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FDZ-METHODENREPORT

Methodological aspects of labour market data

02|2021 EN Hirings in the IAB Job Vacancy Survey and the administrative data — an aggregate comparison

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Die FDZ-Methodenreporte befassen sich mit den methodischen Aspekten der Daten des FDZ und helfen somit Nutzerinnen und Nutzern bei der Analyse der Daten. Nutzerinnen und Nutzer können hierzu in dieser Reihe zitationsfähig publizieren und stellen sich der öffentlichen Diskussion.

FDZ-Methodenreporte (FDZ method reports) deal with methodical aspects of FDZ data and help users in the analysis of these data. In addition, users can publish their results in a citable manner and present them for public discussion.

Content

Figures

Tables

Zusammenfassung

In diesem FDZ-Methodenbericht vergleichen wir die Zahl der Neueinstellungen, die mit der IAB-Stellenerhebung (IAB-JVS) erhoben wurden, mit der aus der Stichprobe der Integrierten Erwerbsbiografien (IEB) berechneten Zahl der Neueinstellungen. Um mögliche wichtige Unterschiede in den Messkonzepten zu identifizieren, untersuchen wir, ob Einstellungen mit bestimmten Merkmalen von den Befragten in der IAB-JVS systematisch über- oder unterberichtet werden. Da dieser Ansatz Kenntnisse über die Zusammensetzung der Einstellungen voraussetzt, ergänzen wir die Umfragedaten mit administrativen Daten, indem wir die Datensatzverknüpfung der IAB-JVS-Informationen über die zuletzt eingestellte Person nutzen. Wir dokumentieren zunächst, dass die IAB-JVS im Vergleich zu den IEB über den gesamten Beobachtungszeitraum eine systembedingt geringere Anzahl von Einstellungen aufweist. Unsere Ergebnisse deuten ferner darauf hin, dass ein großer Teil der festgestellten Diskrepanzen zwischen den IAB-JVS- und IEB-Einstellungen darauf zurückzuführen ist, dass die Befragten zu wenig Wiedereinstellungen und Einstellungen mit sehr kurze Beschäftigungsdauern berichten. Zudem legen ergänzende Ergebnisse nahe, dass fehlende Angaben auf die Frage nach Neueinstellungen für einen zusätzlichen Teil der Unterschätzung verantwortlich sind.

Abstract

In this FDZ method report, we compare the number of hirings measured by the IAB-Job Vacancy Survey (IAB-JVS) with the number of hirings calculated from a sample from the Integrated Employment Biographies (IEB). To this end, we attempt to identify potential important differences in measurement concepts, by conducting a comparison of the aggregate number and structure of hirings in the IAB-JVS and the IEB. Specifically, we explore whether hirings with specific characteristics are systematically over- or underreported by the respondents in the IAB-JVS. As this approach requires knowledge about the composition of hirings, we complement the survey data, by using the record linkage of IAB-JVS information on the last hired person to his or her administrative records from the IEB. We first document that the IAB-JVS provides a systematically lower number of hirings as compared to the IEB throughout our observation period. Our results further suggest that a large part of the established discrepancies between the IAB-JVS and IEB hirings arise from respondents underreporting recalls and very short employment relationships. In addition, supplementary results suggest that missing information in response to the question on new hires is responsible for an additional part of the underestimation.

Keywords

Hirings, Job Vacancy Survey, measurement error, employment duration, recalls

1 Introduction

To answer empirical research questions in a timely manner, researchers often use data from surveys, as survey data have important time advantages over administrative data. While survey data can be used already a few months after the data collection, administrative data are generally only available with a considerable time delay (sometimes of up to several years). This is particularly relevant for micro data. Thus, especially if one aims at analysing empirical research questions in very dynamic times, such as the current CoViD-19 pandemic, survey data often provide the only available data source to work with.

Discrepancies in results derived from survey and administrative data may raise doubts about their comparability, though. Possible reasons are that the measurement concepts of specific variables may differ between survey and administrative data and that potential sources of error, such as measurement error, may differ across both types of data (e.g. Kapteyn and Ypma 2007). Thus, it is important for researchers to understand how measurement concepts and errors in the two types of data sources differ and how these differences influence the interpretation of the results.

In this FDZ method report, we compare the number of hirings measured by the IAB-Job Vacancy Survey (IAB-JVS) with the number of hirings calculated from administrative data. Next to job vacancies, hirings are one of the main topics of the IAB-JVS. The number and structure of hirings play an important role for labour market dynamics, as hirings provide a key measure of labour market flows. While the IAB-JVS is the only data source providing encompassing information on all job vacancies in Germany (see Bossler et al. 2020), there are alternative data sources for the number of hirings. Once one has decided what constitutes a new hire, information on hirings is in principle also available from administrative data, such as the Integrated Employment Biographies (IEB) provided by the Institute for Employment Research (IAB) in Germany.

To compare hirings measured by the IAB-JVS with the number of hirings calculated from the IEB, we conduct an aggregate comparison of the structure of hirings. To identify potential important differences in measurement concepts, we explore whether hirings with specific characteristics are systematically over- or underreported by the respondents in the IAB-JVS. This approach clearly requires knowledge about the composition of hirings with regard to the characteristics that are likely to be subject to misreporting. As the IAB-JVS does not provide sufficient information on the composition of hirings, we complement the survey data, by using the record linkage of information on the last hired person reported in the IAB-JVS to his or her administrative records from the IEB (Lochner 2019).

The report is structured as follows. Section 2 provides a brief overview of our underlying data sets: the IAB-JVS, the IEB, the record linkage of the IAB-JVS with the IEB and the BA-Statistics. Section 3 describes the concept of hirings, the survey measurement of hirings, the identification of hirings in the IEB, a comparison of the data sources and the aggregate comparison approach. Section 4 presents the results and limitations of this analysis. Finally, Section 5 concludes with a short summary and a brief discussion of the interpretation of our results.

2 Data

2.1 IAB Job Vacancy Survey (IAB-JVS)

The IAB-JVS is a representative establishment survey, which aims to quantify the size of the unfilled labour demand in Germany and all kinds of worker flows (Bossler et al. 2020). It is a yearly cross sectional paper-and-pencil survey (with an online response option) combined with a quarterly follow-up telephone survey to update the number of vacancies. The written part of the survey is conducted in the fourth quarter of each year. The sample is stratified by region, industry and establishment size and randomly drawn from the population of all establishments located in Germany with at least one regular employee liable to social security contributions. In recent years, the full sample has consisted of 110,000 establishments. On average, the IAB-JVS collects data of about 13,000 to 15,000 establishments. To address potential nonresponse bias and the disproportionate stratified sampling design, calibration weights are used to produce population estimates. Detailed information on the current extrapolation procedure can be found in Brenzel et al. (2016). Since 2010, it has been possible to link the IAB-JVS survey data to the administrative data from the IAB.

2.2 Integrated Employment Biographies (IEB)

Our administrative data set is the SIAB, which is a 2 per cent random sample of the IEB from 1975 to 2017. The IEB cover the universe of all individuals who have at least one entry in their social security records from 1975 on in West Germany and starting from 1992 in East Germany (Antoni et al. 2019). The data provide daily information on employment records subject to social security contributions, marginal employment (since 1999), unemployment records with transfer receipt as well as periods of job search. The dataset contains an establishment and individual identifier, the type of notification, the daily beginning and ending of the employment episode reported, socio-demographic and job characteristics and individuals' social security and occupational status. In addition, we use the entry and exit information from the Establishment History Panel (BHP) to avoid misclassification of job changes due to a change of the establishment identifier that arises from other reasons than from an employer change (Ganzer et al. 2020, Hethey and Schmieder 2010).

2.3 Record-Linkage IAB-JVS and IEB

While the IAB-JVS asks establishments to report the number of hirings (see Section 3.2.), it does not enquire information about the structure of all new hires with respect to their socio-demographic characteristics, previous employment status or type of employment. In addition to the number of hires at the establishment level, the IAB-JVS collects a rich array of information on establishments' most recent successful hiring process. To retrieve information on the composition of new hires, we exploit information on this most recent hiring process. To do so, we use the record linkage of the most recent hired person in the IAB-JVS to his or her IEB employment biography, as proposed by Lochner (2019). Based on the establishment identifier, the date of hiring, the hired individual's gender, age and occupation, the linkage algorithm identifies the corresponding

individual identifier in the IEB. Using the default settings, we can link about 50 % of all reported hirings in the IAB-JVS to their employment biographies. This record linkage enables us to measure the structure of hirings in the IEB and those reported in the IAB-JVS in the same dimensions, such as length of the employment spell or recalls. In the remaining, we call this matched IEB data JVS-IEB.

2.4 BA-Statistics of Started Employment Relationships

Another official data source, which is sometimes interpreted as hirings, is the statistic of so-called "started employment relationships" (in German: "Begonnene Beschäftigungsverhältnisse") provided by the Federal Employment Agency (BA). This official statistic is also based on the IEB. Because the Federal Employment Agency publishes this specific statistic regularly, we will additionally conduct a comparison with figures from this statistic. The latter defines a started employment relationship as a spell in the IEB, for which the employer registers a new employee to social insurance with the reason "Registration for taking up employment". This also applies to transitions between an apprenticeship and regular employment spell, even if the employee remains with the same employer. As the definition also applies to very short employment spells, every new employment spell of a day labourer (in German: "unständige Beschäftigung",) that lasts less than one week, is also counted as a started employment relationship. A detailed differentiation by recall reasons, changes of establishment or outlier is not carried out (Bundesagentur für Arbeit 2019, 2020). As a result, the concept of started employment relationships in this statistic is quite different from the economic concept of a "true" new hire. In Sections 3.1 and 3.3, we will discuss how one may operationalize new hirings in the IEB.

3 Empirical strategy

3.1 Concept of Hirings

There is no generally accepted definition of what constitutes a new hire. Researchers need to have in mind that several open questions could lead to different concepts of hirings:

- Is there a minimum duration of the employment spell for it to count as a hiring?
- How does one deal with recalls/new employment spells in the same establishment?
- Do temporary workers count as new hirings?
- Are hirings measured at the company or establishment level?

When working with administrative data like the IEB, researchers are generally able to adjust the empirical operationalization of hirings to their specific research interests. For example, the Administrative Wage and Labor Market Flow Panel, which aggregates labour flows from the Employee History (Beschäftigten-Historik, BeH) on a quarterly basis, proposes the following definition to determine the number of new hires: "*Number of workers not employed (at any status) by the establishment at the four preceding reference dates.*" (with the reference dates referring to quarters, see Stüber and Seth (2019, p. 19)). Stüber (2017, p. 537) uses a similar definition: "*An*

individual is a newly hired worker if he / she worked at a different firm before (firm change) or if the individual has not worked (s.t. social security) at the same firm in the last 365 days. The second condition ensures that workers who suspend their employment for a short period of time (for whatever reason) are not counted as newly hired workers when they return to the firm". A common feature of these empirical definitions of hirings is that they explicitly exclude recalls (i.e. employment spells preceded by employment spells at the same employer) that occurred within one year. Note that the second definition by Stüber (2017) is somewhat less restrictive as it allows for recalls within one year, as long as an individual has worked for another employer in the meantime.

3.2 IAB-JVS Measurement of Hirings

When using information on the number of hirings based on survey data, researchers have to deal with the wording of the question and the corresponding understanding of respondents. In particular, the IAB-JVS enquires the number of hirings by asking "*Has your establishment/administrative post hired new employees in the past twelve months, regardless of whether they are still employed or have left already?*" The survey's instructions explicitly exclude "*hiring of apprentices*", "*renewals of fixed-term contracts or conversions into open-ended contracts*", "*employees leased from temporary employment agencies*" and "*publicly-funded employees such as One-Euro-Jobs*". Afterwards, establishments are asked to enter the number of all new employees and the subgroup of employees subject to social security contributions. Additional questions about the structure of new hires are not raised. In this report, we concentrate on hirings subject to social security contributions. Besides, we emphasize that establishments report new hires that were undertaken during the last 12 months, which does not necessarily correspond to the last calendar year as establishments are surveyed during the whole fourth quarter. The question wording was kept consistent over the observation period. However, the placement within the questionnaire varies between survey years.

Figure 1: Question wording of the hiring question in the IAB-JVS

13. Did your establishment/administrative post **hire new employees** in the past twelve months, regardless of whether they are still employed or have left already?

Please do not consider …
- *hiring of apprentices*
- *renewals of fixed-term contracts or conversions into open-ended contracts*
- *employees leased from temporary employment agencies*
- *publicly-funded employees such as One-Euro-Jobs*

Yes ☐ No ☐ ➡ *Please continue with Question 14*

If yes, **number** of new employees ☐

Of these: number subject to social security contributions ☐

3.3 Identifying Hirings in the IEB

To operationalize hirings in the IEB, we proceed as follows: First, we exclude all hirings from the data that are by definition not part of the reported number of hirings in the IAB-JVS. Thus, we exclude hirings into marginal employment periods and into all spells of subsidised one-euro jobs. By definition, temporary workers are registered at the agency and not by the contractor, such that the IEB measure hirings of temporary workers only at their respective agency. We also exclude newly hired apprentices, which are not part of the IAB-JVS definition either.

Second, in line with Jaenichen (2018), we define hirings as a new employment spell subject to social security contributions at an establishment identifier that lasts for at least 3 days and is not preceded by any employment spell at the same establishment within the past 32 days. In addition, we exclude persons with more than 15 short employment relationships, lasting less than 3 days, and persons with more than 100 employment relationships.

Although we account for short gaps up to 32 days, the resulting new employment relationships may still represent recalls with longer gaps. Depending on the specific reason, such a recall may either reflect a new hiring (e.g. due to seasonal employment) or a re-entry into the establishment after an employment interruption (e.g. after an episode of illness or maternity leave).

To distinguish recalls that reflect new hirings from those that arise from re-entries after employment interruptions, we do not count the following new employment spells as recall hirings, if:

- the new employment spell occurs within 365 days after an illness
- the new employment spell occurs within 1096 days after a mother has left the establishment to give birth (identification via Müller and Strauch (2017))
- the new employment spell occurs within 1096 days after an employee has left the establishment for reasons of parental leave

Unfortunately, it is impossible to identify companies with multiple establishments. Thus, in the IEB, internal redeployments between establishments of one (multi-establishment) company will be classified as hirings.

3.4 Comparison: IAB-JVS, IEB Hirings and BA Statistics

Table 1 provides an overview of the different hiring measures from the IAB-JVS, from our own definition of hirings in the IEB and from the “started employment relationships” in the BA statistic. The table shows that there are several attributes of hirings (such as the exclusion of apprentices, the extension of fixed-term contracts), which the wording of the IAB-JVS question has explicitly accounted for. Once one is able to identify these attributes in the IEB (as described in Section 3.3), this allows for a straightforward comparison of IAB-JVS and IEB hirings.

At the same time, there are a number of hiring attributes, such as recalls and the length of the employment relationship, which the IAB-JVS wording has not explicitly addressed. As a result, the question of whether hirings with these characteristics are represented to the same extent in both data sources clearly depends on employers’ reporting behaviour. Thus, a likely explanation for differences between the IAB-JVS and IEB hirings relates to employers’ potential misreporting of new employment relationships with certain attributes. To assess the relevance of this explanation,

the next sections compare the composition of hirings with respect to the above attributes from the matched JVS-IEB data to that from the IEB.

Table 1: Definition of Hirings — Differences between IAB-JVS, our own definition of hirings in the IEB and BA-Statistics

Feature	IAB-JVS	IEB	BA Statistics
Hirings of apprentices	No	Exactly identifiable and excluded	Depends on used statistic
Transitions of apprentices into regular employment	No	Exactly identifiable and excluded	Yes
Consideration of acquisitions, mergers and splitting of establishments	Yes	Yes	No
Day labourer	Depends on reporting behaviour	Exactly identifiable	Yes
Recalls	Depends on reporting behaviour	Exactly identifiable	Yes
Employment Duration	Depends on reporting behaviour	Exactly identifiable	Not distinguished
Extension of fixed-term contracts	No	No	In some special cases
Temporary workers	No	No	No
Publicly funded One-Euro Jobs	No	Exactly identifiable and excluded	No
Differentiation between all hirings and hirings contributing to social security	Yes	Yes	Yes
Establishment-level vs. company-level	Establishment	Establishment	Establishment
Internal redeployments	No	Yes	Yes
Time reference	Data for the last 12 months	Daily data	Monthly data
Aggregation Level	Micro	Micro	Aggregated
Publicly Accessible	1.5 years delay	Up to 3 years delay	6 months delay

Note: Although the IAB-JVS definitions and instructions explicitly exclude some types of rehiring, establishments may not adhere to them, which would lead to measurement error.

3.5 Aggregate Comparison

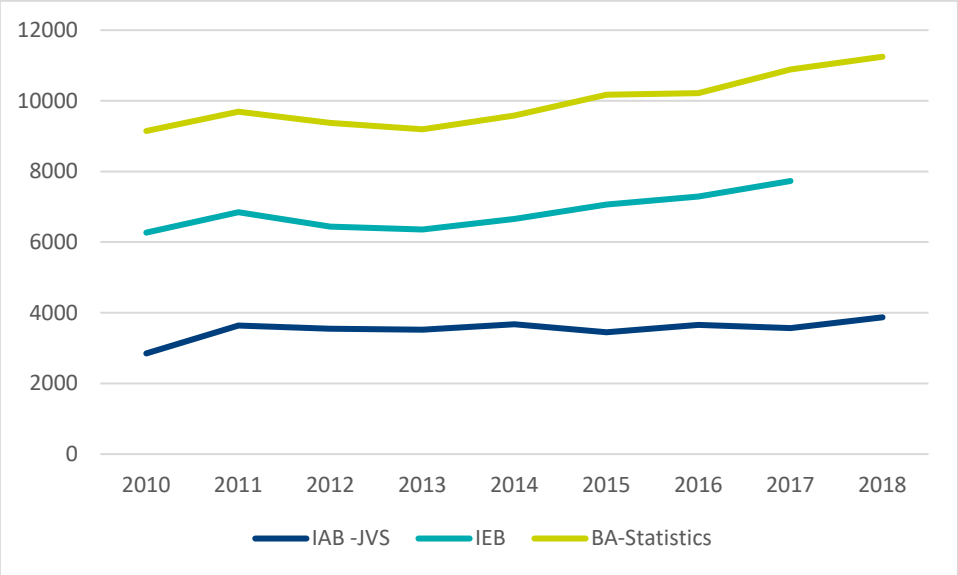
To achieve a better understanding of hirings in the IAB-JVS, we next conduct a comparison of the aggregate number and the structure of hirings. The record linkage allows us to contrast the structure of hirings derived from the IEB employment spells of the most recent hire of the interviewed establishments with the structure of all identified hirings in the IEB. A comparison of characteristics like subsequent employment durations or the share of recalls may help explain whether discrepancies between the IAB-JVS and IEB hirings arise from a potential misreporting of new employment relationships with specific attributes. With such a comparison, we can only identify differences concerning observable variables. Additional differences, which are not measured in our dataset (IEB), are still unknown.

4 Results

4.1 Comparison of Absolute Figures

Figure 2 compares the annual aggregated number of hirings in the IAB-JVS, the IEB and the "started employment relationships" measured by the BA statistic from 2010 to 2017/2018. For this analysis, it is essential to note that missings are set to zero (see for a robustness check in Section 4.3). It is evident that all three data sources differ strongly in the overall number of hirings. The (extrapolated) number of hirings in the IAB-JVS ranges from 2.85 million in 2010 to 3.87 million hirings in 2018. By comparison, the number of hirings identified from the IEB using the above definition from Section 3.3, ranges between 6.27 and 7.73 million hirings. The BA statistic reports with up to 11.24 million even more "started employment relationships". Interestingly, while the figures from the administrative data sources exhibit a similar time trend, the evolution of hirings derived from the IAB-JVS differs from that in the administrative data, as the level of IAB-JVS hirings remained fairly constant between 2011 and 2017.

Figure 2: Number of Hirings (in thousands) by Year and Dataset



Source: IAB JVS extrapolated with establishment weights, IEB, BA Statistics

4.2 A Closer Look — Systematic Differences

Figure 2 suggests that the IAB-JVS provides a systematically lower number of hirings as compared to the IEB throughout our observation period. As spelled out above, one potential explanation for the established discrepancy between the IAB-JVS and IEB hirings might relate to a potential misreporting of new employment relationships with specific attributes. For example, due to a different understanding of what constitutes a newly hired worker employers might also underreport recalls. Moreover, because of reminder error employers might systematically underreport very short employment relationships. To address these issues, we next compare the

composition of hirings with respect to these attributes from the matched JVS-IEB data to that from the IEB.

4.2.1 Recalls

One major source for recalls are seasonal employment relationships, with workers becoming first unemployed and then reemployed in specific periods of the year. Seasonal employment relationships occur most frequently in the following four industries: agriculture and forestry, construction industry, hotels and restaurants, transport and storage. To assess whether and to what extent responding establishments count recalls of seasonal workers as hirings, we conduct a separate comparison of the share of recalls in these industries. Besides, we compare the IEB and JVS-IEB shares of recalls that occurred within one year as well as the share of recalls that occurred over the entire observation period.

Table 2: Share of Recalls in Hirings (in per cent) by Year and Dataset

2010-2016

Year	JVS-IEB			IEB		
	All Recalls	Recalls in recall sectors	Recalls within a year	All Recalls	Recalls in recall sectors	Recalls within a year
2010	8.47	12.50	3.20	18.35	26.61	11.08
2011	9.00	13.39	3.84	16.36	24.15	9.50
2012	7.96	12.62	3.25	16.77	23.98	9.84
2013	7.81	9.56	3.11	17.32	24.96	10.16
2014	7.48	9.65	3.45	16.38	22.87	9.57
2015	7.23	10.80	2.80	15.65	21.78	9.15
2016	7.11	9.72	2.83	15.41	21.09	8.96
Total	7.90	11.22	3.21	16.28	22.90	9.54

Source: JVS-IEB, IEB

Table 2 shows the share of recalls in all hirings between 2010 and 2016. For the three recall measures, the share of recalls is higher in the administrative data than in the matched JVS-IEB data. For example, between 2010 and 2016 the average share of recalls in all hirings is 7.90 per cent in the IAB-JVS as compared to 16.28 per cent in the IEB. The difference in the share of recalls across both data sources becomes even more pronounced, once one conditions on recalls that occurred within one year. In the IEB, recalls within one year account for around 9.54 per cent of all new hires. This is almost three times as large as the corresponding share in the JVS-IEB, which is 3.21 per cent. A similar discrepancy may be observed for the share of recalls in the typical recall industries. Taken together, these comparisons indicate that establishments in the IAB-JVS systematically underreport recalls as hirings.

4.2.2 Employment Duration

In addition, the hirings reported in the IAB-JVS may systematically differ from those in the IEB in terms of their employment duration. One explanation could be that the IAB-JVS enquires retrospective information on the number of hirings during the last 12 months prior to the interview. Given this relatively long time-span, it is conceivable that establishments more easily

remember long-lasting and stable hirings and therefore underreport hirings, whose employment spells lasted only a few months. This mechanism would lead to longer employment durations in the reported hirings of the IAB-JVS.

Since we do not exclude ongoing employment spells from the analysis, our data are censored by the year 2016. Thus, we do not know the full length of all employment spells, which becomes more relevant at the end of the observation period. To consider ongoing employment spells, we estimate Kaplan-Meier-Survival curves (Figure 3), which are not impacted by censoring ongoing employment spells.

Figure 3: Kaplan-Meier-Survival Curves of Employment Durations between Hirings in the JVS-IEB and the IEB

Source: JVS-IEB, IEB
Note: Both curves display results from a pooled analysis including all hirings between 2010 and 2016.

Figure 3 shows that Employment relationships of new hires in the IEB-JVS last considerably longer than those of new hires as measured in the IEB. According to the Kaplan-Meier-Survival curves, half of the IEB hirings last about a year, whereas half of the IEB-JVS hirings lasted almost 3 years. In summary, respondents of the IAB-JVS tend to underreport hirings with short employment durations.

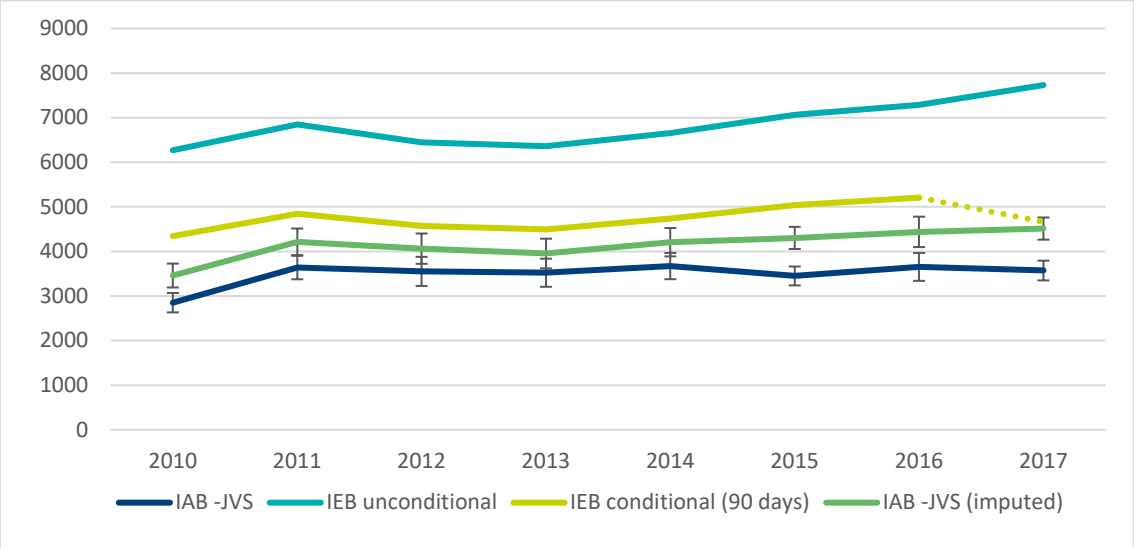
4.3 Impact of Item-level Missings on Total Number of Hirings

Finally, a further source of error may arise from item nonresponse. In the IAB-JVS, on average 7.35 per cent of respondents do not provide information on the number of hirings, with higher values in most recent years. In our analysis, we have set the number of hirings to zero for those respondents not reporting hirings. This strong assumption that missings indicate no hiring may explain part of the established differences. To evaluate the impact of this assumption on the number of hirings, we impute item missings. Therefore, we conducted a regression imputation method using the stratification variables (establishment size, industry and region) and paradata (survey mode and interview date) as explanatory variables. We want to note that this simple imputation procedure could be improved with more auxiliary data and sophisticated methods. However, this method gives an idea of the impact imputation may have on the aggregate number of hirings measured in the IAB-JVS.

4.4 Comparison of Conditional Hirings of the IEB and (imputed) IAB-JVS

To assess the impact of the identified selective reporting on the number of hirings, we calculate the number of IEB hirings after excluding those hirings that are likely to be underreported by IEB-JVS respondents. Hence, we estimate the number of hirings in the IEB conditional on hirings with longer employment periods (lasting longer than 3 months) and without recalls within one year. Figure 4 compares this conditional IEB hirings to the number of hirings of the IAB-JVS. In addition, we show the 95-% confidence interval around the IAB-JVS hirings. It is important to note that this comparison depends strongly on the choice of exclusion parameters in terms of length of employment and recalls. Further, we provide aggregate hirings for the imputed IAB-JVS (incl. 95% confidence interval).

Figure 4: Comparison of Conditional IEB Hirings, Imputed IAB-JVS Hirings and IAB-JVS Hirings (in thousands)



Source: IAB JVS extrapolated with establishment weights, IEB conditional on hirings lasting more than 3 months and exclusion of recalls within one year.

Note: Vertical bar indicate 95% confidence intervals. At the end of the observation period (2017) the conditional IEB drop due to the exclusion restrictions, indicated by the dotted line.

Taking the observed selectivity of hirings into account, the number of hirings in the IEB is reduced to between 4.34 million to 5.21 million. This implies that underreporting of hires with short employment durations and recalls could explain a reduction of about 2 million hires. Imputing for item nonresponse results in an increase of hirings of 600 thousand to 1.0 million. In addition, the trend of hirings is more consistent with the trend in the administrative data. However, the number of hirings measured by the IEB is outside the confidence interval of the IAB-JVS. It is therefore likely that there are additional reasons explaining the difference.

4.5 Limitations

Our comparison of aggregate IAB-JVS and IEB-hirings is subject to several limitations. While the IAB-JVS enquires the number of hirings during the last 12 months, the IEB hirings have been

calculated broken down by calendar years. Since the surveyed IAB-JVS establishments can participate on any day within the fourth quarter, the observation periods do not completely overlap. Another limitation arises from the establishment concept of the IEB, which does not allow distinguishing internal redeployments within a multi-establishment company from our concept of hirings as described in Section 3.3. While IAB-JVS respondents are unlikely to report internal redeployments as hires, the incidence of internal redeployments clearly leads to an overestimation of hirings in the IEB. It should also be mentioned that the sampling frame of the IAB-JVS consists of all establishments that had at least one employee subject to social security contributions on December 31 of the previous year. This implies that newly established establishments within the survey year are not covered by the IAB-JVS. Assuming that newly founded establishments hire more employees to build a stock of employees, this sample selectivity could also contribute to the underestimation of hirings.[1]

Further limitations arise from the JVS-IEB linkage, which relies on information from the most recent hiring process. First, the comparison of the structure of hirings in terms of employment durations and recalls could be distorted if the reported hiring was not the last case of hiring. This would compromise the random selection procedure. Second, reported last-case hires are not evenly distributed throughout the year and occur predominantly in the 3rd and 4th quarters. If employment durations and recalls are subject to specific seasonal patterns, this could also compromise our comparison.

To address the total survey error in measuring hirings in the IAB-JVS, an alternative strategy would be to link all IEB hirings to the surveyed IAB-JVS establishments and to compare the number of IEB hirings among the IAB-JVS establishments to those reported by IAB-JVS respondents. While such a strategy comes at the expense that it does not allow for an in-depth analysis of differences in the structure of hirings, it could identify differences that arise from measurement error, item non-response and the adopted extrapolation procedure. We leave such an analysis for future research.

5 Conclusion

The aim of this FDZ method report is to compare the number of hirings measured by the IAB-Job Vacancy Survey (IAB-JVS) with the number of hirings calculated from a sample from the Integrated Employment Biographies (IEB). To this end, we attempt to identify potential important differences in measurement concepts, by conducting a comparison of the aggregate number and structure of hirings in the IAB-JVS and the IEB. Specifically, we explore whether hirings with specific characteristics are systematically over- or underreported by the respondents in the IAB-JVS. As this approach requires knowledge about the composition of hirings, we complement the survey data, by using the record linkage of IAB-JVS information on the last hired person to his or her administrative records from the IEB. We first document that the IAB-JVS provides a systematically lower number of hirings as compared to the IEB throughout our observation period. Our results further suggest that a large part of the established discrepancies between the IAB-JVS and IEB

[1] An additional sensitivity check (not reported) suggested that about 7-8 per cent of hirings each year occur in newly founded establishments.

hirings is likely to arise from respondents underreporting recalls and very short employment relationships. In addition, we document that item nonresponse is also contributing to lower numbers of hirings.

References

Antoni, Manfred; Schmucker, Alexandra; Seth, Stefan; Vom Berge, Philipp (2019). Sample of integrated labour market biographies (SIAB) 1975-2017. *FDZ-Datenreport*, 02/2019 (en), Nürnberg.

Bossler, Mario; Gürtzgen, Nicole; Kubis, Alexander; Küfner, Benjamin; Lochner, Benjamin (2020). The IAB Job Vacancy Survey: design and research potential. *Journal for Labour Market Research*, 54(1).

Brenzel, Hanna; Czepek, Judith; Kiesl, Hans; Kriechel, Ben; Kubis, Alexander; Moczall, Andreas; Rebien, Martina; Röttger, Christof; Szameitat, Jörg; Warning, Anja; Weber, Enzo (2016). Revision of the IAB job vacancy survey: backgrounds, methods and results. *IAB-Forschungsbericht*, 4/2016 (en), Nürnberg.

Bundesagentur für Arbeit, Statistik der Bundesagentur für Arbeit (Ed.) (2020). Definitionen — Glossar der Statistik der BA. Nürnberg.

Bundesagentur für Arbeit, Statistik der Bundesagentur für Arbeit (Ed.) (2019). Methodenbericht — Beschäftigungsstatistik — Übergänge von Beschäftigten. Nürnberg.

Ganzer, Andreas; Schmidtlein, Lisa; Stegmaier, Jens; Wolter, Stefanie (2020). Establishment History Panel 1975-2018. *FDZ-Datenreport*, 01/2020 (en), Nürnberg.

Hethey, Tanja; Schmieder, Johannes F. (2010). Using worker flows in the analysis of establishment turnover — evidence from German administrative data. *FDZ-Methodenreport*, 06/2010 (en), Nürnberg.

Jaenichen, Ursula (2018). Do we measure employment durations correctly? * The case of German administrative employment data. *FDZ-Methodenreport*, 10/2018 (en), Nürnberg.

Kapteyn, Arie; Ypma, Jelmer Y. (2007). Measurement error and misclassification: A comparison of survey and administrative data. *Journal of Labor Economics*, 25(3), 513-551.

Lochner, Benjamin (2019). A simple algorithm to link "last hires" from the Job Vacancy Survey to administrative records. *FDZ-Methodenreport*, 06/2019 (en), Nürnberg.

Müller, Dana; Strauch, Katharina (2017). Identifying mothers in administrative data. *FDZ-Methodenreport*, 13/2017 (en), Nürnberg.

Stüber, Heiko; Seth, Stefan (2019). The FDZ sample of the Administrative Wage and Labor Market Flow Panel 1976-2014. *FDZ-Datenreport*, 1/2019 (en), Nürnberg.

Stüber, Heiko (2017). The real wage cyclicality of newly hired and incumbent workers in Germany. The *Economic Journal*, 127(March), 522-546.

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