European Data Watch

This section offers descriptions as well as discussions of data sources that are of interest to social scientists engaged in empirical research or teaching courses that include empirical investigations performed by students. The purpose is to describe the information in the data source, to give examples of questions tackled with the data and to tell how to access the data for research and teaching. We focus on data from German speaking countries that allow international comparative research. While most of the data are at the micro level (individuals, households, or firms), more aggregate data and meta data (for regions, industries, or nations) are included as well. Suggestions for data sources to be described in future columns (or comments on past columns) should be send to: Joachim Wagner, Leuphana University of Lueneburg, Institute of Economics, Campus 4.210, 21332 Lueneburg, Germany, or e-mailed to ⟨wagner@leuphana.de⟩. Past "European Data Watch" articles can be downloaded free of charge from the homepage of the German Council for Social and Economic Data (RatSWD) at: http://www.ratswd.de.

New Possibilities for Socio-Economic Research through Longitudinal Data from the Research Data Centre of the German Federal Pension Insurance (FDZ-RV)

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1. Introduction

For many socio-economic analyses micro-data on the life-course of the individual or at least on the employment-biography is needed. The reason for this is that micro structures and developments in socio-economics can only be analysed in detail on the basis of individual data. The dynamics behind changes in micro-economic activities can only be depicted with longitudinal data. Longitudinal data on individuals is also needed in order to analyze socio-economic aspects of the developments in the life-course (Schmähl / Fachinger, 1994, 180 ff.). An example is the evaluation of the question whether higher

education results in higher life-course earnings. Finally, there is an aspect that longitudinal data allows the calculation of models which are superior to models with cross-sectional data, for example with regard to their explanatory power (Engel / Reinecke, 1994, 5 ff.).

The Research Data Centre of the German Federal Pension Insurance (FDZ-RV) supplies cross-sectional and now also longitudinal micro-data. This data is process-produced. In Germany statutory pension insurance is mandatory for all employed persons in the private and public sector. In additional to this, contributions are paid out of unemployment insurance in the case of the unemployed and out of health insurance in the event of long-term illness. So the majority of the German population comes into contact with the German Federal Pension Insurance and the pension data covers more than 90 % of the entire population (Rehfeld / Mika, 2006, 121 ff.) The German Federal Pension Insurance is the biggest income source after retirement. Besides old-age pensions another important function is rehabilitation in the event of inability to work. So the FDZ-RV also provides information on health status data.

The second chapter of this paper gives an overview of the data and especially of the longitudinal data of the German Federal Pension Insurance. The third shows how the FDZ-RV creates Scientific Use Files (SUFs) from genuine process-produced data and gives some examples of research topics. Finally we make some remarks on the FDZ-RV, in particular on the data-supply in the present and the future.

2. Data of the German Statutory Pension Insurance

Figure 1 gives an overview of cross-sectional and longitudinal micro-data of the German Federal Pension Insurance in the fields of retirement, insured persons and rehabilitation with the corresponding names of the micro-data. This grey-marked data is generated from the FDZ-RV as anonymized SUF[1], which you can get free of charge as a scientist working in a research unit, the only requirement being a signed contract with FDZ-RV.

The statistics of the German statutory pension insurance can be divided into datasets that focus on biographic information in combination with retirement and insurance and in a special dataset for rehabilitation. The data-sets listed with a reference period of one day means that this day represents the monitoring day in a specific year. Some statistics have both reference periods, daily and yearly.

The longitudinal dataset for rehabilitation is mentioned here to give a complete overview of the existing data sources. The preparation of this data in the

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[1] For general rules of de facto anonymization in the FDZ-RV see Stegmann et al. (2005).

form of Scientific Use Files has not yet been implemented. For this reason we will only look at this topic briefly. This article focusses on the longitudinal datasets on new pensioners and insured persons. Process-produced longitudinal data of social security is especially useful because the employment career can be analysed. Therefore typical problems with longitudinal surveys in social research can be avoided. Panel mortality and recall errors concerning retrospective questions cannot occur.

Topic of the micro-data-set				
Retirement			**Insurance**	**Rehabilitation**
Retiremen inflow	Retirement stock	Retirement cash-stock		
cross sectional data				
Pensions awarded within a certain period/ cessation of pension payment (reference period 31.12.)	**Pension payments** (reference period 31.12.)	**Pensioners with one or more pension payments** (reference period 30.06.)	**Insured persons** (reference period 31.12. and within reference year)	**Medical and occupational rehabiltation** (reference period 31.12. and within reference year)
longitudinal data				
Biographical and pension information of cohort retiring (reference period 31.12.)			**Sample of insured persons and their insurance accounts** (reference period 31.12.)	**Longitudinal dataset for rehabilitation**

Data-set available as SUF via FDZ-RV

Source: Following Himmelreicher / Radl (2006).

Figure 1: Micro-data-sets of the German Federal Pension Insurance

2.1 Longitudinal Data-sets on Insurance and Retirement

Information on insured persons who are registered in the state pension insurance records is the basis for the statutory pension calculation. Pension-relevant creditable periods are recorded. From the age of 17 (earlier, if a contribution has been paid) until retirement, all contribution periods and relevant non-contributory periods are registered, giving information on the living conditions in a special period of time, and showing periods of insurance liability or periods of child-raising.

Insurance and Retirement		Rehabilitation
Sample of insured persons and their insurance accounts (VSKT) Sample of the main data as panel (disproportional design) Insured Persons without receipt of a pension from the age of 15 until 67 One contribution period is enough or the settlement of pension entitlements in case of divorce	**Biographical and pension information of a cohort retiring (VVL)** Sample of the pension awarded within the reference year Pension awarded to insured persons Invalidity pension and retirement pension (new cases)	**Rehab-statistic database** Survey in cases in which within the period of survey (year x and 7 years before) a rehabilitative benefit was applied for, was filed or was finished a pension claim was applied for, was filed or a pension has begun the case of death appears until the age of 75 a special age was reached (66 and 52)
Time period: Beginning of the contribution record until the reference year		Part of the biography: 8 years: Rehab data 11 years: Contribution records

Source: Following Stegmann (2007: 22, Figure 1).

Figure 2: Longitudinal micro-data-sets of
the German Federal Pension Insurance

By means of the insurance account sample, the so-called "Versicherungs-kontenstichprobe (VSKT)" and the so-called "Vollendete Versichertenleben (VVL)", two special data-sets could be differented concerning the fields of insurance and retirement. These two data-sets with reference to longitudinal information have predominantly the same structure but a different category of persons.

The VSKT provides information on round about 240,000 insured persons of German Statutory Pension Insurance aged between 15 and 67 years and their pension entitlement. Information is given on all relevant registered creditable periods. The results are the basis for the planning department, also for internal planning in insurance. Information is also used in order to inform the press and the public. Statistics are intended to make information available in order to support the preassessment of to the financial development of pension insurance.

Concerning the insurance accounts the reporting is done in a kind of a random sample and is carried through in the next years as a panel. A panel structure has been chosen in order to draw on cleared insurance accounts. On the other hand it is important to minimize the expense because of the effort needed to insurance accounts. The category of insured persons in the statistics covers all persons who are registered in an insurance account of German pension insurance which

– is not closed at the point of time of the evaluation

– contains contribution periods till the census deadline 31.12. of the reference year, means: the insurance account is not empty or a bonus is registered as a result of settlement of pension entitlements

– is without registration till the census deadline (31.12. of the reference year) applying to the notification of the death of the insured person

– concerns a person of a minimum age of 15 (31.12. is census deadline of the reference year) and a maximum age of 67.

The insured persons represent the entire population of the survey. In order to present the panel as a kind of random choice, all insured persons in the primary survey in the year 1983 and newly insured persons in the following years have to be registered proportionately. This occurs by restricting the sample concerning the newly added insurance numbers.

In order not to distort the sample it is important to use the same survey probability in the case of post-operative sampling with reference to the occupied groups and the original primary panel survey. Post-operative cases are marked by being filed into the database in the year of the census deadline. The post-operative sampling occurs at the beginning of the year.

The special survey "Vollendete Versichertenleben (VVL)" is to enable empirical evaluation of changes in pension law with respect to their impact. A sample is taken of the cases of pensions awarded in which the accounts are completely edited. For this sample a scale of 200,000 cases (round about 1 / 5 of the total "inflow-sample" (Rasner et al., 2007,15) population) is strived for. In particular new recipients of insured persons' pensions and non-contract pensions are part of this survey. The VVL gives information on cases of pensions awarded within the reference year. Contract pensions and pensions awarded in which a supranational pension entitlement plays a role are excluded.

The longitudinal data of the insurance accounts which are shown in the "VSKT" and the "VVL" are similar in their structure as to the preparation of data. In the case of "VVL" concerning the pensions awarded, the statistic data set also exist. The data-sets contain statistical characteristics and are established for all cases of pensions awarded.

2.2 Longitudinal Data-Sets on Rehabilitation

German statutory pension insurance is responsible for rehabilitative measures for insured persons and their relatives. In this connection the statistical reporting system services a special database that contains information for recipients of rehabilitative measures. This can be differentiated in medical and occupational rehabilitation. The basic aim of all rehabilitative measures is to restore the ability to work and avoid a persistent inability to work.

In the field of rehabilitation, there is a special micro-data-set called Rehab-Statistik-Datenbasis (RSD). The RSD contains information on claims for rehabilitation (Anträge auf Leistungen zur Teilhabe), their execution and claims for retirement pensions. This data-base combines insurance and retirement information of either eight or eleven years for cross-sectional and longitudinal analysis. The RSD population is defined as such persons from the age of 52 to 66 who claim rehabilitation or retirement pensions in a reference year (see figure 2).

3. Longitudinal Data of the Research Data Centre (FDZ-RV)

3.1 Generating a Scientific Use File based on Longitudinal Register Data

The Scientific Use File Completed Insurance Biographies 2004 (Vollendete Versichertenleben 2004, short SUF VVL 2004) is the first longitudinal dataset provided by the Research Data Centre of the German Federal Pension Insurance.[2] The SUF is based on administrative pension records of individuals, who are entitled to receive public pension benefits. The creation of the Scientific Use File VVL 2004 is an important step to enhance the usability of register data for researchers interested in issues of disability and retirement. The longitudinal data format enables researchers to analyze research questions related to the life-course, earnings and old-age income security.

The SUF VVL 2004 is a systematic random sample of individuals who received state pension benefits for the first time in 2004.[3] In the first step, a 20 % sample was drawn from the pool of first-time retirees in 2004. Only persons receiving old-age pension benefits (Altersrente) and disability benefits (Erwerbsminderungsrente) can be part of the sample population. In the second step, a subsample of 25 % was drawn from selected age groups, namely persons born between 1939 and 1975. The final data product, the SUF VVL

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[2] For the remainder of the article, the authors refer to the short form of the dataset Completed Insurance Biographies 2004, namely SUF VVL 2004.

[3] The SUF VVL 2004 is a so-called inflow sample. Only inflows into retirement, whether old-age or disability benefits, can be part of the sample (Rasner et al., 2007).

2004, is a 5 % sample of first-time pensioners with a sample size of 39,331 cases.

In the analysis of the data, it needs to be taken into account that the data is selective for numerous reasons. The selectivity is partly due to the sampling procedure applied and partly related to the legal rules of the state pension system. Firstly, only persons eligible for old-age or disability pension benefits can be part of the sample. Certain subgroups of the population are therefore systematically excluded. Among those are civil servants and the self-employed when they have never accumulated any pension entitlements in the social security system. Civil servants and the self-employed are also excluded if they do not fulfil the minimum qualifying period.[4] Secondly, certain benefit types are excluded from the sample, such as survivor's or educational pension benefits. Thirdly, so-called Vertragsrentner agree excluded from the sample. Vertragsrentner are eligible for state pension benefits in a foreign country with which Germany has a social security agreement. As a consequence of these selection criteria, the SUF VVL 2004 sample population is representative neither of the population as a whole, nor of the group of the elderly. Hence, it is impossible to draw inference from the sample population for the entire population. For example, the distribution of old-age income in the SUF VVL 2004 does not give any indication of the prevalence of old-age poverty in the total population. Conclusions and generalizations can only be drawn for the respective sample population.

The SUF VVL 2004 consists of two main components. The first part contains cross sectional variables (e.g., year of first-time pension receipt, gender, nationality, etc.), as well as aggregated data related to the calculation of the individual's state pension benefit. The second component of the data is subdivided into several longitudinal files. Ideally, the longitudinal information is available for a maximum of 624 months, starting in January in the year the person turned 14 up to December in the year the person turned 65. A month is coded as missing if no pension-relevant information applies. Other longitudinal files contain information about the monthly earning points accumulated by each individual (file mEGPT)[5], longitudinal information on whether a person worked in marginal employment (file NJOB) or worked as a caregiver (file PFLEGE), etc.[6] Longitudinal information is also provided on the social employment situation of an individual (for more information see below).

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[4] The minimum qualifying period amounts to five years of employment subject to social insurance contributions or 10 to 15 years if creditable periods or credited substitute periods are also considered.

[5] The earning point is one component of the pension benefit formula. The earning points reflect the earnings position of the individual relative to the earnings position of all persons paying social insurance contributions.

[6] For more detailed information on the available longitudinal data see Stegmann, 2006, 549 f.

Any analysis based on data provided by the Research Data Centre requires thorough knowledge of the German Social Code. All the available information is related to pension-relevant activities. For example, information on the birth of a child is only available in the data if the insured person is eligible for childcare credits. In turn, the birth of a child is not pension-relevant if a person works as a civil servant.[7] All data provided by the Research Data Centre needs to be analyzed in the light of the rules and regulations of the German Social Code. However, these rules are not constant over time. Hence, changes in the law are reflected in the data. For example, for all children born before January 1, 1992 childcare credits amount to one year. For all children born thereafter, three years are credited to the pension account of one parent. The interpretation of results based on the Scientific Use File is not straightforward, but results need to be interpreted in the light of the legal context.

The interpretation of the data is further complicated by the fact that two or even more pension-relevant activities can occur at the same time. For example, a mother of a child younger than 3 years works and pays social security contributions. In this situation, the mother accumulates pension entitlements through employment and childcare credits. In the data, these pension-relevant activities are called social employment situations (File SES). A total of thirteen social employment situations are distinguished in the data, which are listed in Table 1:

Table 1

Social Employment Situations in the SUF VVL 2004

	SOCIAL EMPLOYMENT SITUATION (SES)
SES 1	School/University
SES 2	Apprenticeship/Training
SES 3	Homeproduction
SES 4	Unemployment
SES 5	Military/Civilian Service
SES 6	Other Activities
SES 7	Care Giving
SES 8	Invalidity/Sickness
SES 9	Employment Subject to Social Insurance Contributions
SES 10	Marginal Employment
SES 11	Self Employment
SES 12	Invalidity Pension
SES 13	Old-Age Pension

Source: See Stegmann (2006, 2007).

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[7] These peculiarities of the data need to be taken into consideration for fertility analyses.

If more than one social employment situation applies in a given month, only one SES status is recorded in the data. The decision as to which social employment situation to record in the data depends on a set of priority rules. The priority rules are already applied in the process of data preparation.[8] Researchers analyzing the data only see one social employment situation per month. In the file JKUM, one can reconstruct how many social employment situations occurred in a given month without knowing what type of social employment situations applied in the respective month. The application of priority rules in the data preparation serves two main purposes: facilitated usability (1) and anonymization (2).

(1) The priority rules reduce the amount of data to a large extent. If all available information were transferred to the researcher, the amount of data would be very difficult to handle. The SES concept is one way to simplify the data structure, because only the most relevant information is transferred and data use is facilitated.

(2) The priority rules were also applied in order to anonymize the data. By recording only one social employment status per month in the SUF VVL 2004, the risk of reidentification is greatly reduced.

3.2 Research Topics: Using a Longitudinal Scientific Use File of the FDZ-RV

Firstly, the longitudinal administrative pension records have a special utility for research on individual biographies because they have no panel attrition, no non-response and no recall-errors.

Special research topics are labour market research or the research on life time earning, in particular research in the field of age-earnings profiles. In the following we will give short examples for the research topics shown.

3.3 Labour Market Research – Labour Demand

The SUF VVL 2004 offers a new analysis potential for labour market research because of its density of information (see Stegmann, 2006b). In the past for Germany the IAB employee sample called "Beschäftigtenstichprobe" regarded as a longitudinal data set concerning employment, offers adequate data on periods of social insured employment and the receipt of benefits.[9] Depending on the birth cohort, only parts of the career are registered. In contrast to this in SUF VVL 2004 several parts of the biography are documented, for

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[8] For more information on the implementation of the priority rules see Stegmann, 2006, 543 f.

[9] Zur Datendokumentation siehe *www.fdz.iab.de;* Bender / Haas / Klose (1999).

instance the whole career liable to compulsory insurance. Information on contribution records are based on the insurance account. Data on every person in the analysis exist from the beginning of their insurance biography until retirement. In general the period from the age of 17, also earlier if contributions have been paid, is registered. Therefore it is possible in principle to perform cohort-overlapped analyses without the risk of a temporal restriction of left or right censored data.

Within the framework of the award of a pension the whole contribution record is assessed. Under pension law relevant periods are not only periods of employment. Other social circumstances which have effects on the pension calculation and the amount of pension also have to be considered. This information is precisely registered in the insurance account.

Apart from employment, periods of liability to compulsory insurance also include periods of self-employment and social circumstances for which contributions are paid plus child-raising, unpaid caregiving, unemployment and illness. Moreover non-contributory periods are documented which afterwards or indirectly have some influence on the pension calculation. Periods of unemployment or illness without contributions, periods of school education and vocational training also have to be mentioned.

Data on the liability to compulsory insurance and benefits awarded for periods of disability and unemployment are obtained in the same way as the data of the German Federal Employment Agency in form of notification of the statutory social security. Consequently periods of work and periods of benefit receipt can be fully presented and analysed. Additionally, periods of disability and unemployment before 1978 and 1974 respectively are recognized as non-contributory periods. They are registered in the insurance account as such. For this reason analyses are possible even for elderly birth cohorts.

Another advantage is that the career, the transition into retirement and individual coverage in old age can be connected. Therefore old age provision can be seen as a result of a contribution record, can also be analysed as career and be included in the analysis.

By means of SUF VLL 2004 it is possible to show the point of time and the kind of transition into retirement, moreover it is possible to connect this data with the biography. This advantage was used in the framework of a project by connecting data from the IAB employee panel and data from the insurance accounts of the German statutory pension insurance.

3.4 Research in Life Time Earnings and Age-earnings Profiles

Such research projects need individual earning data over a long period, normally over the whole earning biography. The database SUF VVL 2004 con-

tains earning information in the form of relative earning points as monthly information for 52 years. So, if they took place, it is possible to compute age-earning-profiles for 624 monthly earning points.

Figure 3 shows the mean from monthly in yearly periodicity calculated age-earning profiles of west German men, born between 1939 and 1944 and retired in 2004. The data contains information beginning in the age of 14 and ending at the age of 65, the year of retirement. So you see the form of age-earnings profiles of about 52 years according to the level of education. This profiles are free of panel attrition, non-response and have no errors of memory. For further research in age-earnings profiles and their theoretical implications see Bosworth et al. (1999, 2001); Fachinger / Himmelreicher (2006, 2007) and O'Harra et al. (2004).

Source: FDZ-RV – SUF VVL2004, own calculation (see Fachinger / Himmelreicher, 2007).

Figure 3: Age-earnings profiles of west German men of the
birth-cohorts 1939 – 1944 who retired in 2004, according to level of education

4. Conclusion

The implementation of the special survey called "Vollendete Versichertenleben (VVL)" as Scientific Use File for scientific use is a pilot project for the publication of longitudinal data. SUFs enable the researcher to analyse biographical data of the pension insurance records at work, at the universities and in non-commercial research institutes.

The preparation of the data enables the analysis of several biography-focused questions for about more than 624 months of detailed and precisely registered data. By setting up workplaces for guest-scientists in Berlin and in Würzburg an option has been created to enables scientists to evaluate less anonymized data in the case of such questions. The preparation of data records for an evaluation by a visting scientist occurs in according to the project in coordination with the Data Protection Officer and it offers also an additional way of evaluation.

The VVL reports on biographical and pension information of a cohort retiring, and also on the pensions awarded. With the sample of insured persons and their insurance accounts the pension insurance has an additional longitudinal data set. The entire population of this panel are insured persons. In contrast to the VVL, these persons are able for work, without the receipt of a pension. After publishing the VVL the FDZ-RV will begin with the preparation of these data in order to use them as a Scientific Use File. The publication of this SUF data will be expected in 2008.

The data on rehabilitation used as a longitudinal data set will be implemented in 2008 as a Scientific Use File. The potential for different analyses concerning the data of the FDZ-RV can be enhanced by means of processes of statistical matching. For this see: "Best of Both Worlds: Preparatory Steps in Matching Survey Data with Administrative Pension Records – The Case of the German Socio-Economic Panel and the Scientific Use File Completed Insurance Biographies 2004" (Rasner et al., 2007).

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