

FDZ-Methodenreport

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Methodological aspects of labour market data

LPP – Linked Personnel Panel

Quality of work and economic success: longitudinal study in German establishments (data collection on the first wave)

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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 the methodical aspects of FDZ data and thus help users in the analysis of data. In addition, through this series users can publicise their results in a manner which is citable thus presenting them for public discussion.

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Abstract

The project "Quality of work and economic success" examines the correlation between the implementation of sustainable human resource (HR) management approaches, the quality of work and the success of a company. The goal is to identify development processes and approaches for promising measures to maintain people's ability to work and/or increase the employability in companies. In order to gain insight into the working world, at first establishments were interviewed with respect to their HR work. In a second step, employees of these establishments were interviewed on the effect of these HR measures and on their satisfaction. The project is initially designed to include two survey waves at a two-year interval.

This Methodenreport describes the collection of establishment and employee data from its conception to the linkage of the two data sets for the first survey wave in 2012.

Keywords: Quality of work, HR work, establishment survey, employee survey, linked employer/employee data

The project is funded by the Federal Ministry of Labour and Social Affairs (BMAS) and the Institute for Employment Research (IAB).

1 Introduction

The change in the working world is a topic often discussed in the media. Catchwords that often occur are shortage of skilled workers, employment opportunities for the elderly and quotas for women in leadership positions. This change requires modern concepts of corporate HR management. Instruments of HR management characterize essential areas of the daily working routine in companies thus having a central influence on motivation, loyalty and productivity of the staff. Developments and consequences of modern HR management are also being debated extensively in companies and in science. While numerous management consultancies stimulate or accompany the implementation of allegedly effective instruments of HR management in companies, scientists seek methods of analysing the dissemination and the effectiveness of these instruments by taking the heterogeneity of the companies into account.

A comprehensive description of the instruments of HR management, their implications on the attitudes and productivity of employees and, ultimately, the success of a company make extensive demands on the underlying data. The data should:

- allow representative projection,
- cover the viewpoint of employers and employees, and
- be available as longitudinal data.

A comprehensive data set covering all three criteria is not available in Germany so far¹.

Thus, a representative projection of the HR management instruments applied permits statements regarding the relevance and the effectiveness of the instruments and analyses about their heterogeneity of application, for instance with respect to the establishment size classes or sectors.

Information on employer and employee level allows analyses regarding the mechanisms of HR management instruments. Instruments are used, for example, to boost staff motivation with the aim to increase productivity. This interaction requires information on establishment and staff level. Moreover, interlinked employer/employee data enable analyses of the heterogeneity of the impact of measures on employee level. For instance, to what extent the effectiveness of an instrument depends upon the framework conditions within the establishment, the workplace characteristics or upon the socio-demographic background, the personality and the experience of the employees.

In addition, longitudinal information is necessary for examining causal effects of an HR measure on a target variable. Causal analyses are relevant because instruments cannot be implemented at random. The fact alone that economically successful companies use an instrument does not necessarily lead to the conclusion that the use of this instrument was responsible for increasing their success. Financially successful companies might, for instance, be able to afford a more sophisticated HR management system. So, a positive correlation between the use of "modern" instruments of HR management and the economic success of a company does not say anything about the direction of the causal link.

Against this backdrop, a linked employer/employee data set evolves within the framework of the project "Quality of work and economic success" which enables representative statements

¹ However, data sets do exist that fulfill parts of these requirements and have already been evaluated for specific questions.

and longitudinal analyses regarding HR strategy and quality of work in Germany. The project is carried out by the Institute for Employment Research (IAB), the Seminar for General Business Administration and Human Resource Management at the University of Cologne and the Centre for European Economic Research (ZEW) in cooperation, and is funded by the IAB and the Federal Ministry of Labour and Social Affairs (BMAS).

The first wave of the data set consists of a survey in 1,219 establishments from the IAB establishment panel and 7,508 employees of these establishments. A special feature of the data set is the possibility to link the survey data with the administrative data, provided the respondents have given their informed consent. On the part of the surveyed employees, the data may be merged with their employment biographies since entering the labour market or since 1975, and, on the part of the establishments, with the Establishment History Panel (BHP) since the establishment was founded or since 1975. These linkage possibilities, moreover, allow analyses regarding

- potential selection problems in surveys
- developments outside the survey period.

The administrative data, in particular, are also available for future times when the establishment or the employees no longer take part in the survey. This allows, for example, analyses of medium- and long-term developments such as the period of employment in an establishment.

The next chapter gives a brief introduction of the project goals and questions. The method report focuses on presenting the first survey wave of establishment and employee data. It introduces - at first for the establishment survey and then for the employee survey - contents, sample, field phase pattern, response, weighting and representativeness of this survey wave. Linkage possibilities and analysis potential are outlined afterwards.

2 Project Background

One of the objectives of the research project "Quality of work and economic success" is to establish the Linked Personnel Panel (LPP) that is able to describe the dissemination of modern HR management instruments in Germany and to answer a wide range of research questions concerning HR work and quality of work. As much as possible, the project is to investigate causal relationships between the implementation of sustainable HR management approaches, the quality of work and the success of an establishment. Its objective for the political players is to derive approaches for promising measures, for instance to maintain people's ability to work or increase the employability in companies.

The research project is part of the BMAS research focus on the quality of work. A project advisory board consisting of representatives of employer and employee associations, the BMAS and scientists of various disciplines provide advice and monitoring. The development of the data set is funded by the IAB and the BMAS. The primary responsibility for the conception of the questionnaire lies in the hands of the IAB, the ZEW and the Seminar for General Business Administration and Human Resource Management at the University of Cologne.

The original concept envisaged a survey of 600 establishments and 5,000 employees within these establishments. Based on the high response rate of the employer survey, the first wave was enhanced to 1,219 establishments and, as a result of the higher number of estab-

lishments, also to 7,508 employees. This sample forms the basis of the method report. The project is initially funded for two waves, in 2012 and 2014. The project design provides for an extension beyond the second wave.

In order to broaden the potential of analysis, the project has been designed so as to provide a wide variety of possibilities to link with other data sets. Firstly, the establishment survey can be linked to the IAB establishment panel. The IAB establishment panel is an annual representative survey of 16,000 establishments of all sectors and size classes that has been performed in West Germany since 1993 (in the whole of Germany since 1996). With the LPP establishments having been sampled from the IAB establishment panel (cf. section 3.2.1), extensive further survey data are available, for instance on innovation, investment or revenue of the establishments. This information is available for many establishments even for the period before 2012.

Secondly, the establishment survey can be linked to the BHP. The BHP is based on the establishments' aggregated notifications on social insurance and includes variables on the description of the employee structure, employee dynamics and wage structure since the establishment foundation or since 1975.

Thirdly, the employee survey can be linked to the Integrated Employment Biographies (IEB). The employment biographies comprise information on the employment status accurate to the day, i.e. marginal employment and employment subject to social insurance contributions, receipt of benefits under the provisions of Social Code Book SGB III as well as phases of job seeking and participation in training measures. In these biographies, the information on employment subject to social insurance contributions goes back to when the person entered the labour market or to 1975, respectively. For the employees, the IEB also include variables on wage development, change of establishment and employee qualification.

3 LPP Employer Survey

3.1 Contents of employer survey questionnaires "HR work and corporate culture"

The establishment survey in the research project "Quality of work and economic success" focuses on the design of the establishments' HR management. The survey was conducted in the establishments under the title "HR work and corporate culture". In terms of contents and time, it is closely tied to the IAB establishment panel survey and is performed as an add-on survey in approx. 1,200 establishments. This reference has the advantage that the comprehensive data from IAB establishment panel survey can be used for the establishment survey "HR work and corporate culture". Thus, the add-on survey can be given more focus and made more interesting for the establishments because important parameters, such as revenue or staff structure, need not be acquired again. Table 3-1 outlines the contents of the focal points. Other features are success criteria, structural characteristics of the establishments and information of changes over time. The latter are of particular importance for identifying causal effects.

The theme complex of "HR planning and recruitment" enquires, among other things, to what extent strategic HR planning and age structure forecasts are conducted. Another question deals with the recruiting channels of the establishments. In addition to the classic approaches, new strategies also play a role here, such as recruitment via social networks or the targeted search for skilled workers from abroad. The block of questions ultimately ends with questions on duration and criteria for the job matching process.

Table 3-1: Contents of the LPP employer survey

HR planning and recruitment	HR development	Performance management & remuneration	Loyalty, values and corporate culture
Structural features	Success criteria		Changes over time

The second part deals with the "HR development". The focus here lies on appraisal interviews, performance evaluation, qualification and in-house career opportunities. It is recorded, for example, whether target agreements and development plans exist in the establishment, and if so, for which groups. Furthermore, the establishments are requested to indicate whether they conduct systematic performance evaluations and how they deal with employees whose performance is unsatisfactory. The last part of this block of questions enquires whether establishments support their employees in acquiring additional qualification, and whether they qualify their trainees beyond the minimum required by law.

The third block collects data on "Performance management and remuneration". It focuses on target groups of variable remuneration and, in particular, on the establishment's definition of the variable portions of the remuneration. The first question raised is whether the establishment offers the option of variable remuneration. Then, the variable portions are identified, measured by the fixed salary and broken down by leadership and non-leadership personnel, as well as the share of success-based components (company results, team results, individual performance).

The section "Loyalty, values and corporate culture" enquires about measures the establishments use to promote employee loyalty to the establishment. At first, codes of values and establishment certifications are identified as well as the opportunity of participation through employee surveys and women's empowerment in the establishments. At this point, the add-on questionnaire takes the IAB establishment panel 2012 focus of equal opportunity to a greater depth.

The subsequent block of questions deals with "Structural features". The questions asked concern the establishment organisation, such as levels of hierarchy, organisational structure or ownership situations and changes allowing more intensive analyses of the heterogeneity of establishments.

Some of the topics were not considered in the LPP establishment questionnaire, or considered only to a limited extent, because comprehensive questions on them suitable for use in analyses already exist in the IAB establishment panel.

3.2 Sample for the LPP employer survey

The establishment survey "HR work and corporate culture" builds on the IAB establishment panel, both contents-wise and regarding the sample. The survey for the IAB establishment panel is based on the establishment file of the Federal Employment Agency (Bundesagentur für Arbeit – BA) which contains all German establishments with at least one employee subject to social insurance contributions. Sampling date is always 30 June of the preceding year. In order to consider establishments of all sectors and size classes, the sample is drawn in a disproportionate stratified manner by establishment size, federal state and business sector, i.e. large establishments, small states and small sectors are disproportionately represented. New startups are also included in the sample in order to enable representative mapping of the economic development.²

The sample for the LPP employer survey was drawn based on the IAB establishment panel wave of 2011. Exempted were establishments with less than 50 employees and establishments from the business sectors of agriculture, forestry and fishery, as well as civil service and charity organisations.

The establishments were then randomly drawn from a matrix stratified by sector, establishment size and region. The distortions caused by the random sampling can be compensated by supplied weighting factors thus allowing representative statements. The sampling matrices are outlined below.

For the purpose of sampling and projection, the economic sectors were pooled in five sector groups³:

- processing industry,
- metal and electrical industry, automotive sector,
- commerce, traffic and communications,
- company-related services and financial services, as well as
- IT, communication and other services.

The individual sector groups consist of rather heterogeneous subgroups that can be adapted for the evaluation. However, the case numbers are not yet sufficient for evaluations on a very small aggregation level. Thus, the processing industry includes, among others, mining, construction industry, energy and water supply, manufacture of food, beverage and tobacco as well as consumer goods. The last sector group listed comprises, in addition to IT and communication services, also education, teaching and catering.

² For further information on sample generation, see Fischer et al. (2009).

³ The precise allocation to sector groups is shown in the appendix.

For the definition of size cells, the establishments with 50 or more employees subject to social insurance contributions were pooled in the following size groups:

- establishments with 50 to 99 employees subject to social insurance contributions,
- establishments with 100 to 249 employees subject to social insurance contributions,
- establishments with 250 to 499 employees subject to social insurance contributions, and
- large establishments with 500 and more employees subject to social insurance contributions.

The group of large establishments shows a great variance in establishment sizes. The evaluation should take this heterogeneity into account.

The regional distribution was included in the sampling as a third dimension so as to have companies from all over Germany represented in the survey. For this purpose, the individual federal states were pooled in the following regions:

- northern region: establishments from Lower Saxony, Schleswig-Holstein, Hamburg and Bremen,
- eastern region: establishments from the new federal states (including Berlin),
- southern region: establishments from Bavaria and Baden Wuerttemberg, and
- western region: establishments from North Rhine-Westphalia, Hesse, Saarland and Rhineland-Palatinate.

The sampling for each of the regions mentioned was based on the dimensions of establishment size and economic sector. The gross sample for the survey thus considered 2,222 establishments. Table 3-2 shows the gross sample matrix aggregated for Germany.

Table 3-2: Case numbers in the gross sample of the LPP employer survey

	50-99	100-249	250-499	500+	Total
Processing industry	251	272	114	98	735
Metal and electrical industry, automotive sector	172	174	118	143	607
Commerce, traffic, communication	153	107	55	27	342
Company-related services and financial services	137	115	55	47	354
IT, communication, other services	80	59	24	21	184
Total	793	727	366	336	2.222

Source: TNS Infratest (2012).

3.3 Field phase pattern and data check

3.3.1 Field phase

TNS Infratest Sozialforschung was assigned to conduct the establishment survey. The survey institute has long-standing experience in establishment surveys, having conducted, among other things, the annual surveys for the IAB establishment panel. Using the same survey institute as for the IAB establishment panel in 2012 was also helpful in minimising temporal discontinuities and changing interview partners, which has a positive impact on the comparability of information in the IAB establishment panel and information from the survey "HR work and corporate culture" as well as on the participants' willingness to take part in this survey.

Prior to commencement of the survey, the establishments involved were handed a letter with explanations on the survey and an information sheet on data privacy. By giving their consent to the survey, the establishments at the same time declare their agreement with the merging of survey data with the IAB data in compliance with the data protection laws and regulations. TNS Infratest and the project team were available to answer any questions the establishments may have had during the field phase. The appointed interviewers received a basic training and, in addition, a written interview instruction on the special project features. Quality monitoring also takes place continuously. The field phase ran from 30 July 2012 to 12 October 2012. By the latter date at the latest, the completed questionnaires had to be received by TNS Infratest. The tight schedule did not allow for a pretest of the questionnaire to be carried out in the establishments for the first survey wave.

The establishments received the survey favourably, which is also evident in the high level of willingness to participate. 76 per cent of the establishments were willing to participate in the survey, as opposed to the 30 per cent expected. The high response exceeded all expectations and, as a result, the field time was reduced so that nearly 500 establishments of the gross sample were not involved in the survey. Table 3-3 outlines the response to the survey in detail. Only a small portion of the non-responses is due to the establishments or their contact persons being unavailable. The main reasons for non-responses were refusal and lack of time among the respondents.

Table 3-3: Field pattern of LPP employer survey

	Absolut	% of gross amount
Gross amount	2,222	100
Unprocessed because end of field	497	22.4
Used gross amount	1,725	
Establishment ceased its activities	19	1.1
Establishment cannot be found	1	0.1
Adjusted gross amount	1,705	100
Target person unavailable	31	1.8
No participation because of time restrictions	250	14.7
Participation refused	129	7.6
Total number of non-responses	410	24
Total number of interviews	1,295	76
Questionnaires received too late	76	4.5
Evaluable interviews	1,219	71.5

Source: TNS Infratest (2012).

Besides completely refusing to participate, the respondent also has the option to leave single questions of the interview unanswered by refusing to provide details. A high proportion of non-responses in certain questions suggests, among other things, that the question is hard to understand or unanswerable for objective reasons, or that the respondent refuses an answer (for example for reasons of confidentiality). The survey has achieved good results here, too, despite the lack of pretests. Non-responses between five and max. ten per cent concerned only a total of ten questions. A slightly higher non-response rate occurred for the open questions on changes in the establishment that were attached at the end of the questionnaire. This part was exploratory in nature and was included in a survey for the first time.

3.3.2 Data check and editing

Upon receiving the survey questionnaires, the survey institute checked them for completeness and recorded the data. Any illegible data were first provided with an error code and re-edited later. Then followed a content-related check based on pre-determined parameters. In cases where both manual and computer-based checks were unable to dissolve the discrepancies, the establishments were contacted by phone and asked for clarification. Only after this step failed to provide plausible information, the answer was set to "No response". Owing to experienced interviewers and subsequent comprehensive measures of data check and validation, a high-quality establishment data set has emerged.

3.4 Results and projection

3.4.1 Response

After conclusion of interviews and editing, the resulting case number is altogether 1,219 usable interviews. Thus, the net sample contains 55 per cent of the establishments from the gross sample. Distributed over the original matrix of establishment size and sector, the response is as outlined in Table 3-4. The absolute number always indicates the number of establishments surveyed in this cell. In order to emphasise deviations of the individual cells against the original matrix, the percentage based on the original population is also indicated. The response in the smaller establishment size classes was higher than in the big ones. Moreover, establishments from the metal, electric and automotive sectors are represented above average compared to the gross sample, and establishments from the IT and communications sectors below average. Out of the 1,219 establishments, 83 per cent declared their willingness to participate again in the second wave of the LPP employer survey in 2014 (panel participation willingness).

Table 3-4: Response to LPP employer survey

	50-99	100-249	250-499	500+	Total
Processing industry	162 (65%)	147 (54%)	57 (50%)	38 (39%)	404 (55%)
Metal and electrical industry, automotive sector	104 (60%)	104 (60%)	65 (55%)	71 (50%)	344 (57%)
Commerce, traffic, communication	85 (56%)	60 (56%)	31 (56%)	12 (44%)	188 (55%)
Company-related services and financial services	81 (63%)	52 (48%)	34 (62%)	23 (49%)	189 (56%)
IT, communication and other services	38 (43%)	33 (51%)	12 (50%)	11 (52%)	94 (47%)
Total	470 (59%)	395 (54%)	199 (54%)	155 (46%)	1,219 (55%)

Source: Own calculation.

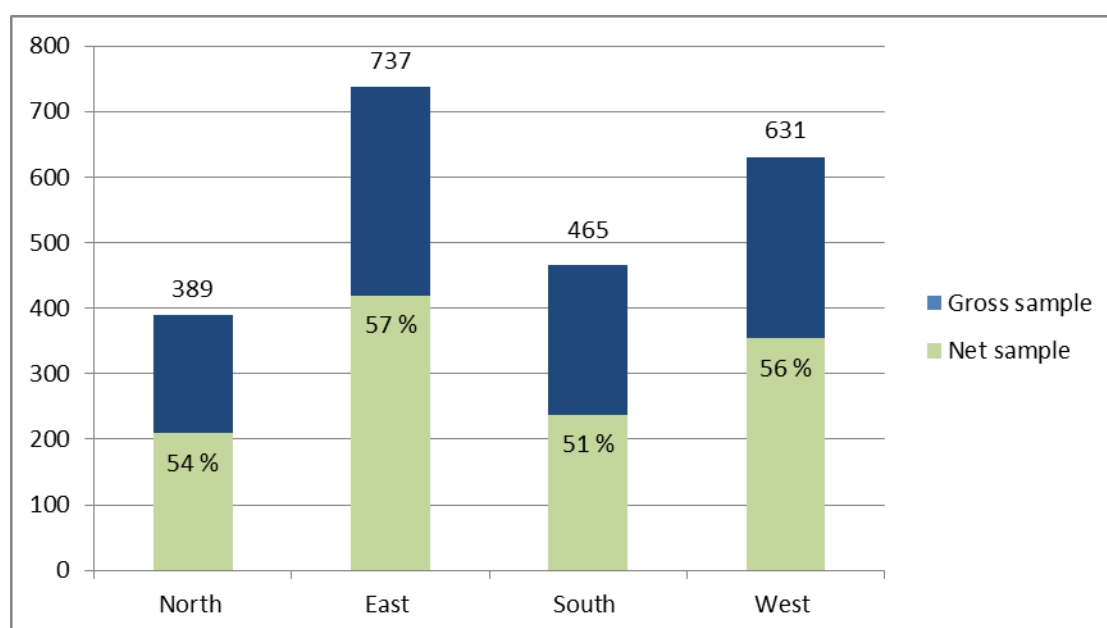
The regional response is outlined in Figure 3-1. The blue bars each indicate the number of establishments in the gross sample, and the red bars represent the case numbers in the net sample. The response here is between 51 per cent (southern region) and 57 per cent (eastern region). The regional distribution of the establishments in the survey does not correspond with the actual distribution of establishments in Germany. Eastern Germany is over-represented, whereas Southern Germany is under-represented in the survey. The deviation is due to the differently sized federal state samples of the IAB establishment panel. However, the deviations can be compensated by the weighting factors available.

Some key figures regarding the establishments are shown in Table 3-5 to give a small impression of the composition of the companies surveyed.

According to their own statements, the establishments interviewed have 435 employees on average, 418 of whom are subject to social insurance contributions. The proportion of women in the total number of employees is about 32 per cent. This low percentage can be due to the exclusion of small establishments and public service institutions.

In the establishments surveyed, sixty per cent are bound by a collective bargaining agreement, and 85 per cent provide vocational training. 56 per cent of the establishments surveyed were established before 1990 and have thus existed for more than 20 years. More than half of the establishments interviewed answered the question whether the establishments was an independent enterprise in the affirmative.

Figure 3-1: Response to LPP employer survey



Source: Own calculation.

Table 3-5: Key figures of the establishments surveyed

	Mean	N
Total number of employees 06/12	435.3	1,218
Number of employees liable to social insurance 06/12	418.8	1,218
Proportion of women in the total number of employees 06/12	32.0 %	1,218
Establishments bound by a collective bargaining agreement	62.0 %	1,219
Establishments providing vocational training	85.4 %	1,219
Independent enterprise	54.1 %	1,219
Establishments founded before 1990	55.9 %	1,216

Unweighted values, Source: LPP Employer Survey wave 2013 (Establishments committed to collective bargaining agreement), IAB Establishment Panel 2012 (else), different numbers of observations because of missings.

3.4.2 Projection

TNS Infratest calculated weighting factors in order to compensate for the disproportionate sample approach, including, for example, the over-representation of establishments from Eastern Germany and of large establishments. The calculation of the factors was carried out analogous to the weighting in the IAB establishment panel⁴. The projection is based on the population of the BA establishment file as of 30 June 2011, the date the establishment samples were drawn. The BA establishment file contains all establishments with at least one employee subject to social insurance contributions. Furthermore, the overall data pool of employees subject to social insurance contributions as of sampling date is indicated. For the purpose of projection, all establishments are classified in the target matrix. The sample of 1,219 establishments was projected to a total of 65,467 establishments in Germany. In addition, the number of employees subject to social insurance contributions was adjusted in the respective cells. In this, the projected number of employees surveyed corresponds to the target values in the BA employment statistics. At the same time, the breakdown by sector and size is retained.

4 Employee Survey

4.1 Contents of employee survey questionnaires

The establishment survey introduced in the preceding chapter forms the first part of the LPP data set. This part is complemented by the employees' perspective captured in the LPP employee survey. The LPP employee survey is to reflect and expand core statements from the establishment level to the employee level. Moreover, the data set provides comprehensive possibilities of analysis apart from the linkage. Unlike the LPP employer survey, the employee survey is based on the administrative data of the social insurance registration. For the design of the survey, this meant a higher degree of liberty in the selection of the questions on the one hand. On the other hand, there is hardly any information available on subjects not directly affecting the employment history. To enable the examination of an establishment's influence on the work quality of its employees, it is necessary to separate the employees' personal attitudes and environment from the establishment's influence. For this reason, various influence variables (input factors) and result variables (output factors) were defined (see Figure 4-1). The development of influence and result factors is mainly based on existing and validated survey instruments. Moreover, the institute assigned with the survey, infas, put forth its expertise to support and optimise the selection and formulation of the questions.

The input factors are composed of job-related, personal and socio-demographic influence variables. In the area of job-related influences, the survey considers the current employment, work conditions and workloads as well as remuneration. Questions regarding employment include information on characteristics of the current job (e.g. occupational status, limited employment, working hours and work from home). The work conditions and workloads are scored on a five-point scale considering various items. The indicator is based on the Work Design Questionnaire (Stegmann et al. 2010). Also, some questions are taken up from the establishment questionnaire including, for example, further training activities and systematic

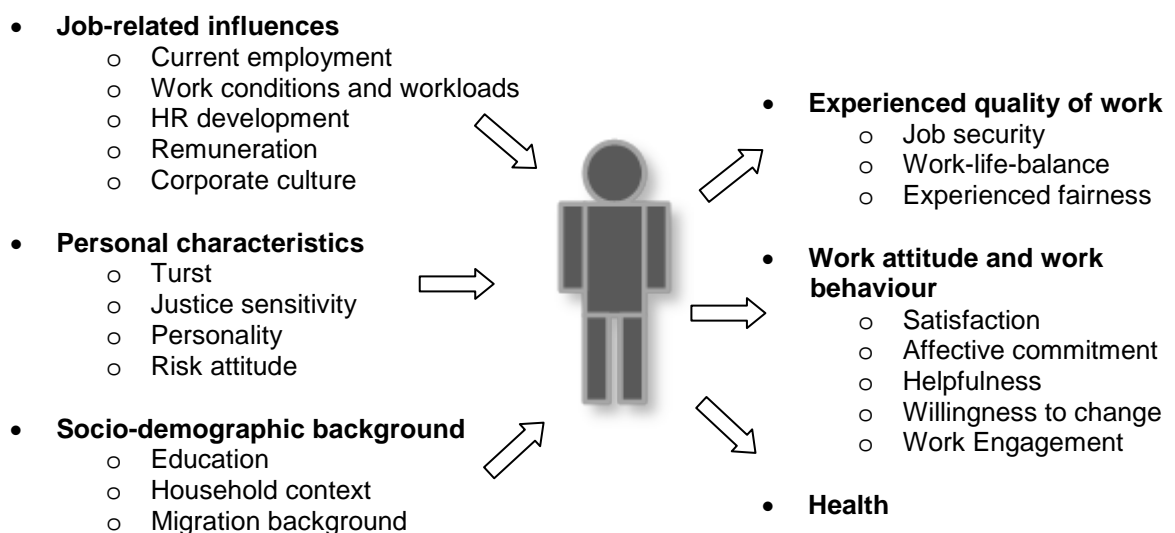
⁴ For further information on projection of the IAB establishment panel, see Fischer et al. (2009).

appraisal interviews. For a part of the establishment influence factors, the establishment perspective can be mirrored with the employee perspective here. While the establishment survey asks the companies whether they conduct appraisal interviews, the employee survey wants to know from the employee whether such an interview has taken place and how long it took.

Another block of influence factors is dedicated to personal characteristics. They include, but are not limited to, the so-called Big Five personality traits: neuroticism, extraversion, openness to experience, agreeableness and conscientiousness (Costa and McCrae 1995; Barrick and Mount 1991). The respondents are asked to assess various statements regarding their own personality on a scale of one to five. Trust in other people and justice sensitivity are other features captured through the personal assessment of statements. These item sets have been used successfully in other surveys before. Some of them were adapted for this survey in order to satisfy the CATI character of the survey. Being stable over time, the personal characteristics need not be included in every survey wave.

The personal and establishment related influence factors are complemented by the socio-demographic background of the person interviewed. The relevant questions pertain to school education, household context and/or migration background. The information on migration also includes the second migrant generation, i.e. the migration status of the parents.

Figure 4-1: Focal questions of the LPP employee survey



Source: Own presentation.

The output factors used take experienced quality of work, attitude to work, working behaviour and health into account. The area "experienced quality of work", for example, captures job security, work-family balance and experienced fairness. The work-family balance consists of two separate indicators that enable to measure the conflict between private life and work on the one hand and the conflict between work and private life on the other hand. This index has

long been successfully used in the COPSOQ survey (Nübling et al. 2006). Work-life balance as well as experienced fairness were operationalised by means of an item battery in which the persons interviewed had to indicate to what extent each statement applied to them.

In order to determine work attitude and work behaviour, the persons are questioned on job satisfaction, on affective commitment (emotional attachment) to the establishment, on work engagement and on willingness to change, among other things. Current job satisfaction originates from the survey on the socio-economic panel (SOEP) established in Germany and is scored on a scale from zero to ten. To measure commitment and work engagement, several statements are available to be assessed on a scale from one to five.

4.2 Employee sample

4.2.1 Population of employee survey

The employee survey is based on a selection of the establishments interviewed. A sample of 7,500 employees was to be realised in these establishments. The sampling is based on the Employee History of the IAB⁵ (Beschäftigtenhistorik – BeH). This data set contains all employee-related notifications including pay data captured by the employer. It encompasses all employees subject to social insurance contributions and those in marginal employment. The information is accurate to the day and available for a long period of time (for Western Germany since 1975 and for Eastern Germany since 1992). Typical effects of selectivity normally found in survey data do not occur in administrative data.

With employee-related notifications entering the database at a time delay, the sampling involves a trade-off between the most current data on the one hand and a complete data basis on the other. The key date chosen for the employee survey was 31 December 2011 so as to achieve a high level of data completeness and to limit the time lag between sampling and survey to one year.

4.2.2 Sample drawing

Not all establishments involved in the LPP employer survey were considered for the drawing of employee samples.

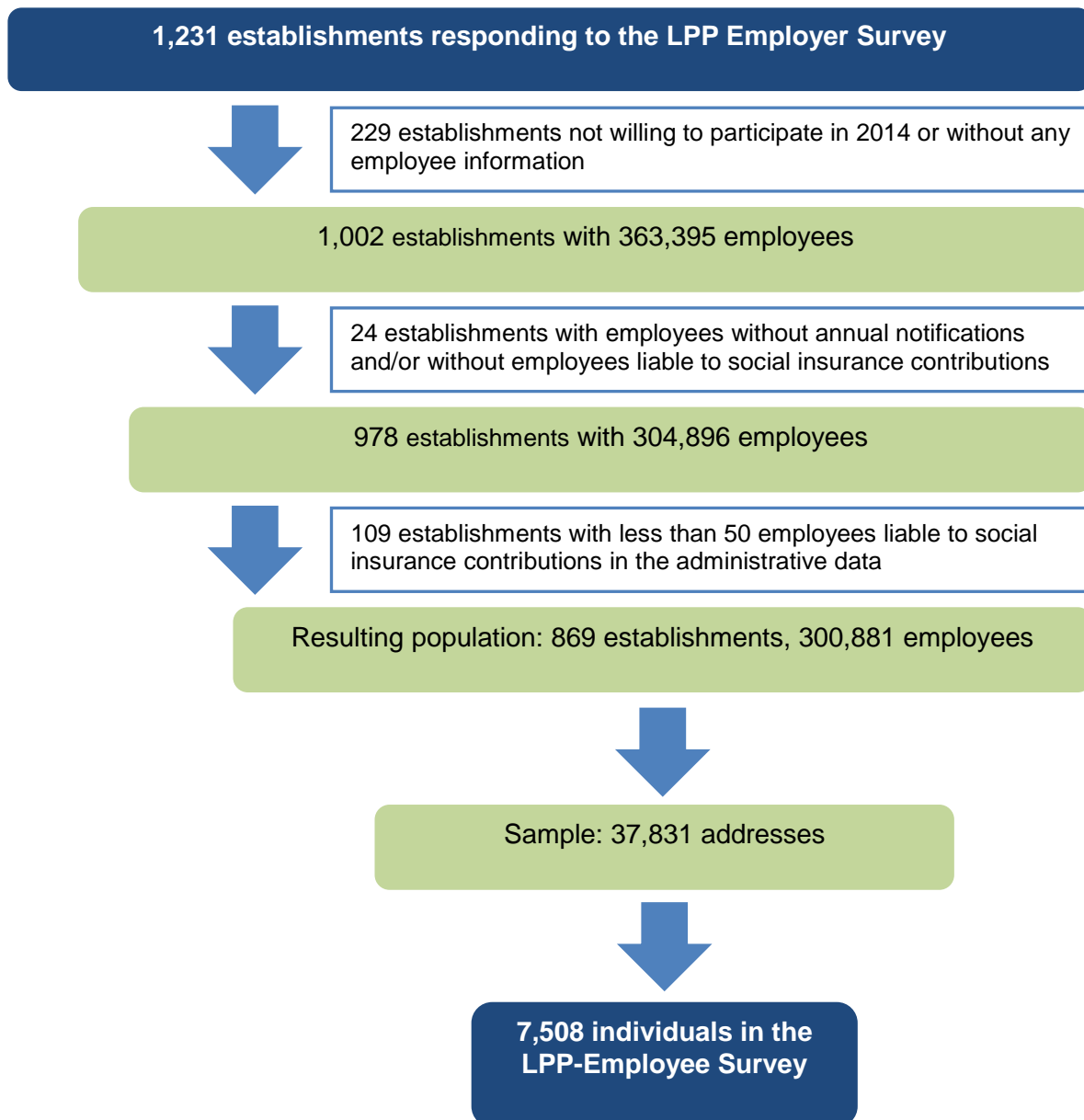
Due to the fact that the final data set of the establishment survey was not yet available at the time the employees were chosen for the survey, the drawing of employees took place based on a preliminary overview of the establishments surveyed. That is why the LPP employer survey does not include any information for some of the employees surveyed⁶. Out of the 1,231 establishments registered as surveyed, only those willing to participate in the panel qualified for the LPP employee survey. This restriction was made in order to create a sound basis for continuing the survey in 2014. Establishments for which no employee information

⁵ The BeH is part of the IEB (Integrated Employment Biographies) outlined in chapter 2.

⁶ This could happen because at the time the sampling for the employee survey took place, an interview on the add-on survey was available that was, however, later declared invalid because the interview on the IAB establishment panel was not yet at hand when the field phase of the add-on survey ran out.

was available in the administrative data were also excluded. This reduces the number of establishments to 1,002. Eligible for the sampling were only individuals for whom an annual notification on social insurance was available and who are considered as employed subject to social insurance contributions without special features (personal attribute 101). This restriction excludes, among others, trainees and employees on parental leave and partial retirement. Employees leaving the establishment form a separate target group for the second survey wave where they will be asked for their reasons to change.

Figure 4-2: Sample frame applied for the LPP employee survey



Source: Own presentation.

For the establishment survey, the establishment size restriction from the IAB establishment panel was used. However, for the employee survey, this variable can only be used to a lim-

ited extent because some of the information given by the establishments in the survey deviates from the establishments' employment notifications.⁷ Establishments having less than 50 employees subject to social insurance contributions in the social insurance data as of 31 December 2011 were, therefore, excluded.

Thus, the population for drawing the employees comprises 300,881 individuals from 869 establishments, from which a sample of around 38,000 addresses was drawn in October 2012. A small pretest sample of approx. 800 persons was generated in addition. For survey stratification, the establishments were used according to their size to make sure that a sufficient number of employees could be surveyed for each establishment. Employees in smaller establishments are more likely to be drawn into the sampling process than employees in large establishments. The objective was to survey at least three employees per establishment, however, no more than ten per cent of the workforce. The number of employees initially drawn per establishment was 20 individuals for establishments with 50 to 99 employees, 27 in the second size class, 69 in establishments with 250 to 499 employees and 122 for larger establishments. In the course of the survey, another sampling had to be done with proportionately more persons being drawn from establishments that had less than three interviews per establishment at that time. The samples were handed over to the survey institute, infas, to carry out the survey.

4.3 Field phase of the employee survey

4.3.1 Performance of the survey and response behaviour

The conversion of the questionnaire into a telephone survey as well as the implementation and documentation of the field phase were conducted by infas Institut für angewandte Sozialwissenschaft GmbH.

The main survey started on 03 December 2012 and was completed by 03 April 2013. In the run-up to the main survey, the questionnaire was tried in a pretest and then adjusted in some places. Infas carried out interviewer training courses beforehand to familiarise the interviewers with the study and sensitise them for the peculiarities of the questionnaire. A monitoring team ensured continuous quality control throughout the survey.

Before the interviewer made the first phone contacts in December 2012, infas researched missing telephone numbers and eliminated duplicates from the data set. 30,703 of the addresses provided could be used for the survey. Before they were contacted by phone, the persons of the target group were informed by letter about the survey, the applicable data protection regulations and their rights. Both infas, via a free service call number, and the project team were available to answer any questions. These measures serve to enhance acceptance and professionalism of the survey. Another measure used to raise the participation

⁷ The deviations may be a result of a different understanding regarding the definition of a business unit and varying key dates.

rate was to contact so-called 'soft refusers'⁸ again in the final phase of the survey in an attempt to encourage their participation in the study.

Table 4-1 gives an overview of the field results. The unadjusted gross sample covered 30,703 persons. For 20 per cent of the persons in the sample, the target group affiliation could not be determined as they could not be reached under the phone number at hand. Another four per cent of the persons contacted did not belong to the target group, mainly because they no longer worked for the establishment, had moved abroad or died. The adjusted gross is thus around 23,200 persons. 22,006 out of these employees could be reached during the field phase and also be interviewed as they were not impeded by language barriers or for some other reasons. The number of valid interviews obtained from this sample was 7,508. With a willingness to participate of one third (relating to the adjusted gross II) and a refusal rate of 48 per cent, the result of the employee survey is positive (Table 4-2).

Table 4-1: Field result of the LPP employee survey

	N	In %
Gross sample	30,703	100
Unknown target group affiliation (not connected; only connected to fax/modem; incorrect telephone number/target person unknown for this connection, target person moved and new address is unknown)	6,283	20.5
TP not in target group / outside the population	1,234	4
Adjusted gross (I): Target group	23,186	75.5
Nonresponse – TP cannot be interviewed	144	0.5
Nonresponse – TP not available	11	0
Nonresponse – Others	4,264	13.9
Adjusted gross (II): Target person is available and can be interviewed	22,006	71.7
Nonresponse – Not willing to participate	11,208	36.5
Interviews, valid	7,508	24.5

Source: infas (2013).

⁸ Infas designates those persons as soft refusers whose response codes read 'no access to target person', 'contact person refuses information', 'hangs up immediately', 'sick', 'not interested', 'no time'. These individuals were contacted again by selected interviewers.

Table 4-2: Response rate of the LPP employee survey

	Basis (abs.)	Interviews (abs.)	Response rate in %
Gross response rate	30,703	7,508	24.5
Net response rate (I): Interviews / Target group members	23,186	7,508	32.4
Net response rate _{contact} (II): Interviews / TP is available and can be interviewed	22,006	7,508	34.1

Source: infas (2013).

4.3.2 Data check and editing

The use of survey software enabled part of the data check to be carried out while the data was collected. The interview program was provided with effective value ranges thus giving the interviewers immediate feedback on the answers entered.

After completion of the data collection phase, 51 interviews were declared invalid, either because the age indicated in the interview deviated from the age stated in the administrative data by more than one year, or because the interview had been started, but never completed. The data check after the interviews also included detecting cases of implausibility that resulted from the combination of answers. For instance, the question about children under 14 years of age was answered in 108 cases to include older children. Also, there are a few cases where the total of sick leave and further training days exceeded 200. The cases identified by infas as possibly containing errors were documented, but left in the data set. The number of cases with implausible information is small and not expected to have any impact on the evaluation.

4.4 Response and weighting

4.4.1 Response

After completion of the field phase, a data set with 7,508 persons interviewed from a total of 861 establishments is available. The average number of employees interviewed per establishment is nine, with the range going from one employee surveyed per establishment (27 cases) to 42 employees interviewed per establishment (one case).

The LPP employee survey was able to reach individuals with different socio-demographic backgrounds, which enables the performance of advanced analyses for various groups of employees. Table 4-3 gives a small insight into socio-demographic key figures of the LPP employee survey. Out of the persons interviewed, 2,084 were female, which corresponds to a proportion of woman of 28 per cent. Around five per cent of the respondents do not hold German citizenship. The share of those with at least one parent not born in Germany is about 18 per cent.

The LPP employee survey was able to reach persons both at the beginning and at the end of their employment career, as can be seen from the minimum and maximum of age distribu-

tion. The average age of the persons interviewed was 45.2 years. The average respondents lived in households with two more persons.

Table 4-3: Key figures of the LPP employee survey

Key figure	Mean	Standard deviation	Min	Max	N
Proportion of women	27.8 %				7,508
Age	45.2 years	10.55	18	67	7,508
Proportion of Germans	94.9 %				7,507
Household size	2.8 persons	1.23	1	10	7,488
<u>Education:</u>					
School education or vocational training	59.0 %				7,494
Technical college, master craftsmen	20.3 %				7,494
University degree or degree from a university of applied sciences	17.7 %				7,494
No recognised qualification	2.6 %				7,494

Unweighted values, Source: LPP Employee Survey wave 2013.

The LPP employee survey reaches persons of different training backgrounds. Individuals having completed school education or vocational training form the largest group. Every fifth respondent indicates to have completed the training for master craftsmen or technicians, and about 18 per cent have a university degree. It is only a minority of respondents who are without any recognised qualification. The structure of qualifications for persons with training and university degree roughly corresponds to the distribution of these qualifications among all gainfully employed persons in Germany. Persons with a craftsmen master qualification are over-represented, and persons without a recognised qualification are under-represented (destatis 2012).

4.4.2 Weighting

The weighting concept of the LPP employee survey differs from that of the establishment survey. Here, the population for the sample consists of the total of all employees subject to social insurance contributions working in one of the 869 establishment selected for the survey as of 31 December 2011. A projection to all employees in Germany is not possible because, due to the restrictions in the sampling described above, the 7,508 persons cannot map the situation of all German employees. Instead, adjusted design weights are calculated to compensate the varying probabilities of drawing and participation.

Infas first calculated design weights from the selection probabilities of establishments and employees and then adjusted them in a two-stage procedure. Two selection stages were examined for the adjustment. Using a logistic model, the first stage ascertained each person's probability to be part of the field sample, i.e. a phone number was available or successfully researched. The probability of a realised interview was calculated in a second step by

determining the failure probability due to non-availability or lack of willingness to participate. The design weights were adjusted by means of these calculated probabilities. Unlike in the establishment survey, the weighting factors do not constitute projection factors, i.e. the total of weights corresponds to the case number, and the average value of the weighting factors is consequently 1 (Infas 2013).

4.5 Agreement to panel participation and merging of data

At the end of the survey, the employees interviewed were asked for their consent to merge the survey data with other data stored with the IAB. This declaration of consent can be revoked at any time. The participants were also asked whether they agreed to be contacted for the repeated interview. Consent to the merging of data and the willingness to participate in a repeated interview are of crucial importance for high-quality research. With more than 80 per cent, the LPP employee survey achieved a good value in both respects. Table 4-4 gives an overview of the agreement to panel participation and merging of data.

Table 4-4: Agreement to panel participation and merging of data in the LPP employee survey

		Agreement to merging of data		
		Permission	No Permission	Total
Willingness to participate	Permission	6,051 (80.6%)	1,003 (13.3%)	7,054 (94%)
	No permission	144 (1.9%)	310 (4.1%)	454 (6.0%)
	Total	6,195 (82.5%)	1,313 (17.5%)	7,508 (100%)

N=7,508; Source: infas (2013).

The willingness to participate in the panel is in the upper range, and the agreement to the merging of data is also in a good range of the values common for telephone interviews. Approximately 81 per cent of the respondents have agreed both to the merging of their data and to a repeated interview. In total, the willingness to participate in the panel is 94 per cent and thus higher than the agreement to merge the data with other data sources (83 per cent). About four per cent of the respondents refused to give their consent to any of the two questions.

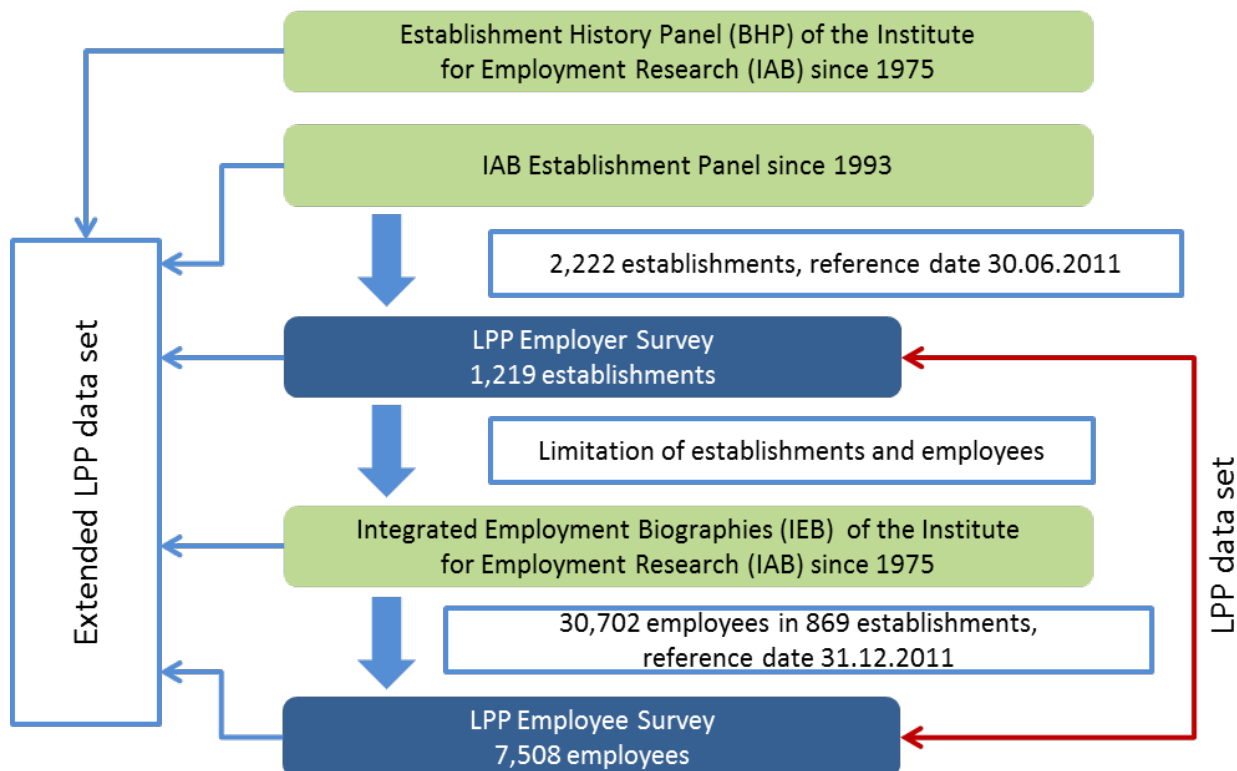
5 LPP data linkage

The big advantage of the LPP survey data is their multiple linkage potential to other survey or administrative data. Some of the linkage possibilities are briefly outlined below. In the personal interviews, it was not necessary to make a detailed survey of the employment history because this information is available in the IAB administrative data. The fact that many structural factors, such as revenue or number of employees, were already acquired in the IAB establishment panel also facilitated the data acquisition in the establishment surveys.

Figure Figure 5-1 shows the existing linkage possibilities. The LPP employer and employee surveys are the starting basis. These two data sets constitute the core which can be extended by additional information. On the part of the establishment, the data can be enriched

mainly with information of the IAB establishment panel and the Establishment History Panel (BHP). On the part of the employees interviewed, the data can be linked to their individual employment histories (IEB). These data can also be used for analyses without having to interview the person again. In addition, this allows to follow-up on persons who change establishment and those not participating in the second survey wave.

Figure 5-1: Linkage possibilities



Source: Own presentation.

All linkage possibilities shown are always realised in compliance with the data protection regulations, which means that persons and establishments will not be identifiable through the linkage. Explicit consent is always the prerequisite for data to be linked.

The analysis potential of the data set will be raised further once the second wave of the survey is concluded in 2015 as this will allow longitudinal studies to be carried out. For example, changes in the use of HR instruments and their impact on the employees can be examined through the establishment of a panel. According to good scientific practice, the data set will be made available to the public for scientific research upon completion of the project at the latest.

6 Conclusion

The LPP provides HR economics research and related scientific fields with a data set of extraordinary analysis potential. It combines survey data on employee and establishment level with administrative data. On establishment level, the LPP is representative for German establishments with 50 and more employees in the processing industry and in the service sector. The future longitudinal character of the data set enables descriptions and developments over time as well as the identification of causal effect of HR management measures on economic target variables.

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Appendix: Composition of sector groups

Sector group	Sector classification from IAB establishment panel 2011
Processing industry	Mining and extraction of stone and earth Energy and water supply, disposal of waste and waste water, recovery Manufacture of: food, beverage and tobacco, textiles, leather goods, wooden goods, paper, printed matter, chemical and pharmaceutical products, rubbers and plastics, glass and ceramics, data processing devices, electronic and optical products, furniture Construction industry
Metal and electrical industry	Metal production and metal processing Manufacture of: metal products, steel and light metal construction, electronic equipment Machine building industry Automotive industry Installation and repair of machinery
Commerce, traffic and communications	
Company-related services and financial services	Financial and insurance services; economic, scientific and free-lance services
IT, communication and other services	Education, teaching Health and social sector Lodging and catering Other services

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