IT-Management Department of the Institute for Employment Research (IAB), especially Cerstin Rauscher, the Statistical Department of the German Federal Employment Agency and the Research Data Center at the IAB for indispensable support. We gratefully acknowledge financial support by the German Research Foundation under the project "Wage and Employment Effects of Bankruptcies".

1 Introduction

There is a vast literature from various disciplines dealing with firm exits, their determinants, and their consequences. A reliable identification of exits in administrative data is therefore an important issue for empirical research in this field (e.g., Benedetto et al. 2007 for the US, Hethey-Maier and Schmieder 2013 for Germany). Beyond that, various studies about firm exits point out that it is important to distinguish between voluntary and involuntary exits (e.g., Mueller and Stegmaier 2015). Empirical results by Bates (2005) and Headd (2003), for example, suggest that around one third of closed firms were regarded as successful by their owners, which in turn highlights that different phenomena may be mixed up if economic failure cannot be distinguished from other types of closures that are not necessarily the consequence of economic distress (e.g., closures due to better outside options, retirement of the owner, etc.).

This report presents new supplementary data to the German Establishment History Panel (BHP) – an administrative establishment level data set based on social security notifications (see, e.g., Schmucker et al. 2016 and Eberle and Schmucker 2017 for more information) – that allows identifying establishments that vanish from the data due to bankruptcies. In contrast to closures in general, bankruptcies can be unambiguously regarded as indication for economic failure (Mueller and Stegmaier 2015). It should however be noted that the data presented in this report do not allow to construct a complete bankruptcy statistic (which is available at the German Federal Statistical Office) for mainly two reasons. First, the BHP contains only establishments with employees subject to social security. Bankruptcies of firms without employees are therefore not visible. Second, the information in the BHP refers to establishments, i.e., local units, rather than firms (legal units), whereas bankruptcy occurs at the firm level. Hence, if a multi-plant firm goes bankrupt our data still captures all establishments belonging to this firm, but we cannot count the number of bankrupt firms and we do not know which establishments belong to the same firm.

The report is structured as follows: Section 2 describes the different data sources that are used to identify bankruptcies, and Section 3 deals with the importance and contribution of these sources. Section 4 explains how the data can be used in combination with the BHP, and Section 5 presents a brief comparison with official bankruptcy statistics by the Federal Statistical Office. Section 6 concludes with some brief information on data access.

2 Data sources

The bankruptcy data set is obtained from four data sources. The largest part is collected routinely by the German Federal Employment Agency's (BA) local branches in the course of the administration of *Insolvenzgeld*, a compensation scheme for workers who do not receive their wages due to their employer's bankruptcy. In general, every employee is eligible, even employees who are not subject to social security. *Insolvenzgeld* is provided by the BA and each case is administered by one of the approximately 600 local branches of the BA. Two of our data sources originate from the administration of *Insolvenzgeld*. This information is complemented with data from two further sources, namely social security notifications and data on

bankruptcy filings published by German courts. In what follows we describe each source in more detail.

2.1 *Insolvenzgeld* monitoring data

First, the directives of the BA on the implementation of *Insolvenzgeld*¹ require close local monitoring. Therefore, the employees of the local branches of the BA are required to not only handle applications for *Insolvenzgeld* but also to actively monitor local bankruptcy processes. In particular, they are obligated to be up to date regarding the local situation and to communicate regularly with the courts that decide on the bankruptcy filings. If (upcoming) bankruptcies become known to the BA, the staff that is responsible for *Insolvenzgeld* stores information on the status of each case (e.g., formal opening of the bankruptcy process, rejection due to lack of assets, or the final closure of the firm; see §165 Social Code III).² Importantly, this information is collected even if no employee applies for *Insolvenzgeld*. All in all, the implementation directives require highly proactive behavior of the respective BA staff. Moreover, the administration is legally obligated to check the prerequisites for an *Insolvenzgeld* application, e.g., by requesting court decisions.

The information collected by the BA staff is stored in the BA's data warehouse and contains a unique establishment identifier allowing us to merge it with the BHP or other administrative data from the Institute for Employment Research (IAB). In the following, we refer to these data as "monitoring" data. It may occur that there is more than one entry for an establishment in the data, for example, one for the formal opening of the bankruptcy proceedings and one for final closing. We aggregate this information at the establishment level and store the first and last entry date for each establishment. In some cases bankruptcy proceedings and therefore the time span between the first and the last entry in the data may cover several years. However, 61% of the observations appear in the original data for the first and last time within 365 days.

The data are building up from 2007 onwards although there are a few cases (1.5%) that start earlier. A closer inspection of the time structure of bankruptcies reveals that there is an outstanding spike on November 16th 2011 covering 22% of all establishments. This can be explained by the fact that the date available in the data warehouse is not a date of the actual event, but a technical date marking an entry by the BA staff. Therefore, the dates included in the data cannot be used directly to analyze the actual bankruptcy proceedings but may serve as a crude approximation. Further inquiries at the Federal Employment Agency revealed that especially the above mentioned date is due to major changes in the IT-infrastructure and the way the data is stored. We therefore exclude cases from November 16th 2011 when inspecting date information from this source.

¹ See section "DA Verfahren" in the *Insolvenzgeld* directives (Bundesagentur für Arbeit 2013).

² It should be noted that in some cases the BA may store information about firms that are about to become bankrupt but eventually manage to avoid it. However, these firms are still very likely to have severe economic problems.

2.2 *Insolvenzgeld* application data

While the first data source is built mainly for internal usage and to support administrative processes within the BA, the second data source stems from the administration of *Insolvenzgeld* itself. This information is stored at the level of individual *Insolvenzgeld* applications and may involve one or more employees per establishment.³ In order to identify establishments that are affected by bankruptcies from these applications, we identified the establishment identifier from each worker's employment biography⁴ that is closest to the date of the respective *Insolvenzgeld* application.

As in the monitoring data, we add the first and last date we have for an establishment. We refer to this as "application" data. Generally, the data are also available from 2007 onwards, but it turned out that it cannot be matched with any establishment identifier before 2010. The number of establishments in the application data decreases since mid-2013, which mimics a trend that is also visible in the official statistics on *Insolvenzgeld*.

2.3 Social security notifications

Third, we consider data from administrative social security notifications. In Germany, every employer is obliged to notify each employee subject to social security at least once a year to the social insurance. Moreover, there are further mandatory notifications during the year, for example if an employment relationship begins or ends. According to current legislation (§8a *Datenerfassungs- und -übermittlungsverordnung*, DEÜV), employers must inform the social insurance if employees are exempted due to employer bankruptcy. Therefore, this data source is more restrictive than the before mentioned sources as a firm has to actually exempt at least one of its employees from work.

In what follows, we refer to this data source as "notification" data. The data are extracted from individual-level social security data (the BeH) and aggregated at the establishment level. Again, we add the first and last date for each establishment. This data is available from 2007 onwards and the development of the number of bankruptcies is relatively stable over time. However, two spikes (March 30th and June 30th 2012) stand out, indicating 2,765 and 1,123 establishments, respectively, with information on exempted workers. The date and the timing coincides perfectly with the bankruptcy process of *Schlecker*, a large German drugstore chain with several thousand stores all over Germany that filed for bankruptcy in 2012.

2.4 Bankruptcy announcements

Our last data source is collected from publicly accessible information on the universe of all bankruptcies in Germany published by the responsible authorities in an online database.⁵ This database has been in operation since 2003 and the accessible information comprises court

³ Not only employees are entitled to apply for *Insolvenzgeld*, but also social insurances (if they did not receive their social security contributions) and third parties (in case a worker's wage was seized).

⁴ Individual employment biographies generated from social security announcements are stored in the Employment History (BeH) at the IAB.

⁵ <https://www.insolvenzbekanntmachungen.de>

decisions. The major advantage of this data source is its completeness. Unfortunately, it is organized at the firm level, meaning that we cannot identify all establishments associated with a given corporation in case of multi-plant firms. However, as most bankrupt firms are rather small, these firms often comprise only one establishment. Since the database contains no establishment identifier, we use the name and address of the respective firm from the online notification and link it with the names and addresses in the administrative data collected by the BA. The linkage algorithm returns 55% unique matches and 19% ambiguous matches. As we are rather interested in the correct identification of closures due to economic distress than building up a complete data base that covers the universe of all bankruptcies in Germany, we drop ambiguous matches. Our self-collected “announcement” data comprises information beginning in July 2011.

3 Contribution and overlap of the different data sources

In order to identify establishment exits due to bankruptcies, we combined our lists of establishments from the four data sources with the list of establishments exiting from the BHP (see also Section 4). Our final data set includes 190,618 establishments identified as bankruptcy cases in the period from 2007 to 2013. Some of these establishments are identified by only one of the four sources, others by two or three, and some can be found in each of the four source data sets. Table 1 shows the contribution of each source to our final data set. It turns out that the monitoring data is by far the most important source, which is not surprising given the proactive procedure of the data collection by the local branches of the BA. It comprises 175,847 establishments and 38% of the establishments in our final data are solely identified with this data source. Only 7% of all establishments in the final data set are not contained in the monitoring data suggesting that this data source is rather complete. 94,775 establishments can be identified with the application data, but only 1.4% of the final data are solely identified by this source and not included in any other source. The notification data contain 28,748 establishments and 2,676 (4.8%) establishments that are not included in the other three sources. Finally, we obtain 16,829 establishments from the announcement data and 1.3% of all establishments in the final data can only be found in this data source.

There are several reasons why the number of identified establishments varies strongly between the four data sources. The announcement data includes the fewest observations as data collection only started in July 2011 leaving us with a shorter period of observation than for the other data sources. In addition, as the data lack a numerical establishment identifier we have to rely on a linkage algorithm that uses name and address information leading to non-matches and ambiguous matches (which we dropped). The notification data contributes only little to the final data set as exempting employees from work due to a bankruptcy is probably a rare event because it is not legally required.⁶ Because of the proactive data collection process in the local branches of the BA, the monitoring data contains the largest number of establishments and a relatively large fraction of establishments is contained only in this source. In contrast to the notification data, the monitoring data do not require that the employer reports

⁶ Note that exempting a worker is not a dismissal. It rather means that the worker does not have to show up at his workplace while the employment relationship is still ongoing.

a worker to be effectively exempted due to the bankruptcy and in contrast to the application data, actual applications for *Insolvenzgeld* are not necessary.

Table 1: Number of establishments in final bankruptcy data set and in data sources

Data sources	Monitoring	Application	Notification	Announcement
Total no. of establishments identified in each source	175,847	94,775	28,748	16,829
No. of establishments identified only in the respective source (% of final data set)	72,472 (38%)	2,676 (1.4%)	9,182 (4.8%)	2,425 (1.3%)
Overlap with monitoring data (no. and % of establishments)	---	92,052 (97%)	19,133 (67%)	14,300 (85%)
No. of establishments in final data set	190,618			

4 Merge with the Establishment History Panel (BHP)

Since we want to distinguish between establishments that exit the market due to bankruptcies and other closures, we combine our bankruptcy data with a list of establishment exits generated from the BHP. The BHP contains all establishments with at least one employee subject to social security on June 30th each year. In the following, we consider all establishments as exits if they vanish from the BHP, i.e., they are counted as exits in year t if they appear in the data that year but not in any of the following years.⁷ Since the current version of the BHP ends in 2014, it is possible to identify exits up to the year 2013. Combining this list of exiting establishments from the BHP with our bankruptcy data yields the above mentioned 190,618 establishments that exited the market due to bankruptcies between 2007 and 2013.

To be sure, if an establishment identifier vanishes from the data this does not necessarily reflect a “true” closure because establishment identifiers may also alter due to changes of ownership, of legal form or other administrative reasons. In order to distinguish between ID changes and true closures, one can use worker flow information as described by Hethey-Maier and Schmieder (2013) that are available as supplementary files to the BHP and these worker flow information can also be combined with our bankruptcy data. If economic activity is continued with a new establishment identifier after bankruptcy the approximation by Hethey-Maier and Schmieder (2013) can be applied to gauge whether this is, e.g., a takeover by a pre-existing plant. The disappearance of the establishment ID may also be triggered by the bankruptcy administrator requesting a new establishment ID when beginning his work⁸ which might be close to the date reported in our data sources.

In principle a firm may survive bankruptcy and then close later due to other reasons. To make sure to only use closures due to bankruptcy, it is tempting to concentrate on ID’s vanishing within a particular time-span around the bankruptcy notification. However, a bankruptcy is a

⁷ It should be noted that an exit from the BHP occurs when the last employee leaves the establishment. See, e.g., Brixy and Fritsch (2002) for more information on the identification of exits.

⁸ A bankruptcy administrator is typically appointed when a court decides to open bankruptcy proceedings. The administrator is free to use the old establishment ID or to request a new ID.

legal procedure that may take up to several years⁹ and clearly, an establishment may disappear from the BHP at various points in time during this process. Given the length of the process and the various points in time where an establishment might close, the difference between the date of the bankruptcy information and the date of the establishment exit may cover a long time span and it is hardly possible to decide which time span should reasonably be chosen to ensure that the closure was due to bankruptcy. We therefore provide the year of an establishment's first and last appearance in our bankruptcy data for each of the four sources.¹⁰ This enables the user to vary this time span. To give an impression, we found that the majority of all observations have a first appearance in the source data that is within one year before or after the last day an establishment appears in the BHP.¹¹

5 Validation with official statistics on bankruptcies

In a last step, we compare our data with the official statistics on bankruptcies of the German Federal Statistical Office (see Statistisches Bundesamt 2017). Figure 1 depicts the number of bankruptcies in our data (solid line) and the respective figures from the official bankruptcy statistics (dashed line). The year in our data refers to the establishment's exit year as described above. The numbers from the Statistical Office are counted at the firm level and refer to all bankruptcy proceedings that are open or rejected due to insufficient assets per calendar year.

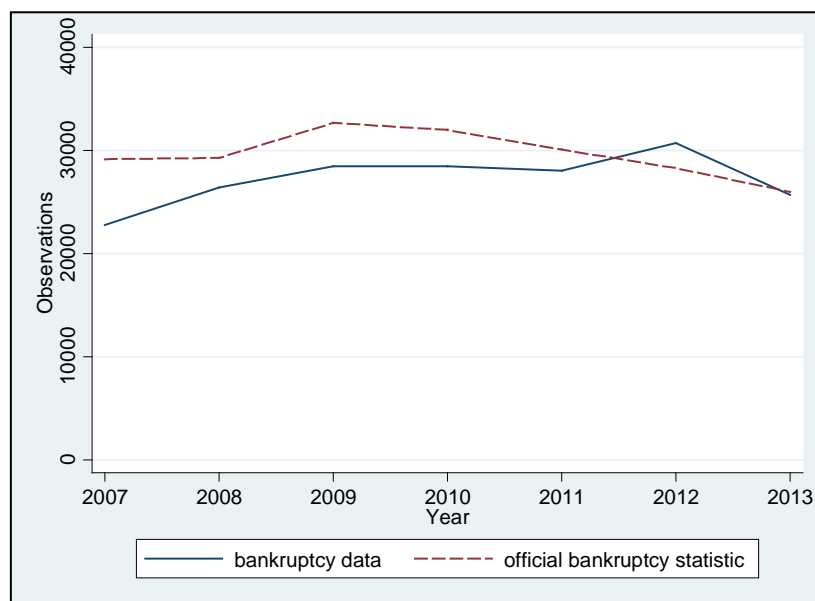


Figure 1: No. of bankruptcies per year, 2007-2013

⁹ Kranzusch (2010) reports a mean duration of 4 years for bankruptcy proceedings in Germany.

¹⁰ 61% of the monitoring data and practically all observations of the application and notification data have a first and last occurrence in the source data that is in the same calendar year. The announcement data has only one date.

¹¹ We compared the actual dates and found that 71% of the monitoring data (excluding observations from November 16th 2011, see above), 67% of the application data, 96% of the notification data and 75% of the announcement data are within this range.

It can be seen that the time series look quite similar and that the number of bankruptcies reported by the Statistical Office is slightly higher in most years. This is mainly because the official statistics also include firms without employees (active owner only) whereas the BHP comprises only establishments with at least one employee liable to social security. The larger difference in 2007 than in the following years might be attributed to the fact that the monitoring data is still building up from March 2007 onwards. Another important difference is that our data refers to establishments (local units) whereas the official statistics count the number of firms (legal units). But as most bankrupt firms are rather small, these firms often comprise only one establishment. However, in some cases it may matter: The number of bankruptcies in 2012 is larger in our data because in that year, *Schlecker* – a large drugstore chain with several thousand stores all over Germany – became bankrupt and this was the largest bankruptcy in German post-war history. Since *Schlecker* is one firm comprising several thousand establishments, it seems quite plausible that we observe an extraordinarily huge number of establishments affected by this bankruptcy in our data whereas such a spike is not visible in the official statistics referring to the firm level.

6 Data access

The bankruptcy data set described in this report is not yet available. It will be published in 2018 via the Research Data Centre of the Federal Employment Agency at the Institute for Employment Research as a supplementary data set with the next version of the BHP, which will cover the years 1975-2016. The bankruptcy data set will also be extended and will then comprise the years 2007-2015. It should be noted, however, that future versions of the data set may differ to some extent from the data described in this report, e.g. due to data protection issues. Please visit the homepage of the Research Data Centre (<http://fdz.iab.de>) or subscribe to the FDZ-Newsletter to be up to date regarding data availability.

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Imprint

FDZ–Methodenreport 10/2017 (EN)

Publisher

The Research Data Centre (FDZ)
of the Federal Employment Agency
in the Institute for Employment Research
Regensburger Str. 104
D-90478 Nuremberg

Editorial staff

Dana Müller, Dagmar Theune

Technical production

Dagmar Theune

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Corresponding author:

Jens Stegmaier
Institute for Employment Research (IAB)
Regensburger Str. 104
D-90478 Nürnberg
Phone: +49-911-179-3042
Email: Jens.Stegmaier@iab.de