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Thomas Körner and Katharina Puch
Coherence of German Labour Market Statistics



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Preface

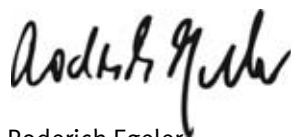
Currently there is hardly a methodological issue that is of similar importance for official statistics as the issue of the coherence of statistical results. This is not only due to the fact that different results from two or more sources will inevitably cause users to ask questions. Instead, coherence is a prerequisite for combining data from several sources, which is a development we aim for as part of our strategic goals. Also, using data from several sources may contribute to reducing the burden on respondents.

In the last few years, many discussions focused on the differences between results of the Labour Force Survey and Employment Accounts, the measurement of persons in marginal employment, and the differences between results of registered unemployed of the Federal Employment Agency and unemployed according to the definition of the International Labour Organization (ILO).

It is the great merit of this study to have shed light – in analytical and methodological terms – on the labour market for the first time from the aspect of coherence of such different data sources and to have explained the differences.

The study was kindly supported by the European Commission. The results help, among other things, to advance the further development of the Labour Force Survey, which is among the statistics used most often both at the national level and in the European Statistical System.

Yours,

A handwritten signature in black ink, appearing to read 'Roderich Egeler', written in a cursive style.

Roderich Egeler

President of the Federal Statistical Office

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List of abbreviations

BAZ	=	Bundesamt für Zivildienst (Federal Office for the Alternative Civilian Service)
BST	=	Beschäftigungsstatistik (Employment Statistics Register)
BMVg	=	Bundesministerium für Verteidigung (Federal Ministry of Defence)
CAPI	=	Computer Assisted Personal Interview
DOA	=	Dienstordnungsangestellte (Employees with contract conditions similar to public officials)
EA	=	Employment Accounts
ESA	=	European System of National and Regional Accounts
ESR	=	Employment Statistics Register
ESS	=	European Statistical System
gB	=	geringfügig Beschäftigte (marginal employees)
GDR	=	German Democratic Republic
ILO	=	International Labour Organization
LAMAS	=	Eurostat Working Group Labour Market Statistics
LBF	=	Laufende Bevölkerungsfortschreibung (update of the current population figures)
LFS	=	Labour Force Survey
MFa	=	unbezahlt mithelfende Familienangehörige (unpaid family workers)
MZ	=	Mikrozensus (Microcensus)
NA	=	National Accounts
na	=	not available
NACE Rev.	=	Statistical Classification of Economic Activities in the European Community, NACE Rev.
Para.	=	Paragraph
PS	=	Personalstandsstatistik (Statistics of public sector personnel)
RSE	=	relative standard error
SB	=	Selbstständige (Self-employed)
SGB	=	Sozialgesetzbuch (Social Code Book)
SNA	=	System of National Accounts
svB	=	voll sozialversicherungspflichtig Beschäftigte (Employees subject to full social insurance contributions)
USR	=	Unemployment Statistics Register
ZAV	=	Zentrale Auslands- und Fachvermittlung (Central Placement Services)

Explanation of symbols

/	=	Value is not sufficiently reliable
–	=	No figures or magnitude zero
.	=	Numerical value unknown or not to be disclosed

Introduction

Coherence is on top of the agenda of many statistical offices. Having been one of the standard quality criteria for statistical data for many years, coherence nevertheless received even growing attention over the last decade. Against the background of a trend towards a combined use of different data sources (or even the integration of data sources), obtaining coherent results becomes at the same time increasingly important. As the European Statistical System Handbook for Quality Reports (Eurostat 2009a, p. 87) states, “corresponding sets of statistical outputs” should be “reconcilable”. One way to gain transparency on the coherence of data is to use reconciliation tables. However, despite the ambitious statement in the ESS Handbook, the use of reconciliation tables is far from being standard practice in many statistical areas.

The importance of coherent data applies particularly to the area of labour market statistics, in which the main primary source – the Labour Force Survey (LFS) – is based on almost identical definitions as the National Accounts (NA). Therefore, inconsistent results between the employment figures from the LFS and the NA immediately lead to questions regarding the reliability of the results of either source. The situation is further exacerbated by the fact that both the employment figures from the LFS and the NA are headline indicators (the LFS in the context of the Lisbon and Europe 2020 strategies, the NA in the Euroindicator framework), which are widely communicated and disseminated to the press and research institutions.

The situation in Germany is a striking example. The German Labour Force Survey, since many years, largely deviates from the Employment Accounts (the source of the employment figures within the German National Accounts and the monthly “ILO-Arbeitsmarkt-statistik”). The lack of coherence is not limited to the employment figures. In the field of (registered) unemployment similar deviations can be observed: The Labour Force Survey shows a number of persons registered as unemployed at the Federal Employment Agency, which is more than 10 % higher than the figures disseminated by the Federal Employment Agency.

Unfortunately, there is no quick answer to the question of why figures from the LFS and the other data sources differ so strongly. A proper understanding of these incoherences requires in-depth conceptual and methodological analyses taking into account not only differences in definitions, but also the differences in operationalisation of the data sources as well as various other methodological differences in collecting or processing data.

The project presented here focussed on two main parts: (1) The coherence of the LFS and the Employment Accounts for the number of employed persons and (2) the coherence of the LFS and the register of unemployed persons for the number of registered unemployed.

- (1) Regarding the differences in the employment figures reconciliation tables constitute a useful means to inform the users. Therefore, the starting point of this project has been the reconciliation table recommended by ESS Task Force on Quality of the LFS. Unfortunately, in the case of Germany, the template proposed by the Task Force does

not shed sufficient light on the backgrounds of the incoherences, as the largest part of the difference will end up in the residual category. The main reason for this specific situation is that the German Employment Accounts (EA) are in large parts compiled independently from the LFS. Building bridges between the results from the LFS and the EA for this reason necessitates a large number of various analyses. This is due to the fact that the German Employment Accounts (providing the employment figures in the estimation procedures of the National Accounts), differently from most other member states, bases its estimation of the number of employed persons on a large number of different data sources. In the context of the Employment Accounts, only limited use is being made of results from the LFS, which constitutes the main source for the estimation of the number of self-employed and unpaid family members (together amounting to around 10 % of total employment).

For this reason, the analyses have to take into account at least the most important data sources used for the estimation of employment in the context of the Employment Accounts, i.e. the Employment Statistics Register of employees subject to full social insurance contributions (“voll sozialversicherungspflichtig Beschäftigte”), the Employment Statistics Register of marginal employees (“geringfügig Beschäftigte”) as well as the register statistics on public service personnel. Together with the reconciliation table, detailed comparisons of these sources with LFS results are provided in this study. The differences in the results have been systematically assessed and possible reasons for the differences have been indicated as well as quantified (as far as possible on the basis of the data available).

Furthermore, a comparison is also being made for the differences in the monthly and quarterly time series of employment between Employment Accounts and LFS (both available, but hardly published, in monthly as well as quarterly frequency in Germany).

- (2) Regarding the number of persons registered as unemployed, the situation is different. The figures on registered unemployment do not stem from various sources, but from a register statistics, the unemployment register kept by the Federal Employment Agency. Therefore, in-depth comparisons between the LFS and the unemployment register of the Federal Employment Agency are easier to obtain (albeit limited by the overlapping variables in both sources). The comparison, in this study, is being provided for all available breakdowns, for instance age and sex. The discrepancies in the results are being analysed for deviations in definitions, differences in the operationalisation and other methodological reasons. Building on the findings in this exercise, cross-tabulations have been carried out between the LFS variables regarding the registration at the Federal Employment Agency and the status in employment according to the ILO guidelines.

A further element of the project concerns the analysis of the time series both regarding intra-annual results and mid-term developments. In a trend analysis it has been investigated whether changes in the results of both sources on registered unemployment can be reliably used as a predictor for both the LFS data on registered unemployment as well as the monthly LFS results on unemployment according to the guidelines of the ILO.

After a brief definitional chapter on the data quality criterion of coherence, this study starts with a comprehensive description of the German LFS as well as the Employment Accounts. Subsequently, it presents the reconciliation table as proposed by the Eurostat Task Force on Quality of the LFS. The main part of the study tries to refine the analysis in order to shed light not only on the extent of the incoherence, but also its structural effects and methodological background.

1 Concepts and definitions

Coherence is not easily defined. The standard documents of the European Statistical System (Eurostat 2003, Eurostat 2009a, 2009b) unfortunately do not give a clear definition and only to some extent provide guidance on how to analyse coherence in detail.

The definition of coherence applied in this contribution follows the one outlined by Eurostat (2003): According to this view, statistical outputs are coherent, if they can “be reliably combined in different ways and for various uses”. The Eurostat handbook in the following wisely notes that “it is generally easier to show cases of incoherence than to prove coherence”. The underlying problem is that coherence is achieved in the (complex) processes of the statistics in question, but can in many cases only be judged by the results, i.e. the final outcome of the processes. Two sources providing non-deviating results are therefore not necessarily coherent (as various effects in the underlying processes might mutually compensate each other).

As the coherence of processes is difficult to investigate (in particular if the methodologies differ fundamentally, as in the case of NA and LFS), this study nevertheless starts from the deviations in statistical results. This is necessary in order to achieve an operational definition. It is also justified as users are particularly annoyed by deviating results, but less interested in the details of the production processes. The simplified operational definition for this study assumes that statistical outputs referring to identical concepts have to be numerically consistent. In other words, e.g. LFS and NA are coherent if the number of employed persons does not deviate (given that identical concepts are being used).

Deviating results do have two main sources: (1) differences due to the *concepts* (like the target population, the reference period, or the definition of the items for analysis) and (2) differences due to the *methods* used (e.g. the data collection methods and procedures, the data processing approach, or the sampling design).

Consequently, for the analyses in this study, a two-step approach was applied: In a *first step*, definitional differences have been identified and quantified. It is only after this step that we can see whether the results are diverging. The *second step* focuses on the methodological differences. Methodological differences cover a very wide spectrum, for instance when comparing a sample survey (like the LFS) with an accounting system

(in our case, the Employment Accounts). It covers, e.g., all elements of survey design and errors, but also the accounting rules and estimation methodology in the case of the employment accounts.¹

Note, that due to the fundamental methodological differences between LFS and NA differences due to the methods are not easily identified. The assessment of the accuracy of the results from statistical compilations like the NA requires “a very different approach than for sample surveys” (Eurostat 2009a, p. 64).

While for sample surveys the diverse types of error are defined quite clearly (although, often not easily accessible either), a direct approach for measuring accuracy in statistical compilations like the NA is often not considered possible. Therefore, assessments of accuracy of the NA are frequently reduced to analyses of revisions: “Revisions show the degree of closeness of initial estimates to subsequent or final estimates. Since all estimates are affected by error, this type of analysis can not definitively demonstrate the accuracy of initial estimates. But clearly the amount of revision is still an indicator of accuracy, since it is reasonable to assume that estimates are converging towards the true value as estimates are based on more and more reliable sources.” (Eurostat 2009a, p. 65). Beyond the analysis of revisions there are two main paths to follow: (1) An analysis regarding the main sources used for the compilation of the NA and (2) an analysis of the (published or unpublished) adjustments made to arrive at the published results from NA. The analyses shown in chapters 3 and 4 follow both these paths.

The second part of this study concerns the coherence of the number of registered unemployed. It compares the results of the LFS regarding persons who indicate that they are registered unemployed with those results according to the register statistics of the Federal Employment Agency. Here, the situation is less difficult as compared to the coherence with the NA, as the unemployment register is based on a single data source and not a compilation of various different data sources. However, comparisons of the unemployment register and the LFS are not straightforward either.

Both main parts – employment and unemployment – are being dealt with on an annual as well as on an intra-annual basis. The basic problems of coherence are first elaborated on the basis of the annual results, taking the year 2009 as the reference year of this study. These general aspects of coherence apply to the level of employment and unemployment, not only in the annual, but particularly also in the quarterly and monthly results.

1 In the latest Eurostat (2009a) publications, while also distinguishing conceptual and methodological differences, a slightly different terminology is being used: Coherence is now defined there in a stricter sense. It is assessed entirely in terms of the statistical processes (and not concrete statistical outputs). Interestingly enough, the examples provided in Eurostat 2009a (as being copied from Eurostat 2003) nevertheless do exclusively focus on statistical outputs. Furthermore, Eurostat 2009a distinguishes between the methods (i.e. statistical processes) and “the actual operations that produce the data (i.e. the accuracy)”. This distinction is not used in this report as it seems hardly feasible to be applied in practical analysis. Almost all types of errors are inevitably linked to the survey methods used. Errors can not (only) be defined as deviations from the planned methodology, but they are partly inherent to the methods themselves. E.g., the sampling error is a combination of the effects due to the sampling design and the deviations from it in practical implementation. Similarly, the survey mode, albeit being part of the methodology, will directly influence the results which could be obtained.

In contrast, the coherence of short-term changes over time – the pattern and trend of the time series – applies only to the intra-annual results. The coherence of the time series will therefore be covered in dedicated sections, focussing on aspects specific to the monthly and quarterly time series.

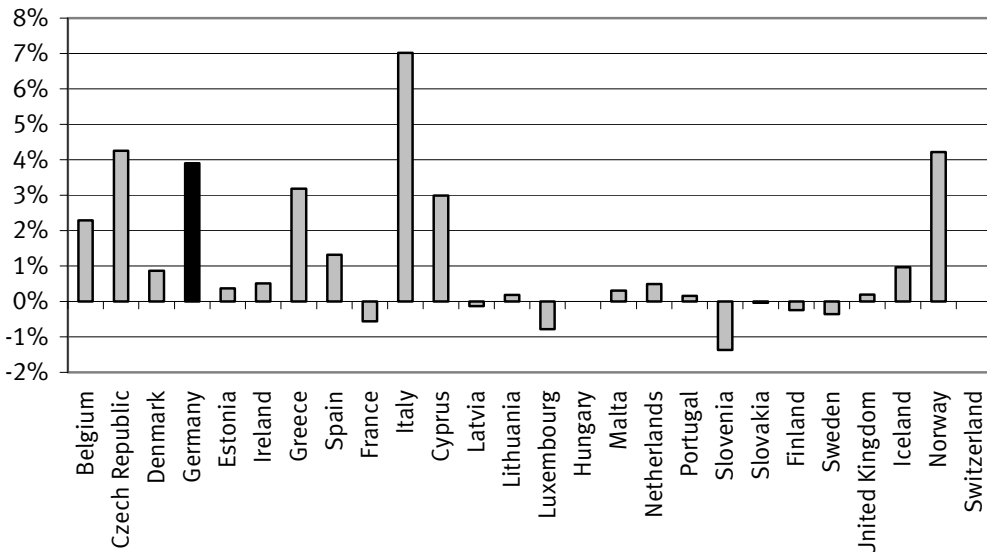
For the reason of clear arrangement, the concepts and definitions of each of the sub-groups by status in employment as well as of the registered unemployed will be provided in each section of this study. Starting with the comparison of the two employment sources, chapter two describes quite detailed the concepts and definitions of both sources.

2 The German Labour Force Survey and the Employment Accounts in comparison

Employment statistics in Germany is dominated by two major data sources – the Employment Accounts and the Labour Force Survey. Both are extensively used for various purposes and receive large attention in the public. Despite only fairly small conceptual differences, they do not yield coherent results. Since many years, the Employment Accounts and the Labour Force Survey are facing quite huge deviations regarding the number of employed persons. In the year 2009, the deviation was roughly 1.5 million employed persons (national concept). Thus, the employment accounts recorded 3.9 % employed persons more than the Labour Force Survey. Over the last years, this deviation has already caused some public debate in Germany.

The German situation is also remarkable in international comparison: In the European Statistical System, Germany is among the five countries with the largest coherence problems. Incoherences regarding employment, in the year 2009, have only been bigger in Italy (7 %), the Czech Republic (4.3 %) and Norway (4.2 %). Greece (3.2 %) and Cyprus (3 %) show similar levels of incoherence (see figure 1). Although it should be noted that international comparisons (also) in this respect might be hazardous (the compilation of the NA employment figures is subject to large differences within the ESS), this comparison nevertheless shows that the coherence of employment figures deserves special attention and efforts in Germany.

Figure 1
Relative difference of the number of employed persons (national concept) according to NA and LFS in different countries, 2009 (NA minus LFS as a share of the LFS)



The approach of analysis favoured by the Eurostat Task Force on Quality of the Labour Force Survey (Eurostat 2009c) serves as a starting point for the analysis presented in this study. The Task Force basically addressed coherence by the use of a reconciliation table. In such a table, the level of coherence should be specified by distinguishing differences in concepts, scope and definitions from inconsistencies resulting from methodological differences. On the one hand, the reconciliation table should facilitate a systematic coherence analysis. On the other it is seen as a device for the communication of the incoherence to users.

Following a first test of the reconciliation tables, the Task Force concluded that “the production and subsequent analysis of reconciliation tables is essential for a proper understanding of incoherence between NA and LFS estimates of employed persons. The production, at least annually, of such reconciliation tables is therefore recommended in order to enable targeted improvement measures for the LFS and National Accounts and for communication to users. A suitable common template should be used in order to allow cross-country comparisons” (Eurostat 2009c, p. 43).

The template of the Task Force is shown in table 1, filled in with the German results for the years 2006 to 2009. As can easily be seen from the table, a large part of the difference between LFS and Employment Accounts is summarised as “residual”. Regarding the item “Adjustments for hidden/undeclared employment”, the information is limited as it is not fully clear to which degree the LFS succeeds in covering these types of employment.² The result is that the table does not provide very useful information regarding the deviation due to methodological differences (labelled “Difference due to inconsistencies among different sources” in line P). The background is an (implicit) assumption made during the development of the reconciliation table, namely that the LFS was the main source for the National Accounts’ employment estimates (which is the case for at least 10 ESS members; see Eurostat 2010). In this case, one can easily and systematically show any changes made from the LFS estimates, together with the respective reasons for the changes. In such situations, the template can indeed provide users with a very transparent and clearly structured picture of the reasons of incoherence.

In countries which do not use the LFS as main source for the National Accounts’ employment figures (like Germany), the outcome is neither very clear nor very well structured. Therefore, one of the objectives of this study is to propose an improved template which tries to overcome the weaknesses of the one proposed by the Task Force.

Against this background, the approach of analysis in the current study had to be adapted. The basic idea was to widen the scope of the comparative analysis. In addition to the comparisons of LFS and EA, we also compared the LFS with the major EA source, which drastically enhances the analytical possibilities.

2 For the purpose of the reconciliation table, it was assumed that the LFS does not capture any hidden or undeclared employment.

Table 1: Reconciliation table between LFS and NA estimates of employment in Germany
Annual Results

Grey cells are to be filled in by the statistical institute

(1)	(2)	(3)				(4)	(5)	(6)
		Reference year						
		2006	2007	2008	2009			
	Sign	Thousands					Source used	Notes/ description
A)		39,075	39,724	40,276	40,271	NA employment – domestic concept (in persons)		
B)	+	139	148	154	156	Residents working outside the economic territory	1, 2, 3, 4	
C)	–	218	221	214	256	Non residents working inside the economic territory	5	
D)	=	38,996	39,651	40,216	40,171	NA employment – national concept (in persons)		
E)	–					Conscripts/persons carrying out alternative community service	6, 7	Included in the German LFS
F)	–					Employed persons living in collective households (if not included in LFS figures)	5	Included in the German LFS
G)	–	na	na	na	na	Unpaid trainees and apprentices (if not included in LFS figures)		
H)	–	na	na	na	na	Farmers only producing for own-consumption (if not included in LFS figures)		
I)	–	22	22	23	24	Employed persons aged less than 15	5	
J)	+/-	na	na	na	na	Other discrepancies in definitions, concepts, coverage (if applicable, please specify)		
K)	=	101	95	83	124	Difference due to definitions, concepts, coverage $K=SUM(B:C, E:I)$		
L)		na	na	na	na	Difference between source used in NA and LFS for specific economic activities (e. g. agriculture, public administration, etc.) (if applicable, please specify and add lines needed)		
M)		568	564	550	568	Adjustments for hidden/undeclared employment not included in L (if applicable)		
N)		na	na	na	na	Other adjustments (if applicable, please specify and add lines needed)		
O)	–	1,062	902	909	917	Residual		Comparisons of the LFS with other data sources indicate that the largest part of the residual is due to difficulties to achieve full coverage of marginal employment as well as hidden/undeclared employment in the LFS
P)	=	1,630	1,466	1,459	1,485	Difference due to inconsistencies among different sources $P=SUM(L:O)$		
		1,652	1,488	1,482	1,509	Difference LFS – NA employment (national concept)		
Q)	=	37,344	38,163	38,734	38,662	LFS (c) employment (in persons) $Q=A+/-K+/-P$		

Sources: 1 Federal Employment Office; 2 Federal Pension Insurance; 3 Ministry of Finance; 4 Federal Budget;
 5 Labour Force Survey; 6 Ministry of Defence; 7 Federal Office for Civilian Service

The EA in Germany estimate the number of employed persons from different sources which are broadly divided by status in employment.³ For the compilation of the EA, largely following the International Classification on Status in Employment (ICSE-1993), five statuses are being distinguished, which are each estimated based on one main source in the Employment Accounts:

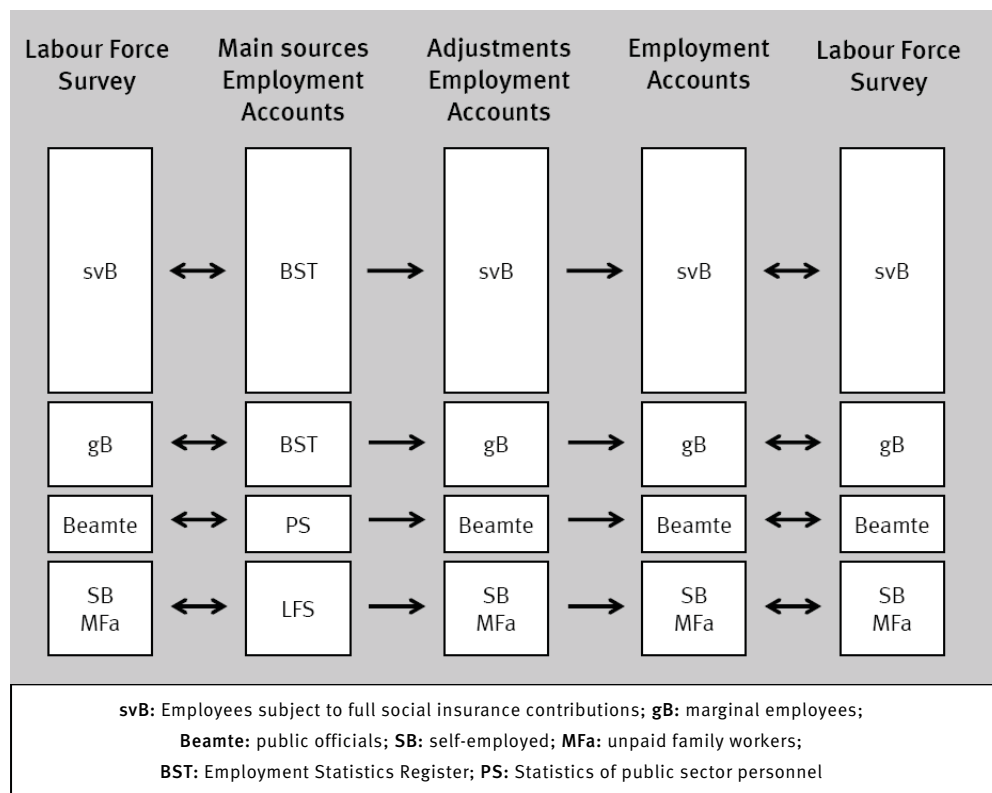
- Employees subject to full social insurance contributions (voll sozialversicherungs-pflichtig Beschäftigte – svB)
- Marginal employees (geringfügig Beschäftigte – gB)
- Public officials (Beamte)
- Self-employed (Selbstständige – SB)
- Unpaid family workers (unbezahlt mithelfende Familienangehörige – MFa).

As shown in figure 2, the number of employees subject to full social insurance contributions (svB) is predominantly estimated on the basis of the Employment Statistics Register (Beschäftigungsstatistik – BST) kept by the Federal Employment Agency. The BST has also been chosen as the basis for the number of the marginal employees (gB).⁴ It is important to note that both groups have to be distinguished in comparisons of LFS and EA, as they show different signs regarding the deviations. The estimation for the public officials is mainly based upon the register statistics on public service personnel (Personalstandsstatistik). Only for the group of self-employed and unpaid family workers (which, in 2009, accounted for no more than 10.9 % of all employed persons in Germany), the Labour Force Survey is being used as the main source.

3 Another option would have been to compare LFS and EA by industry branches. Although being informative in other respects, this possibility was however abandoned for the purpose of the study as the measurement of the industry branch itself is subject to heavy differences (see section 3.1). Therefore, a comparison of the number of employees by industry branches would not be sufficient to understand coherence of the employment figures in total and might even be misleading. Furthermore, the estimation of the Employment Accounts – at least regarding the extrapolation of the current trend of the total number of employed persons – is based on sources by status in employment. Sources focussing on the situation in the individual industry branches come into play at a later stage in the estimation processes and are mainly used for the estimation of employment by industry branches (without touching upon the total number of employed persons which has been previously established). Nevertheless, it has to be noted that the differentiation by industry branch plays a more important role for the estimation of the benchmark calculation of the “base year”.

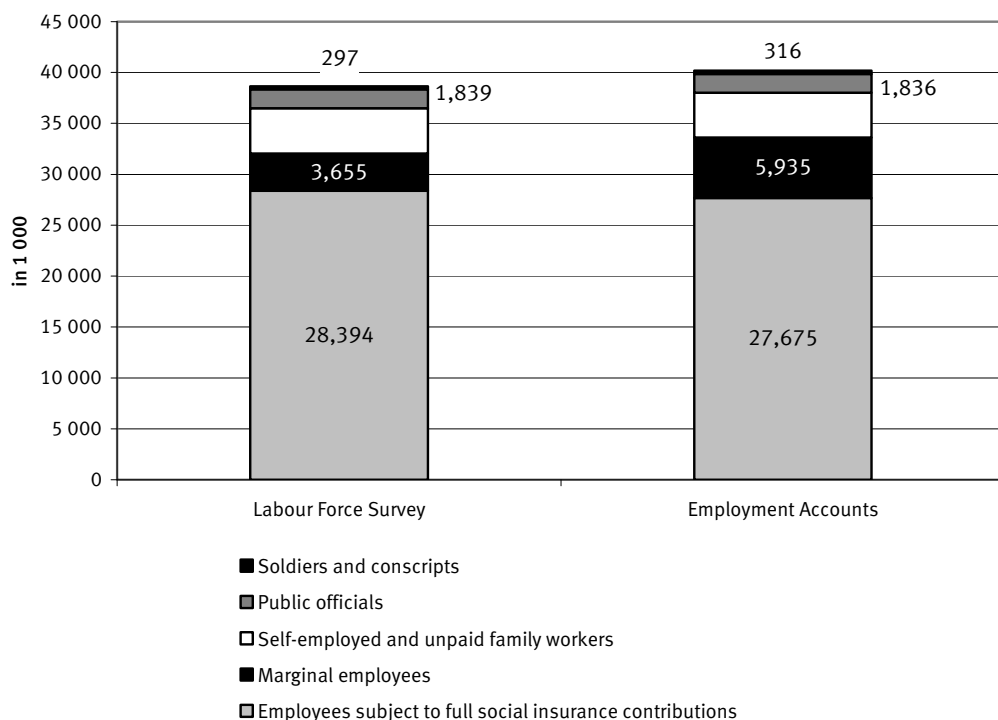
4 Marginal employees in the definition of the EA include employees with reduced social insurance contribution due to their low earnings (“geringfügig entlohnt Beschäftigte”) or due to short-term employment (“kurzfristig geringfügig Beschäftigte”), but also include persons employed in the workfare scheme “Ein-Euro-Job”. For the latter group not the BST, but another register from the Federal Employment Agency is being used. This will be taken into account in the analysis further down this study.

Figure 2
Outline of the analysis



It should be noted that there are further sub-groups of employed, which are neither shown in figure 2, nor discussed in this study. These groups include the soldiers and conscripts (estimated on the basis of information provided by the Federal Ministry of Defence) as well as persons obliged to render alternative civilian service (Zivildienstleistende – estimation based on information provided by the Federal Office for the Alternative Civilian Service). Both groups account for hardly more than 100 000 persons (0.25 % of all employed persons). Furthermore, the LFS, in its weighting scheme, applies calibration marginals based on the same sources as used in the EA. Therefore, it is evident that the impact of these groups on the total incoherence will (at most) be marginal.

Figure 3
Employed persons in LFS and EA by status in employment, 2009



As can easily be seen from figure 3, the largest structural differences concern the marginal employees as well as the employees subject to full social insurance contributions. Whereas the Labour Force Survey has a higher share of employees subject to full social insurance contributions, it captures much less marginal employees than the employment accounts (5.9 m in the EA compared to 3.7 m in the LFS).

Any analysis as to the underlying reasons for these differences is difficult, as the Employment Accounts do not provide breakdowns other than status in employment and industry branch. As the comparability of the distributions by industry branch are of limited comparability (see chapter 3), there are no further breakdowns which could be used for comparison and provide hints regarding the methodological differences. It should be noted that the breakdowns by industry branch provide insightful comparisons for an analysis of the effects due to adjustments to the EA (e.g. regarding hidden or undeclared employment).

The situation largely changes if one directly analyses the main sources of the Employment Accounts in comparison with the LFS. The employees subject to full social insurance contributions detected in the LFS can directly be compared with the same group in the Employment Statistics Register (ESR). In both sources detailed analyses are possible regarding the most important socio-demographic background variables. For this reason, regarding the structural differences, most of the analyses presented in this study focus

on the respective main sources of the Employment Accounts. Analysing results by further breakdowns makes it possible to test more differentiated hypotheses regarding the underlying methodological reasons for deviating results. For example, the significance differ a lot if the deviation is equally spread across all age groups or if it concerns particular population groups.

One problem needed to be solved following this approach: The Employment Accounts do not take the results from the various sources without any changes. For every source, adjustments are made for diverse reasons. These adjustments are modest in size and do not change the broad lines of the results. Nevertheless, in order to have the complete picture, these adjustments need to be taken into consideration.

The following chapter will discuss the coherence by status in employment. Each status in employment is devoted one section. Each of the sections has the following structure:

- Presentation of the *differences Employment Accounts vs. Labour Force Survey* for each of the groups
- More detailed discussion of the difference of the respective *EA main source* vs. the *Labour Force Survey*
- Identification of *conceptual differences* between the sources
- Discussion of the relevant *methodological differences* regarding the background of the deviation
- And finally, a documentation of *adjustments of the EA* to the respective main source.⁵

As a background for these analyses, the following two sections start with a brief description of both, the Employment Accounts and the Labour Force Survey, as well as a detailed picture of the conceptual differences of both sources.

Any comparison of the results from the EA and the LFS has to take into account the conceptual as well as the methodological differences of both statistics. Therefore, before starting to present the data from EA and LFS, the following sections give an overview on the differences in definitions used, methods as well as procedures applied. In addition, it is important to note that EA and LFS, although both providing a number of persons employed, are not carried out for identical purposes. The EA will be used for different types of analysis than the LFS.

2.1 The Employment Accounts

The Employment Accounts are an accounting system within the German system of National Accounts. Based on all available sources (presently around 50 statistics), the EA estimate the number of employed persons on a monthly basis. The EA publish results for the employed at their place of residence (national concept) as well as at their place of work (domestic concept). The quarterly and annual estimates are built up from monthly estimates (arithmetic means). The main uses made of the Employment Accounts are:

⁵ Note that a different approach is chosen for the analysis of the intra-annual results in chapter 4, where the time series of the LFS and the EA are directly compared without analysing the subgroups and the sources of the EA.

- monthly presentation of employment in the context of short-term labour market and economic trends
- quarterly and yearly presentation of employment in the context of short-term economic trends and within the System of National Accounts
- presentation of the complete number of employed persons
- international comparisons in the context of National Accounts as well as macroeconomic developments.

The estimation method of the EA distinguishes two different phases that should be considered separately: A first release of monthly and quarterly employment figures for the total economy after some $t+30$ days and a second regular release of quarterly employment figures by industries after some $t+48$ days. The first results are based on employment flash estimates, which are built up from three different components. The latter results also rely on monthly estimations but are based on more sources on employed persons available. The three components of the monthly flash estimates are as follows:

1. Expert estimation: This is the core of the flash estimate. The calculations are done for the total economy and as far as possible by industries separately for 9 statuses in employment (marginal and regular self-employed with/without employees, unpaid family workers, workers/employees, marginal employees, public officials) on the basis of an incomplete set of monthly macroeconomic statistical sources available.
2. Econometric forecasts: Namely ARIMA time series analysis and indicator based regressions (VAR/ADL models) are being used. The econometric forecasts supplement and support the expert estimates. The ARIMA forecasts are undertaken separately for different statuses in employment (self-employed and unpaid family workers, employees, marginal employees, public officials). The VAR/ADL-regressions are based on a set of macroeconomic labour market and production indicators. The econometric forecasts are not linked to (i.e. are independent of) the expert estimates.
3. Reconciliation of the results of the expert estimations, the ARIMA and VAR/ADL forecasts and processing of monthly data from the continuous Labour Force Survey (LFS; Microcensus), by taking into account the overall economic situation and labour market trends.

The regular estimates of quarterly and yearly employment figures by statuses in employment and industry branches (as well as the expert estimations as part of the monthly flash estimates described above) rely on a benchmark calculation which is extrapolated for the current reporting period.

- The benchmark calculation (i.e. employment level): The benchmark calculation serves to generate very much detailed employment levels (48 industries for each status in employment) for a “base year”.⁶ The employment levels of the “base year” (i.e. the 12 months of the “base year”) are the basis for the monthly extrapolations and backward calculations.

⁶ The former “base year” was 1987 (year of the last population census in the former territory of the Federal Republic, incl. Berlin-West). By now, the “base year” of the current employment estimates for Germany after unification is 2002.

- Extrapolation to current periods (i.e. monthly, quarterly and annual employment trends): The trend extrapolation of the benchmark employment levels by 9 statuses in employment and 48 industries is carried out on the basis of any source of employment data available at the time of estimation (about 50 sources). The estimation is produced monthly and built up in consistent quarterly and annual estimates too (e.g. quarterly results are the average of the monthly results of the respective quarter). Thereby a high degree of accuracy, reliability and completeness of the results are ensured. The monthly and, derived from it, the quarterly total employment numbers according to the domestic concept were thus determined by addition of the results of computation for individual occupational statuses and industries (bottom-up approach).

The number of persons in employment is obtained in the EA on the basis of any source of employment statistics available at the time of calculation. This is to say, monthly employment data are not gained from the LFS, only. On the contrary, the LFS does not play a predominant role in the current estimation of the number of employed persons. Levels and trends are based on an estimation model integrating about 50 sources. The sources differ in periodicity and coverage. The most important sources are:⁷

- Monthly and quarterly register statistics compiled by the Federal Agency for Employment: The Employment Statistics Register (“Beschäftigungsstatistik”) covering employees subject to full social insurance contributions (“voll sozialversicherungs-pflichtig Beschäftigte” – svB) as well as marginal employees (“Geringfügig Beschäftigte” – gB).

These administrative sources are based on the monthly reports of employers on their employees contributing to the social insurance system (old age, health, care, unemployment insurance). At the time of estimation, provisional data for the month proceeding the reporting month are available, only. Therefore, expert estimations or econometric forecasts are necessary in order to fill the gap of one month. Additionally, data revisions have to be carefully observed, since results of the monthly employment statistics register are provisional during a period of six months. Since 2008, detailed data by NACE Rev. 2 classification are available.

- The continuous Microcensus (Labour Force Survey), mainly used for the estimation of the number of self-employed and the unpaid family members:

Since 2005, the Microcensus (Labour Force Survey) is carried out as a continuous survey, which provides monthly employment figures for purposes of employment estimations. The former (reference week based) annual Microcensus, based on a single reference week, has been the major source for self-employed persons and unpaid family workers. The Microcensus as a household survey offers employment data according to the place of residence. All economic activities are covered (NACE Rev. 1.1. classification until 2008).

⁷ The publication “Weiterentwicklung und Verbesserung der Schnellschätzung in der Erwerbstätigenrechnung” (December 2007) contains a complete list of all sources integrated in German employment accounts on pages 8 – 12.

- The statistics on public service personnel (“Personalstandsstatistik”):

The statistics on public service personnel provides yearly data (30th June) on the persons working for public-sector employers, being directly employed by the respective institution as public officials or on the basis of an employment contract. Public-sector employers are the public service and legally independent institutions with a legal form under private law and with predominantly public participation. The public service consists of the public service in the narrow sense, namely the Federation, the Länder, the municipalities/associations of municipalities, special-purpose associations and the Federal Railways Fund, and of the indirectly subordinate public service, namely the Federal Employment Agency, the German Bundesbank, social security agencies and the legally independent institutions under public law as well as legally dependent companies with predominantly public participation.

- Monthly, quarterly and annual business reports for certain industry branches.

Provided that reliable information was available, explicit adjustments for undeclared employment activities (i.e. in construction industries and private domestic services) have been made, which is one of the reasons why the results from the main sources deviate from the results of the EA. These adjustments were introduced into the benchmark calculations. The magnitude of these adjustments regarding the status in employment, are indicated in chapter 3.

2.2 The German Labour Force Survey

The Labour Force Survey is currently integrated in the Microcensus, the largest official household survey in Germany. Since 1957 – in the new Länder (including Berlin-East) since 1991 – the Microcensus has supplied statistical information in a detailed subject-related and regional breakdown on the population structure, the economic and social situation of the population, families, consensual unions and households, on employment, job search, education/training and continuing education/training, the housing situation and health. Due to this wealth of different topics, the LFS as well as the Microcensus allows a huge number of different analyses for very diverse population groups as well as thematic areas. The main uses made of the LFS and the Microcensus are

- the presentation of structural analyses beyond the possibilities of the EA and the analysis for various population subgroups (e.g. by sex, age, educational attainment, migration status)
- cross-cutting analyses covering variables for different topics on the basis of the individual data (educational attainment and employment, citizenship and occupation, conciliation of family life and employment)
- analysis of the diverse subgroups of employment (like fixed-term employment, atypical employment, working time, night work, shift work or continuous vocational training)
- international comparisons in the context of the Labour Force Survey.

The Microcensus provides official representative statistics of the population and the labour market in Germany. The Labour Force Survey (mandated by European legislation) currently forms an integral part of the Microcensus. The majority of the variables cov-

ered by the Labour Force Survey are also covered by the (national) legal basis of the Microcensus.⁸

The purpose of the Microcensus is to provide benchmark and structural data at regular and short intervals on the above-mentioned topics and their development, thereby bridging the data gap between two population censuses. The Microcensus is designed as a multi-topic survey, integrating many different subject fields. With regard to a number of small-scale surveys of empirical social and opinion research as well as of official statistics, the Microcensus is a tool for extrapolation, adjustment and control.

The Microcensus is organised as a decentralised statistics, which means that the organisational, methodological, and technical preparation (as well as the publication of the national results) is done at the Federal Statistical Office, while conducting the survey and processing of the data are tasks of the statistical offices of the Länder. It is based on a law with a limited period of validity, the Microcensus Law. In 2004, the former “Law on the Execution of a Sample Survey of the Population and the Labour Market and of the Housing Situation of Households” of 17 January 1996 (Microcensus Law 1996; Federal Law Gazette I, p. 34) was replaced by the same-named Microcensus Law of 24 June 2004 (Microcensus Law 2005; Federal Law Gazette I, p. 1350). The current legal basis for the Microcensus has led to content-related and methodological changes in the Microcensus design for the years 2005 to 2012.

Until 2004, the survey design of the Microcensus was characterised by one single reference week per year, which means that the majority of questions should refer to the situation in this reference week. Usually that was the last holiday-free week in April. Consequently, the Microcensus results up to 2004 provided a snap-shot of the conditions in spring and were affected to differing degrees – depending on the variable concerned – by seasonal variations. Section 3 of the Microcensus Law 2005 – following the requests in the LFS context – provides for a continuous survey. Since January 2005, the entire survey volume is meant to be distributed evenly over all calendar weeks of the year, with the last week preceding the survey being the reference week (so-called sliding reference week). The goal was to fulfil the requirements from the regulations regarding the LFS and to provide Microcensus users not only with annual but also with quarterly and monthly average results. The publication of quarterly results, however, did not yet start due to severe methodological problems leading to biased quarterly trends.

The survey is conducted in a decentralised way by the statistical offices of the Länder by means of interviewers. The interviewers are equipped with laptops and visit the households (CAPI – Computer Assisted Personal Interviewing). The household members may also complete a questionnaire by themselves (self-administered paper-and-pencil questionnaire). Largely, there is an obligation to provide information. Only for a few variables, legislation provides for voluntary response. Variables representing only the variables of the Labour Force Survey are always subject to voluntary response. The Microcensus allows proxy interviews, i.e. an adult household member may give a response on behalf of other household members. Such third-party information is available for about 25 % to 30 % of the persons aged 15 years or over.

⁸ The following presentation is based on the recent quality report of the Microcensus, which provides further details (see Statistisches Bundesamt 2010).

The sampling design of the Microcensus is a random sample. For every sampling unit, there is the same probability to be included in the sample. The basic concept of sampling methodology here is a one-stage cluster sampling (area sampling), i.e. sampling units are areas and not individual households or persons. The annual sample size is 1 % of the sampling units. Sampling units are clusters or artificially delimited areas (sampling districts) which consist of entire buildings or parts of buildings. In the Microcensus 2009, some 51 000 sampling districts with an average of 15 persons per sampling district were interviewed. Forming the sampling districts is closely connected with stratification (see below). All persons or households in a sampling district must be covered as statistical units.

For the additional monthly processing, all sample units are included which are interviewed in the relevant reference month and whose data have been received by the end of the week following the last week of the reference month. Every time, less than 1/12 of the annual sample is available because, at the time of processing, a (small) part of the responses are not available yet. Due to the different number of reference weeks (see chapter 4) and due to seasonally varying delays of response, the number of persons taken as a sample for the additional monthly processing varies between about 30 000 and 55 000. As the persons interviewed in a specific reference month may have been included in the sample at different points in time, seasonal delays of response may lead to variations in the composition of the samples for the additional monthly processing. A number of measures are currently being implemented which are intended to contribute to minimising such variations.

To form the sampling districts and for subject-related stratification, data on the number of dwellings and persons, broken down by municipality, street and street number, were taken from the material of the 1987 population census for the former territory of the Federal Republic. In the new Länder, the samples were formed in the same way, taking as a basis the population register "statistics". For the purpose, the data from the central population register of the former German Democratic Republic (GDR) regarding the number of persons and the number of family households per street number were aggregated. The number of family households for a specific street number was used as a substitute for the number of dwellings.

As an element for forming the sampling districts, entire buildings or, in the case of larger buildings, parts of buildings were used. The buildings were classified into three size classes or strata by the number of dwellings in the building: The first stratum covers the smaller buildings with 1 to 4 dwellings. They were grouped to form sampling districts with the target value of 12 dwellings, following the sequence of street numbers within the street or, where necessary, also across streets. The second stratum comprises the medium-sized buildings with 5 to 10 dwellings. Each of those buildings forms a sampling district of its own. The buildings of the third stratum with 11 or more dwellings were broken down into sampling districts with a target value of 6 dwellings. This means that different sampling district sizes were implemented for each building size class stratum. Across the strata, there was an average value of about 9 dwellings. In another stratum 4, which is a special stratum, the population in collective households was subdivided into sampling units with a target value of 15 persons. Those subject-related strata are complemented by another stratum to update the basic sample. Annual updating of

the sample is done by means of the data reported for the statistics of building activity. The new buildings reported there are classified into the size classes mentioned before. Compared with the sample based on the 1987 population census, the following modifications apply: For the sample of new buildings, the building size class is only used to form the sampling districts rather than to stratify the sample; the third building size class starts with 9 dwellings per building. The fact of a building belonging to the special stratum of collective household is directly shown in the data reported. The sampling districts formed by the buildings with 1 to 4 dwellings have a target value of 6 rather than 12 dwellings. Hence, the new sampling districts of all building classes have roughly the same size. They are grouped to form just one subject-related stratum (stratum of new buildings) per regional stratum.

Due to the obligation to provide information, the share of known non-response in households to be covered (unit non-response) is very small at about 5 % in the yearly sample. The share of non-response for individual questions or variables (item non-response) is generally well below 10 %. It may however be considerably higher in individual cases, especially for sensitive variables with voluntary response. Compared with the Microcensuses conducted up to 2004, item non-response has decreased. The main reason is probably the fact that, when changing over to the continuous survey, the use of laptops was introduced everywhere, which in turn resulted in a further standardisation of the interviews. It should be noted that, for the quarterly, as well as the additional monthly processing, no unit non-response rate can be determined because the households come from samples for different reference periods. This may lead to seasonal fluctuations in the sample composition.

Sample surveys like the Microcensus involve two kinds of errors: Sampling errors and non-sampling errors. Sampling errors are deviations arising from the fact that not all units of the population are included in the survey. The standard error, which is calculated using the individual data of the sample, serves as an estimate for the sampling error. The simple relative standard error exceeds 15 % for extrapolated annual results of less than 5 000 and – if based on provisional figures – extrapolated quarterly results of less than 20 000, which relate to fewer than 50 persons in the sample. Such results are of little informative value and should, therefore, not be used for comparisons. This is why extrapolated cell frequencies of less than 5 000 at an annual level or less than 20 000 at a quarterly level are not shown in Microcensus publications but are replaced by a slash (“/”).

Non-sampling errors are non-random deviations which may arise from errors occurring at any stage of statistical production (for example deficiencies in adequate questionnaire design and interviewer training, wrong information provided by respondents and interviewers, data capture errors). As noted above, despite improvements in the last few years, the results of the Microcensus regarding the labour force participation measured according to the labour force concept of the International Labour Organization (ILO concept) still differ in part from the results of other data sources of labour market statistics. For 2009, the number of persons in employment shown by the Microcensus is by 3.9 % smaller than the figure obtained in employment accounts as part of National Accounts.

More detailed comparative analyses indicate that there are differences especially for small-scale and minor activities and for the search for such activities. To examine those differences, a follow-up survey was conducted in 2008 as part of a Federation/Länder project. About 4 000 persons who had participated in the Microcensus before were questioned by telephone again on their employment status by the participating statistical offices of the Länder. The survey tool of a follow-up survey was optimised specifically to cover small-scale activities and secondary jobs. Comparisons drawn between the information given in the Microcensus and that of the follow-up survey clearly showed that, in many cases, especially pupils, students and pensioners with a casual job or minor employment had indicated such activities only in the follow-up survey. It must, therefore, be assumed that those groups of persons, who in their everyday concepts do not consider themselves as persons in employment, base their answers particularly on their main social status (e. g. pupil or pensioner) and do not always think that the Microcensus questions on labour force participation apply to them.

The effects of proxy interviews, however, are smaller: About one quarter of the answers are given by other household members on behalf of those to be covered. The follow-up survey showed that the effects of proxy interviews can explain only a small part of the differences in results. Although in some subject fields differences were observed between the information given by other persons in the Microcensus interview and the information provided in the follow-up survey by the persons to be covered, most of those differences are within the range of differences observed for all respondents, irrespective of whether the information was provided by themselves or by other persons in the Microcensus/LFS.

The underestimation of marginal employment does not only result in an underestimation of the overall level of employment and hence of the employment/population ratio. What is also affected is the structure of employment, for example the breakdown of persons in employment according to demographic variables such as age and sex, by part-time and full-time employment or the average number of hours worked.

2.3 Conceptual differences of the Employment Accounts (EA) versus the Labour Force Survey (LFS)

In contrast to the fundamental methodological differences, the Employment Accounts and the Labour Force Survey are subject to only minor conceptual differences. The measurement of the employment status in both cases is based on the regulations and guidelines of the International Labour Organization (ILO 1982; ILO 1998). The basis provided by the resolutions and guidelines of the ILO are further specified differently for both sources, which leads to few deviations. In the case of the EA, the ILO resolutions and guidelines are specified in the System of National Accounts (SNA) as well as in the European System of National and Regional Accounts (ESA 95). In the LFS, the definition of the employment status needs to be operationalised in order to become measurable in surveys. The operationalisation of the LFS is laid down in a targeted Commission Regulation (No. 1897/2000) as well as in the “Explanatory Notes”, a detailed recommendation on how to implement the survey variables in the questionnaire. Despite the different specifications, there are remarkably few conceptual differences. In the following the differences are briefly explained.

National versus domestic concept

The results of the Labour Force Survey normally have the population at their place of residence as target group.⁹ The figures from the EA, at least within the context of National Accounts normally take the population at the workplace as a reference (domestic concept). This is also due to the fact that the EA focuses on macro-economic problems, whereas the Microcensus is more often used to analyse socio-economic and social policy related questions. Nevertheless, the EA also estimate the number of employed persons according to the national concept, which could directly be compared with the results from the LFS. Still the Employment Accounts are initially drawn up in accordance with the workplace concept. For the transition to the national concept, the commuter flows to and from Germany have to be taken account of. Commuters are those employees or self-employed persons who live in Germany and work abroad or who live abroad and work in Germany. The estimation model for the commuting flows is based on various monthly data sources such as the administrative data of Zentrale Auslands- und Fachvermittlung (ZAV) of the Federal Employment Agency, data from the university statistics on the number of foreign students in employment, information from statutory pension insurance about the employees subject to pension insurance contributions living abroad, information from the Federal Ministry of Finance about German nationals employed at foreign embassies and foreign armed forces, data from the education statistics on German students in employment abroad, information from national statistical offices of neighbouring countries in the EU, as well as information from the Labour Force Surveys of other member states.

For comparisons of the LFS and the EA, in both cases, the results according to the national concept should be used. This is problematic, when breakdowns from the EA are being required. Both the breakdowns by industry sector and status in employment are being published according to the domestic concept only. In this study, this problem is managed by using internal calculations according to the national concept whenever possible.

Breakdown by industry: local business unit versus enterprise

Regarding comparisons of the respective breakdowns by industry, there is a further conceptual difference. In the EA, the number of persons in the diverse industry branches is published according to the enterprise concept (*Unternehmenskonzept*), whereas the LFS according to the provisions of the regulation 577/98 is using the local business unit concept (*Betriebskonzept*). I.e., in the LFS, the main activity of the local business unit is the basis for determining the industry sector, while in the EA the main activity of the whole enterprise is taken as the basis. This is a further reason not to base this study on differences by industry sector. Nevertheless, it has to be mentioned that the main problem for a comparison of the breakdowns by industry sector is the different operationalisation in the LFS and the EA (see chapter 3).

⁹ It is nevertheless possible to analyse the number of employed persons at the place of work using the LFS. The only problematic group are persons living abroad and commuting to Germany. Figures regarding this group might however be obtained from the Labour Force Surveys of the neighbouring countries.

Differences regarding the target population

The EA and the LFS are not in full concordance with their target populations. The EA, in accordance with the objective to cover any person involved in productive activities, always makes reference to the entire population. This is also due to the fact that otherwise it might become problematic to use data from very diverse sources, such as household surveys, registers and establishment surveys. The LFS, for different reasons does often not make reference to the entire population, but only to sub-groups of it. In accordance with the 1982 ILO resolution employed persons are only considered as employed when they are “above a specified age” (ILO 1982, para. 9). In the LFS, in most member states, employment is only covered for persons aged 15 years and over.¹⁰

Similarly, for the calculation of indicators, in the LFS further restrictions might apply when e.g. only the situation for the working-age population should be focussed on. Due to reasons of the operationalisation further differences apply. For instance, the LFS does not cover persons living in collective households (but the German Microcensus does), nor conscripts or persons obliged to render alternative civilian service (included in the Microcensus as well). As a deviation from the ESA, both the LFS and the EA do not cover unpaid trainees and farmers only producing for own consumption. It should be mentioned that these are undeniably conceptual differences that, however, are rather limited in their effect. Taking all differences together, the conceptual difference for the employed was about 200 thousand persons. However, as the German Microcensus covers most of the information needed to reduce the conceptual difference, it reduces to around 24 thousand employed persons aged less than 15 years (reference year 2009). For the comparisons in this study, we use the results of the LFS including conscripts and conscripts on compulsory community service as well as persons living in collective households. That way, conceptual differences due to the target population can be almost completely reduced. The drawback of this approach is that the LFS results used for comparison slightly differ from those published in the Eurostat database.

Treatment of persons on extended leave

A last conceptual difference concerns the treatment of persons in extended leave. In the EA, following the treatment in its major (register-based) sources, employed persons who are presently not at work due to a leave are treated as employed without exception¹¹. This is due to the fact that most EA sources do not provide the necessary information to treat these persons according to the criteria of the ILO (which are also a bit vague in this case). In contrast, the LFS, in accordance with the results of the meeting of the Eurostat Working Group “Labour Market Statistics” (LAMAS) in June 2010 tries to implement the Guidelines of the ILO (1998) concerning treatment in employment and unemployment statistics of persons on extended absences from work as closely as possible. To this end, persons absent from their job are only treated as employed if the absence period is no longer than three months or they receive a continuous pay of salary of at least 50 % of their (former) net salary.

10 Few member states apply a higher age limit of 16 years.

11 A different treatment is applied to public officials. Here, persons registered as being on extended leave in the PS may (temporarily) be working as employees and are therefore partly not counted in the EA.

Lacking an independent estimation of the EA, the impact of this difference is not easy to estimate. Taking the LFS as a basis for such estimation, the impact is around 250 000 – 350 000 employed persons. It has however to be mentioned that this estimation assumes that persons on extended leave are fully covered by the LFS. This might not always be the case, as for instance persons on parental leave tend to interrupt their employment for up to ten or fifteen years. Therefore the estimated impact should rather be treated as the lower boundary.

In summary, one has to conclude that despite some differences in details, the conceptual deviations between the EA and the LFS are not more than modest in size. In any case, conceptual differences are not likely to explain a substantial part of the differences between the EA and the LFS. The only point of real quantitative relevance is the different treatment of persons with extended absences – and also in this case hardly more than 15 % of the entire difference is concerned. Thus, an explanation of the incoherence between EA and LFS has to be looked for at the methodological and procedural differences.

2.4 Methodological and procedural differences between EA and LFS

From a methodological point of view, the Employment Accounts and the Labour Force Survey differ fundamentally. The methods used for the data production is in each case targeted towards the primary use of each of the respective statistics. Therefore, it is not surprising that the key explanations for the differences should be found at these differences.

The basic methodological difference is in fact that the EA estimate the total number of employed persons based on all available sources. For each subgroup of employed persons the most suitable source is being used. Presently, about 50 statistics are being used for the estimation of the employed persons. The use and comparison of multiple sources enables the Employment Accounts to arrive at a differentiated assessment of the strengths and weaknesses of the individual data sources. For example, subgroups of the employed persons which are not covered well, could (expressed in a very simplified way) be taken from another source, which is deemed more accurate for this group. Furthermore, in contrast to primary and secondary statistics alike, the EA has the opportunity to make adjustments for areas that are known to be difficult to cover by the existing data sources (like undeclared employment). The appropriateness of such adjustments can to some extent be verified looking at the coherence of the results of the EA with other aggregates from the National Accounts (like, e.g., the earnings of employees). Due to these comparisons, the results from the EA are fully consistent with other areas of the National Accounts. The advantage of this approach is that a highly complete coverage of all employed persons can be achieved. The drawback is, that with the multitude of different sources, only few breakdowns could be provided (namely, industry branch and status in employment). A further drawback is that the errors of the individual sources can be taken into account during the estimation process, but cannot be estimated in quantitative terms.

Regarding the estimation of short-term trends, the EA use a trend extrapolation approach that makes sure that the recent and most accurate information is always being used for the entire time series. Thus, breaks in the time series can be avoided due to constant

revisions, taking place regularly at the end of each quarter for smaller revisions, once a year in August for more significant changes, and every four years with a revision of the benchmark calculation.

Compared to the EA, the methodological approach of the LFS is fundamentally different. The results of the LFS are being obtained through a household survey, which is (ideally) being carried out continually during the year among one percent of the population. The key objective of the LFS is less to produce the total number of persons in employment, but more to provide a basis for structural analyses in various breakdowns. The sample size together with the variety of survey topics makes the LFS an ideal basis for such purposes. Furthermore, as the survey response is mandatory for most LFS variables in Germany,¹² a reasonable coverage is being achieved for population subgroups that are usually difficult-to-reach. Nevertheless, also the LFS has its drawbacks: First of all, results from sample survey are always prone to sampling errors. Sampling errors thus have to be taken into account, especially when interpreting results for small population subgroups. Secondly, the LFS results are weighted and benchmarked to the update of the current population figures (Laufende Bevölkerungsfortschreibung – LBF). The population figures are based on the last German census in 1987 and known to be obsolete. According to a test survey in 2001, population statistics overestimated the population by about 1.3 million persons, which – through the benchmarking procedure – is being reproduced in the LFS results. Furthermore, the results from household surveys are always influenced by further sources of error, like for instance coverage bias, non-response bias, and measurement errors. Measurement errors occur, e.g., for survey variables which are problematic to be measured in a household interview. Methodological studies have shown that also the questions related to the employment status are among such problematic variables. In particular, small jobs and side jobs as well as undeclared employment situations are to a significant degree not being detected in the household interview (for details, see chapter 3). In contrast to the EA, it is not possible to make adjustments for such errors in the LFS, which at the same time has some effect upon the results of employed persons by sex, full-time/part-time work and many others.

12 Response is currently mandatory for all LFS variables, which are at the same time included in the legal basis of the Microcensus (in which mandatory response is laid down). The most important cases of survey variables with voluntary response include most ad hoc module variables as well as few structural variables not included in the Microcensus law.

3 Towards a reconciliation table for the Labour Force Survey and the Employment Accounts

Reconciliation tables play a key role in creating transparency regarding divergences between two sources. If well designed, they can help internal as well as external users in various respects: First of all, they quantify the incoherence between the statistics under consideration. Secondly, they help to distinguish deviations which are based on conceptual differences from those which are due to methodological differences. And finally, in an ideal case, they also contain information as to the reasons for methodological differences and (if applicable) the sub-populations which are particularly concerned.

Against this background, the Eurostat Task Force on Quality of the LFS concluded, in its final report (Eurostat 2009c), that the development and dissemination of reconciliation tables forms integral part when dealing with comparisons of the LFS with other data sources. In this chapter, we try to tailor the template for a reconciliation table proposed by the Task Force to the situation in Germany, by differentiating between the coherence of LFS and EA as a whole (section 3.1), the coherence of the LFS and the main sources of the EA (sections 3.2 to 3.5), as well as the adjustments made by the EA to those sources (section 3.6).

In a final section (3.7), built on the results of the preceding analyses, a modified template of the reconciliation table is proposed that maximises the information and offers transparency to the user.

3.1 Total Employment

Although the definition of the two main sources for data on employment in Germany is almost identical, the results differ quite strongly. The LFS result for total employment (38.7 million) shows 1.5 million persons less than the EA in its results of the national concept. As stated before, this concept is the one to compare the LFS figures because the conceptual differences are smaller compared to the domestic concept. For this reason and in the context of this study, whenever possible, the breakdowns by status in employment are referred to using the national concept. Unfortunately, the breakdown by industry branches exists only according to the domestic concept. The difference of the number of employed persons compared to the EA results based on the domestic concept is by 100 000 persons higher, it results in 1.6 million (see reconciliation table, table 1).

Analyses on the status in employment enable us to identify the groups for which the EA and the LFS differ the most. In the cases of self-employed and unpaid family members, the EA use the LFS as the major source to estimate their result. Therefore, not surprisingly, these two groups show the smallest differences (due to small adjustments to the LFS result in the context of the EA estimation procedure). The employees show a bigger discrepancy. Here, the result is almost 5 % bigger than the one of the LFS. The breakdown by different types of employees shows that this difference is not evenly spread across the groups of employees: It can mainly be explained by the marginally employed who show a figure that is 2.45 million persons smaller in the LFS, which is equal to a

share of about 71 % of the marginal employees covered by the LFS.¹³ In contrast to the marginal employees, the employees subject to full social insurance contributions show a considerably higher number (+ 930 000 persons or 3.3 %) in the LFS and thus attenuate the difference for all employees. The last group, public officials and soldiers, present hardly any difference. For the purpose of a later comparison of public officials it should be mentioned that the group of the soldiers (approx. 300 000 persons) is included here.

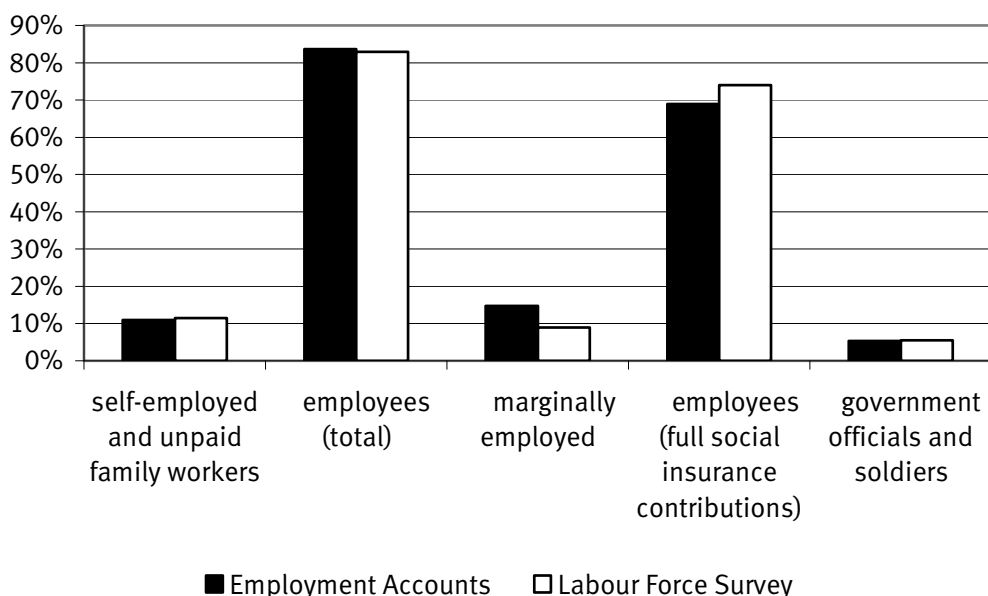
Table 2: Employed persons by status in employment, 2009

	Employment Accounts (national concept)	Labour Force Survey	Difference	
			absolute	%
			in 1 000	
Total employment	40 171	38 662	– 1 509	– 3.9
Self-employed and unpaid family workers	4 409	4 446	37	0.8
Self-employed	4 175	4 215	40	1.0
Unpaid family workers	234	231	– 3	– 1.4
Employees and public officials	35 763	34 216	– 1 547	– 4.5
Employees (total)	33 611	32 077	– 1 534	– 4.8
Marginal employees	5 935	3 470	– 2 465	– 71.0
Employees (full social insurance contributions)	27 676	28 608	932	3.3
Public officials, conscripts and soldiers	2 151	2 139	– 13	– 0.6

This difference in the level of employment is also reflected when focusing on the structures of the labour market. As indicated by the absolute values, differences are quite small for the self-employed as well as the public officials: In both sources, the EA and the LFS, the self-employed and unpaid family workers make a share of about 11 %. The public officials, too, show a very similar share of about 5 %. Looking at the total number of employees, the differences stated above partly compensate each other (see figure 4). In the two subgroups of employees, the massive differences in the absolute level can also be seen in its structure: The share of marginally employed is much higher in the EA, the LFS shows a much higher share of employees subject to full social insurance contribution.

¹³ For a detailed analysis of this group of employees see section 3.3.

Figure 4
Share of employed persons by status in employment, 2009



Looking at differences in the second possible breakdown, the results by industry branches¹⁴ opens the view to further explanations. It becomes obvious that there are not only differences in the employees in marginal employment, but also in specific industry branches. Before looking into details, it should be mentioned that the results differ more strongly because, in the EA, the breakdown exists only in the domestic concept (a surplus of 100 000 employed compared to the national concept), while the LFS always refers to the national concept.

The LFS shows a considerably higher number of persons in the branches „industry“, „construction“ and „health and social work“ than the EA (see table 3). Whereas, the EA show a higher number of employed in the branches „wholesale, retail and household services“ as well as in the „real estate, renting and business activities“ and „activities of households“. The higher number of employed in these branches is very probably due to a higher number of marginally employed in the EA, who are working in these branches to a high degree. But the higher number in the LFS in some branches cannot be explained by that. It can rather be explained by the way the information on industry branches is collected. The LFS asks the respondent for the branch of the establishment he or she works at. For the data collection an open question is being used. The coding is done on site by the interviewer using the CAPI tool. The procedure means that the perception of the respondent as to the branch of the establishment plays an important role. Therefore, e.g., persons working at the same establishment might well be coded with different NACE codes in the LFS. Furthermore, there also seems to be room for improvements of the IT

¹⁴ The breakdown for the results 2009 by industry branches in the EA is only possible in NACE Rev. 1.1 because there is no data available yet in NACE Rev. 2.

tool supporting the field coding (completeness of list of terms, use of a thesaurus). A note in the questionnaire asks the respondent to refer to the establishment (local business unit) and not the enterprise as a whole. Despite this, the results on industry branches from the LFS lead to the assumption that the respondents partly answer referring to either their enterprise or their job or occupation. This might for instance partly explain why there are 0.9 million more employed persons in “industry” in the LFS, but 1.6 million less employed persons in “real estate, renting and business activities” (for instance in the sub-section “labour recruitment and provision of personnel”) The assumption is backed up by several analyses regarding the industry branches in different sources and its employment status groups.

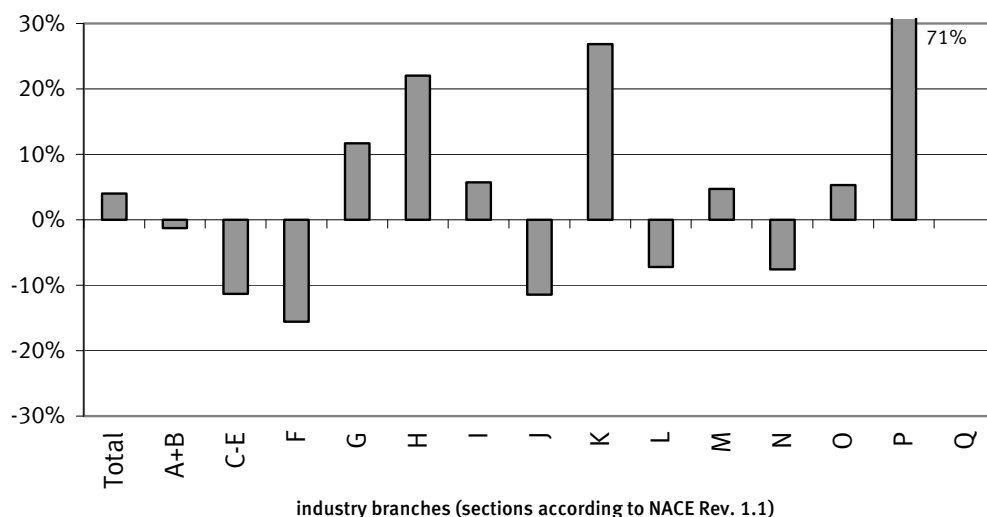
Table 3: Employment by industry , 2009

Industry branches (NACE Rev. 1.1)		Employment Accounts (domestic concept)	Labour Force Survey	Difference	
				absolute	share (in % of EA)
		in 1 000			
Insgesamt		40 271	38 662	– 1 609	4.0
A+B	Agriculture, forestry and fishing	859	870	11	– 1.3
C–E	Industry, including energy	7 796	8 678	882	– 11.3
F	Construction	2 204	2 547	343	– 15.6
G	Wholesale and retail trade; repair of motor vehicles, motorcycles and personal and household goods . . .	5 951	5 256	– 695	11.7
H	Hotel and restausants	1 905	1 485	– 420	22.1
I	Transport, storage und communi- cation	2 209	2 082	– 127	5.7
J	Financial intermediation	1 176	1 311	135	– 11.5
K	Real estate, renting and business activities	5 778	4 226	– 1 552	26.9
L	Public administration and defence; compulsory social security	2 654	2 846	192	– 7.2
M	Education	2 454	2 338	– 116	4.7
N	Health and social work	4 355	4 686	331	– 7.6
O	Other community, social and personal service acticivities	2 218	2 100	– 118	5.3
P	Activities of households	712	206	– 506	71.0
Q	Extra-territorial organizations and bodies	0	31	31	–

The biggest relative difference in branch „activities of households“ (+ 71 % in the EA, compared to the LFS) can only be tried to be explained by a further assumption: Household activities, in comparison with employment in other industry branches is more frequently carried out as a small job and/or is significantly more often not declared to the

tax and social insurance authorities. Therefore, respondents tend to be reluctant (or simply forget) to indicate such employment. Note that in this branch the largest part of the difference is due to important adjustments for undeclared employment within the EA, as undeclared employment is logically enough not covered by the Employment Statistics Register either.

Figure 5
Difference of employed by industry branches (NACE Rev. 1.1)
in % of Employment Accounts, 2009



Apart from the difference in the method the information on industry branches are collected, there is a conceptual difference. As explained above, the LFS asks for the branch of the local business unit whereas the EA uses the enterprise concept to receive its results. A further, but minor difference is that the EA does not take into account persons working in extra-territorial organizations and bodies.

Further insight regarding the underlying causes for these differences can only be obtained by analysing the key sources used for the estimation of the employment in the EA.¹⁵ With these sources, analyses with more differentiated breakdowns are being possible. Thus it is possible, e.g., to identify specific population groups for which the measurement of employment is particularly problematic. In the following, the results of such a differentiated analysis are being presented for the employees subject to full social insurance contributions, marginal employees, public officials, as well as self-employed and unpaid family workers.

15 The EA does not use the key sources 1:1, but introduces corrections based on the further sources which deliver information on breakdowns by industry. The result of these corrections is, e.g., a much higher number of persons working in the area of state sector in the EA compared to the BST.

3.2 Employees subject to full social insurance contributions

In the EA, the key source of the number of employees subject to full social insurance contributions is the Employment Statistics Register of the Federal Employment Agency (Beschäftigungsstatistik – BST). This source is generally considered very reliable, as inaccuracies in the registration and de-registration of employees are connected to financial penalties for the employers (see Bundesagentur für Arbeit 2010).

However, compared to LFS the BST offers a lower number of breakdowns, so that the comparison will only regard the socio-demographic features sex, age groups and nationality. A further analysis will compare the employees by industry branches.

Concerning the comparison, it is necessary to note that a full or correct operationalisation of the employees subject to full social insurance contributions in the LFS is not possible. In addition to these operational differences, methodological and conceptual features of both sources must be taken into account. The main differences of the LFS and the BST are the following:

- The group of employees subject to full social security insurance in the LFS can only be defined approximately. While the BST relies directly on the common reporting procedures to statutory health-, care-, pension- and unemployment insurance, the LFS relies – indirectly – on the number of workers with occupational status “employee”, “worker” or “apprentice”. To arrive at the number of employees subject to full social insurance contributions, the group identified as “marginally employed” is being subtracted. Therefore, the operationalisation of employees subject to full social insurance contributions depends indirectly on the detection of marginal jobs. The detection of such complex socio-legal statuses as „marginal employment“ in a household survey is, however, quite problematic (see section 3.3).
- The results of the LFS are – broken down by age group and sex – adjusted to benchmarks from the update of the current population figures (Laufende Bevölkerungsfortschreibung – LBF). Because of the long interval between the last German census in 1987, it appears that such extrapolated population figures are too high (overestimation according to census test in 2001: about 1.3 million persons). This overestimation is reflected in all results of the LFS. Comparing the number of employees with the figures of the Employment Statistics Register, in particular with respect to certain sub-populations, this effect must be taken into account. For example, the higher results of the LFS for the employees aged 35 to 44 years may be linked to the adaptation to the age groups of the LBF. As tested, not adjusting by age group leads to significantly reduced differences in the age structure of employees. Unfortunately, a quantification of the impact can only be seen after obtaining the estimates from the 2011 census, which will not be available before early 2013. As data from registers are not based on a sample and are not adjusted (e.g. to the population figures), errors associated with the extrapolation do not occur in this cases (while these registers may well suffer from similar deficiencies as the municipal population registers). Apart from the variation of the results due to the adjustment to benchmarks by age groups, a further adjustment to the nationality leads to the most obvious influence of the adjustment effects. Persons with a Turkish nationality are adjusted to marginals obtained

from the central register of foreigners (Ausländerzentralregister) whereas all other nationalities, including Germans, are adjusted to the benchmarks from the update of the current population figures (LBF). This probably produces a bias which can be seen in comparisons regarding of German and non-German employees.

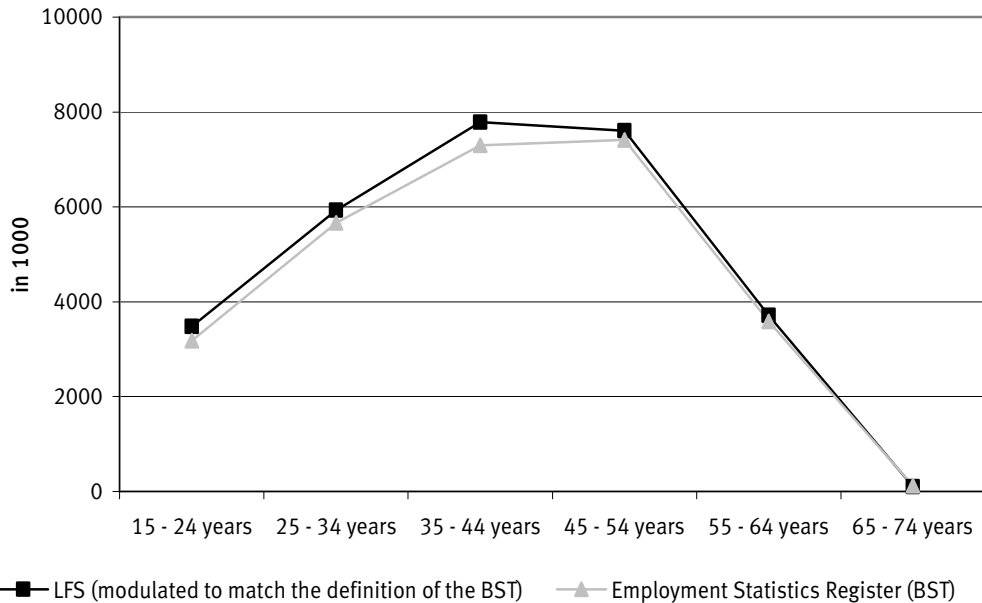
- The data collection methods are fundamentally different (administrative data, based on reports from the employer vs. a population survey). Therefore, limitations in the comparability of the results can be expected.
- The reference period is different: The results of the BST are based on the last day of the month or quarter, whereas the LFS shows annual and quarterly averages. In this analysis, the BST results refer to the 30th June 2009 and compares to the annual average of the LFS results. The results of the 30th June are chosen for the comparison because they hardly differ from the yearly result of the BST.¹⁶

The difference in the number of employees subject to full social security contributions in the LFS compared to the BST is 1.3 million in 2009 (28.6 million persons in the LFS compared to 27.3 million in the BST, so that the result from the LFS is 5 % higher compared to the BST). Looking at the difference by sex, it becomes visible that it is primarily due to men (940 000).

Looking at the results broken down by age group, it becomes clear that the differences between LFS and BST in 2009 mainly concerned the younger employees: The biggest differences can be found for the employees aged 15 to 24 years (for which the result of the LFS is about 10 % above that of the BST) and those aged 35 to 44 years (LFS 7 % above BST). The largest relative deviations in the number of employees subject to full social insurance contributions are found at the age of 65 years and older, the LFS is the result of about 16 % less than the BST. But this group includes only very few cases.

16 Based on the monthly test results the BST also reports that the results of the last day of a month do not differ significantly from the average monthly results of the BST, which were calculated using exact daily inventory counts. Taking the results for 30th June of each year as a proxy for the annual average is standard practice at the Federal Employment Agency. Nevertheless, a comparison with intermediate calculations from the EA indicate that, in 2009, the “real” annual average (calculated for EA purposes) is some 97 000 persons higher than the BST result for 30th June 2009.

Figure 6
Employees subject to full social insurance contributions by age group, 2009



The results of employees subject to full social insurance contributions regarding nationality show bigger differences than the results by age and sex. The share of German employees in the LFS is on average (in all age groups and by sex) about 2 % lower than in the BST, although in absolute numbers the LFS counts more employees. At the same time the LFS shows much more employees subject to full social insurance contributions with non-German nationalities (+ 600 000). This can also be seen in the proportion of non-national employees: The result of the LFS is 25 % above the share of the BST.

Concerning a further possible breakdown, employees differentiated by full- and part-time employment, further differences can be seen. But first it has to be noted that the definition of part-time differs. The BST shows the number of part-time employees with contractual working hours of less than 18 hours a week. The LFS asks the respondent self-perception on part-time or full-time or takes his usual or actual working hours to define part-time. It should be noted that the collection of the usual hours worked in the LFS clearly associated with some rounding effects. This is relevant, as analyses show hardly any persons working 17, 18 or 19 hours, while the value 20 hours, however, shows an intriguing peak. This is at least a suspicious result, although there is also reason to think that part-time workers with 20 hours per week are quite common. Nevertheless, a comparison of persons working less than 18 hours is possible but problematic.

The following comparison is based on the information from the BST and the self-perception from the LFS. Here, the LFS counts slightly more (+ 7 %) employees subject to full social insurance contributions in part-time than the BST. Regarding the age groups in this comparison, more differences become visible. In contrast to the very well matching age structure for full-time employees, the age structure of part-time employees differs.

In the older age groups, the BST counts more employees in part time: In the age group of 55 – 64 years, the difference amounts to 14 % and to 21 % in the age group of 65 – 74 years.

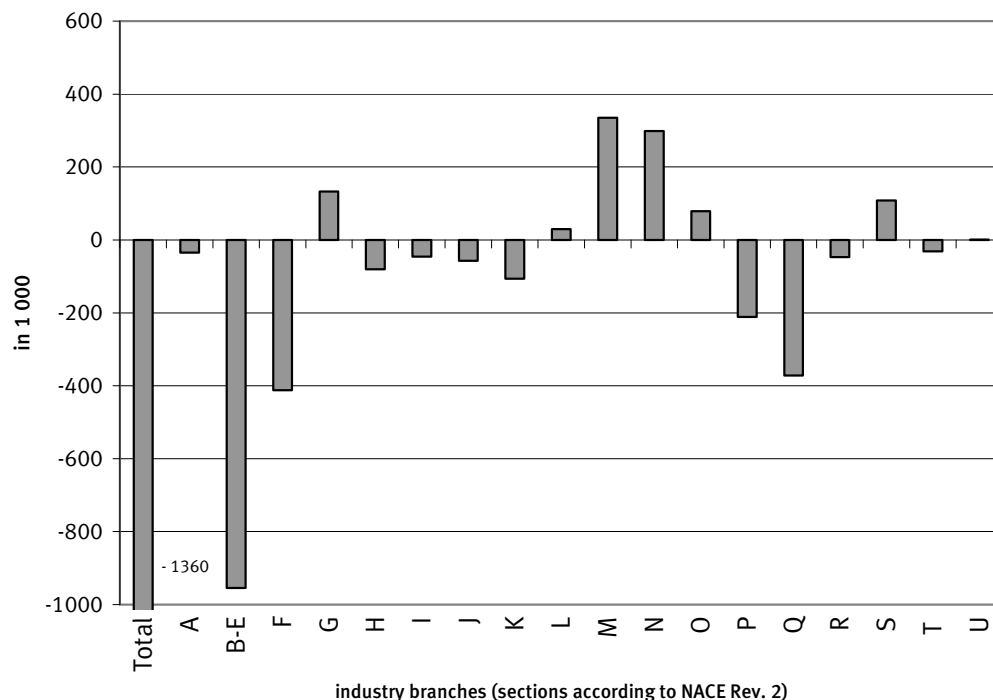
These results may partly be due to people in so called “partial retirement” where employees can choose whether they would like to reduce their working time in two ways: Working genuine part-time with a lower number of working hours or working full-time for up to five years and not working the following year(s) to be able to retire early. The latter group of persons are registered as full-time employees and may answer contrary in the LFS.

Big differences can be found by a comparison of the employees subject to full social insurance contributions by industry branch. Before looking into the comparison it is necessary to note that the BST data is based on the smallest local unit of a company (Betriebsstätte) whereas the LFS asks for the local business unit (Betrieb). One “Betrieb” can include several “Betriebsstätten”, given that the “Betriebsstätten” are located in the same municipality. The impact of this difference cannot be quantified, but should be minor compared to the methodological differences and the distinct operationalisation. The LFS collects the information on industry branches with an open question (and computer assisted field coding by the interviewer) through self-assessment of the respondents. It is likely that the respondents relate their answers in part, to the establishment, but rather to the company or enterprise or even to the job activity. The BST, however, takes the registered branch of the local unit that is assigned when an employer registers the company at the Federal Employment Agency.

These differences in definition and operationalisation of the industry branches are reflected in the results. In comparison to the BST, the LFS shows more employees in nearly all branches. In absolute figures, the biggest differences can be found in the branch “B-E: manufacturing and extractive activities”. The BST shows distinctly more employees only in the branches “M: professional, scientific and technical activities” and “N: administrative and support service activities”. The branches that show more employees in the BST are characteristic for misclassification of respondents. Additionally it includes temporary employment agency workers that might often make a declaration referring to the industry branch of the company they work for (hirer) instead of referring to the company of the contractor (temporary employment agency).

Figure 7

Difference of employees subject to full social insurance contributions in LFS and BST, 2009 (NACE Rev. 2) *



* To read: The number of employees in sector "F" is by 400 000 smaller in the BST than in the LFS.

This is a slightly different picture than drawn in the comparison of the LFS results with the EA. The differences might also be due to the new classification of industries. The comparison between LFS and EA is based on the 2003 Statistical Classification of Economic Activities (NACE Rev. 1.1) whereas the comparison with the BST uses the revised 2008 Statistical Classification of Economic Activities (NACE Rev. 2).¹⁷ The more important point probably is that the comparison of LFS and EA includes all employed persons and not only employees subject to full social insurance contributions. So that differences that rather stem from underestimations in some employment statuses level out in the EA estimation. E.g. the number of persons in marginal employment is much bigger in certain NACE sections, for instance the services. Furthermore, differences might also be due to the use of the enterprise concept in the EA and the concept of local business units in the LFS as well as to adjustments in the context of the institutional sector accounting.

¹⁷ The different NACE versions are used because the NACE Rev. 2 was introduced in the BST in 2008, while the EA, according to the provisions of National Accounts will adopt the NACE Rev. 2 in 2011 only. Fortunately, both versions were collected in the LFS for the year 2009 in parallel.

3.3 Marginal employees

In addition to the analyses of employees subject to full social insurance contributions, comparisons of the persons in marginal employment are also possible based on the Employment Statistics Register. Results on marginally employed can be compared with the BST of the Federal Employment Agency. In the BST, two types of marginal employees are being distinguished: Marginal employees with low income (i. e. a regular monthly income of 400 Euros or less; “geringfügig entlohnte Beschäftigte”, also referred to as “400-Euro-Jobs” or “Mini-Jobs”) and short-term marginal employees (working no more than 50 days or two calendar months per year). As the marginal employees with low income are the vast majority under all marginal employees (representing more than 90 %), the following analyses focus on marginal employees with low income.¹⁸

The registration process for employees with marginal income is basically the same as for employees subject to full social insurance contributions. This means that registration, de-registration, discontinuities and annual reports must be reported. Due to the rather complex socio-legal context of marginal employment, data from the registration and reporting required of the employers are generally suited better for determining the number of low-paid marginal employees than a population survey. This is true at least for the objective to count the number of marginally employed according to the social law (not always clear to the individual respondent).

There are significant differences in the number and structure of marginally employed (see below) that stem from various causes but are generally based on differences in the methods and procedures applied by the LFS and the BST. In general these are the same as in the comparison of the employees subject to full social insurance contributions. But some are more relevant for the group of marginally employed:

- The different reference period might be more important in comparisons of marginal employment. The results of the BST are based on the last day of the month or quarter, whereas the LFS shows annual and quarterly averages. In this analysis the BST results refer to the 30th June 2009 and compare to the annual average of the LFS results. The results of the 30th June are chosen for the comparison because they hardly differ from the generally yearly result of the BST. Regarding the fact that some marginal employment contracts are tied to specific seasons (i.e. tourism in summer and shop assistance around Christmas) the different reference period should however be kept in mind. Nevertheless it seems unlikely that a significant part of the incoherence could be attributed to this difference.

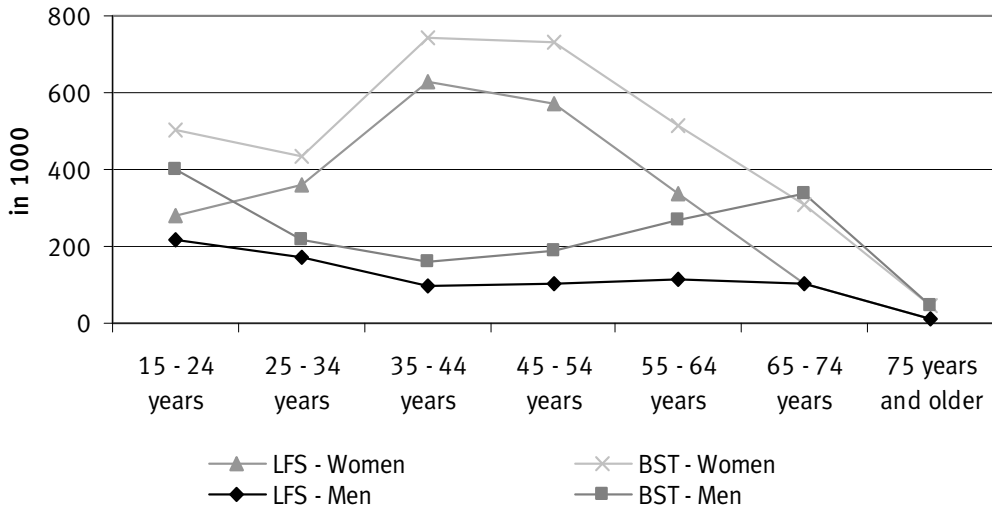
¹⁸ A third group included in the EA and the questionnaire of the LFS includes the participants in the workfare scheme “Ein-Euro-Job” (registered unemployed who are obliged to carry out a low payed job as a measure to improved labour market integration and placement success). Compared to the marginal employees with low pay, the employees with an “Ein-Euro-Job”, as the short-term employees, are a quite small group. The LFS shows a number of 260 000 persons in short-term employment and 220 000 persons in “Ein-Euro-Jobs” for 2009. The corresponding figures from the registers of the Federal Employment agency are higher (350 000 short-term employees and 322 000 “Ein-Euro-Jobbers”. Furthermore the Federal Employment Agency started publishing results on the number of short-term employees only very recently (for details see Dundler 2010).

- More importantly, it is necessary to note the different operationalisation of marginally employed in the LFS compared to the BST. The problems are similar to the ones found for measurement of the employees subject to full social insurance contributions. The LFS determines the number of marginally employed by a self-perceptive answer that might be contrary to the registration. The respondent might not be aware of the registration at the social insurance and therefore have a different status in the BST. The results of the LFS show employees who indicate their main activity as marginal. The main indicator of marginal jobs is the earning threshold of 400 Euro per month “regularly”. (This detail is determined by the social insurance authority in charge of the registration and leads to re-registrations if the limit is exceeded.)
- Another possible reason for the differences, the effect of an adjustment to benchmarks of the population statistics, compared to the employees subject to full social insurance contributions obviously has a lower impact for the marginally employed. Nevertheless, the fact that the calibration marginals from population statistics seem to overestimate the total population should lead to higher numbers of marginally employed in the LFS. As the LFS captures much less marginally employed than the BST, one might conclude that the differences between LFS and BST presented in the following are even an underestimation.

The results of the BST and the LFS on the number and structure of the marginally employed have significant differences, which have been reduced significantly since the year 2004. A change in the order of questions and the wording of the question itself in 2009 makes it possible to differentiate the different groups of marginally employed and allows comparing exactly the same group of employees in the year 2009 for the first time. Still, there are big differences.

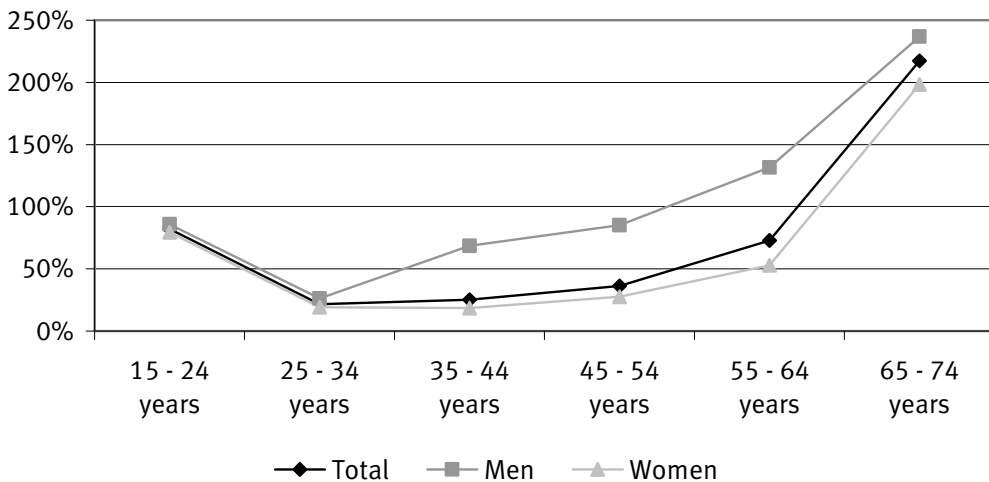
Thus, in 2009, according to the BST over 4.9 million persons were marginally employed, whereas, according to LFS, this was true for only 3.1 million persons. The difference of 1.8 million in the result is distributed very unevenly across age groups and for men and women (see figure 8).

Figure 8
Marginally employed men and women in the BST and the LFS, 2009



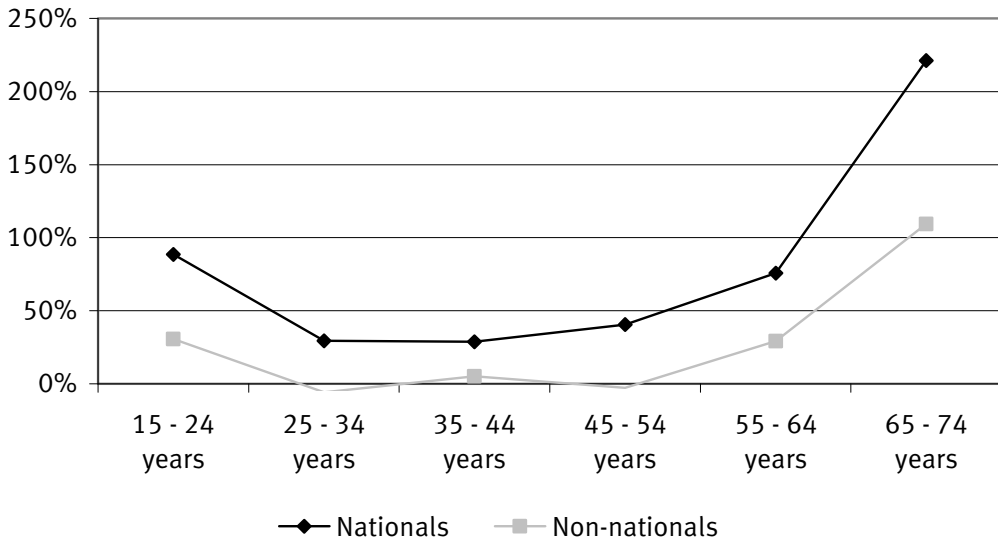
The results for the age groups 25 to 54 years show less differences than the results for marginally employed in the age groups above and below. Especially in the age group of 15 to 24 years, 55 to 64 years and 65 to 74 years, the BST shows largely more marginal employees than the LFS. In total, the result of the BST is by more than one third higher than those of the LFS. For persons in the age group of 15 to 24 years and 55 to 64 years, the BST shows nearly twice as many marginally employed. In the age group 65 to 74 years the BST is as much as four times higher than the LFS. Men show more significant differences than women, at least in relative terms (see figure 9).

Figure 9
Difference of marginally employed men and women in the BST and the LFS in % of the LFS, 2009



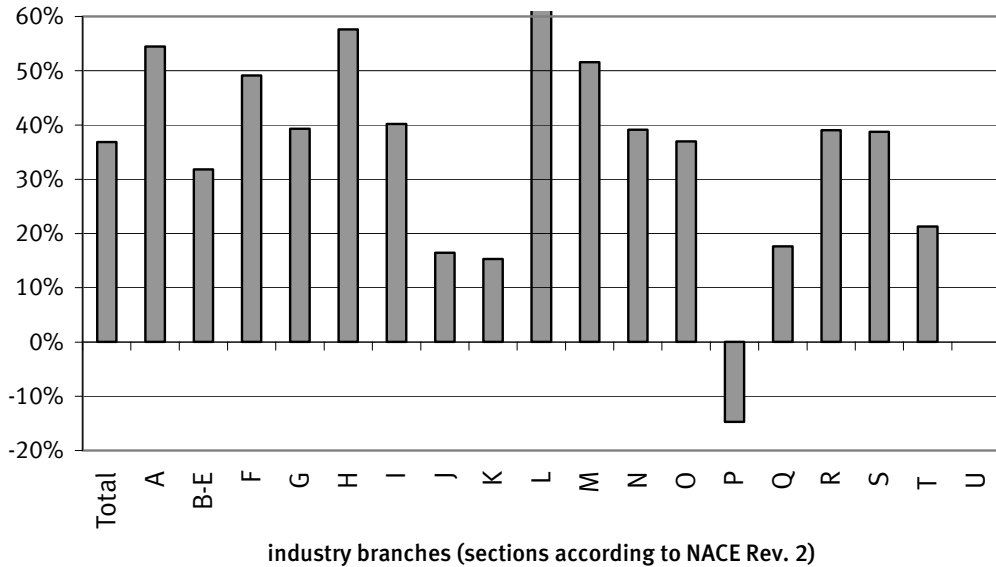
Surprisingly, the results broken down by nationality show that the biggest difference is in the group of nationals. Not only in absolute numbers, but also in share and difference in percent (see figure 10). This leads to the assumption that non-nationals respond correctly to the question on marginal employment to a higher share, i.e. know about the legal employment status. But this assumption may also be misleading, as the foreign population is adjusted to calibration marginals from a different source than the national population.

Figure 10
Difference of marginally employed by nationality in the BST and the LFS
in % of the LFS, 2009



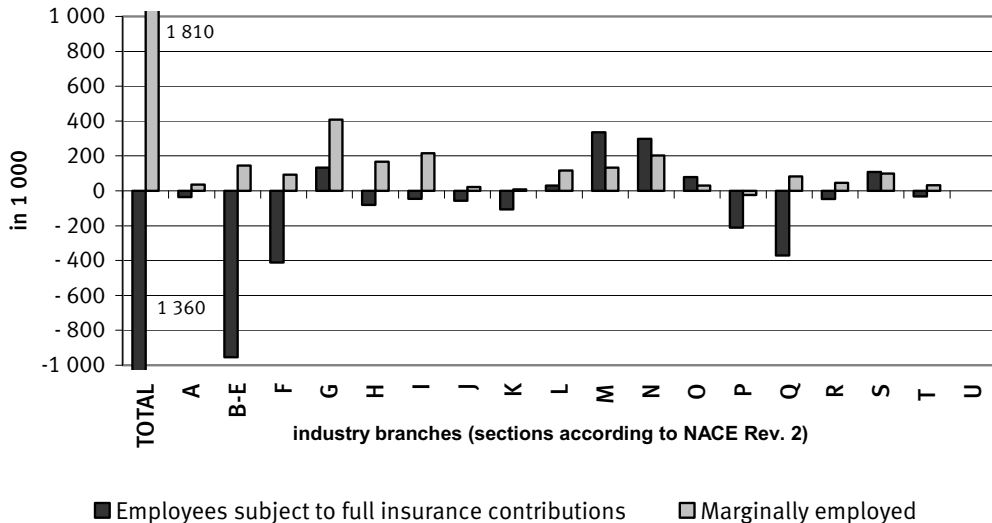
Looking into the last breakdown available, the industry branches, it can be stated that the BST counts more marginally employed in nearly all branches. This is pretty obvious because of the much higher number of marginally employed in the BST. This analysis points out that the difference is spread quite regularly across most branches (see figure 11). The LFS shows a higher number and share of marginally employed only in the branch “P: education”.

Figure 11
Difference of marginally employed in % of Employment Statistics Register (BST), 2009



One could expect that the picture drawn in the comparisons of employees subject to full social insurance contributions becomes complementary: In those branches where the LFS showed more employees than the BST, the BST showed more marginally employed than the LFS. In some cases the difference seems to level out. But, as just presented, this is only true for a few branches. Figure 12 illustrates that the difference only partly levels out in most branches, some to a bigger extend than others. Outstanding is the branch “P: education”. Here, the LFS has more employed than the BST. And although the BST is the main source for the EA, the EA has a higher number of persons working in education than the LFS. This must be due to adjustments applied to the sources of the EA, especially in respect to the adjustments regarding the institutional sector accounting.

Figure 12
Difference of BST – LFS for employees and marginally employed, 2009



All these results are known for quite a long time and have been subject of many analyses and research. Therefore, it can be stated that the significant differences in the number and structure of marginally employed stem from various causes, but are generally based on differences in the methods and procedures. The difference with probably the most impact is the operationalisation. The LFS operationalised marginal employment on self-perception of the respondents. This implies that the respondent must be aware of his marginal employment during the interview and that the respondent is willing to give information about it. As experiences show, the detection of marginal employment is difficult in the following examples which lead to a set of hypotheses:

- The respondent as well as the interviewer refers to the main status. Questions concerning marginal employment are answered incorrectly because they typically differ from the respondent's main status, e.g. in the case of pupils students or pensioners (main status thesis).
- Respondents answer the questionnaire for themselves, but – in about 25 % of the cases – also for other household members. Incorrect answers might be the results as the respondent might not be sure about the labour status of their relatives (proxy thesis).
- In bigger households it is thinkable that interviewers and respondents want to shorten the duration of the interview. Due to the amount of questions on the employment situation it is possible that questions are answered incorrectly or even jumped, especially in the case of small jobs (efficiency thesis).
- Due to the complex legal construction of marginal employment some respondents might categorise themselves incorrectly, even if they are captured correctly as being employed (misled classification thesis).

Several studies have already tested this set of hypotheses: The results of a follow-up survey of the LFS, conducted in 2008, allow a rough estimation of the empirical relevance of these theories (see Statistisches Bundesamt 2008; for an English summary see Köhne-Finster/Körner 2009). It has been shown that particularly in the case of persons whose main social status is “not working”, small economic activities remained undetected in the LFS. This applies particularly to pupils and registered unemployed, but also to pensioners, students and housewives/housemen. However, it could not be determined whether it was always a reported small activity or one that does not need to be reported in the context of social law. And it could not be quantified precisely, whether the results of the follow-up survey fully explain the difference. At the same point, analyses of the follow-up survey point out that the effect of proxy interviews is presumably lower than the effects of the orientation on the main status.

A further analysis tested the “mislead classification thesis” by looking at the earnings of employees. It was expected that a significant number persons who classified themselves as employees subject to full social insurance contributions earn less than 400 Euro and therefore might belong to the group of marginally employed. The operationalisation did not take into account the self perceptive answers on the legal status of being marginally employed, but the monthly net income of less than 300 Euro, respectively 500 Euro. Unfortunately, the LFS asks for the income in classes and does not cover the threshold for marginal employment of 400 Euro.¹⁹

The analysis shows that difference of marginally employed (1.8 million) could theoretically be explained by the misclassification of employees subject to full social insurance contributions who earn less than 500 Euro (see table 4). As the number of employees earning less than 300 Euro shows, the difference cannot be explained with this threshold. One open question remains: The number of persons with a net income of 400 Euro.

Table 4: Test of the misclassification thesis

	Total Number BST	Total Number LFS	Difference	Employees subject to full insurance contributions with a net income below . . .	
				500 Euro	300 Euro
Marginally employed	4 903	3 106	– 1 797		
Employees subject to full social insurance contributions	27 263	28 628	1 364	1 821	414

Therefore, it has to be kept in mind that this attempt to find the number of misclassified marginal employee is not very reliable (due to the missing threshold of 400 Euro and other items). It is perfectly possible that employees earning less than 400 Euro are subject to full social insurance contributions (e.g. in the case of part-time employment with few working hours). And, regarding the difference of the employees subject to full social

¹⁹ Further it has to be mentioned that the net income includes all kinds of payment (including pensions, public social benefits, interests of investments, rental incomes) etc. as well as income from an economic activity.

insurance contributions, the number would be too high to explain that difference of 1.4 million. Overall, the test indicates that the misclassification thesis has its reason but it can not fully explain the difference between LFS and BST concerning the number of marginal employment and employees.

Apart from these studies on figures from the LFS, the different results may also be subject to measurement errors in the BST. These, and the theses on measurement errors in the LFS, are the subject of a register survey on marginal employment in the year 2010 which was carried out by the Federal Employment Agency in co-operation with the Federal Statistical Office. The register survey is expected to explain the differences and test the effects of deviations due to on late de-registrations, discontinuous employment relationships or abusive registrations. The first results will be available in summer 2011. The register survey equally is a project supported by the European Commission.

3.4 Public officials

The prior source of the EA regarding the number of public officials is the statistics of public sector personnel (Personalstandstatistik – PS). This statistics is generally considered very reliable, as the data stem from a complete enumeration of the data supplied mainly by personnel departments of public offices. The quality of the results depends critically on the knowledge of changes in law and the legal form of the reporting units. Because of the great dynamics in the target population (i.e. changes in property relationships) and the time delay in the publication of such transactions some under-reporting must be considered, but can not be quantified. Less significant is the over-coverage, which implies interviewed units that do no more need to report due to changes in property relationships. These units usually question their reporting requirements and will be removed from the target population. In the area of public service units, the changes are much more manageable. Therefore, the accuracy of the data to the general government sector is higher than that of the institutions under private law. Hence public officials are not affected by under-reporting (see Statistisches Bundesamt 2009a).

Concerning the comparison it is necessary to keep in mind the methodological differences as well as some further ones:

- The number of public officials in the LFS relies on the self perception of the respondent. In contrast, the PS counts directly on the common reporting procedures. This difference has presumably less impact than in the case of the marginal employees as being a public official in the vast majority of the cases is a fairly clear defined status, which should be present in the respondent's mind.
- The reference period is different: The results of the PS are based on the 30th June of every year, whereas the LFS shows annual averages. In this analysis the PS results refer to the 30th June 2009 and compare to the annual average of the LFS results. As in the case of the Employment Statistics Register, the impact is considered to be minor.

- The LFS categorises the employment status into different groups and, concerning public officials, adds judges and so called “Dienstordnungsangestellte – DOA”.¹⁹ Unfortunately, there is a group of persons who formerly had the status of public officials but who were (partly) transferred to employees because their employer changed legal status. This happened for example in the case of the German postal officials and German railway officials after the German post agency and German railway agency were privatised in 1994 and 1995.

There is reason for the assumption that this group of former government or public officials still categorises themselves as such because they used to be a public official and they continue to be treated as public officials in terms of pay, pensions and employment security. Another reason to categorise as a public official might as well be the reputation.

- Those subgroups can be differentiated in the PS and are, for the reason of this comparison, displayed as needed. There are a few subgroups of public officials or persons with a similar status that are not counted in the PS, such as church officials (Kirchenbeamte) or officials in the “semi-public” financial sector (Sparkassenbeamte).
- The results of the LFS are – broken down by age group and sex – adjusted to calibration marginals from the update of the current population figures (LBF). Because of the long interval between the last census in 1987, it appears that such extrapolated population figures are too high (overestimation according to census test in 2001: about 1.3 million). This overestimation is reflected in all results of the LFS. Comparing the number of public officials with the figures of the PS, in particular in respect of certain sub-populations, the effect must be taken into account.

Unfortunately, the effect can only be quantified after having the results from the 2011 census available. As data from registers are not based on a sample and not adjusted (e.g. to the population figures), errors associated with the extrapolation do not occur.

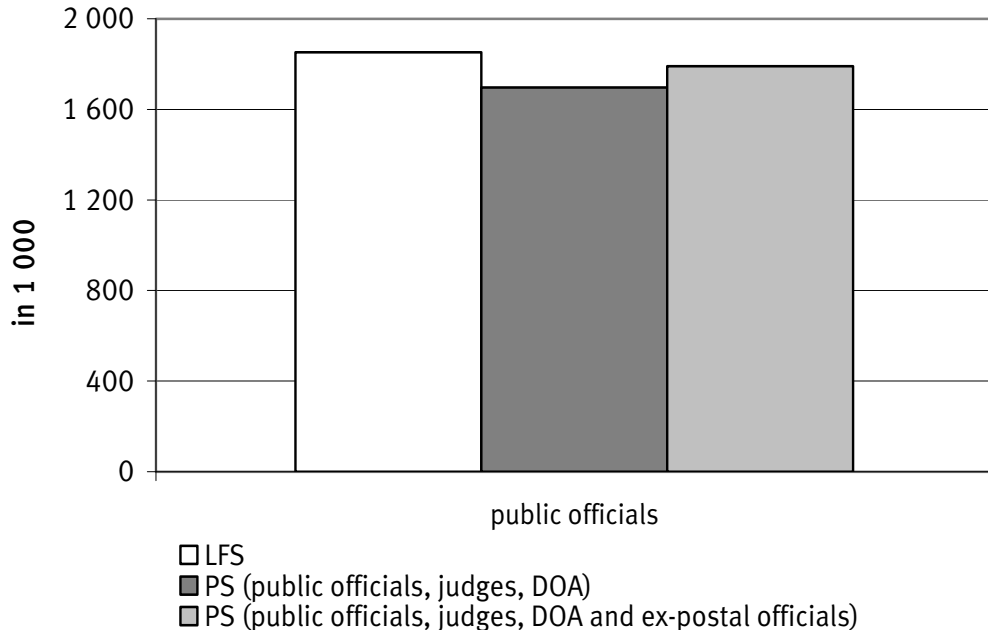
However, compared to the LFS, the PS offers a lower number of breakdowns, so that the comparison will only regard the socio-demographic features sex and age groups. A further analysis will compare the employees by the kind of contract: full-time or part-time.²⁰

Regarding the differences in the total number of public officials, the LFS shows higher numbers than the PS in two different operationalisations. The difference amounts to 160 000 persons or 10 % of the PS, respectively 60 000 persons (3 %) regarding the wider operationalisation (including ex-postal officials). Figure 13 illustrates very clearly that the ex-postal officials still exist in a significant amount of about 100 000 persons. Therefore, the further analyses will use the wider operationalisation for comparison to the LFS. The remaining difference may be explained by those ex-officials and other officials who are not counted in the PS.

¹⁹ So called “Dienstordnungsangestellte” have contract conditions like public officials.

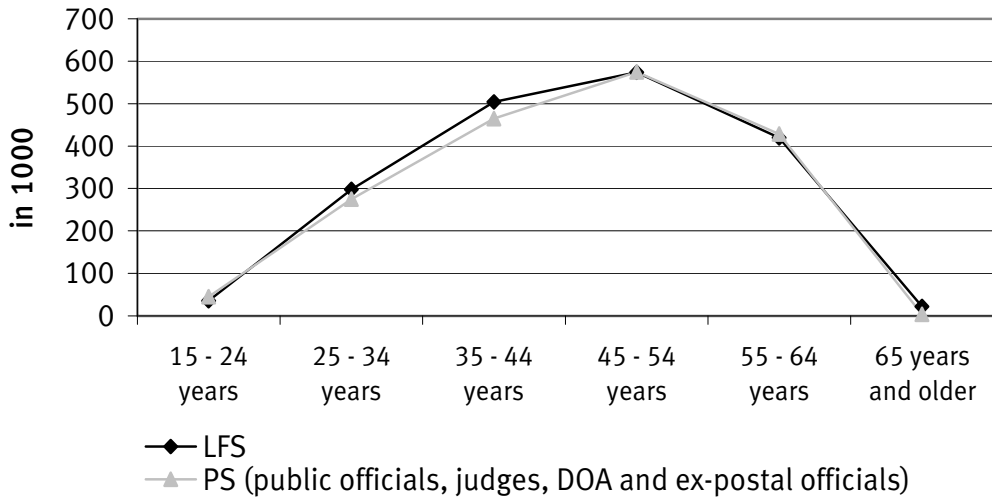
²⁰ It should be noted that the results of the PS used in this comparison may differ from the official publications. This is due to a, for the purpose of the comparison, special analysis which offers results comparable to those from the LFS.

Figure 13
Number of public officials in the LFS and the PS, 2009



The difference is equally distributed between men and women, but not within the age groups. The LFS result shows more public officials (in absolute numbers and share) in the age groups 25 – 44 years and 65 years and older. For the overestimation of the public officials aged 65 years and older there is the assumption that some persons still declare themselves working who are already receiving a pension. This may be true for professors emeritus. The explanation of the difference in the younger age groups is not straightforward. It may be due to the adjustment of the LFS results to the LBF that might overestimate the younger population more than the older population. Interestingly enough, a very similar pattern was found for the age groups of employees subject to full social insurance contributions. This and the fact that differences are largely reduced when looking at the unweighted data, backs up the assumption that the weighting procedure plays an important role in the explanation of the incoherences.

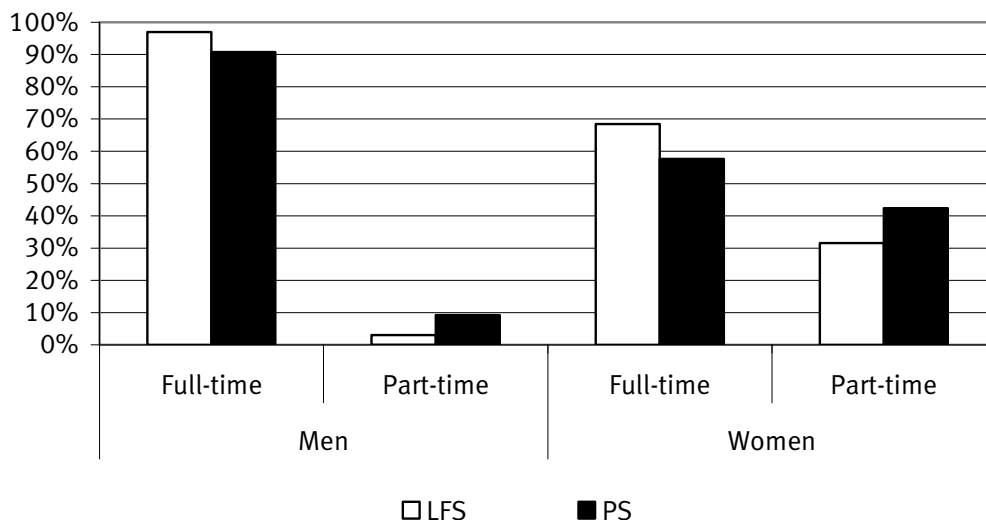
Figure 14
Number of public officials in the LFS and the PS by age, 2009



Looking into a further aspect, the breakdown by officials working full-time or part-time, even bigger differences become visible. The LFS shows much more persons in full-time employment than the PS (+ 275 000) and fewer in part-time (– 120 000). Differentiated by sex (see figure 15) it can be seen that it is not due to the characteristic phenomena of men working part-time but declaring to work full-time in the LFS, but that the difference is observable for both sexes approximately to the same extent. In the LFS there is no sign for a reason of these inconsistencies. A possible reason may be the definition of part-time work in the PS. Here, a person is treated as working part-time if he or she earns less than 100 % of the wage of full-time public officials. In the case of part-time retirement, a person may still be working full-time, but receiving less than 100 % of his earnings. He/she quasi works his hours in advance and receives the withhold remuneration later without working any more hours.

Figure 15

Number of public officials in full- and part-time employment in the LFS and the PS, 2009



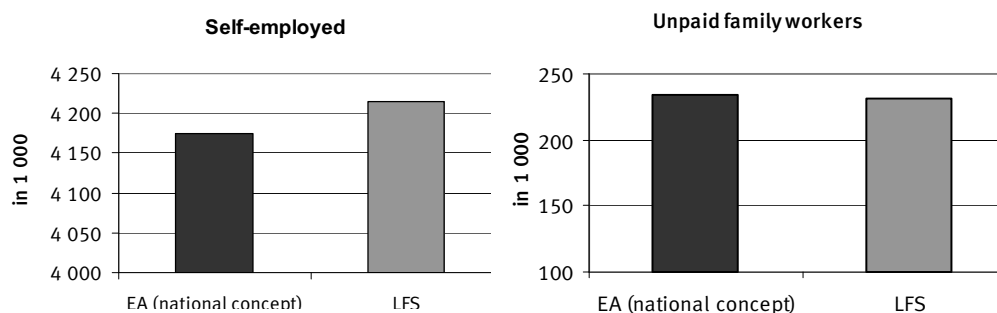
3.5 Self-employed and unpaid family workers

For the group of self-employed and unpaid family workers there are fewer sources available compared to the other groups of employed persons. As there are no (suitable) registers available, the EA uses the LFS as its key source for this group. This results in very coherent figures of EA and LFS, but heavily restricts the possibilities to carry out comparative analyses. Nevertheless, there are a few sources which the EA uses to adjust the figures obtained from the LFS. Furthermore, it consults further sources that include persons who very probably are not included in the LFS, such as persons working in the hidden economy or self-employed persons who have not registered a business. For this group of persons it is assumed that they do not answer correctly in the LFS out of fear of being discovered of doing something illegal.

Knowing this, the EA is expected to have a higher number of self-employed. But, in 2009, the result of the EA is by 37 000 persons lower than the LFS. One of the reasons is the second source used to adjust the self-employed: The register of persons who start in self-employment as part of a government-funded scheme to help jobless people to start-up their own business (for whom the relevant register statistics from the Federal Employment Agency is being used as a source in the EA). For a more detailed explanation of the composition of the number of self-employed see section 3.6.

The number of the unpaid family members is very much the same. The difference sums up to no more than 3 000 persons (see figure 16).

Figure 16
Number of self-employed and unpaid family workers, 2009

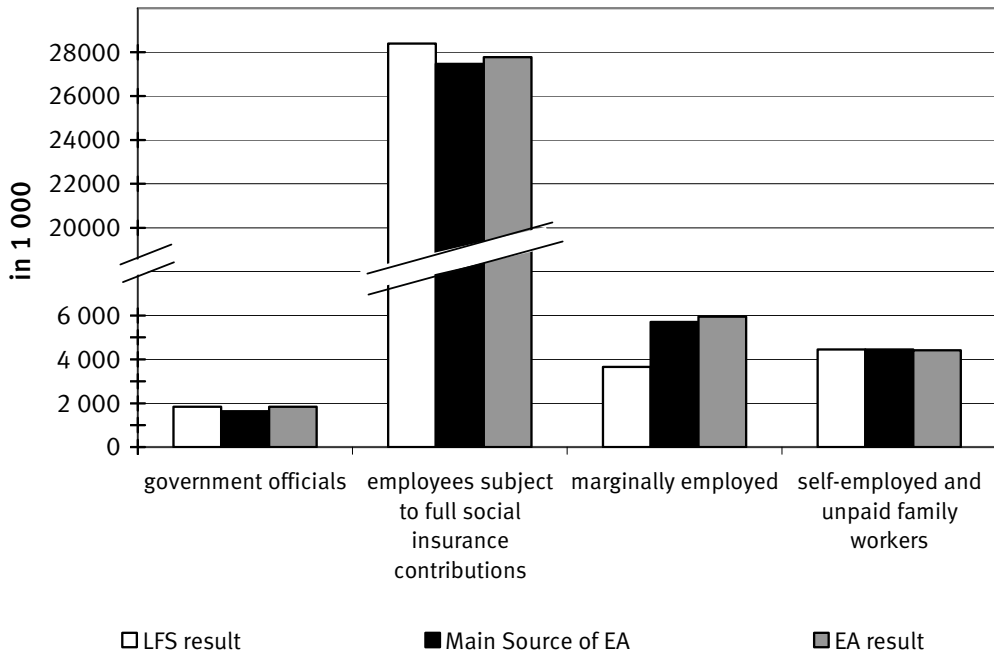


3.6 The remaining difference – from the main sources to the result of the EA

The sections 3.2 to 3.5 focussed on the differences between the respective main sources of the EA and the LFS. Comparing the results of the LFS, the main source of the EA and the EA itself, there are further differences. This is due to adjustments made in the EA to the main sources. There may be many reasons for such adjustments, which can either be applied directly to the source or in the context of the estimation process of the National Accounts (NA). Many adjustments are rather technical, e.g. in order to avoid double-counting when combining the various sources. For example, the employees working in the public sector are reported on the basis of the register statistics on public service personnel (PS). In order to achieve consistent sector accounts, employees working in public administration have therefore to be adjusted with data provided by the Employment Statistics Register (BST). A further reason for adjustment corrections are complementary or more detailed information from further sources, e.g. information on undeclared employment, which is not covered by the BST. Finally adjustments also become necessary in order to achieve consistency of the EA results with other aggregates from the National Accounts.

This chapter gives a brief overview on how the EA, using the main source and then making various kinds of adjustments, gets to its final results. The final result of the EA is, regarding the employment status, higher in all cases. The following figure shows the differences from one source to the next and illustrates how the differences between LFS and EA results are connected to each other.

On the example just seen in the last paragraph, this paragraph presents the composition of the EA results for all employed by status in employment. The self-employed show the smallest difference because, here, the EA use the LFS as their main source. Still, there is a difference of 37 000 self-employed. On the one hand, this is due to a reduction of the EA based on an additional source, the register of persons who start in self-employment as part of a government-funded scheme to help jobless people to start-up their own business. On the other hand the EA add an estimated figure for persons in the hidden economy. This leads to the final EA result which reports 37 000 self-employed and unpaid family workers less than the LFS result.

Figure 17**Comparison of the result of the LFS, the EA main source and the EA final result**

Having seen the composition of the self-employed and unpaid family workers, now the group with the biggest discrepancies is presented: The employees subject to full social insurance contributions. For this group, the LFS shows a higher level (+ 1.4 million) than the main source, the BST. The difference of the LFS result to the EA, who use a slightly different operationalisation to compare the LFS figures, is 930 000 persons. The difference between the BST and EA result is 315 000 persons. This indicates that the EA takes the number of employees subject to full social insurance contributions (2009: 27.36 million) from its main source, the BST, and adds estimated figures for employment in private household services, management or executive board members and persons working in hidden economy. Further adjustments are being made in order to use the PS as the source for employees in public administration as well as in the context of the institutional sector accounting (Sektorenrechnung). The adjustments do, however, not change the total number of employees in public administration. Further adjustments might still apply in coordination with other aggregates of the NA. Therefore, the final result of the EA (2009: 27.68 million) is higher than the result of the BST and reduces the difference to the LFS.

For the marginally employed, the EA does very much the same as for the employees subject to full social insurance contributions. It takes the main source (BST) for the marginal employees (low earnings as well as short-term), as well as persons working in the workfare scheme “Ein-Euro-Job” which are taken from another source of the Federal Employment Agency. As other sources indicate that the BST does not fully cover (undeclared) marginal employment in private household services, an adjustment is made for this group.

At the same time, to avoid double-counting, a deduction is used for self-employed and public officials also holding a marginal job.²¹ Therefore the number of marginally employed persons is 230 000 persons higher than the result of the BST (2009: 5.7 million). In comparison to the LFS result (that for this comparison includes "Ein-Euro-Jobs" and marginal short term employees), the adjustment of the EA leads to an increase of the difference to the BST and finally amounts to 2.2 million persons.

Last, but not least, the public officials are also adjusted in the EA. The difference between the EA and its main source, the PS, is 200 000 persons. As mentioned in section 3.4, the PS has not registered in detail employed persons in agencies that have been transferred from a public agency to a private one. Therefore, in those areas where there are more detailed sources than the PS, i.e. the employment statistics of the German Railway and German Postal Agency, the EA takes these sources and adjusts the PS results. Finally, the result of the EA is higher than the PS-result and very similar to the result of the LFS (both sources declare 1.8 million public officials).

Table 5 gives an overview on the net adjustments applied by the EA, either directly to the source or in the context of establishing consistent NA aggregates. As can be seen, the adjustments, in summary lead to an increase of the number of employed persons by 0.7 million persons, not more than a bit less than half of the difference between EA and LFS.

Table 5: Adjustment in the Employment Account's estimation of the total number of employed persons by status in employment, 2009

	Main Source EA		Net adjustments	EA (domestic concept)	EA (national concept)
		in 1 000			
Marginal employees	BST	5 707	228	5 935	5 935
Employees subject to full social insurance contributions	BST	27 460	315	27 775	27 675
Public officials	PS	1 635	200	1 836	1 836
Soldiers and conscripts	BMVg/BAZ	316	0	316	316
Self-employed and unpaid family workers	LFS	4 446	- 39	4 409	4 409
Total employed		39 564	708	40 271	40 171

21 For the largest share of the cases, the BST allows to identify persons exclusively holding a marginal job ("ausschließlich geringfügig Beschäftigte"). An exception are marginal employees who have a main job as self-employed or as public official. These groups are not registered at the Federal Employment Agency and therefore have to be deducted by an adjustment.

3.7 Proposal for an enhanced reconciliation table

As noted before, the reconciliation table template developed by the Eurostat Task Force on Quality of the LFS does not fully satisfactorily succeed in making the divergences between the LFS and the EA employment results transparent. As discussed in chapter 2, in such a reconciliation table, the largest part of the incoherence due to methodological differences ends up under “residual”, which is neither very informative nor does it lead to further insight as to the background of the difference.

For this reason, based on the results of the analyses presented in chapter 3, we propose a few modifications of the reconciliation table that drastically increase its informational and analytical value under the German conditions. The most important modification is the breakdown of differences in the results by status in employment. In the template recommended by the Task Force, deviations were to be differentiated by industry branches. As the analyses have shown, this is problematic in Germany (and most probably not only there) due to the severe differences regarding the operationalisation behind this variable. In this respect, although the differentiation by status in employment is not without problems either, it can help much better identifying the underlying reasons of incoherence. In analogy to the template of the Task Force for the industry branches, also our proposal first lists the deviations of the LFS compared to the primary data sources. The main difference is that the breakdown is by status in employment. In order to avoid double-counting of effects, it is important to take into account that the primary source will also have conceptual differences compared to the LFS. For example, in the case of the BST, like the EA, employed persons under the age of 15 years are included just as the persons who have a job, but are on an extended leave. These conceptual differences have been removed in order to identify the methodological differences only. For the sake of simplicity, the persons on extended leave have been deducted from the employees subject to full social insurance contributions, and the employed persons under the age of 15 years from the marginal employees (which seems at the same time to be the most plausible solution). After this slight modification, the reconciliation table shows that there are 2.2 million less marginally employed on the LFS, while there is a surplus of employees subject to full social insurance contributions that amounts to 1.6 million persons. For the groups of the public officials there is a surplus of 188 000 persons. This divergence is mostly due to the fact that the source data used for the EA exclude the ex-postal and ex-railway officials (later adjusted in the EA on the basis of other data sources), who presumably refer to themselves as “official” in the LFS interview.²²

After the presentation of the divergence from the primary sources of the EA, Table 6 (line N) indicates the extent of the net adjustments made to the Employment Accounts. Due to the complexity of the EA’s estimation approach it is not possible to give a detailed account of all the individual adjustments. Nevertheless, it should already be insightful for the user to learn about the share of the divergence that is due to adjustments in the EA estimation.

22 This is quite misleading and contrary to the results shown in section 3.4, i.e. the fact that there is only a quite small divergence for the public officials. Nevertheless, this approach was chosen as it necessary for a systematic compilation of the reconciliation table.

At the bottom of the reconciliation table three new lines have been added. In order to reduce the conceptual differences as far as possible and thus to keep the reconciliation table as simple as possible, the comparisons first refer to the LFS results including employed persons living in collective households as well as conscripts and persons obliged to render alternative civilian service. The three lines at the bottom of the table build the bridge to the standard LFS result used in international comparisons (i.e. referring to persons living in private households without conscripts and persons obliged to render alternative civilian service).

With these changes, the reconciliation table is a powerful tool to inform the users about the level of incoherence and its causes. Nevertheless, it should be noted that the reconciliation table is not without limitations. Most importantly, it can only show divergences that are quantifiable. Unfortunately, this is not always the case. For example, throughout chapter 3, there were indications that the LFS results are subject to important weighting effects. The current update of the population figures (which an important basis of the LFS's calibration marginals) seems to be overcounting the population by some 1.6 %. One might assume that this should be reflected by an overcounting of the employed persons by the same rate (which is not the case, at least not in comparison with the EA). These effects might thus explain part of the surplus for the number of employees subject to full social insurance contributions, and might even make the undercounting of marginal employees look more dramatic. However, before the population figures from the next German census become available, any quantification of these effects is highly speculative. Another limitation is that the operationalisation of the status in employment in the LFS does not fully match the operationalisations used in the other sources so that a certain degree of fuzziness cannot be denied.

**Table 6: Enhanced reconciliation table between LFS and NA estimates
of employment in Germany
Annual results, reference year 2009**

Grey cells are to be filled in by statistical institute

(1)	(2)	(3)	(4)	(5)	(6)
	Sign (a)	Thousands (b)		Source used	Notes/description
A)		40,270	NA employment – domestic concept (in persons)		
B)	+	156	Resident working outside the economic territory	1, 2, 3, 4	
C)	–	526	Non residents working inside the economic territory	5	
D)	=	40,170	NA employment – national concept (in persons)		
E)	–		Conscripts/persons carrying out alternative community service	6, 7	Included in LFS
F)	–		Employed persons living in collective households (<i>if not included in LFS figures</i>)	5	Included in LFS
G)	–	na	Unpaid trainees and apprentices (<i>if not included in LFS figures</i>)		
H)	–	na	Farmers only producing for own-consumption (<i>if not included in LFS figures</i>)		
I)	–	24	Employed persons aged less than 15	1	
	–	326	Employed persons on extended leave (> 3 months; < 50 % salary)	5	
J)	+ / –	na	Other discrepancies in definitions, concepts, coverage (<i>if applicable, please specify</i>)		
K)	=	450	Difference due to definitions, concepts, coverage $K = \text{SUM}(B:C, E:I)$		
L)		na	Difference between source used in NA and LFS for specific economic activities (e. g. agriculture, public administration, etc.) (<i>if applicable, please specify and add lines needed</i>)		
L)	–	451	Net difference between main source used in NA and LFS for specific status in employment (e. g. employees, public officials, marginally employed, etc.) (<i>if applicable, please specify and add lines needed</i>) $K = \text{SUM}(L1:L4)$		
L 1)	+	1,574	– employees fully covered by social security contributions	1	Persons on extended leave were deducted from the source
L 2)	–	2,213	– marginal employees	1	Persons aged less than 15 were deducted from the source
L 3)	+	188	– public officials and soldiers and conscripts	6, 7, 8	
L 4)	+	0	– self-employed and unpaid family workers	5	
M)	–		Adjustments for hidden/undeclared employment <u>not included in L</u> (<i>if applicable</i>)		Included in N
N)	–	708	Other adjustments (<i>if applicable, please specify and add lines needed</i>)		
O)	–	1	Residual		
P)	=	1,160	Difference due to inconsistencies among different sources $P = \text{SUM}(L:O)$		
Q)	=	38,662	LFS (c) employment (in persons) $Q = A + / - K + / - P$		
R)	–	106	Conscripts/persons carrying out alternative community service (LFS)		
S)	–	86	Employed persons living in collective households (LFS)		
T)	=	38,471	LFS employment (private households without conscripts)		

Sources: 1 Federal Employment Office; 2 Federal Pension Insurance; 3 Ministry of Finance;
4 Federal Budget; 5 Labour Force Survey; 6 Ministry of Defence; 7 Federal Office
for the Alternative Civilian Service; 8 Statistics Register on Public Personnel

4 Coherence of the intra-annual employment results

According to the European Council Regulation no. 577/1998, since the year 2005, in Germany, results from the Labour Force Survey are to be made available in quarterly frequency. Since October 2007, based on a gentleman's agreement, Germany is providing Eurostat furthermore with aggregated monthly results from the LFS.²³ Whereas monthly figures are being published for the number unemployed persons only (in four demographic breakdowns), quarterly data are being delivered to Eurostat as micro data, but not being published by the Federal Statistical Office itself.²⁴ The reason for not publishing quarterly results is mainly due to serious methodological concerns that lead to volatile and heavily biased time series. The interpretation of these series seems to be very problematic. In any case, it requires in-depth methodological knowledge of the German LFS. In some cases a meaningful interpretation seems to be hardly possible at all.

The objective of this chapter is to present the monthly as well as quarterly employment results in comparison to the EA's estimations and to give an overview on the methodological effects leading to the bias of the LFS monthly and quarterly series. The chapter, under section 4.1, first of all presents and discusses the coherence of the monthly and quarterly time series of the LFS and the EA, both the not seasonally adjusted and the seasonally adjusted values. Secondly, methodological effects that are subject to the intra-annual series are assessed in section 4.2. A third section finally tackles the issue of incoherences between the monthly and the quarterly results **within** the LFS, which are due to deviating response patterns as well as differences in the weighting schemes used.

4.1 Monthly and quarterly results from the LFS and the EA

Both the monthly and the quarterly results from the LFS largely differ from the short-term trends shown by the results from the EA. This is even more of a problem as the EA are specifically designed to provide reliable information regarding the month-to-month changes (see chapter 2), so that any deviation the LFS shows necessitates a solid justification. The following analysis firstly focuses on the original (i.e. not seasonally adjusted) results, followed by a comparison of the trend for the number of employed persons in the LFS and the EA. Taking a 12 month moving average as a rough indicator for the trend, it comes clear that the deviations regarding mid-term developments are much less distinct compared to the month-to-month changes.

4.1.1 Original results on employment

The intra-annual results from the LFS do not only differ regarding the number and structure of employed persons (as shown in chapter 3), but also regarding their trends. In most cases, the differences are more apparent for the monthly series, but they can also be

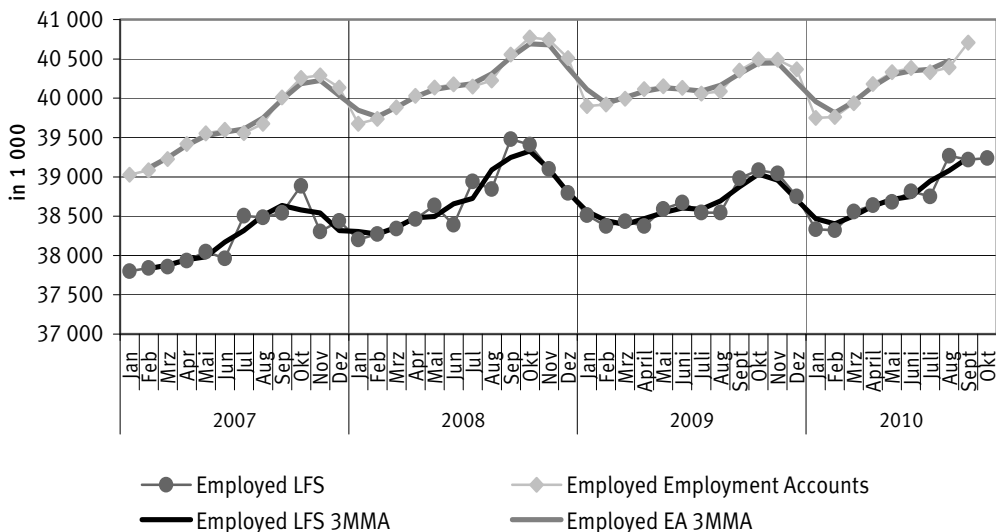
23 Monthly unemployment figures have been provided since the year 2005 on the basis of the Monthly Telephone Survey, carried out by the Federal Statistical Office Germany (see Rengers/Körner/Klass 2008).

24 The decision to publish (few) monthly, but no quarterly results might be surprising at first sight. However, the monthly publication is mainly due to a strategic decision to continue previous publications from the Monthly Telephone Survey, published from 2005 to 2007. Furthermore, a specific estimation approach has been used for the monthly statistics which smoothes the volatility out at least in the case of the seasonally adjusted results.

clearly seen in the quarterly results. It should be noted that the reasons for the deviations are similar for monthly and quarterly results, but monthly and quarterly results are also subject to specific effects, which will be further specified in section 4.3. This section puts emphasis on a comparison of the intra-annual results from the LFS and the EA.

Looking at the monthly series from January 2007 to October 2010, we can easily see that the LFS series is not only deviating from the one provided by the EA, but also lacking the seasonal stability exhibited by the EA series. As figure 18 shows, there is a similar underlying trend in both LFS and EA.²⁵ In each year in either source the number of employed persons increases in spring and (quantitatively more pronounced) in autumn, before heavily decreasing around the turn of the year. The similarity of the underlying pattern becomes more obvious when looking at the three month moving average (3MMA) of both series.

Figure 18
Employed persons in Germany, 2007 to 2010



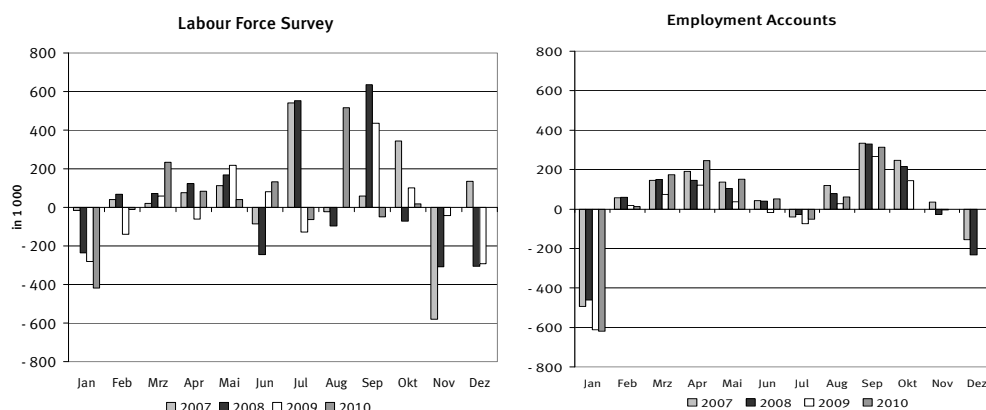
Comparing the three month moving averages, the shape of the series is similar. However, this comparison also points out some striking differences of both time series. First, the turning point in each autumn is one to two months earlier in the LFS. This is due to the fact that the hibernal decrease in employment starts earlier in the LFS and extends over more months than in the EA (in the EA the decrease essentially takes place from December to January). Secondly, and more importantly, the EA has a clear (month-specific) seasonal pattern, whereas the LFS does not.

Looking at the month-to-month changes of both the EA and the LFS, there are huge differences. The series of the EA is characterised by a very stable month-to-month pattern.

²⁵ For the LFS, figure 18 refers to all employed persons (including persons living in collective households and conscripts), not benchmarked to the quarterly results. The benchmarking to the quarterly results introduces further bias and will be discussed in section 4.3.

In contrast, in the LFS it is hard to detect a month-to-month pattern at all.²⁶ As figure 19 indicates, for the years from 2007 to 2010 (the years 2005 and 2006 are not being considered in this analysis due to phasing-in problems after the introduction of the intra-annual LFS in Germany), a clear seasonal pattern could be identified for few months at all (if any). In the EA, the month specific changes in almost all months point into the same direction. Variations in the magnitude of the specific month-to-month changes are consistent with the general economic background. For example, the increase in the number of employed persons is stronger in May 2010 compared to May 2009, which is in line with the recovery of the labour market after the crisis of the financial market.

Figure 19
Employed persons – Month-to-month changes in the LFS and the EA



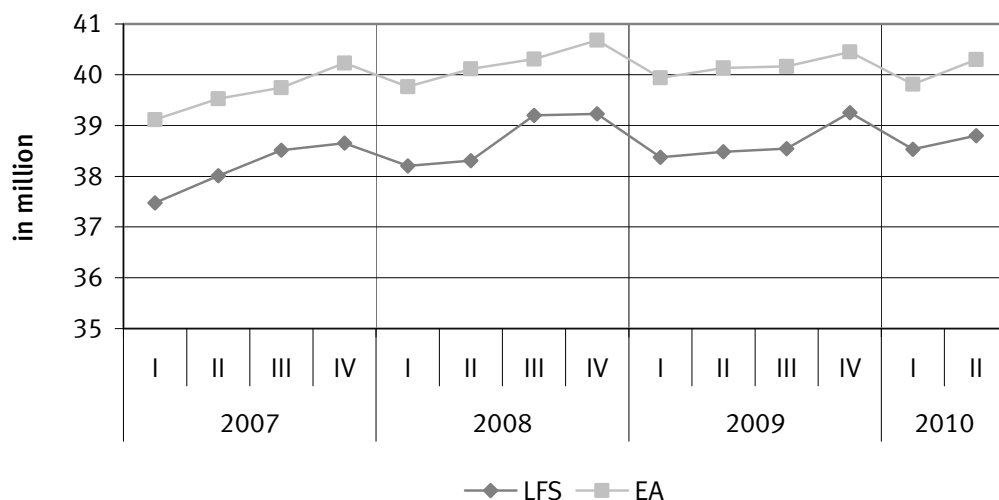
In the LFS, there are only three months for which the change had the same sign all the time (January, March and May). Even in these months, one could not speak of stable seasonal effects as – despite the consistent direction of change – the magnitude shows large variation. Variations regarding the magnitude are also frequently not consistent with the general economic context. For example, in May 2009 the increase in the number employed persons is the strongest in the entire reporting period. This is inconsistent with the fact that the labour market was still under the impact of the financial crisis at this point in time. A further feature of the monthly LFS series is that the magnitude of the month-to-month changes is much bigger than in the EA series. Apart from the month of January, in which the number of employed persons is decreasing about 0.5 million every year, the EA month-to-month changes are well below 400 000 persons. In contrast, the LFS series has frequent and often surprising month-to-month changes particularly in summer and in the second half of the year.

²⁶ This result has important implications for the possibility of applying seasonal adjustment techniques. As stated in the seasonal adjustment guidelines of the ESS, “making any seasonal [. . .] adjustment on series which do not show any evidence of [seasonal] effects is an inappropriate statistical treatment” (Eurostat 2009d, p. 8). This problem has led to the decision to use a trend estimation as a substitute for seasonal adjustment in the monthly publications of the LFS for a transition period (see Körner/Rengers 2010).

In summary, the results from the LFS, albeit providing a broadly reliable picture of the mid-term development, seem to include an erratic element on the level of the changes specific to individual months. It has to be noted that the variations are much more important when focusing on individual statuses in employment. Only the month-to-month changes for the employees subject to full social insurance contributions are the similar to the picture of all employed persons. All smaller and more specific groups show larger and implausible month-to-month changes. The marginal employees, as well as the public officials and the self-employed do not have any seasonal pattern. The magnitude of the volatility at the same time makes it unlikely that sampling errors are the only reason for this strange variation.²⁷ One might hypothesize that the groups of self-employed, public officials, but also marginal employees have distinctive features regarding their availability for the participation in the survey interview. There are indications that, e.g. self-employed tend to participate with a larger delay than other groups of employed, which might contribute to the stronger month-to-month variation.

As could easily be expected, the incoherences between EA and LFS are smaller for the quarterly series of employed persons compared to the monthly one. On a quarterly basis, similar seasonal patterns can be identified, at least when not going too much into detail (see figure 20).

Figure 20
Number of employed persons in EA and LFS (quarterly series)

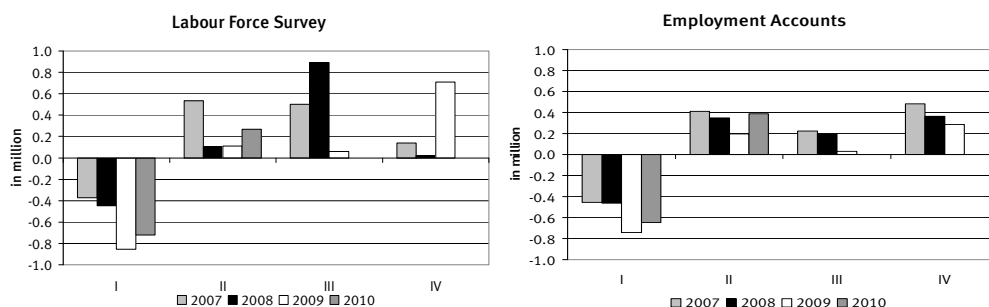


²⁷ The group of the unemployed is similar to the size of the marginal employees and the self-employed, but clearly has more features of a seasonal pattern (although also far from being perfect in this case as well).

When comparing both quarterly series more closely, it can easily be seen that both series are far from showing a parallel trend. The divergence between the EA and the LFS on average is 1.47 million employed persons, with a range from 1.1 million (third quarter 2008) to 1.8 million (second quarter 2008), without showing a specific trend. There is also no stability in the incoherence regarding certain quarters (e.g. an increase of the difference in all the third quarters).

Nevertheless, a comparison of the quarter-to-quarter changes of both EA and LFS confirms the impression that the seasonal pattern of the quarterly results is clearer than for the monthly series. At least the direction of change in the quarters is the same throughout the observation period. There are, however, few quarters in the LFS which do not fit the general picture at all and that can be identified quite clearly. The second quarter 2008, the third quarter 2008 and the fourth quarter 2009 turn out to be particularly problematic. Here, the LFS estimates a strong increase, which is not plausible in the general economic context and can neither be found in the respective results from the EA. There is some evidence that these quarters are biased due to heavy variations regarding the share of persons living in new construction areas (see section 4.2). Apart from these specific quarters, the increase in the number of employed persons is generally less strong in the fourth quarter and more pronounced in the third quarter compared to the EA.

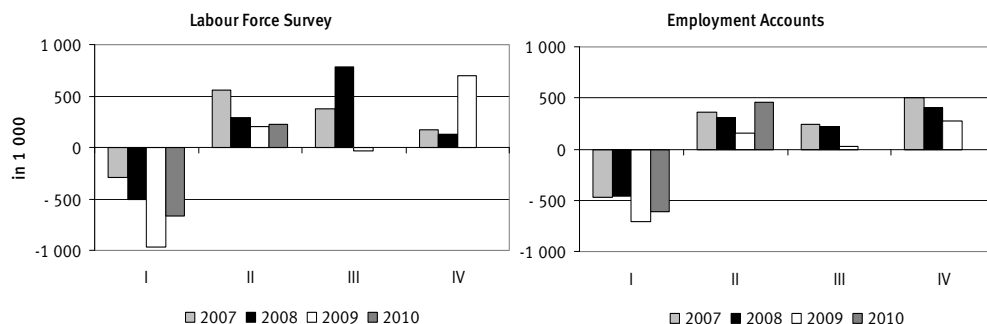
Figure 21
Quarter-to-quarter changes regarding the number of employed persons: LFS versus EA



In contrast to the monthly results, in the EA quarterly figures are also published broken down by status in employment, roughly differentiating self-employed (including unpaid family members) and employees (including public officials, soldiers as well as conscripts and persons obliged to render alternative civil service). For this reason, for the quarterly results, the comparison can be extended to this simple breakdown by status in employment. The results for the employees are largely in line with the series for all employed persons (this is not surprising as employees cover about 90 % of employed persons). Again, there are suspicious changes in 2007, quarter 1, 2008, quarters 3 and 4, as well as in 2009 quarter 4. The changes in these quarters are highly implausible and most likely due to variations in the share of persons living in new construction areas (see section 4.2). Apart from these (heavy) biases, the quarter-to-quarter changes by and large show a more similar pattern compared to the results of the EA than the monthly series.

One seemingly systematic difference nevertheless seems to be that the seasonal increase in the fourth quarters is less pronounced in the LFS, which might be an effect of the turn-of-the-year bias (see section 4.2).

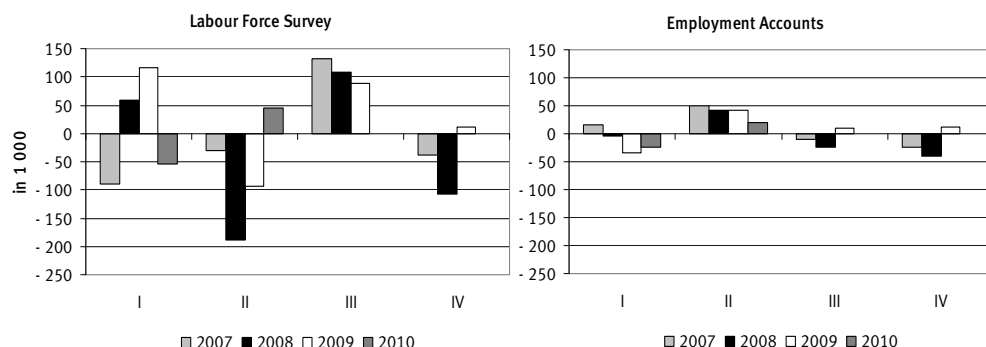
Figure 22
Quarter-to-quarter changes regarding the number of employees: LFS versus EA



The picture changes when focussing on the group of self-employed (as published by the quarterly EA, including unpaid family members). Here the seasonal pattern which could well be seen for the employees has almost completely vanished. The quarter-to-quarter changes in the LFS – taken apart maybe the third quarters – are quite erratic and do not exhibit any intra-annual pattern. Given that the subpopulation under consideration here comprises about 4.5 million persons, it seems not likely that this volatility can be attributed to sampling errors alone. Maybe it is in some way connected to the fact that the self-employed are a heterogeneous group, which is presumably more difficult-to-reach in surveys than employees. Therefore, the time series for the self-employed might be affected more strongly if the composition of the sample varies as in the case of the monthly and quarterly results. As a side remark, it should be noted that the seasonal pattern for the self-employed is not very clear in the EA either. This is due to the fact that the LFS is one of the very few sources providing intra-annual data regarding the number of self-employed persons. Therefore, the EA is in the unfortunate situation to use the information from the LFS which is deemed reliable and omit the rest. This problem leads to a seasonal pattern which is somehow attenuated.

Figure 23

Quarter-to-quarter changes regarding the number of self-employed: LFS versus EA



4.1.2 Coherence of the trend in EA and LFS

The analysis of intra-annual results normally includes some kind of time series analysis. Alongside with the original values, seasonally adjusted results are usually being published. These take into account constant seasonal patterns and make it easier to detect underlying trends. Apart from this, the publication of seasonally adjusted results is standard practice for the series of employed as well as unemployed. Unfortunately, comparing seasonally adjusted results from the LFS and the EA is not straightforward. As we have seen before, at least the monthly results from the LFS do not show a clear seasonal pattern. As stated in the Seasonal Adjustment Guidelines of the ESS, applying seasonal adjustment methods in the absence of a clear seasonal pattern has to be considered an “inappropriate statistical treatment” (Eurostat 2009d, p. 8). Although the procedure might provide a valid (and maybe even plausible) result, the result is nevertheless nothing else but a statistical artefact.²⁸

For the analyses carried out in the context of this study this unfortunate situation is problematic. On the one hand, one wants to assess the coherence of the seasonally adjusted results. On the other hand, a seasonally adjusted series is unavailable from the LFS given the lack of a seasonal pattern. Therefore, we focus on the trend as a substitute of the seasonally adjusted series. This has several advantages: First of all, by estimating the trend, not only seasonal effects but also irregular effects and methodological biases are taken into account. Consequently, it can be assessed whether the EA and LFS, despite the huge deviations in the original series, are nevertheless coherent regarding their trend. Secondly, by choosing the 12 month moving average as a simple, but robust estimation method, there are no effects which might be introduced through complex seasonal adjustment procedures or the specifications chosen for seasonal adjustment.²⁹ The drawback

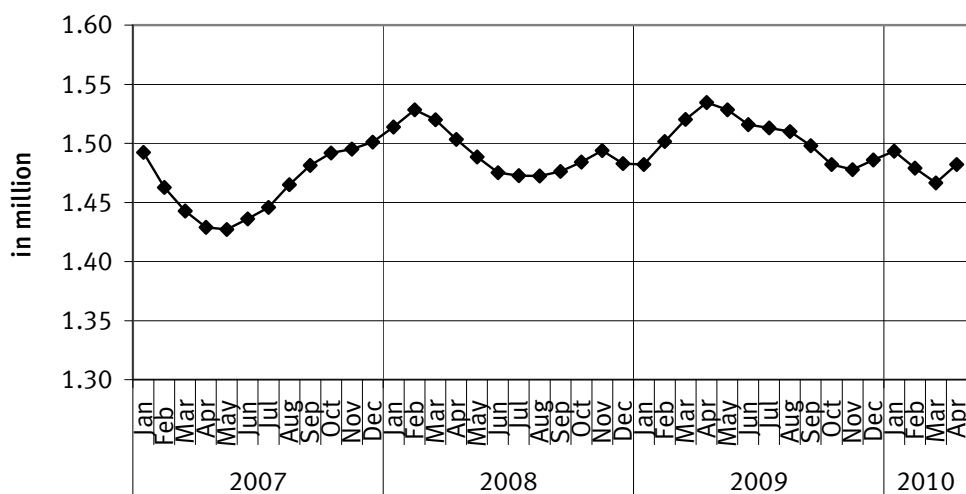
28 In the monthly unemployment statistics, this problem has been bypassed by using the seasonally adjusted results on registered unemployment from the Federal Employment Agency (which have very stable seasonal effects) as a benchmark. However, it is evident that this procedure is not suitable for a methodological analysis of the LFS.

29 The moving averages presented below were calculated using a centred 12 month moving average, with the first and the last period weighted half (moving average $(t) = (1/2(t-6) + (t-5) + (t-4) + (t-3) + (t-2) + (t-1) + (t) + (t+1) + (t+2) + (t+3) + (t+4) + (t+5) + 1/2(t+6))/12$).

of the 12 month moving average is that no results are available for the six most recent months. This could however be neglected for the present assessment, which focuses more on the time series as a whole and less on the situation in the most recent reference periods.

A comparison of the 12 month moving averages from the EA and the LFS shows only little incoherence. As indicated in figure 24, the moving average from the EA is rather constantly 1.5 million higher than the one from the LFS. It is true that difference is not strictly constant. A horizontal shape of the line in figure 24 would signify a coherent trend of EA and LFS. Nevertheless, for most months, it oscillates between 1.46 million persons and 1.54 million persons. Significantly smaller differences can be found from February to August 2007. This peculiarity is mainly due to two effects: A particularly small proportion of persons living in new construction areas in the first quarter 2007 (and hence less employed persons) as well as an overestimation of the number of employed persons in the second half of the year 2006 (which is one of the reasons why no original monthly results are being published prior to the year 2007).

Figure 24
Differences of the 12 month moving averages of the number of employed persons (EA minus LFS)



In summary, despite the huge deviations in terms of the month-to-month changes, but also the quarter-to-quarter changes, the trend of EA and LFS for the number of employed persons is largely consistent. This is however true only for recent years. The coherence of long term developments is discussed in detail in chapter 5.

4.2 Methodological problems related to the intra-annual results from the German LFS

As we have shown in section 4.1, at least the original LFS time series are characterised by high, and often implausible, rates of change from one month to another. The situation is less critical for the quarter-to-quarter changes, but also in this case there is strong

evidence that methodological effects systematically contribute to the bias. The monthly changes are often bigger than the relative standard error (RSE) of the month-to-month changes provided from the LFS. The problems are of particular importance at the turns of the year.

As analyses of variables that are (relatively) stable over time (i.e. level of education completed, marital status, one person households, etc.) indicate, the problem of the volatility on the monthly employment and unemployment data does result from systematic biases. For example, the number of persons with low educational attainment tends to be significantly lower in the beginning of each year. Correspondingly, there are more persons with higher educational attainment at the end of each year (see figure 25). It should be noted that the amplitude of the variation is reduced in 2009 and (more distinctly) in 2010, while the huge month-to-month variations persist. This can be seen in the monthly as well as in the quarterly results.

Figure 25

Number of persons with higher school degree ("Abitur" or equivalent), monthly LFS



This bias (unfortunately) cannot be attributed to one single or a few sources of error. On the contrary, there are diverse methodological effects, which are not easily assessed. As data from experimental studies are only rarely available, these effects are difficult to quantify. Even a rough assessment of the likely impact upon the monthly or quarterly results is sometimes not straightforward. The reason is that various effects interact. In some months they might cumulate, in others they neutralise each other to some degree.

The aim of this section is to present an overview of the most important methodological effects that contribute to the volatility of the time series. The main methodological features disturbing the monthly as well as the quarterly figures (apart from the usual sampling error) include effects due to

- The “sliding” reference week: The sample design applies the concept of a “sliding” reference week, which leads to high, unexpected variations in the composition of the monthly (and quarterly) samples affecting also the employment status variables.
- The “turn-of-the-year bias”: The sample was “closed” at the end of the years 2005 (partly) and 2006, leading to heavy biases in the results for the 1st and 4th quarters respectively. Similar effects occurred also in subsequent years in which “too few” households were transferred from one year to the next.
- Errors in the sampling frame. From 2007 to 2010, the share of persons living in new construction areas was subject to large variations. These variations create serious biases in the quarterly, but also in the monthly figures.
- Limited availability of monthly calibration marginals: The weighting procedure is affected by the limited availability of monthly calibration marginals causing numerous breaks in the monthly time series.
- Obsolete sampling frame: The sampling frame is to a large extent based on the last German population census carried out in 1987 leading to effects which are hard to predict. Unfortunately, this type of error is not easily assessed, unless new results become available from the next German census in 2011.

In the following paragraphs, the most important methodological effects that contribute to the volatility of the results on employment and unemployment are being discussed in more detail.

The “sliding” reference week

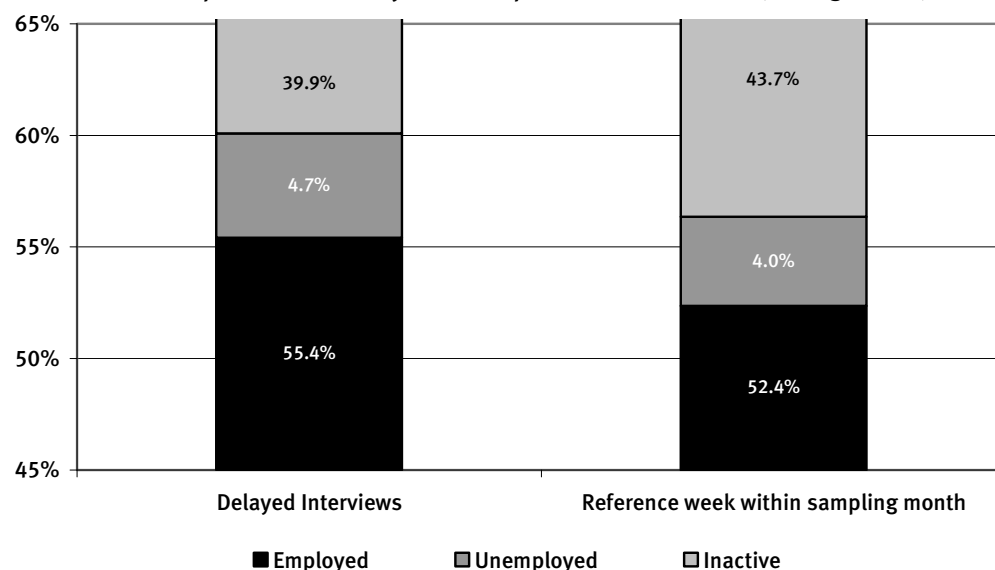
In contrast to most other member states, the German LFS applies the concept of the “sliding” reference week. According to this concept, the reference week is not being fixed during the sample selection, but is always defined as the week preceding the interview (and thus “sliding” together with delays of the interview). For this reason, about one third of the persons selected for month n , refer in their interviews to a week in the (subsequent) months $n+1$, $n+2$ etc.³⁰ In addition, a (small) proportion of the interviews is anticipated, i.e. refers to the months $n-1$, $n-2$ etc. The figures shown in the monthly and quarterly time series do, therefore, not refer to a sample selected for a specific period. They simply include every person, who had its reference week within the month or quarter under consideration. For the same reason, it is hardly possible to calculate a response rate for a specific month or quarter, simply because there is no gross sample to which one could refer. The intention of using the sliding reference week originally was to achieve an easier implementation of the fieldwork operations. One might also argue that this approach helps reducing possible memory effects and limiting the rate of proxy interviews.

30 The situation is further complicated by the fact that there are no samples allocated to each of the calendar weeks. Instead, the sample is divided into 48 (not 52 or 53) sub-samples. Interviewers receive packages with the households to be interviewed only on 24 dates per year. Thus, the gap between two interviewer packages varies between 2 and 3 weeks, which has further effects, at least for the monthly sample size. For the purpose of this study, a simplified form of presentation was chosen comparing only (derived) “sample months” and reference months. Nevertheless, this way of presentation equally allows assessing the problems connected to the concept of the “sliding” reference week.

However, while applying the concept of the sliding reference week, a bias in monthly (as well as quarterly) results can only be avoided if certain assumptions are being met. The first (unrealistic) possibility would be to assume that there are no structural differences between “punctual” interviews (persons selected for month *n* and interviewed in the same month *n*) and “delayed” interviews (persons that are being interviewed in a subsequent month).

As shown in figure 26, the punctual and the delayed interviews considerably differ regarding the employment status. The results of the interviews with the reference week within the sampling month for 2008 (the months of the year 2009 yield almost identical results) show 52.4 % employed and 4.0 % unemployed persons, whereas the results of the “delayed” interviews show 55.4 % employed and 4.7 % unemployed persons. Consequently, the share of inactive persons was significantly higher among the persons interviewed punctually.

Figure 26
Labour status of persons in “delayed” and “punctual” interviews (average 2008)



Not surprisingly, at the same time also many other socio-demographic variables show distinct differences. The share of persons with high and low level of education completed, as well as of persons with German nationality is higher in the group of punctual interviews. At the same time, the share of persons living in one-person-households is higher among the delayed interviews (see table 7).

Table 7: Socio-demographic differences of respondents who answer “delayed”

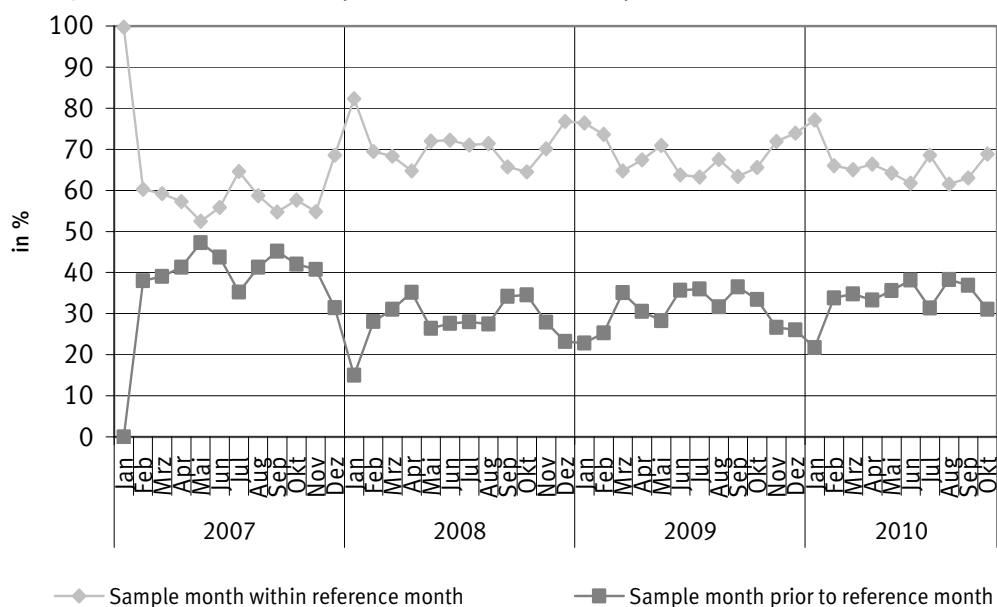
“Punctual” interviews (reference week within sampling month)	“Delayed” interviews (reference week not in sampling month)
Inactive	Employed, unemployed
25 – 49 years old	more 49 than years old
Multi-person households	One-person households
Persons with vocational training	Persons without vocational training
Persons with ISCED levels 3,4	Persons with ISCED levels 1, 2, 5, 6
Nationals (Germans)	Foreigners
CAPI	Self-administered interview (PAPI)

As the structural differences between punctual and delayed interviews are obvious, a bias in the monthly results can only be avoided if both of the two following assumptions are being met:

- The share of delayed interviews in all interviews remains constant over time.
- The structural differences between punctual and delayed interviews remain constant over time.

Figure 27

Timing of the interviews: Sample month within versus prior to reference month



Analyses clearly show that both assumptions are not being met. The percentage of interviews that have taken place in a month subsequent to the sample month varies intra-annually. This variation persists despite a reduction in the share of “delayed” interviews

from 2007 to 2008, 2009 and 2010.³¹ The month-to-month variation also in 2010 reaches ten percentage points and more. The variation seems to follow a general pattern: The share of interviews taking place within the sampling month is highest in January as well as in November and December. There also seems to be a higher proportion of interviews within the sampling month during the holiday period (although this pattern is less clear compared to the turn-of-the-year). In 2009, the percentage of “delayed” interviews varied between 23 % and 37 %. Although the impact upon the number of employed persons is difficult to quantify, this variation can obviously cause major biases especially in the month-to-month changes of employment. Also the clear differences in the time series around the turn-of-the-year compared to the EA could (at least partly) be caused by variations in the number of “delayed” interviews.

Furthermore it should be noted that the structural differences between “punctual” and “delayed” interviews are far from being constant over time as well. E.g., the share of persons with upper secondary education completed (“Abitur”) in the delayed interviews varies between 24.1 % in February 2008 and 27.5 % in November 2008. The “time series” of the share of persons with upper secondary education follows a completely different pattern for punctual interviews.

The “turn-of-the-year bias”

The magnitude of the effects of “delayed” and – at the end of the year – anticipated interviews (in the months before Christmas and New Year’s Day the interviews sometimes are anticipated in order to finalise the year) becomes even more of a problem at the turn of the year. In some years, the sample had to be “closed” at the end of the year due to organisational and legal aspects. In those years, fresh samples were used from January (2004 – 2005, 2006 – 2007). That implies that no households were „transferred” from year Y to year Y+1. In the turns of the year 2005 – 2006 and 2007 – 2008 the sample was not completely closed at the end of the year, but too little households were transferred from year Y to year Y+1. Both led to heavy biases in the 1st and 4th quarters of all results since the introduction of the continuous LFS.

Nevertheless, in more recent years, i.e. at the turns of the year 2008 to 2009 and 2009 to 2010 the situation improved further suite to technical, organisational and legal changes. The share of persons selected in the previous year was increased to 23 % in 2009 and 22 % in 2010. Nevertheless, the turn-of-the-year is still different from the transition between all the other months of the year for which the share of persons selected into the sample of previous months is bigger than 30 % in most cases (with an average of 31 % in 2009 and 33 % in 2010). The turn-of-the-year, therefore, remains a critical factor in the concept of the “sliding” reference week. The problems due to the availability of households at Christmas and New Year’s Day remain and will be difficult to solve without a change in the sampling design.³²

31 The share of interviews, for which the sample month is identical with the reference month, is 100 % in January 2007, because no cases from the sample of 2006 were transferred to the year 2007.

32 The concept of the “sliding” reference week and the turn-of-the-year bias do not only affect the labour market results, but even the annual household figures (see Statistisches Bundesamt 2009b).

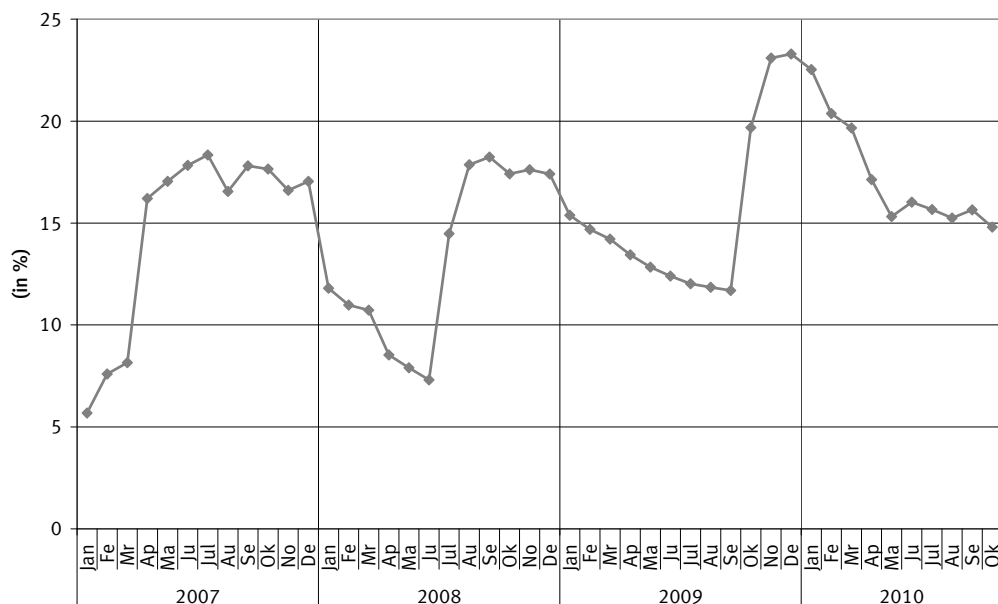
Effects due to the share of persons in new construction areas

The – maybe – most important effect, at least in terms of the magnitude of the error, was introduced more or less independently of the effects discussed so far. It is due to a bias in the sample selection that was introduced deliberately and the negative effects which had not been assessed correctly at the time of the introduction.

To understand the background some basic features of the sampling design of the LFS need to be introduced: To form the sampling frame and for subject-related stratification, data on the number of dwellings and persons, broken down by municipality, street and street number, were taken from the material of the 1987 population census for the former territory of the Federal Republic. In the new Länder and Berlin-East, the samples were formed in the same way, taking as a basis the population register “statistics”. In order not to lose persons living in areas, in which no constructions have been found in 1987 (or 1991 for the new Länder), data are taken from the statistics on construction activity to complement the sampling frame. As the construction activity proceeds, the share of these “new construction areas” is constantly increasing.

This procedure is not problematic as such (although it would clearly be very advantageous to dispose of a more up-to-date sampling frame), but following the redesign of the LFS in 2005 an error with far reaching consequences occurred. The new construction areas of each rotation quarter were allocated to one (calendar) quarter only. This was problematic as all new construction areas were allocated to the sub-sample used for the structural variables. Therefore, it has been decided to reallocate the new construction areas starting from 2007 so that they are equally distributed over all quarters of a year. This reallocation process, step-by-step, improved the situation for the structural variables and ad hoc modules but had disastrous consequences for the intra-annual results.

Persons living in new construction areas systematically differ from persons living in areas that have already been dwelled in 1987. Persons in new construction areas live in bigger households, are younger, have a higher educational attainment and are more often employed. Therefore, the intra-annual results are heavily biased for many variables. The effects upon employment are particularly striking. Whenever the share of persons living in new construction areas increases, also the number of employed persons increases.

Figure 28**Share of persons living in new construction areas (unweighted results)**

The average share of persons living in new construction areas is about 15 %. As can be seen in figure 28, the share was far below average in the first quarter 2007, and steeply increases before quarter 2 2007, quarter 3 2008 and quarter 4 2009. It always decreases at the turn of the year. This pattern is the clear consequence of the reallocation scheme. The three increases in the share of persons living in new construction areas are parallel to the increases in the number of employed persons, particularly in the third quarter 2008 (+ 900 000 employed) as well as the fourth quarter 2009 (+ 700 000 employed). These increases are by no means plausible, given the information provided by other data sources.

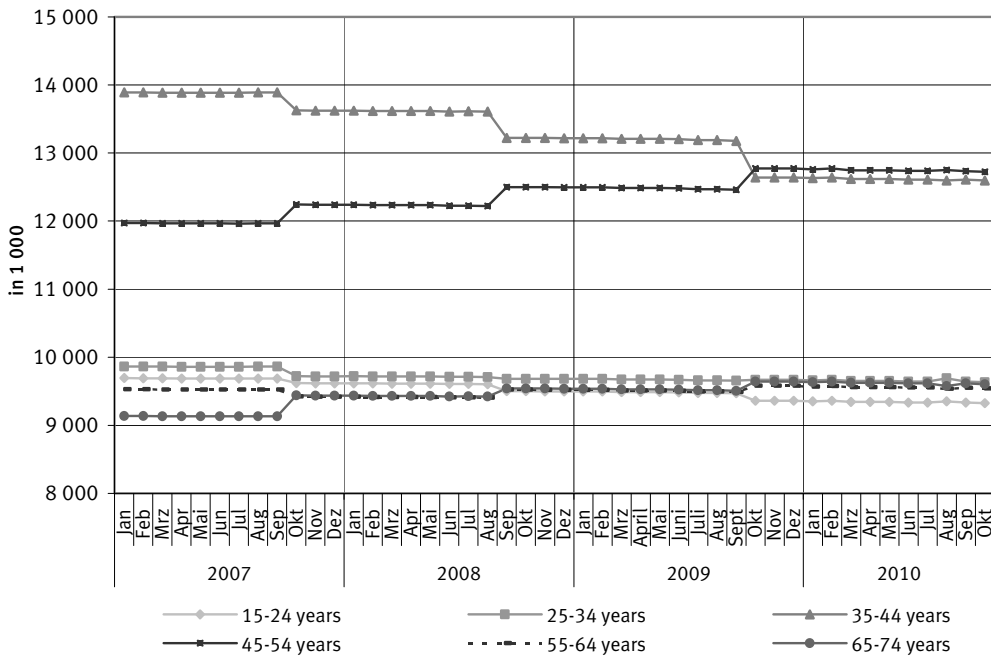
Surprisingly enough, the effects due to the share of persons living in new construction areas are much stronger in the quarterly results than in the monthly ones (the yearly results being affected only marginally). The reason presumably is the difference in the weighting scheme: Whereas, for the monthly weighting scheme, calibration is by 13 five-year age groups, the quarterly results are calibrated only by three age groups (below 15 years, 15 to 44 years, 45 years and over). As the fact that a person lives in a new construction area is strongly correlated with the age, the different weighting scheme used for the monthly results obviously neutralises some of the bias.

Fortunately, the reallocation of the persons living in new construction areas has been finished for the largest part in the fourth quarter 2010. Therefore, this effect will only impact upon the time series from 2007 to 2010, and have to be taken into account whenever (monthly as well as quarterly) data of the LFS are being disseminated.

Limited availability of intra-annual calibration marginals

Particularly the monthly results, but to a lesser degree also the quarterly ones, suffer from the limited availability of the calibration marginals. Calibration marginals by age groups are not available on a monthly basis. Calibrating the results by age, therefore, inevitably means that the age structure is being updated at some period during the year. In the case of the LFS, this update usually takes place in autumn. Depending on the demographic changes that occur in a given year, this can cause significant breaks in the time series, particularly regarding the employed persons. Figure 29 shows the number of persons in the different age bands. The breaks in the time series due to the updating of the calibration marginals can clearly be seen.

Figure 29
Population by age groups, monthly LFS



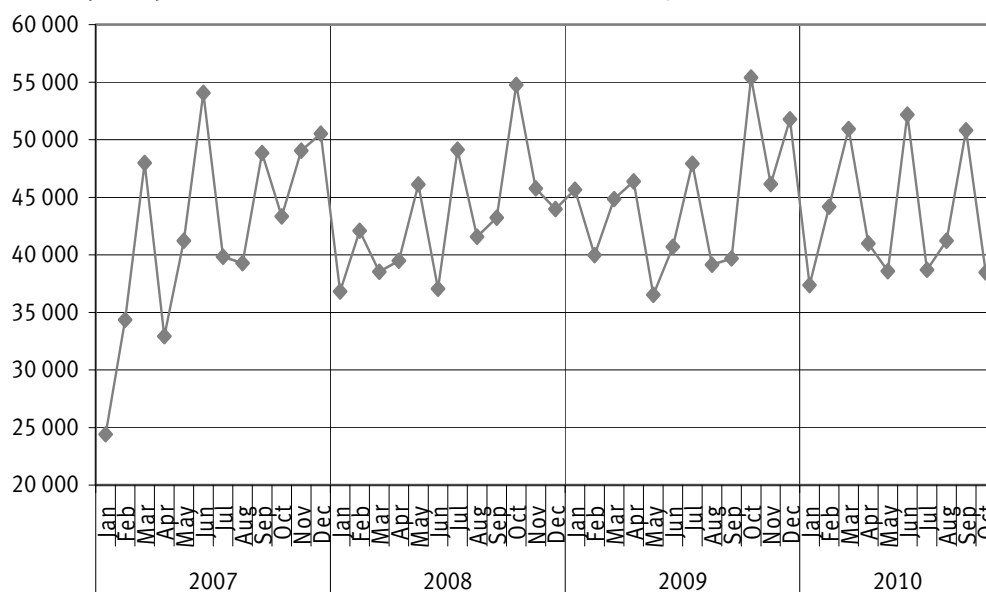
Although the breaks in the different age groups might partially neutralise each other in terms of the effects upon the employment figure, there also seem to be systematic effects. The groups with rather high employment rates seem to decrease with the updates of the population figures (in particular, the decrease of those aged 35 to 44 years is only partly paralleled by an increase of persons aged 45 to 54 years).

Sampling design and sampling error

Still caused by the effects of the “sliding” reference week, the monthly sample size is very volatile itself, not regarding any special characteristic of the respondents. The sample size varies from 25 000 to 55 000 interviews per month (see figure 30). This contributes to some variation regarding the sampling error. As no monthly (nor quarterly) rotation is

being used in Germany, in the relative standard error for the month-to-month change rate reaches considerable levels (around 5 %). Looking at the 95 % confidence intervals, it is only possible to state a clear increase or decrease of unemployment in four (out of 25) months since 2007.

Figure 30
Monthly sample size of the German LFS (number of unweighted cases)



4.3 Coherence of monthly and quarterly results

There are also deviations between the monthly and the quarterly results of the LFS. The reasons for these deviations are manifold. The following items are considered to be of major importance:

- The size and composition of the sample differs. While there are between 130 000 and 170 000 persons in each quarter,³³ the respective months sum up to no more than 120 000 and 140 000 persons. Due to the specificities of the sampling design, the difference is smallest in the first quarter of the year and tends to be largest in the fourth quarter of each year. The difference is due to the fact that, for the production of the monthly results, only those cases can be considered that are processed by the Sunday following the last reference week of a month. That leads to a lower share of persons interviewed with the self-administered questionnaire, for which data capture and editing requires more time than for the personal interviews. For the year 2009, the average share of interviews with the self-administered questionnaire was 17.4 % for the monthly samples, but 20.4 % for the quarterly ones (unweighted re-

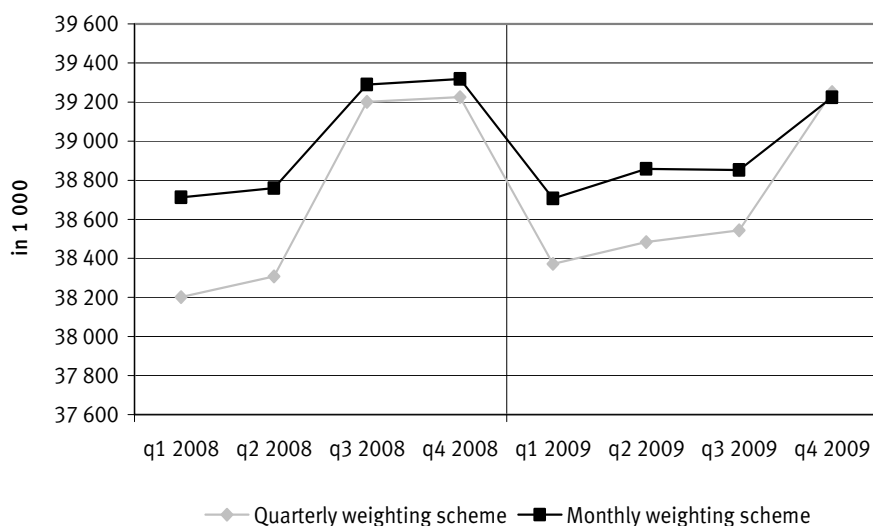
³³ An exception is the first quarter 2007, which due to the turn-of-the-year bias contained no more than 106 000 persons.

sults).³⁴ This leads to a slight underestimation of the number of employed, but also of unemployed persons in the monthly results, while the number of economically inactive persons is slightly overestimated in the monthly results.

- A different weighting scheme is being applied for the estimation of the monthly results. The breakdowns and cross-combinations of the calibration marginals used, is implemented differently in the monthly and the quarterly weighting. The most significant difference is the weighting by age groups. While there is a differentiation of 13 (five-year) age groups in the monthly weighting scheme, there are only three age groups in the quarterly LFS (under 15 years, 15 to 44 years, 45 years and over). As the age structure of the unweighted sample and the population statistics (the source from which the marginals are being obtained) differs surprisingly strong, the impacts on the number of employed and unemployed persons are quite heavy as well. If the weighting scheme with 13 age groups as an additional constraint for the quarterly weighting is used, the number of employed persons rises, particularly in those months where the number of persons in new construction areas is smaller.

In order to quantify this effect, the weighting scheme used for the monthly results has been applied to the quarterly results for the years 2008 and 2009 for the purpose of methodological tests. The results confirmed that the weighting scheme is one of the key factors for the differences (see figure 31). It is important to note that the results shown in figure 31 are based on **identical** unweighted data.

Figure 31
Employed persons in the quarterly LFS: The weighting scheme of the monthly and the quarterly sample in comparison



³⁴ In the LFS 2009, 17 % of the economically not active persons, but 22 % of the unemployed and 23 % of the employed were using the self-administered paper-and-pencil questionnaire (unweighted results). Besides, it should be noted that the experimental study Q-MED LFS suggested that the self-administered questionnaire as such was performing worse than the interviewer-administered modes in capturing persons in employment (see Statistisches Bundesamt 2010).

Generally, using the monthly weighting scheme with the breakdown by 13 age groups, the number of employed persons is higher by 0.2 to 0.3 million persons (or 0.7 %). But this is not all. The effect is far from being stable over time. It increases to 0.5 million in the first and second quarter 2008 and reduces to less than 0.1 million in the third quarter 2008 and the fourth quarters 2008 and 2009. One can see at first sight that the trends obtained with the monthly weighting scheme are far more plausible (compared to the results of the EA, but also the general economic trends). As presumed before, obviously the monthly weighting scheme helps to attenuate the effects due to the variations of the share of persons living in new construction areas.

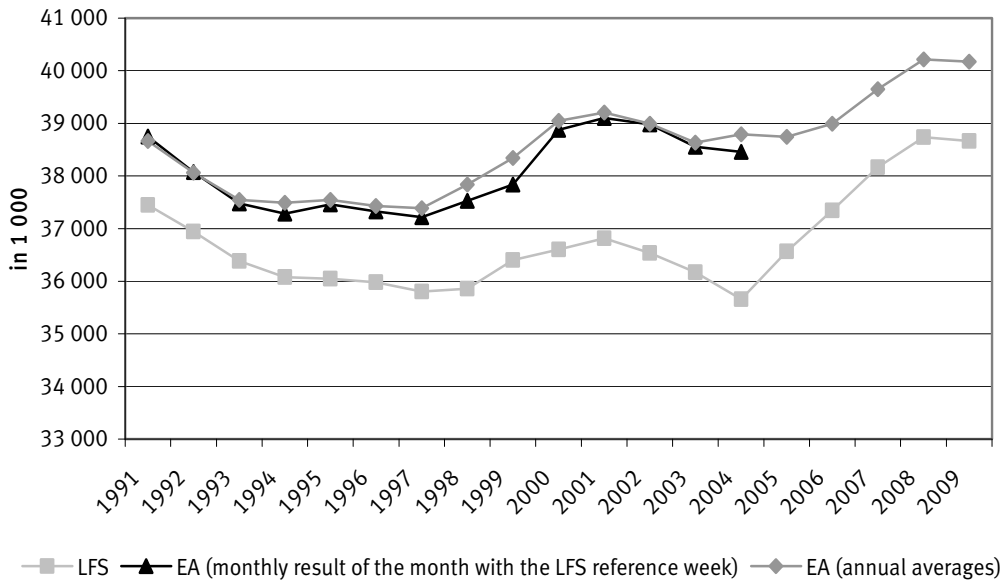
- The effects due the variations of the number of persons living in new construction areas obviously have a different impact on the monthly and on the quarterly results. The background presumably is that the fact that a person lives in a new construction area is correlated with the age, so that the more differentiated weighting by age group can obviously neutralise some of the effects related to variations of the new construction areas.

5 Coherence of long term employment developments

The long-term developments of employment figures are a key outcome of both the Employment Accounts and the Labour Force Survey. In a very rough assessment, the LFS and EA display the long-term socio-economic developments regarding employment in Germany in a largely corresponding way. For example, the main developments of the number of employed persons since the early 1990s are quite similar in both statistics (although not consistent regarding each individual year-to-year change). The changing distribution of employed persons within the major economic sectors (increase of the number of employed in the tertiary sector, decrease in the secondary sector) is shown largely in unison. Deviations of the annual series of the LFS and EA are usually due to methodical breaks in different years, but in the overall picture the series do not fundamentally deviate. At the same time, a closer analysis of the yearly results from LFS and EA also reveals important differences, e.g. around the years 2000, as well as 2004 – 2005 and 2006.

This section provides the methodological background for the time series breaks in the LFS. Regardless of the roughly matching long-term trend, the LFS and EA, however, differ as to the number of employed persons (see section 3.1, p. 35 sq.) and its breakdowns by sex, age and employment status.

Figure 32
Total employment 1991 – 2009 ³⁵



³⁵ Before 2005: LFS results of a single reference week in spring; 2005 onwards: yearly average.

5.1 Description of the major methodological changes in the LFS since 1991

• Impact of termination of the single reference week and the change to a continuous survey

Before 2005, the LFS was carried out annually with a single reference week in spring. The reference week was usually the last holiday-free week in April, but varied depending on the calendar conditions between the months of March and May (prior to the year 1991 sometimes even in June). Thus, the reference week in 2003 was in May, in 2004 in March. With this significant distance between the reference weeks in two consecutive years, effects to the number of employed are obvious, as employment varies seasonally. For interpretations of the time series this must be taken into account, particularly in regard to the years 2003 and 2004. Furthermore, the break due to the change to a continuous survey is visible in the time series in the year 2004 to 2005.

Since 2005, the LFS is collected continuously throughout the year and provides results for annual averages. This stands in contrast to the spring results until 2004 that represent only the conditions at the time of the spring-terminated reference week. Regarding the figures on employment, and despite the ongoing problems in achieving an equal distribution of the sample over the calendar weeks, this is an important improvement. The number of employed persons in the LFS increases (and the difference to the EA becomes smaller) partly because the result of an annual average is usually higher than the monthly employment in spring.

• Changes to the leading questions on employment

Breaks in the employment figures of the LFS also result from changes in the first block of questions, the “leading questions” (Leitfragen) on the employment status. Since the year 1992 they have been changed in 1996, 2005 and 2007 – 2010. Generally, employment is not being measured by a single question, but a sequence of “leading” questions that try to capture all kinds of employment according to the labour force concept. Since the 1990s, this system of leading questions was modified several times in order to improve the measurement of employment, e.g. regarding persons in marginal employment or holding casual jobs. The main changes to the leading questions for the measurement of employment are documented in Körner/Puch (2009). Unfortunately, the effects of questionnaire changes and its effects on the number of employed are hardly possible to quantify, since they overlap with other effects (especially in 2005). Split ballot experiments have not taken place so that any estimation regarding the effects is an approximation only. Given this restriction, the impacts on the time series on employment are estimated as follows:

- 1996: The leading questions were modified by adding an additional question for persons with a job, but not at work and a probing question on persons in marginal employment. Compared to the results from the EA, the modification however showed no remarkable changes in the total number of employed persons. However, there is evidence of significant effects of an exchange between different groups of employment. This concerns in particular the time series of persons in marginal employment. However, over the years the total number of employed persons shows no major impact.

- 2005: The fundamental reformulation of the leading questions on employment led to an improved detection of employment activities. As a result, an increase related to the changed methodology can be seen in 2005 in comparison to the previous year. However, the increase caused by the change in the weighting scheme is estimated to be quantitatively more significant (see below). Thus, approximately 85 % of the increase in the number of employed persons from 2004 to 2005 is due to the changed weighting scheme.
- 2007: The changes of the leading questions in 2007 were thought to be of minor relevance. The main change was done in context with the first leading question: It was split into two, the first one asking if a person was working at least one hour in the reference week, the second one asking if the respondent had an employment or occupation (in order to capture also jobs of self-employed who did not make profit in the reference week). In the total number of employed persons any impact can hardly be seen, but there are effects regarding the distribution of the employed on the leading questions.
- 2008: The change of the first leading question in 2007 was withdrawn following the feedback from interviewers as well as respondents who argued that the system of leading questions was becoming too complex and increasingly difficult to handle in practical fieldwork. Furthermore, the questions for the persons having a job, but not being at work were newly organised. In total these changes did not have a visible effect upon the total number of employed persons.
- 2009: The system of the leading questions was further simplified by moving the question on marginal employment in the main job into the questionnaire section on the main job. This change concerned the measurement of the employment status only indirectly and had no visible effects upon the total number of employed persons. Nevertheless, one effect was a slight reduction in the number of employed persons who indicated that their main job was marginal employment.
- 2010: Following the results from a small-scale cognitive pretest, the explanations and instructions in the self-administered version of the questionnaire were redesigned. For explanations and examples broad use was made of boxes. The wording and order of the questions as such remained unchanged. The effects of the redesign can not yet be evaluated conclusively. However, the results from the first three quarters of 2010 indicate that no dramatic effects have taken place. It should be noted that most of the changes introduced in 2010 have been removed again in 2011 when a radical redesign of the questionnaire with a changed order of questions and a new approach regarding the leading questions was executed (see Gauckler/Körner 2010). Furthermore the layout of the skip instructions was radically revised in 2011 as well.

- **Change of the weighting scheme in 2005**

For the interpretation of the time series, the redesign of the weighting scheme in the context of the transition to a continuous survey in 2005 is of great importance. In this context, it should be noted that the calculation of the weights, in addition to cali-

bration marginals for sex, region, and nationality,³⁶ now started to use three age groups (under 15 years, 15 to 44 years, 45 years and older). To calculate the weighting marginals, the updates of the current population figures (LBF) were used.

This change resulted in an improved coherence of the age structure of the LFS with the LBF from the year 2005 onwards.³⁷ At the same time, it also means that the temporal comparability of LFS results is limited for variables that strongly correlate with the age of the respondents. This is also the case for some characteristics of employment (for more details, see Iversen 2007; Afentakis/Bihler 2005).

The modified weighting scheme and the improved coherence of the age structure of the LBF also lead to a methodologically related increase in the number of employed persons of almost 700 000 people, representing about 85 % of the total increase from 2004 to 2005. In addition, the new weighting scheme affected the number of younger employed workers and temporary employees by a larger increase. Hardly any effect is visible regarding the distribution of the employed persons by sex, residence in East and West Germany as well as in full-time and part-time employment.

- **Improvements in fieldwork and interviewer training**

- 1997: Through an intensified public debate as well as an improved interviewer training awareness was raised for the growing importance of marginal employment. It was assumed that the larger attention devoted to the issue of marginal employment led to an improved measurement (“Aufmerksamkeitseffekt”). However, while there is a suspicious increase of marginal employees, no significant effect can be detected for the entire group of employed persons.
- 1998: In an experimental study integrated in the regular LFS fieldwork, 5 % of the respondents received a special treatment using a showcard with examples of typical marginal employment situations. The resulting showcard effect (“Karten-effekt”) led to an increase of the number of marginal employees, but did again not affect the development of the entire group of employed persons. It can not be excluded that the awareness raised by the discussion is one of the reasons for the strong increase in the number employed persons (as well as in the number of marginal employees) in the year 1999.
- 2005 and 2006: The change to the continuous survey went along with a number of improvements in the fieldwork and the training of interviewers. Notable are particularly the higher standardization of the survey by the implementation of computer-assisted personal interviews (CAPI), the reduction of the number of interviewers and the intensification of interviewer training in regard to the ILO employment status.

36 Further marginals are applied for the weighting of the soldiers, conscripts, and persons obliged to render alternative civil service.

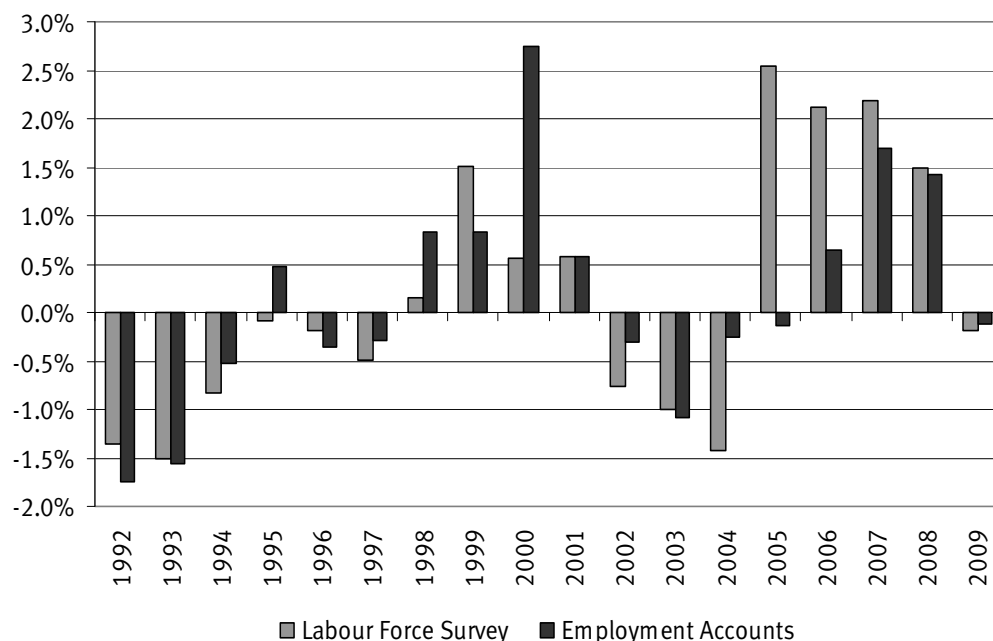
37 The choice of having only three age groups (instead of 13 as required by the Council regulation no. 577/1998) involved that the age structure from the LFS and the LBS are still fairly incoherent **within** the age classes chosen for calibration.

Comparisons with other sources indicate that these improvements have led to a better surveying of the working population and thus to a methodologically-related increase in employment in 2005 and (in particular) in 2006.

All together it can be stated that, while the impact of the measures taken in the 1990s is not fully clear, the results of the continuous LFS from the year 2005 are only partly comparable with the annual results of previous LFS. When interpreting the change in the employment figures from 2004 to 2005 and onwards, the major changes in 2005 should be kept in mind as well as further changes to the questionnaire, which were made successively in the following years.

5.2 Results and quantification (as far as possible) of changes

As stated in the first part of this chapter, the LFS and the EA display quite similar long-term socio-economic developments in Germany. Nevertheless, there is a difference in the level of employed persons that varies from 1.2 million in the early nineties to 2.5 million persons in 2004. In 2009, the difference, following the numerous changes to the LFS was again reduced to 1.5 million persons (see figure 32, section 5.1). In order to assess the differences of the long-term trend also a comparison of the year-to-year change rates is instructive. As figure 33 shows, the year-to-year changes in the LFS and the EA are quite similar in most years. Nevertheless, there are also years with striking differences: In 1995 and 2000, the EA show a far stronger increase of the number of employed persons than the LFS. The reason of this difference is difficult to determine today, all the more as there were no apparent changes to the methodological set-up of the LFS in these years. Also the years 2004 to 2006 show strongly diverging trends. Of these divergences, the background for the year 2004 is again unclear, while the divergences in 2005, 2006 (and, at a smaller scale, also in 2007) are clearly due to the methodological changes in the LFS just mentioned. The exact reasons are manifold, as mentioned above, and mostly due to changes in the methodology of the LFS.

Figure 33**Number of employed persons: Year-to-year changes in EA and LFS 1992 – 2009 ³⁸**

Starting with the effects of the reference week, shown in a comparison of the LFS results to the annual average of the EA, this section tries to quantify the impact of given factors and changes. In the comparison of the results from the EA and the LFS 1991 to 2004 the reference week in spring was one common explanation. On the basis of the EA results for the month of the LFS-reference week of each year, this reason of difference has been tried to quantify. Figure 32 in section 5.1 displays, the LFS result and two lines for the results of the EA. The mid-grey line shows the results of the EA result for the month of the LFS-reference week, whereas the black line illustrates the EA result of the annual average. This analysis proves that the annual average is not one to one the same as the results of a month in spring. The spring result is by up to 500 000 (in 1999) employed persons lower than the annual average. The average difference of the spring month result and the annual average is about 150 000. Therefore, this might explain a part, but not the whole difference of up to 2.5 million employed persons.

38 The changes for both EA and LFS refer to the month with the single reference week of the LFS (before 2005) respectively to the annual average (from 2005 onwards). Some of the difference might before 2005 be due to the fact that the LFS focuses on a single reference week, while the EA give a monthly average, referring to all weeks of the month under consideration. Furthermore it should be kept in mind that the LFS referred to a single reference week in spring, but it took several months to complete the fieldwork operations. Therefore, the results regarding employment in the reference week are quite likely to be biased through some memory effects.

The quantification of the impact of changes in the leading questions is much harder. The leading questions have been changed in the years 1996, 2005 and 2007 – 2010.³⁹ As an introduction the composition of the leading questions is listed in table 8. Here, it can be seen, that the question on an employment activity not carried out in the reference week has been added in 1996.

Table 8: Composition of leading questions on employment 1991 – 2009

Leading question . . .	1991 – 1995	1996 – 2004	2005 – 2009
1	Question on economic activity of at least one hour during reference week		
2		Question on economic activity, but not in the reference week	
3	Question on unpaid family members		
4	Question on marginal employment		
5			Question on casual employment

An analysis of the number of persons who answer positively to one of the leading employment questions⁴⁰ shows, that most respondents react to the first leading question (see figure 34). Since the second question has been introduced in 1996, about 1.5 % to 2 % answered this question. From 2005 onwards, very probably in context with an improved interviewer training, it became more relevant. Since 2005 the average share of persons responding to the second leading question (asking for persons having a job, but not having been at work in the reference week) is 7 %. The two extreme values of 2005 and 2007 might be explainable by phasing-in problems of the continuous survey in 2005 and an overload of questions in the questionnaire in 2007.

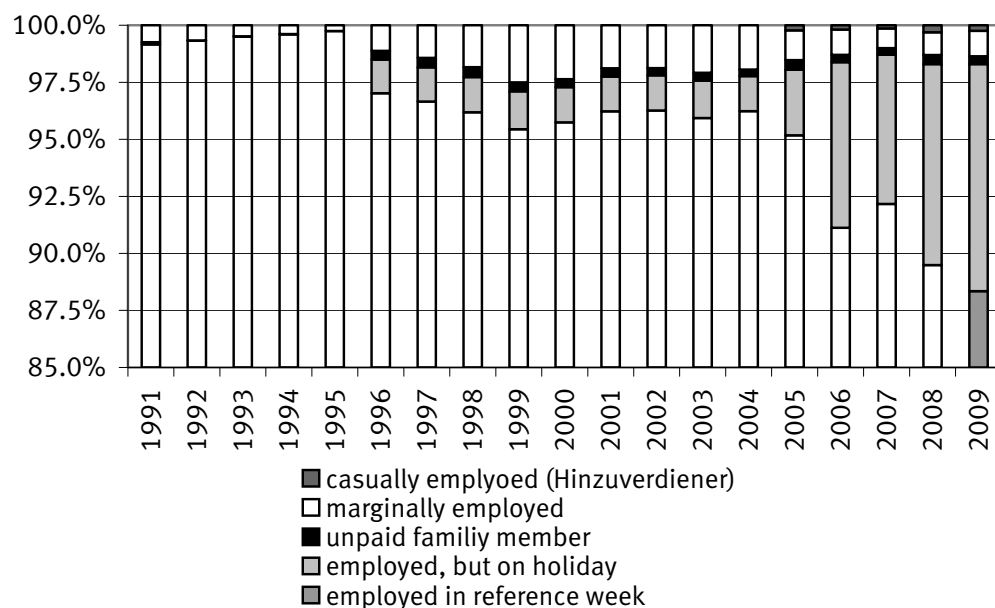
The question on unpaid family members is very stable over time, about 0.3 % to 0.4 % answer this question positively. Marginal employment is of great importance because this question is meant to detect all persons with marginal jobs. From 1991 to 1995 hardly anybody answered here. This is probably due to the fact that marginal employment did not play such a big role in those days. Another possible explanation might be that the interviewers were trained to detect any kind of employment in the first question. From 1996 the question gave separate results – about 2 % of the respondents expressed here that they are employed. From 2005 onwards this share decreased, very probably due to the fact that much more persons responded to the second leading question and the additional leading question on casual jobs was introduced.

39 A detailed list of the questions (in German) and the changes can be found in Körner/Puch (2009).

40 The analysis on the leading questions took the first answer of a person reporting an employment activity. Therefore, no person is counted twice. And, the total number of persons responding to the leading questions is higher than the number of employed persons, because the question on the reason for not working in the reference week and the duration of absence has not been taken into account.

The last leading question on casual employment, added in 2005, was meant to detect all those persons in employment who feel they have another main status and do not answer in the first leading questions due to this reason. It addresses explicitly students and retired persons with minor jobs. But it did not have the impact that was expected: Only 0.2 % answer to this question.

Figure 34
Share of persons answering to the different leading questions



The effects of the improved interviewer training and the re-organised field work can not be quantified. There is a project on the effects of different modes used in the LFS which states that there are mode effects, which also affect the measurement of the number of employed persons.⁴¹ But, due to a missing split-ballot-experiment the changes in 2005 can not be quantified.

Last but not least, the effect of the change to the new weighting scheme can be quantified rudimentarily. To examine the possible effects of the weighting scheme including the adjustment to figures from the LBF, the LFS results for 2005 and 2006 were compared using the old and the new weighting factors. This analysis can only be done in the two mentioned years, but it gives hints on the effect of the new weighting scheme. In addition, the raw data and the weighted data of the LFS results 2009 have been compared to different secondary sources, i.e. the BST. The main results of the tests are:

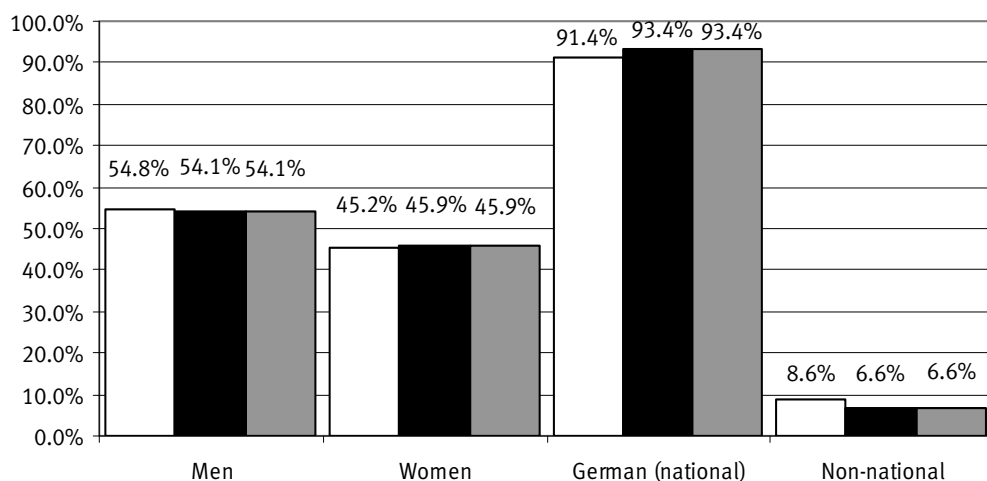
⁴¹ For further details see: Statistische Ämter des Bundes und der Länder (2010): Quantifizierung von Methodeffekten unterschiedlicher Erhebungsinstrumente auf die Datenqualität im Labour Force Survey, Wiesbaden, 2010.

- The share of employees by specific breakdowns from the unweighted data in 2009 matches much better to the results of BST than the weighted data. Broken down by age group and sex, differences in some demographic groups are identified. But it seems that the unweighted data of the LFS is equivalent to the structure of the BST data rather than that of the weighted LFS results. This is especially true for the employees subject to full social insurance contributions by gender and nationality (see figure 35).

The weighted data show a higher share of non-national workers than the unweighted data. This could also be due to the new weighting procedure for the non-national population. It adjusts the Turkish population to benchmarks from the Central Register of Foreigners and the rest of the foreign population to the LBF.

Figure 35

Share of employees subject to full social insurance contributions in the BST, the weighted LFS and the unweighted data of the LFS 2009 by sex and nationality



□ Labour Force Survey (weighted) ■ Labour Force Survey (raw) ▒ Employment Statistics Register (BST)

- The comparison of the different weighting schemes showed that the results of the old weighting scheme are more similar to those of the BST. The new weighting scheme leads to an increase in the number of employed persons below the age of 44 years and to a decrease of the older age groups (see table 9). A further breakdown shows this tendency for all types of employment, albeit at different levels.

Table 9: Effects of the new weighting scheme on the number of employed persons, LFS 2005 ⁴²

	Men	Women	Total
	%		
Employed persons (aged ... to ... years)			
15 – 74	1.5	2.1	1.9
15 – 24	6.5	5.4	6.0
25 – 34	6.0	5.4	5.7
35 – 44	3.4	3.7	3.5
45 – 54	– 2.4	– 0.8	– 1.7
55 – 64	– 3.5	– 2.6	– 3.1
65 – 74	– 4.8	– 4.1	– 4.5
Fixed-term contract	6.2	4.1	5.2
Open ended contract	1.4	2.0	1.7
Full-time	1.8	3.2	2.3
Part-time	2.4	1.0	1.2
Employees subject to full social insurance contributions	1.6	2.5	2.0
Other employed persons	2.7	1.5	2.1
Marginally employed	2.7	1.3	1.7
Other employed persons	1.8	2.4	2.0
Germans	2.0	2.3	2.2
Non-Germans	0.2	0.9	0.4
Self-employed	0.3	1.3	0.6
Unpaid family members	0.6	0.6	0.6
Employees and public officials (without persons in vocational training)	1.9	2.2	2.1
Persons in vocational training . .	3.9	4.4	4.1
Conscripts	17.8	.	17.8

As a conclusion it could be stated that the impact of the new weighting scheme in 2005 revealed that the age structure of the unweighted LFS data distinctly deviates from the age structure of the population benchmarks from the LBF.

⁴² Increase or decrease (in %) of the results using the new weighting factor compared to the weighting scheme used before 2005.

6 The German Labour Force Survey and the Unemployment Statistics Register in comparison

Apart from the coherence of the employment results, the coherence of registered unemployment figures also receives attention by the users, albeit to a somewhat lesser degree. Although the unemployment according to the Labour Force Concept of the ILO is the headline indicator in the LFS context, the number of registered unemployed is also an important variable – in the Unemployment Statistics Register, but also in the LFS. In the media coverage of German labour market developments, the number of registered unemployed is even – and until today undisputedly – the indicator which receives the highest interest. Hence, unemployment statistics in Germany in the media is dominated by one data source – the Unemployment Statistics Register (USR) from the Federal Employment Agency. As the concept of registered unemployment is determined by the German social legislation and differs in some important aspects from the unemployment according to the Labour Force Concept of the ILO, any analysis of coherence has to focus on the number of registered unemployed, which is available from both sources. In addition to unemployed according to ILO definitions, the Federal Statistical Office obtains the number of registered unemployed also through a question from the LFS. Despite only marginal conceptual differences, the results are even more incoherent compared to the employment figures from the EA and the LFS.

A comparison of the results on registered unemployment is – as with the comparison of the results on employees using the BST and LFS (see section 3.1) – not straightforward. It has to be noted, first, that the operationalisation in the USR and LFS is different. While the LFS relies upon the self-declared status of the respondent (“Have you, in the past week, been registered as unemployed or as a job-seeker at the Employment Agency or other labour authorities?”), the USR uses the administrative data resulting from the administrative reporting procedures. In these reporting procedures, the different legal regulations of the Social Code Book (SGB), book II and III, are being applied. These complex social legislative provisions are principally difficult to operationalise in household surveys. The main problem is that it cannot be assumed that all respondents know about their official registration status. Thus, concerning the categorisation as an unemployed person, for example, the social code separates groups of persons that are not counted in the statistics. It is to be assumed that the respondents of a survey are not always aware of these fine distinctions and would declare their status as registered unemployed. The task of the respondents is further complicated by the fact that the legal provisions regarding the question which groups are to be counted as registered unemployed have been changed quite often in recent years (for an overview, see Hartmann 2009 and Bundesagentur für Arbeit 2009).

Such legal provisions first of all concern persons who participated in active labour market policy programmes (such as training measures or the workfare scheme “Ein-Euro-Job”) or persons who are not available for the placement efforts of the Federal Employment Agency for other reasons (such as illness or holiday). Furthermore, it concerns persons from the age of 58 years, who do not have to be available for the labour market (“58 threshold rule”) and persons who are looking for a vocational training (Suche nach einem Berufs-

ausbildungsplatz).⁴³ All these groups are not counted in the statistics as registered unemployed. In contrast, in a household survey there are reasons to assume that some of these persons might answer they are registered unemployed, because in their self perception the (close) contact to the employment agencies to receive support and advice reminds them of their registration. Furthermore, in everyday life's knowledge, the term "arbeitslos" (unemployed) is used in a somewhat broader sense compared to the criteria laid down in social legislation.

This chapter discusses the conceptual and methodological differences between the USR and the LFS. In the following chapter 7, the annual results from both sources are compared and the differences are quantified. As a background for these analyses the following section starts with a brief description of both, the Unemployment Statistics Register and the Labour Force Survey, as well as a detailed picture of the conceptual differences of both sources.

6.1 The Unemployment Statistics Register (USR)

The Unemployment Statistics Register is a statistical register with information on the registration of persons seeking support or benefits from regional employment agencies or further local social administration agencies (Träger der Grundsicherung für Arbeitsuchende). The Federal Employment Agency publishes results for registered unemployed on a monthly, quarterly and yearly basis. The legal aspects of the register and its content are specified in the SGB. According to the legal definition of § 16 SGB III, a person is registered unemployed if (1) the person does not have an employment relationship (of 15 hours per week or more), (2) is seeking an employment and is available to placement efforts of the Employment Agency and (3) registers him- or herself as unemployed at an Employment Agency.

A further specification of the concept is described in §§ 116 sq SGB III concerning the entitlement to unemployment benefits. Furthermore, there are particular requirements that are important for an interpretation of the statistical number of unemployed (for a more detailed description, see Hartmann 2009):

- **Age restriction**
 - Employees, who have reached the standard retirement age as defined in SGB VI, are not entitled to unemployment benefits from the beginning of the next month (§ 117 Para. 2 SGB III). It follows that the registered unemployment status also ends with exceeding that age. Currently, this limit is at the age of 65 years, but will gradually increase in the coming years to the age of 67.
- Since 2008, unemployed persons under the jurisdiction of the SGB II (arbeitslose erwerbsfähige Hilfebedürftige) who received unemployment benefits for at least 12 months and are over the age of 58 years, are no longer counted as unemployed if they did not receive a job offer for an employment subject to full social

⁴³ The "58 threshold rule", for unemployed under the jurisdiction of the SGB III (one third of all registered unemployed), has been discontinued from 2008 onwards, which was followed by an increase of the number of registered unemployed aged 58 years and over in the years 2009 and (particularly) in 2010, which was neither mirrored by the general economic trends nor by the results from the LFS.

security contributions in the last twelve months, even if all other criteria for the registered unemployment status are fulfilled. Confusingly enough, a similar “early retirement” rule was discontinued for the unemployed under the jurisdiction of the SGB III at the same time.

- **Small jobs, apprenticeships, and voluntary activities**

- Voluntary activities are not counted as employment as long as the placement efforts of the Employment Agency are not impaired (§ 119 para. 2 SGB III).
- A small job with less than 15 working hours per week is not counted as employment (§ 119 para. 3 SGB III).
- Persons searching a post as an apprentice (Auszubildende) are not counted as unemployed, but as persons in search of an apprenticeship (“Ausbildungsuchende”; § 15 SGB III).

- **Job search**

- The unemployed person has to use all the possibilities for vocational integration. This includes in particular (1) the performance of the obligations from the integration agreement concluded between the unemployed person and the local Employment Agency, (2) assisting the placement efforts of third parties and (3) the use of self-information possibilities of the Employment Agency.

- **Availability**

- Available for placement efforts of the Employment Agency are persons, who (1) are able to and allowed to perform an employment that is subject to full social insurance contributions with a minimum of 15 working hours per week under the usual and reasonable labour market conditions, (2) can promptly respond the proposals for jobs or training measurements from the Employment Agency within a specific distance, (3) are prepared to take each employment within the usual and reasonable labour market conditions, and (4) are willing to take part in measures of vocational training and integration (§ 119 para. 5 SGB III).
- In the context of availability the following regulations on the concrete impact of disability and reduced performance in employment for the registered unemployment status are important:
 - People who are incapacitated for work will continue unemployment benefits for a period of up to six weeks (§ 126 SGB III).
 - Persons whose performance over more than six months is sufficiently reduced so that they can not engage in any employment covered by at least 15 hours per week, are entitled to unemployment benefits if reduced capacity to work is not yet stated by the statutory pension insurance (§ 125 SGB III).
 - According to the regulations of §§ 126 and 125 SGB III, these people receive unemployment benefits, but the registered unemployment status, however, ends, because the condition of availability is no longer complied with.
- There are further regulations for the availability in special cases that are not to be explained in detail here (for further details see Hartmann 2009).

- **Persons in training and integration measures**

- Participants in measures of active labour market policies (in training and integration measurements) are not considered unemployed, even if all other characteristics of unemployment are met. The participation in a measure of the active labour market policy is, therefore, a separate criterion for the exclusion from the unemployment status in any case. Since January 2009, such integration measures include the use of commercial personnel service providers for the placement efforts. I.e. that persons for whom the placement efforts have been “handed over” from the Employment Agency to a personnel service provider are no longer counted as registered unemployed since January 2009 (§ 46 SGB III).

Through all these regulations, the registered unemployment concept is actually split in two: The statistical term unemployed within the meaning of § 16 SGB III and the legal performance-term unemployed within the meaning of §§ 118 et seq. SGB III that regulates the reception of benefits.

The statistical term of registered unemployment can be summarised as shown in table 10.

Table 10: Characteristics of registered unemployment in the statistical context

Criterion	Legal reference in the Social Code Book (SGB)
Unemployment (not being in employment)	§ 16 para. 1 clause 1 Nr. 1 in conjunction with § 119 para. 2 und 3 SGB III
Availability	§ 16 para. 1 clause 1 Nr. 2 in conjunction with § 119 para. 5 und § 120 SGB III
Job search	§ 16 para. 1 clause 1 Nr. 2 in conjunction with § 119 para. 4 SGB III
Registration at the Employment Office or another Social Agency	Träger der Grundsicherung § 16 para. 1 clause 1 Nr. 3 in conjunction with § 122 SGB III
No participation in a measure of the active labour market policies	§ 16 para. 2 SGB III
Exemption does not apply: Persons 58 years of age or more have obtained unemployment benefits for a period of twelve months, are not counted as registered unemployed if they have not been offered a regular job in this period.	§ 53a para. 2 SGB II

6.2 The German Labour Force Survey (LFS)

The Labour Force Survey, the largest official household survey in Germany (details see section 2.2), asks (at least in theory) for the same concept of unemployment but shows different results. This is very probably due to different methodology and operationalisation, but maybe just to the complex legal definition of the registered unemployment status and its perception by the respondents.

Looking into the results from the LFS, it is necessary to take into account that a sample survey like the LFS inevitably involves two kinds of errors: Random sampling errors and systematic errors. These errors have been described in detail in section 2.2. Therefore the description given there will not be repeated here, unless special aspects regarding the measurement of registered unemployment are concerned. Furthermore, the questions on registered unemployment may underlie further characteristics of the LFS: The reference week as well as the acceptance of proxy answers and the adjustments to the LBF in the weighting scheme. The specific differences will be described in more detail in the following sections.

6.3 Conceptual differences of the USR versus the LFS

In contrast to the fundamental methodological differences, the Unemployment Statistics Register and the Labour Force Survey theoretically collect, according to the definition, the same information and therefore have no conceptual differences. The measurement of the unemployment status in both cases is based on the Social Code Book (Sozialgesetzbuch). Still, there are minor conceptual differences regarding the target population. The USR counts persons in the age of 15 – 64 years whereas the questions on registered unemployment in the LFS are asked to persons aged 15 – 74 years. This should not have an influence on the results, as the group of persons aged 15 – 64 years is available from the LFS. Similarly, for the calculation of indicators, in the LFS further restrictions might apply, when e.g. only the situation for the target population should be focussed on. Furthermore the LFS does not cover persons living in collective households (but the German Microcensus does, so this could be accounted for in the following analysis), nor conscripts or persons obliged to render alternative civil service (who anyway cannot register as unemployed by definition).

These conceptual differences are very limited in their effect. A quantification of the conceptual differences is possible by counting the population, respectively the registered unemployed aged 65 years and over. For the comparisons in this report, we used the results of the LFS including conscripts and persons obliged to render alternative civil as well as persons living in collective households. That way, conceptual differences due to the target population can be almost completely reduced.

Further, it should be mentioned, that in the context of international comparability, the LFS produces figures on unemployment following the labour force concept (ILO concept). ILO unemployed are persons, who (1) are not working in the reference week, (2) have actively tried to find work during the reference week or three weeks before and (3) are available for a new activity within the two weeks after the reference week. This definition differs from the definition of registered unemployment. Therefore, the number of ILO-unemployed, obviously, differs from the number of registered unemployed both from the LFS and the USR because of its different concept.⁴⁴ For an overview of the conceptual differences of registered unemployment and ILO-unemployment see table 11.

44 Although the conceptual differences are major, the following comparison includes the results for ILO-unemployment.

Table 11: Conceptual differences of registered unemployment and ILO-unemployment

Criteria	Registered unemployment	ILO-unemployment (operationalisation of the LFS)
Unemployment (not being in employment)	No existent employment relationship, but <ul style="list-style-type: none"> – Voluntary activities or – jobs with less than 15 working hours per week are not counted as employment	No work at all in the reference week
Job search	Job search, in particular: <ul style="list-style-type: none"> – observance of the obligations from the integration agreement – assisting the placement efforts of third parties – use of self-information possibilities of the Agency (not defined precisely in terms of duration)	Active job search during the reference week or three weeks before
Availability	Available to placement efforts of the Employment Agency (many exceptions from the rule; not defined precisely in terms of duration)	Available for a new activity within the two weeks after the reference week
Registration	Registration as unemployed at an Employment Agency	–
Participation in a measurements of the active labour market policies	No participation in measurements of the active labour market policies	–
Age boundary	15 – 64	15 – 74
Exemption	<ul style="list-style-type: none"> – Persons aged 58 years or more are not counted, if they have obtained unemployment benefits for a period of twelve months and have not been offered a regular jobs in this period – Further exemptions from SGB III 	–

6.4 Methodological and procedural differences between USR and LFS

From a methodological point of view, the Unemployment Statistics Register and the Labour Force Survey do differ fundamentally. The methods used for the data production is in each case targeted towards the primary use of each of the respective statistics. Therefore it is not surprising that the key explanations for the differences should be found at these differences.

The basic methodological difference is in fact that the USR counts the total number of registered unemployed persons based on a register. The methodological approach of the LFS is fundamentally different. The results of the LFS are being obtained through a household survey, which is (ideally) being carried out continually during the year among one percent of the population. The key objective of the LFS is less to measure the total number of registered unemployed persons, but more to provide a basis for structural analyses in various breakdowns. The sample size together with the variety of survey topics makes the LFS an ideal basis for such purposes. Furthermore, as the survey response is mandatory for most LFS variables in Germany,⁴⁵ a reasonable coverage is being achieved for population subgroups that are usually difficult-to-reach.

Nevertheless, also the LFS has its drawbacks: First of all, results from sample surveys are always prone to sampling errors. Sampling errors thus have to be taken into account, especially when interpreting results for small population subgroups. Secondly, the LFS results are weighted and calibrated using the population figures from current population statistics (LBF) and might be overestimated (for details see section 2.4). Furthermore, the results from household surveys are always influenced by further sources of error, like for instance coverage bias, non-response bias, and measurement errors. Measurement errors occur, e.g., for survey variables like the registered unemployment status which are problematic to be measured in a household interview.

Finally, although the definition being identical to the one used in the USR, the operationalisation in the LFS is far from being straightforward. Similarly as in the case of marginal employment, the concepts are legally defined and their primary purpose is not a statistical one. This has important consequences: As shown in section 6.1, the definition of registered unemployment is of extreme complexity. Even if a respondent with perfect intentions had the relevant books of the Social Code at his or her disposition, it would hardly be possible to grasp all the aspects without the help of an expert specialised in social law. Despite this complexity, registered unemployment in the LFS is being measured through a simple self-declaration (“Last week, have you been registered as unemployed?”). In the vast majority of cases this self-perception will be broadly in line with the definition. Unfortunately, this is not necessarily the case. There are situations, in which it is not clear whether the status is unemployment or not. As already mentioned these situations include unemployed who are temporarily in a training measure, or who have been put on “early retirement” by the Employment Agency. Therefore it is not surprising that the number of registered unemployed is significantly higher in the LFS compared to the USR.⁴⁶

45 Response is currently mandatory for all LFS variables, which are also included in the legal basis of the Microcensus (in which mandatory response is laid down). The most important cases of survey variables with voluntary response include most ad hoc module variables as well as few structural variables not included in the Microcensus law.

46 Since autumn 2009, the Federal Employment Agency also publishes results referring to registered unemployed persons „in the broad sense“. In this concept, most situations problematic for measurement have been included. According to preliminary results for 2010 (those for 2009 are not fully comparable due to the phasing-in of the new statistics), the number of registered unemployed in the LFS is much closer to the unemployed “in the broad sense” than to the strict legal definition of unemployment.

7 Coherence of annual averages of the unemployment results

As for employment, an analysis of coherence also in the case of unemployment has to cover various aspects. This chapter firstly focuses on the structure of the annual averages. In a second step, we analyse the coherence of the multi-annual trends. The situation for registered unemployment is somewhat less complex than for employment. In contrast to the EA, the USR is not an accounting system, but a register-based statistics, so that no reference needs to be made to diverse statistical sources. The following analysis has to be restricted to a comparison of the aggregated results. This is an important restriction, as different types of incoherence can occur: (1) Persons who claim to be registered unemployed in the LFS, but not counted in the USR, as well as (2) persons who are counted as registered unemployed in the USR, but not replying correspondingly in the LFS. The intersection of persons being registered unemployed according to both the LFS and the USR is very likely to be smaller than the difference in the aggregate results. However, in order to estimate the extent of this intersection, a linking of the micro data from the LFS and USR would be required. Such type of analysis is currently not possible due to data protection restrictions.

The final section of this chapter (7.3) is devoted to the question, how the structure of registered unemployed and unemployed according to the ILO concept differs and which consequences arise by the use of registered unemployment as a predictor for unemployment according to the labour force concept.

7.1 Coherence of level and structure of registered unemployment

Although the definition of the two main sources for data on registered unemployment in Germany (at least in theory) is the same, the results differ quite strongly. In 2009, the LFS result for total registered unemployment (3.9 million) showed 470 000 persons more than the USR in its results. This is against the expectations, as usually unemployed are considered a sub-population which is rather difficult-to-reach. Furthermore, unemployment is not regarded as socially desirable, so that one could assume that being unemployed might in some cases not be revealed to the interviewer. If such effects occur in the LFS (which is not unlikely), they are obviously overcompensated by other effects resulting in an unemployment figure that is 14 % higher in the LFS compared to the USR.

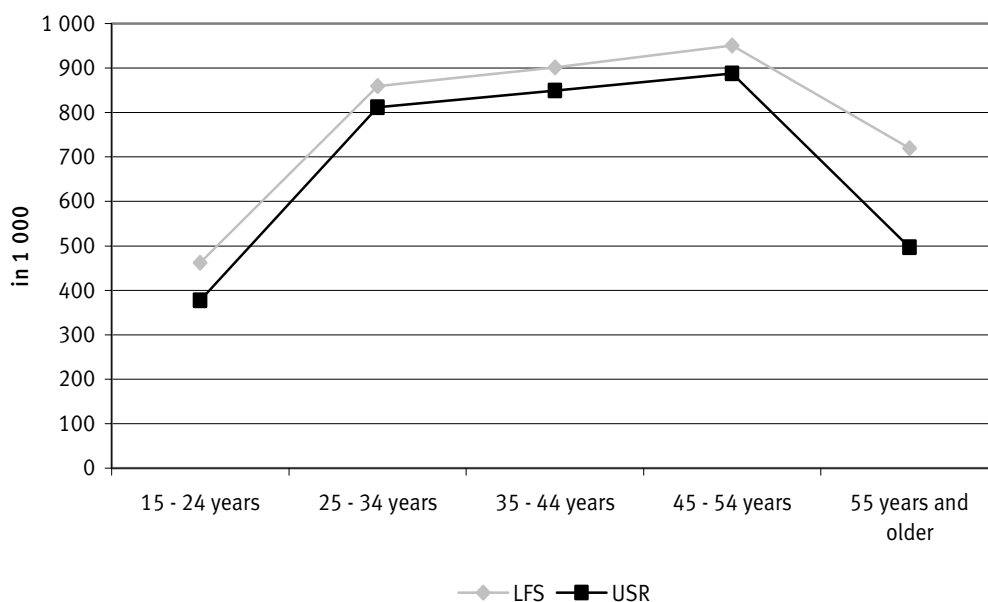
Looking at the results by sex, this difference is considerably bigger for men (LFS 18 % higher than USR) than for women (LFS 8.5 % higher than USR). This result also becomes visible in some structural divergences between the share of registered unemployed men and women in both sources (LFS: 56.7 % men and 43.3 % women, USR: 54.6 % men and 45.4 % women). This certainly is an interesting result, but it cannot explain the difference. Furthermore, it is not fully clear what the reasons are for this divergence. One reason might be that men are more often in situations in which their official unemployment status is not fully clear, because they are more frequently concerned by the provision of “early retirement” from unemployment. At the same time, it cannot be excluded that there is a gender difference in the perception and response behaviour to the question on the registration at the Federal Employment Agency.

The absolute numbers of registered unemployed by age group show an over-counting of unemployed in all age-groups in the LFS. However, there are different degrees of incoher-

ence: Whereas the LFS measures about 6 % more registered unemployed for persons aged 25 to 34 years, 35 to 44 years and 45 to 54 years, the differences are much more important for the younger, and particularly the older unemployed persons. For the age group of 15 to 24 years, the LFS estimates 0.46 million unemployed persons, compared to 0.38 million in the USR (+ 23 %). This difference might partly be caused by the differential treatment of persons searching a job subject to full social insurance contributions and those searching an apprenticeship in the USR. Both groups might consider themselves as registered unemployed and respond accordingly in the LFS (in which no special response item is provided for persons looking for an apprenticeship), but only those searching an employment subject to full social insurance contributions are counted in the register.

The difference is even bigger for persons aged 55 years and over. In this age group there are 0.72 million unemployed according to the LFS and only 0.5 million according to the USR (+ 45 %). This difference, at least in part, should be due to unemployed in situations similar to early retirement who continue to refer to their status as registered unemployed in the household interview. According to the Federal Employment Agency, in 2009 there have been 0.12 million “unemployed” persons in situations similar to unemployment. Consequently, even if the entire group indicated the self-perceived status instead of the official one, this would still not suffice to explain the difference.

Figure 36
Registered unemployed by age group, 2009

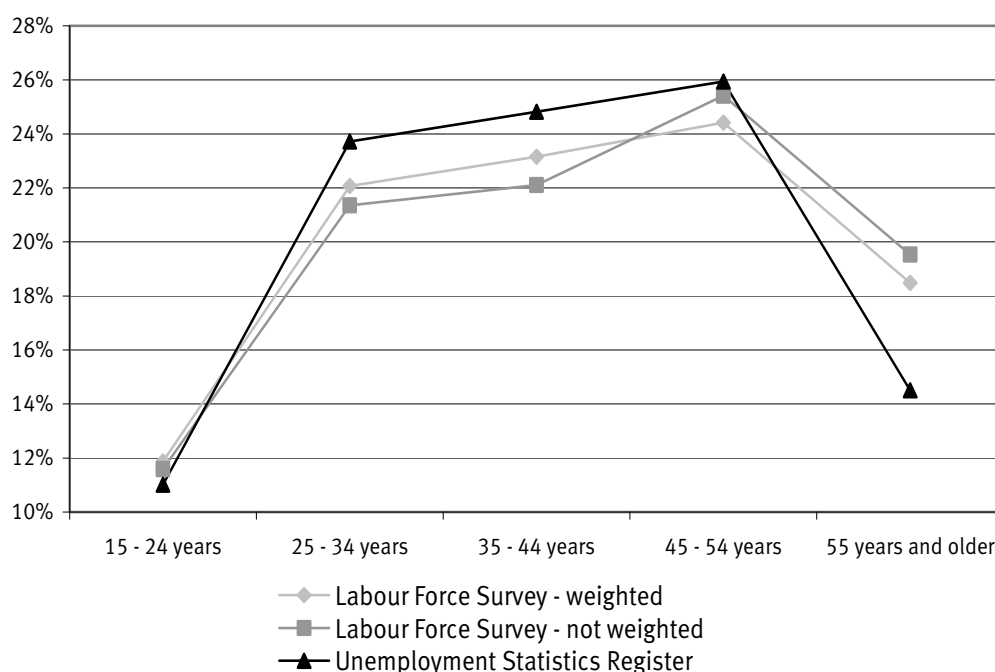


Looking at the age structure in terms of shares, a corresponding picture becomes visible. Here, too, one can easily see that the over-counting is not spread evenly over all age groups (see figure 37). This is very possibly due to the weighting procedure in the

LFS which has, as stated for employment as well, an important impact on the results by age group. As the weighting scheme in the yearly results are based on three age groups (0 – 14 years, 15 – 44 years and 45+ years) and are calibrated to marginals from the update of the current population figures (LBF), the incoherences in the age groups seem explainable.

When looking at the respective shares of the problematic age groups (15 – 24 years and 45 – 54 years) in the weighted and the unweighted results, the differences of the unweighted results match slightly better. The differences in the age group of 55 years and older are obviously due to other reasons (see figure 37).

Figure 37
Share of registered unemployed by age group, 2009

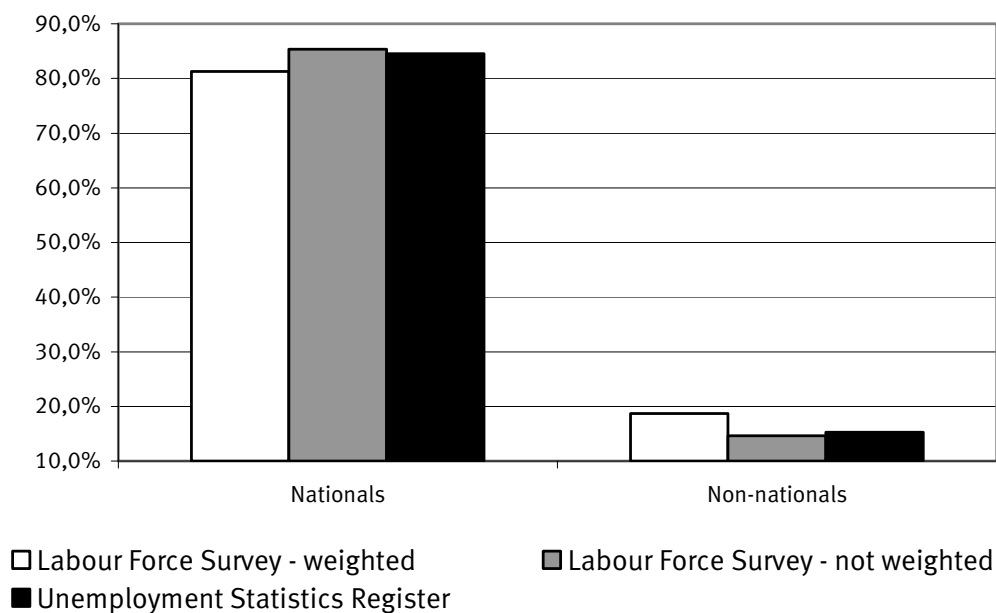


The results of registered unemployed regarding nationality even show bigger differences than the results by age and sex. The share of German unemployed in the LFS is on average (in all age groups and by sex) about 3 percentage points lower than in the USR, although, in absolute figures, the LFS counts more unemployed (3.2 million in the LFS compared to 2.9 million in the USR, which corresponds to a difference of + 9 %). At the same time the LFS shows much more unemployed in numbers and proportion of non-national unemployed: The result of the LFS is 39 % above the result of the USR (0.73 million compared 0.52 million registered unemployed according to the USR). Again, also this result is quite surprising, as one might assume that foreign nationals are more difficult-to-reach in a survey due to language problems, their lower average educational attainment and other factors. One reason for the big differences by nationality might be the complex legal

issue of the registration status. It is well conceivable that non-nationals have more difficulties to indicate their exact status in a survey interview than nationals. However, if such effects occur, they are obviously overcompensated by effects in the opposite direction. One of these impacts might be due to the weighting procedure in the LFS, which was already suspected to be one of the main reasons for the incoherence of the results for nationals and non-nationals for the employees subject to full social insurance contributions. The weighting scheme of the LFS regarding nationality relies on two different sources which are not coherent themselves: Persons with Turkish nationality are calibrated using marginals from the central register of foreigners. All other nationalities are weighted using marginals from the update of the current population figures (LBF). The difference between LFS and USR concern for instance the registered unemployed with Turkish nationality, which suggests impacts due to the weighting scheme. When looking at the respective shares in the unweighted results, the differences almost vanish: The difference in the share of non-nationals decreases from 3.4 to 0.7 percentage points (see figure 38).

Figure 38

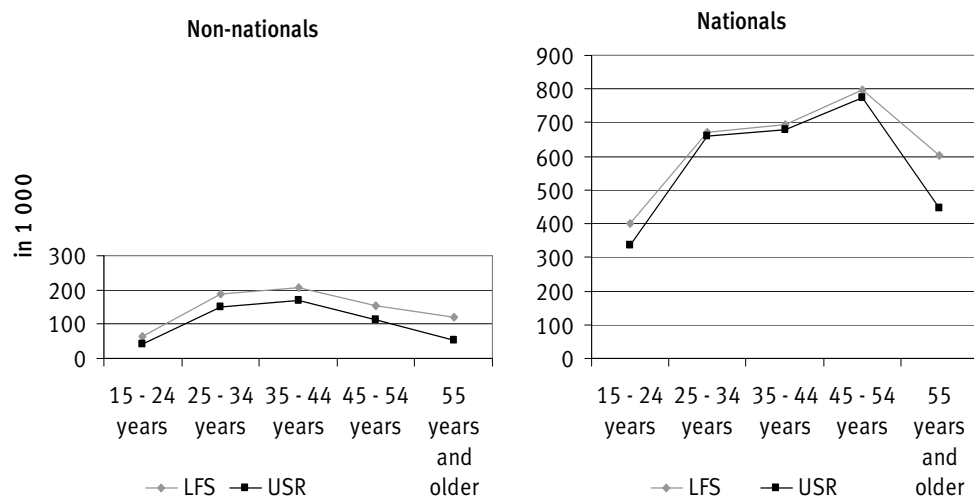
Registered unemployment for German citizens and non-nationals, 2009



The picture of differences by nationality and age group is instructive, too: Whereas for the non-nationals, there are major differences that are quite similar for all age groups. For the German nationals, there are only few differences for persons aged 25 to 54 years old (+ 2 % to + 3 % only), while there are huge differences for the age groups from 15 to 24 years (+ 19 %) and for instance from 55 years and over (+ 35 %).

Figure 39

Registered unemployment for nationals and non-nationals by age group, 2009

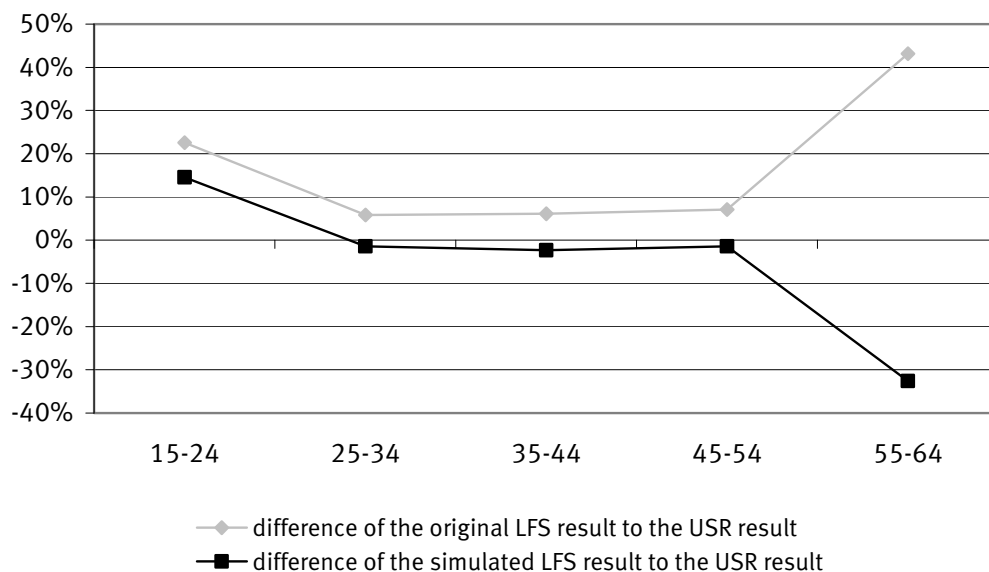


As for the German citizens, also for the non-nationals, the differences are much bigger for men than for women. According to the LFS, the number of non-national registered unemployed is 52 % higher than in the USR (0.43 million compared to 0.29 million). For non-national women this difference amounts to “only” 24 % (0.3 million in the LFS versus 0.24 million in the USR). The differences between men and women are thus similar to the ones found for the German citizens, albeit on a higher level.

For a methodological analysis on registered unemployed, it was tried to simulate the number of registered unemployed according to the legal definition. For this purpose, the legal restrictions of the 58 years threshold rule and the working time threshold of a maximum 15 hours per week were combined with the variable regarding registered unemployment from the LFS. This means, that persons who declared themselves as registered unemployed, but who were over the age of 58 years or indicated to work usually more than 15 hours per week were not counted as registered unemployed in this analysis. Doing this, it has to be kept in mind that it does not apply the criteria for the registration as unemployed comprehensively. Therefore, the result may be misleading as, e.g., persons aged 59 years and over are not necessarily excluded from the unemployed in the USR, but only under certain conditions. Any robust coherence analysis, therefore, would require a linking of the micro-data obtained from both USR and LFS. This, however, is not possible today because there is no appropriate identifier in both data sets and because of legal restrictions.

The results of the comparison show that the number of registered unemployed persons who are above the age of 58 years is about 360 000. Adding the number of persons who are working more than 15 hours per week, the number of registered unemployed reduces by 620 000 persons to a simulated number of 3.2 million. Not only the total number, but also the structure regarding the age groups, shows a pattern that is more similar to the one from the USR than the original LFS (see figure 40). However, the simulated LFS-number does not change anything regarding the structure by sex.

Figure 40
Percentual difference of the simulated and original LFS result
to the result of the USR, 2009



Consequently, it can be assumed that not only persons above 58 years misclassify themselves, but also persons in all age groups who are working more than 15 hours per week. These persons may not be aware of the fact that they are not counted as registered but they declare a registration because they are in close contact with the registration offices.

This assumption is supplementary to the so called main status thesis concerning the collection of the ILO employment status. It assumes that registered unemployed have problems identifying themselves as ILO-employed because they are registered at an employment office.

For the sake of completeness and to prove the hypotheses on methodological issues as thoroughly as possible, an analysis on the effect of the new weighting scheme⁴⁷ introduced in the year 2005 was conducted. The result is very different to the effects concerning employment. As regards the registered unemployed, the effect of the new weighting scheme is of minor importance. The total number of unemployed increases only about 1.75 % (or 85 000 persons) due to the new weighting scheme. In respect to the age groups, the younger age groups increase stronger but do not exceed 5 % (see table 12).

⁴⁷ For a general description of the background and the analysis see chapter 5.

Table 12: Effects of the new weighting scheme on the number of unemployed using LFS 2006 ⁴⁸

	Registered unemployed	ILO-unemployed
	%	
Men	2.0	2.1
Women	1.5	1.5
Total	1.7	1.8
Aged . . . to . . . years		
15 – 24	5.3	4.2
25 – 34	3.2	3.9
35 – 44	4.8	4.9
45 – 54	– 2.0	– 1.9
55 – 64	– 2.1	– 1.9
65 +	/	/
German	2.1	2.2
Non- German	0.3	0.3
Total	1.7	1.8

7.2 Coherence of long term developments of registered unemployment

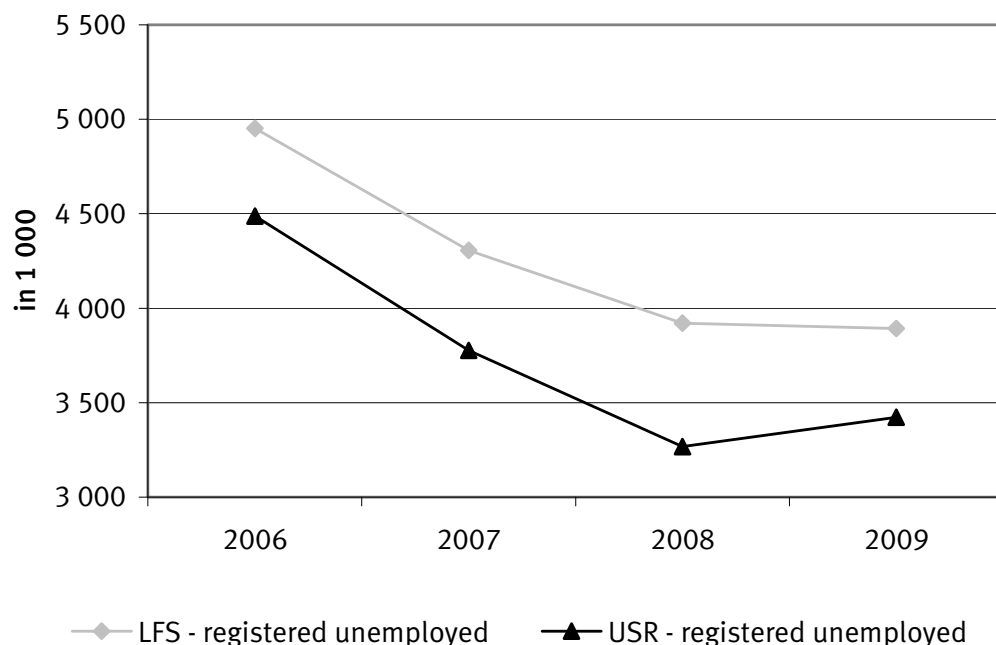
In the case of registered unemployment, a comparison of the LFS and the USR is subject to restrictions. The main problem is the length of the time series: Unfortunately, a comparable time series of the number of registered unemployed is only available from the year 2006 onwards. This is due to the combination of two registration characteristics (registered unemployment and registered job seekers) in one item of a question in the LFS questionnaire until the year 2005.

Taking a very rough measure, a quite similar long-term trend is visible, at least at first sight. For example, the trend of the decreasing number of registered unemployed until 2008 and the increasing number in 2009 is visible from both statistics (see figure 41). Nevertheless, there is a difference in the level of unemployed persons that is ranging around 500 000 persons. Although, in figure 41, the lines representing registered unemployed from LFS and USR, seem to be quite parallel at first sight, there are important differences in the year-to-year trends: In 2007 and 2008, the decrease was significantly stronger in the USR (– 16 % in 2007 compared to – 13 % for the LFS; – 13 % in 2008 compared to – 9 % in the LFS). In 2009 (as well as in the preliminary results for 2010) this pattern was reversed. Now the registered unemployed exhibited an increase in the USR (+ 5 %), while – despite the financial market crisis – it slightly decreased in the LFS

⁴⁸ To read: The result of the LFS 2006 using new weighting factor is x % higher than using the old weighting factor until 2004.

(– 1 %). The reasons for these incoherences are difficult to determine, as they are presumably due both to changes in the definition of unemployed used in the USR, but also to methodological changes in the LFS (which have taken place for instance in 2009).

Figure 41
Unemployment 2006 – 2009



As there are no conceptual changes in either source, the deviation of the number of registered unemployed must be due to methodological aspects. Concerning the LFS, the questions regarding job search were fundamentally redesigned in 2009. The redesign aimed at separating the questions on job search (which are the basis for determining unemployment according to the Labour Force Concept) and the question on the registration at the Employment Agency. The redesign led to a decrease in the intersecting group of persons who claim to search work **and** to be registered unemployed. The groups who were “only” searching and “only” registered as unemployed increased at the same time. This result suggests that the sequence of questions used until 2008 (in which both questions are closely together in the questionnaire) went along with context effects. As those context effects might have been reduced in 2009, it might explain why the development was quite different in 2009. Relating to changes in the USR, there were no legal changes that could explain the divergences. However, in the years from 2007 to 2008, the Federal Employment Agency regularly informed its users that the ongoing reduction of registered unemployment was also due to the intensified support of job seekers, a more systematic update of the data of job seekers as well as the more frequent use of the workfare scheme “Ein-Euro-Job”. Nevertheless, it could not be quantified in how far these measures could account for the diverging trends.

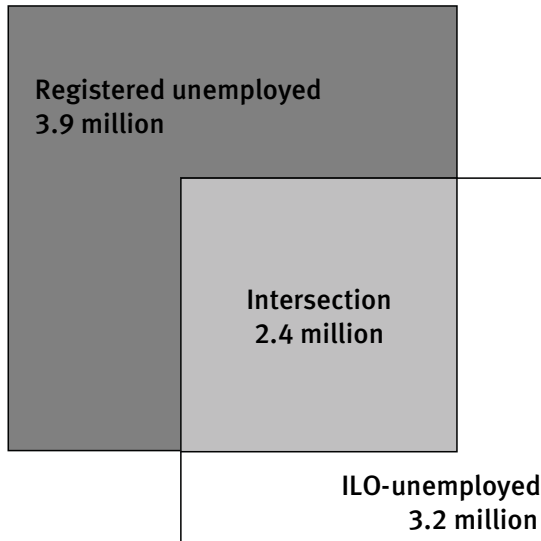
7.3 Registered unemployed of the USR as predictor for ILO unemployment?

In many countries, monthly results on registered unemployment are available earlier than (monthly or quarterly) ILO unemployment figures from the LFS. As, furthermore, the monthly results from the LFS – in particular for smaller countries – will be subject to a large volatility, using the registered unemployment figures of the national Employment Agency to predict the ILO unemployment figures seems to be a promising alternative – at least for the seasonally adjusted values. The analyses carried out for this report provided a good opportunity to check whether this is a feasible approach in the case of Germany despite the conceptual differences between ILO unemployment and registered unemployment.⁴⁹ From October 2007 to February 2011, for the estimation of seasonally adjusted results, such an approach was already applied in Germany, i.e. the seasonally adjusted results from the LFS on ILO unemployment are estimated on the basis of the seasonally adjusted results on registered unemployment from the USR. This section first of all compares the intersection of registered unemployment and ILO unemployment on the basis of the LFS. Secondly, structural differences between the groups of registered unemployed and ILO unemployed are being assessed. Finally, the suitability of the registered unemployment figures from the USR as a predictor for ILO unemployment results is being investigated on the basis of trend comparisons.

In a first step, we did a cross-tabulation of persons being registered unemployed and ILO unemployed in the LFS. It has to be noted that this cross-tabulation is exclusively based on results from the LFS. This is an important restriction as we have seen that the registered unemployed in the LFS differ in many regards from the registered unemployed shown in the USR. Nevertheless, as the cross-tabulation requires micro data, there is no alternative to this approach. For the year 2009, the cross-tabulation reveals an intersection of 2.4 million persons, who at the same time were registered unemployed and ILO unemployed (see figure 42). This means that 62 % of all registered unemployed at the same time were ILO unemployed, while 75 % of all ILO unemployed at the same time indicated that they were registered unemployed. Furthermore this intersection is not even stable over time: The share of the ILO unemployed also indicating registered unemployment decreased from 70 % in 2006 over 68 % in 2007 and 64 % in 2008 down to 62 % in 2009. The decrease in 2009 could be explained by the changed questionnaire design, which contributed successfully to separate ILO unemployment and registered unemployment in the questionnaire. The decrease of the intersection in 2008 is most likely due to a change in the plausibility checks running in parallel to the laptop interview: Until 2007, any respondent who indicated to be registered unemployed was automatically assigned to be actively searching work in the ILO context. It seems plausible that abandoning this plausibility check contributed to reducing the intersection of registered and ILO unemployed.

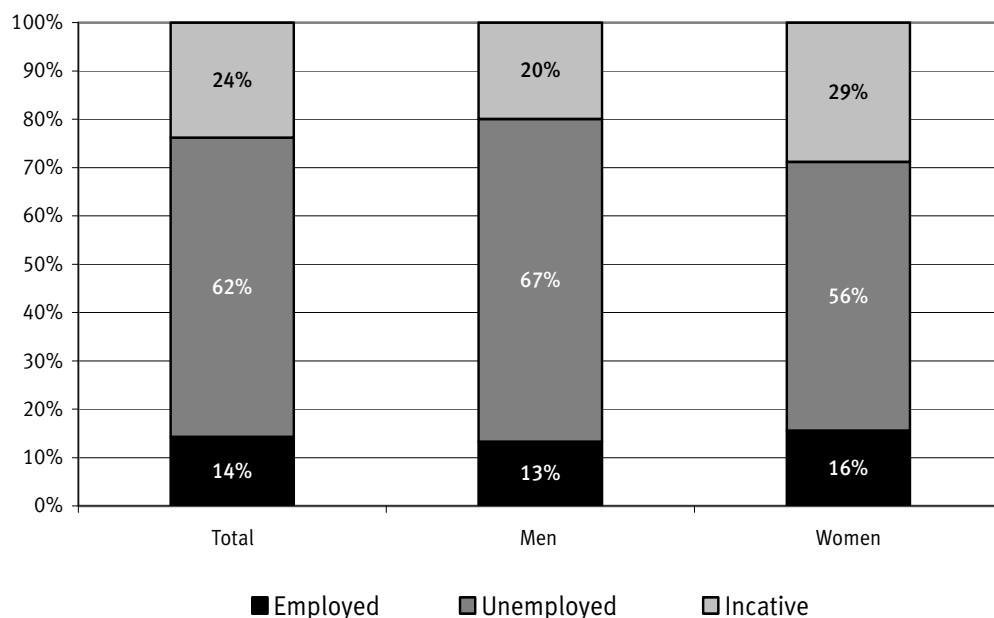
⁴⁹ It has to be noted that the results can only be generalised to a very limited extent, as the definition of registered unemployment is dependent on the national social legislation.

Figure 42
Intersection of ILO-unemployment and registered unemployment, 2009



The intersection splits differently for men and women; the intersection is smaller for women than for men. 56 % of the registered unemployed women are also ILO unemployed, which is true for 67 % of the male registered unemployed. At the same time, 13 % of the men and 16 % of the women were registered unemployed and employed according to the definition of the labour force concept. Registered unemployed women are also more often not economically active: 29 % of the female registered unemployed, but only 20 % of the male registered unemployed did not indicate any paid productive activity in the LFS interview. This is presumably due to restrictions regarding the availability due to family related duties (which are assumed more often by women). Correspondingly, 67 % of the ILO-unemployed women and 80 % male ILO-unemployed are indicating to be registered unemployed.

Figure 43
Registered unemployed by ILO employment status, 2009



The intersection is also differing a lot regarding the different age groups. It ranges between 63 % and 64 % for the middle age groups (25 – 34 years, 35 – 44 years, 45 – 54 years), is slightly larger for the young registered unemployed (66 %), and distinctly smaller for the unemployed aged 55 years and older (54 %).

The quite low intersection is already a hint that the use of the number of registered unemployed as predictor for the number of ILO unemployed at least requires some caution, in particular if applied to individual demographic subgroups.

An analysis of the month-to-month change of the number of registered unemployed from the USR and the ILO-unemployed from the LFS confirms this first impression. The month-to-month changes in the LFS are far too volatile to predict a serious number using a stable time series like the one from the USR (see figures 44 and 45). In some months, i.e. June and July 2008, the development of the LFS figures is hardly explainable (for a detailed analysis, see chapter 8). Therefore, the number of registered unemployed from the USR does not seem to be a very good predictor for the ILO unemployment, at least regarding the not seasonally adjusted results. Obviously, this is not necessarily due to the source of the registered unemployed, but more due to the volatile and often biased trends of monthly ILO unemployed in the LFS.

Figure 44
Development of ILO-unemployment and registered unemployment

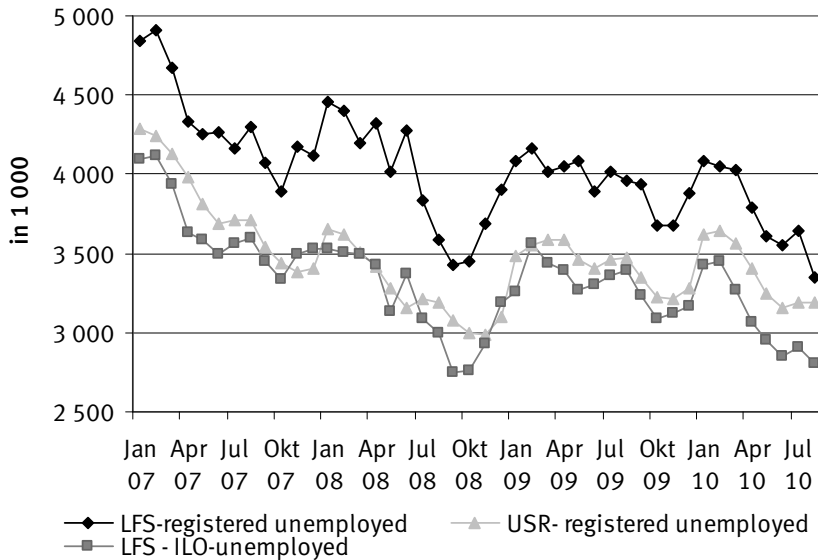
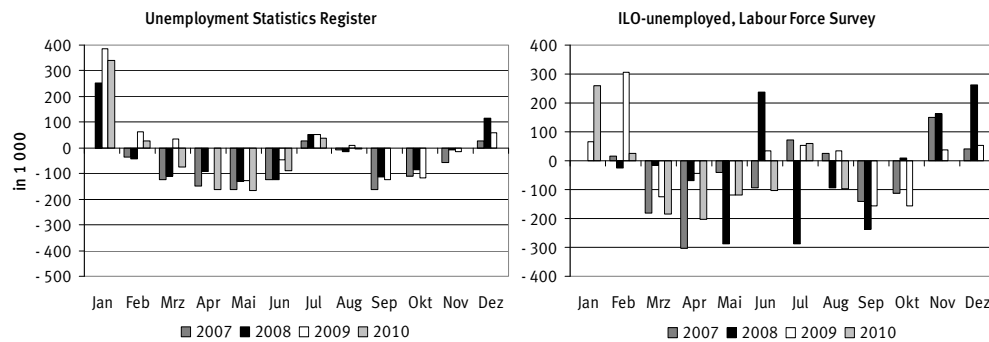


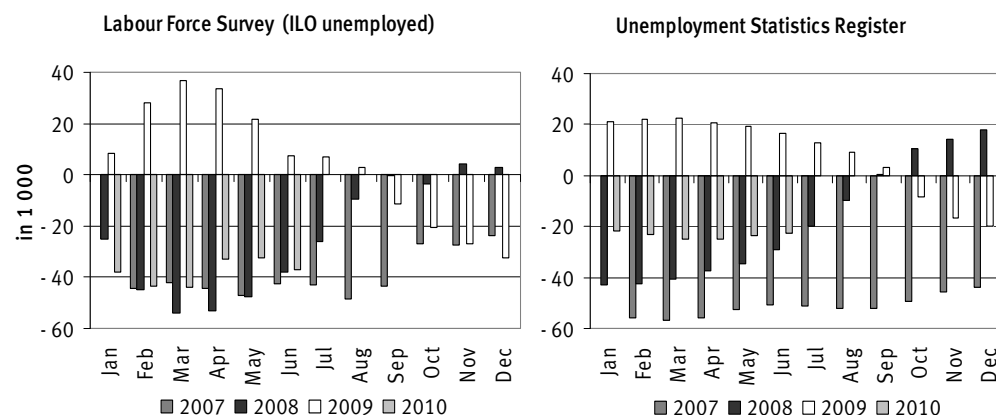
Figure 45
Month-to-month changes of ILO-unemployment and registered unemployment



The situation improves when focusing not on the original values, but on the trends of the USR regarding registered unemployment and the LFS regarding unemployment according to the ILO concept. As in chapter 4 and chapter 8, the 12 month moving average is used as a simple, but robust measure for the trend of the time series. It is particularly suited for the current question, as it radically removes not only the seasonal component, but also irregular effects and methodological biases. As figure 46 shows, the trend of the ILO unemployed from the LFS and the registered unemployed from the USR are largely in line. The most striking differences are a smaller decrease in the LFS in the last quarter of 2007 followed by a stronger increase in spring 2008. Also the turning points are slightly

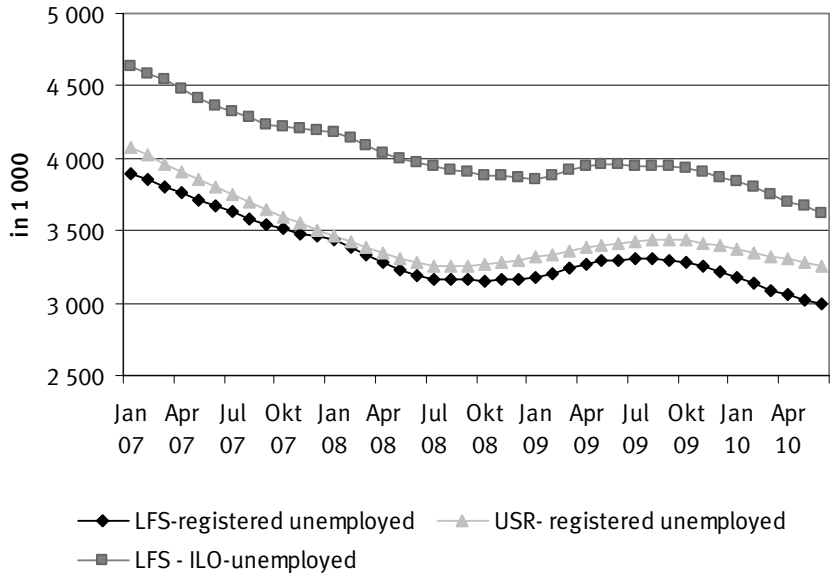
shifted on the time axis: At the financial market crisis, the trend of registered unemployed starts to turn positive in October 2008, while the trend for the ILO unemployed does not start to increase before November 2008 (and then in a less distinct way). The end of the crisis on the labour market was reached earlier in the LFS: The trend of the ILO unemployed turned negative in September 2009, followed by registered unemployment in October 2009. Nevertheless, it has to be mentioned, that – given the incoherence in the time series of the original values – there is a quite remarkable coherence of the trends.

Figure 46
Month-to-month changes of the 12 month moving average: ILO unemployed (LFS)
versus registered unemployed (USR)



Regarding the differences of the trends it furthermore has to be mentioned that it is not fully clear whether they are really due to the conceptual differences between registered unemployment and ILO unemployment. A comparison of the USR with the trends (12 month moving average) of the registered unemployed persons according to the LFS reveals very similar differences as the comparison with the ILO unemployed (see figure 47).

Figure 47
12 month moving average: ILO unemployed vs. registered unemployed



8 Coherence of intra-annual unemployment results

According to the European Council Regulation no. 577/1998, the registration at the Employment Agency (variable REGISTER) has been designated as a structural variable. Therefore, registered unemployment is part only of the yearly LFS results and generally not available in quarterly frequency. Fortunately, in the case of Germany, although the monthly and quarterly results on registered unemployed are not required by the regulation, the Labour Force Survey also produces monthly and quarterly results as a kind of side product of the monthly estimation of the unemployed according to the Labour Force Concept. Nevertheless, only the annual average is being published by Eurostat. The Federal Statistical Office itself does not publish any results on registered unemployment from the LFS (which should be reconsidered at least for specialised publications), as the USR is considered the main source, which is suited best for the reporting on the number of registered unemployed.

Apart from very few exceptions (such as the ILO unemployment), the Federal Statistical Office does not publish monthly and quarterly results mainly due to serious methodological concerns that lead to volatile and heavily biased time series. The interpretation of these series seems to be very problematic. In any case, it requires in-depth methodological knowledge of the German LFS. In some cases a meaningful interpretation seems to be hardly possible at all.

The objective of this section is to present the monthly as well as quarterly results on registered unemployment in comparison to the USR and to give an overview on the convergence and divergence of the quarterly and monthly series from the LFS and the USR. The underlying methodological effects leading to the divergences are largely the same as presented for the intra-annual results on employment, which have already been outlined in chapter 4. Therefore, this chapter is restricted to the presentation of the results from the USR and the LFS. Methodological effects will only be presented if not yet dealt with in chapter 4.

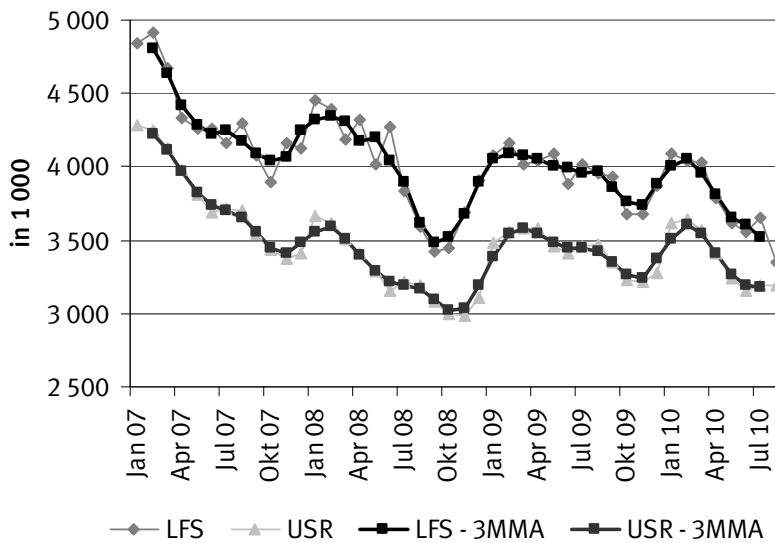
The first section of this chapter presents and discusses the coherence of the original monthly time series of the LFS and the USR, as well as the trend of the series from both sources. In the following section 8.2, the quarterly series of the LFS and the USR will be discussed. A third section finally briefly tackles the issue of incoherencies between the monthly and the quarterly results **within** the LFS, which are due to deviating response patterns as well as differences in the weighting schemes used.

8.1 Monthly results on registered unemployment

The intra-annual results from the LFS do not only differ regarding the number and structure of registered unemployed persons (as shown in chapter 7), but also regarding their trends. In most cases, the differences are more apparent for the monthly series, but they can also clearly be seen in the quarterly results. It should be noted that the reasons for the deviations are similar for monthly and quarterly results, but they are also subject to specific effects, which will be further specified in section 8.3. This section puts emphasis on a comparison of the monthly results from the LFS and the USR.

Looking at the monthly time series from January 2007 to August 2010, we can easily see that the LFS series is not only deviating from the one provided by the USR, but also lacking the stability exhibited by the USR series. As figure 48 shows, there is a similar underlying general pattern in both LFS and EA, especially since 2009. Here, elements of a seasonal pattern are visible that shows a clear increase of the number of registered unemployed at the beginning of each year and decreases in spring (slightly) and in autumn (more distinctly). During summer, the series takes the shape of a saddle (this feature cannot be detected in the LFS in 2008). Even more than in the case of the monthly employment figures, the series on registered unemployment is being affected by frequent erratic turns, which in part will be due to the sampling error.⁵⁰ Nevertheless, the similarity of the underlying pattern becomes more obvious when looking at the three-month-moving average (3 MMA) of both series. As for the employed, the turning point, at the end of the year seems to be somewhat shifted on the time axis in the LFS: The hibernal increase of registered unemployment starts earlier in the LFS. While the hibernal increase in the USR is concentrated in a steep rise of unemployment in January each year (complementary to the employment trend in the EA), the increase in the LFS already starts already in October.

Figure 48
Registered unemployed persons in Germany, 2007 to 2010

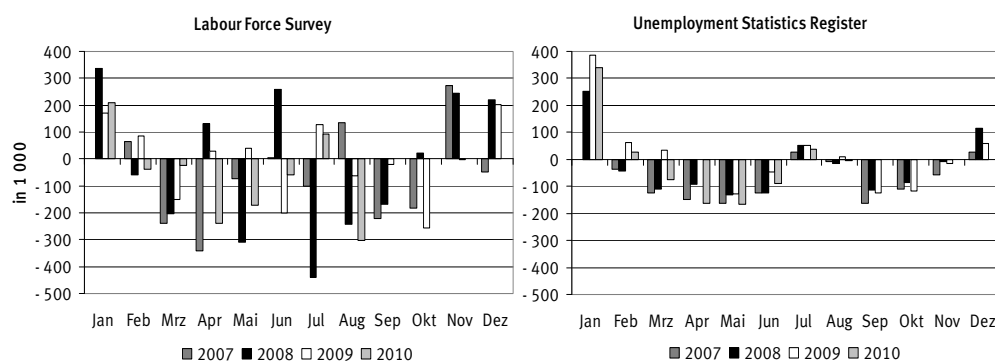


⁵⁰ The simple relative standard error is about 3 % for the registered unemployed, but only about 0.4 % for the employed (monthly data).

Before 2009, the decrease of registered unemployment due to the positive economic development is much stronger and straighter in the USR than in the LFS results. From 2009 onwards, the series seem to show the same trends. This may be due to the reallocation of the question on registered unemployment (see chapter 7).⁵¹

Despite the similarity of the general pattern of both series, there are huge discrepancies regarding the month-to-month changes of both the USR and the LFS. The series of the USR is characterised by a very stable month-to-month pattern (apart from February to April 2009, due to the extraordinary situation during the financial market crisis). In contrast, in the LFS it is hard to detect a month-to-month pattern at all.⁵² As figure 49 indicates, for the years from 2007 to 2010 (the years 2005 and 2006 are again not being considered due to phasing-in problems after the introduction of the intra-annual LFS in Germany), a clear pattern could be identified for few months at all (if any). In the USR, the month specific changes in almost all months point into the same direction. Variations in the magnitude of the specific month-to-month changes are consistent with the general economic background.

Figure 49
Registered unemployed persons – Month-to-month changes in the LFS and the USR



In the LFS, there are only few months for which the change had the same sign all the time (January, March and September). Even in these months, one could not speak of stable seasonal effects as – despite the consistent direction of change – the magnitude shows quite large variation. A further feature of the monthly LFS series is that the magnitude of the month-to-month changes is much bigger than in the USR series. The USR

51 Since 2009, the question on registered unemployment has been relocated in the questionnaire. The reason was to gain an unaffected answer to the questions on ILO-unemployment (it was assumed that registered persons remember their legal duties of looking for a job and gave a misleading answer to the ILO-job search questions). This relocation of the questions seems to have an effect on registered unemployment, too.

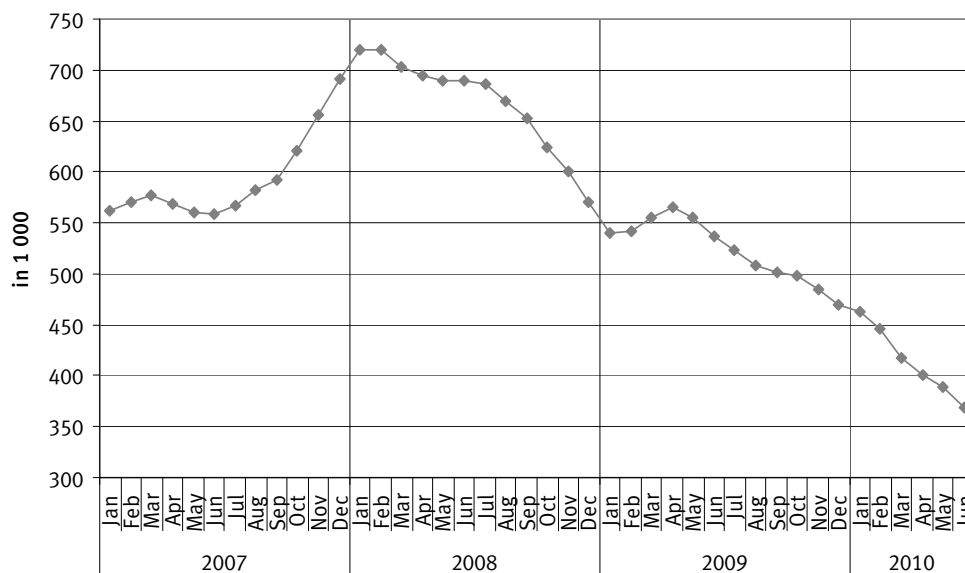
52 This result has important implications for the possibility of applying seasonal adjustment techniques. As stated in the seasonal adjustment guidelines of the ESS, “making any seasonal [...] adjustment on series which do not show any evidence of [seasonal] effects is an inappropriate statistical treatment” (Eurostat 2009d, p. 8). This problem has led to the decision to use a trend estimation as a substitute for seasonal adjustment for the time being (see Körner/Rengers 2010).

month-to-month changes are well below 200 000 persons, whereas the LFS shows a much higher and surprisingly irregular variation of changes up to 400 000 persons.

In summary, the results from the LFS, albeit providing a broadly reliable picture of the mid-term development, include a strongly erratic element on the level of the changes specific to individual months. It has to be noted that the variations are much more important when focussing on subgroups of unemployed. Smaller and more specific groups show larger and implausible month-to-month changes.

For an analysis of the underlying trend of the monthly series from the LFS and the USR, a similar approach as in chapter 4 is chosen: The 12 month moving average is being used as a simple, but robust and transparent proxy for the trend shown by the series. The results show striking differences compared to the trends found for the employed persons. While the trend for the employed persons was roughly in line in the EA and the LFS, it is heavily diverging for the registered unemployed from the LFS and the USR. The divergence increases from 2007 to early 2008, before steadily decreasing from mid 2008 onwards (see figure 50). The “saddle” in spring 2009 might possibly be explained with the revision of the question sequence in the LFS from January 2009 onwards, even more as similar divergences can be found if comparing registered unemployed from the USR with ILO unemployed from the LFS. At the same time this finding suggests that the trend of the registered unemployed measured with the LFS is more similar to the trend of the unemployed according to the ILO concept than to the results from the USR.

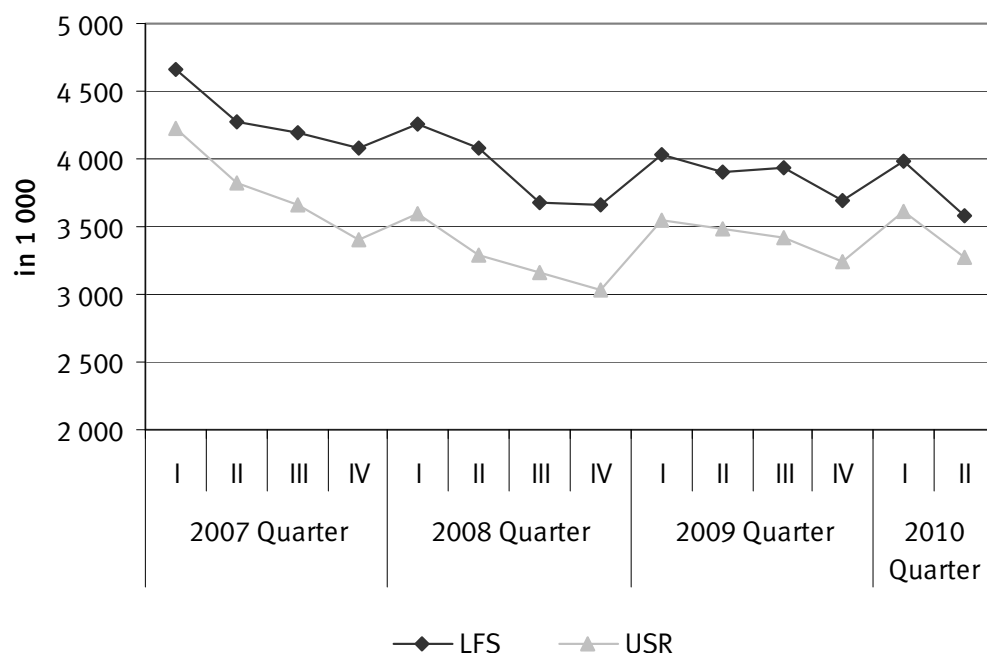
Figure 50
Difference LFS minus USR: 12 month moving average of the number of registered unemployed



8.2 Quarterly results on registered unemployment

As could easily be expected, the incoherences between USR and LFS are smaller for the quarterly series of registered employed persons compared to the monthly one. On a quarterly basis, similar seasonal patterns can be identified, at least when not going too much into detail (see figure 51).

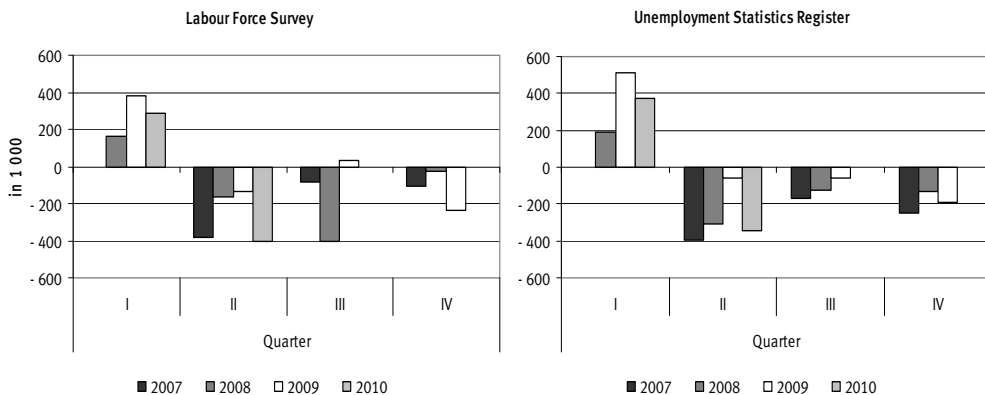
Figure 51
Number of registered unemployed persons in USR and LFS (quarterly series)



When comparing both quarterly series more closely, it can easily be seen that the series are not running fully in parallel. The divergence between the USR and the LFS on average is 500 000 unemployed persons, with a range from 300 000 (second quarter 2010) to 700 000 (second quarter 2008). Nevertheless, the difference is not wobbling around erratically, but showing a quite distinct pattern: It increases during the years 2007 and 2008, and starts to decrease in 2009. The decreasing difference in 2009 is probably explainable by a relocation of the question on registered unemployment from 2009 onwards (see chapter 7). Interestingly enough, the decrease continues in the first quarters of 2010. The reasons for this further decrease remain to be determined. They might be linked to the effects of the end of “early retirement” for a sub-group of registered unemployed that, in the USR, (contrary to the general trend) led to an increase of unemployment among persons aged 55 years and over. These systematic differences in the trends pose severe difficulties for the interpretation of the data. This is even more the case, as a similar pattern can be found for the difference between the unemployed according to the labour force concept and the registered unemployed.

Nevertheless, a comparison of the quarter-to-quarter changes of both USR and LFS confirms the impression that the seasonal pattern of the quarterly results is clearer than for the monthly series. At least the direction of change in the quarters is the same throughout the observation period (apart from the third quarter 2009). There are, however, few quarters in the LFS which do not fit the general picture at all and which can be identified quite clearly. Here, an increase is indicated, which is not plausible and can not be found in the respective results from the USR. The most distinct differences can be found in quarters 3 and 4 of the year 2008, as well as the second quarter 2010. There is some evidence that these quarters are biased due to heavy variations regarding the share of persons living in new construction areas (see section 4.2).

Figure 52
Quarter-to-quarter changes regarding the number of employed persons: LFS vs. USR



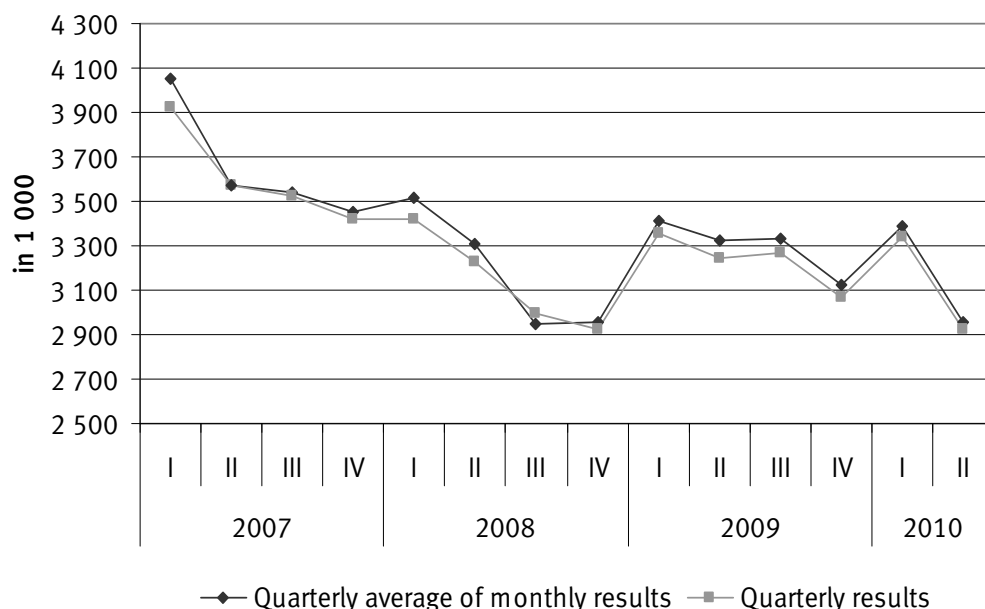
8.3 Coherence of the monthly and quarterly LFS results

As noted in chapter 4, there are also incoherences between the monthly and the quarterly results within the LFS. Here, the unemployed according to the ILO definition (as the more prominent indicator in the LFS context) are being compared. For the comparison, a quarterly average has been calculated from the monthly LFS results, which can easily be compared with the quarterly figures obtained from the LFS. As figure 53 shows, there is some incoherence, which is albeit slightly smaller (at least in terms of absolute figures) than the incoherence found for the monthly and quarterly employment results from the LFS (see section 4.3).

The monthly result, on average, is 1.4 % higher than the quarterly one. The more important feature (and main distinction to the results on employment), however, is that the difference is fairly stable over time. The lines only cross one time in quarter 3 of the year 2008. This might be due to the different impact of the variation of persons living in new construction areas under the monthly and the quarterly weighting scheme. Strangely enough, no such effect could be observed in the fourth quarter 2009, where it would have been expected. Obviously the effect due to the variation of the share of persons in new construction areas is less distinct in the case of the unemployed. Nevertheless, also the differences in 2007 are in line with the speculation that lacking stability in the

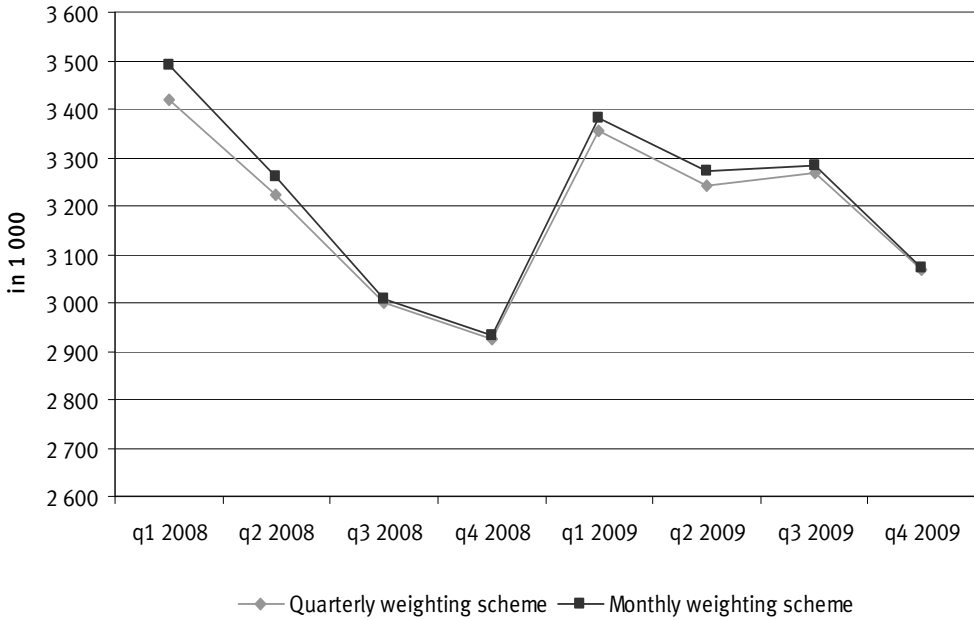
difference might be due to this effect (larger difference in the first quarter, which was characterised by a very low share of persons living in new construction areas, and nearly no difference in quarter 2 to 4, in which the share of persons living in new construction areas was “too high”; see section 4.3). Another difference compared to the monthly and quarterly results for employment is that one could not state that – compared to the time series of the USR – neither the monthly nor the quarterly results perform significantly better.

Figure 53
Unemployed according to ILO concept: Quarterly and monthly LFS in comparison



Also in the case of unemployment, a comparison of the weighting schemes used for the monthly and the quarterly sample is instructive. From another research project, quarterly results are available for the years 2008 and 2009 applying the weighting scheme of the monthly sample (calibration in breakdown by 13 age classes) to the quarterly sample (normally calibrated by three age classes only). On average, the number of unemployed persons in the quarterly sample is about 25 000 smaller with the quarterly compared to the monthly weighting scheme (– 0.7 %). Again the differences are not stable over time. In the quarters in which the number of persons living in new construction areas is “too high” (quarters 3 and 4 2008 as well as quarter 4 2009), the difference is less than 10 000 persons. In the other quarters (with “too few” persons in new construction areas), it is higher with about 30 000 to 70 000 persons. So in relative terms the effects are similar to those found for the employed, but in absolute figures they are less apparent as the group of the unemployed is much smaller in comparison to the employed.

Figure 54
Unemployed (labour force concept): Comparison of the weighting scheme
of the monthly and the quarterly sample



It has to be noted that the differences between the monthly and the quarterly results are not exclusively determined by the divergences between the weighting schemes. As noted in section 4.3, there are further deviations: The monthly results are based on smaller sample sizes and they have a smaller share of “delayed” interviews. These factors will influence the results on employment and unemployment, too.

9 Conclusions and recommendations

This study proves that there is no easy way to study and document the coherence of various data sources. Furthermore, comparisons become the more difficult the more the statistics under consideration differ methodologically.

The respective sources of errors could still be overlooked when comparing two population surveys: Each source of error, from frame errors over non-response errors to errors occurring in the weighting scheme, can be compared so that in summary an overall assessment of the strengths and weaknesses of either source is possible. The differences between the monthly telephone survey of the LFS conducted by the Federal Statistical Office Germany in the years 2005 to 2007 and the current LFS, which occurred despite large methodological similarities, are a case in point. As this example proves, also in the case of coherence between population surveys, quantifying the reasons for the differences is a complicated exercise and has no easy solution and can lead to intensive debate.

Further problems are being introduced when comparing a register and a survey, as in the case of the Employment Statistics Register and the LFS or the Unemployment Statistics Register and the LFS. Here, not only the methodology of data collection follows completely separated paths but also the operationalisation of the identical basic concepts comes into play as a further source of incoherence. In data sources based on administrative registers, administrative and legal rules, and not the reasoning of statisticians or the perception of respondents, determines the concepts to be measured. These concepts, invented (in the case of the USR and the ESR) mainly for purposes of the social insurance system, are not easily translated into a survey questionnaire and they are furthermore often not part of the respondents' everyday perception. Any measurement of such concepts in surveys is therefore limited.

Nevertheless, as this study also shows, the effort of comparison is clearly worthwhile. It can not only reveal possibilities of improvements in the Labour Force Survey but also teaches us a lot about the limitations of the use of statistical registers. In our analyses, we found the least problems for the groups of the public officials and the employees subject to full social insurance contributions. In the case of the public officials (given the officials of the ex-postal administration are being considered), the respondents seem to have a similar concept of how a public official is being defined. This is not surprising as the appointment as public official is a quite ceremonial act, which is usually followed by far-reaching changes regarding the social insurance and the earnings.

For the employees subject to full social insurance contributions, the situation is already becoming a bit more vague. Our findings suggest that it is not problematic as such to capture this group of persons (making up around 70 % of the all employed persons). However, there are indications that there is, in the operationalisation used by the LFS, also a significant number of marginal employees included in the result for the employees subject to full social insurance contributions. This directly leads to the insight that the group of marginal employees is even more problematic in survey measurement: First of all, there are obvious difficulties to achieve a comprehensive measurement of this group in the LFS,

which has also been proven by the follow-up survey carried out in the year 2008.⁵³ At the same time, quite obviously many respondents have problems to identify themselves as marginal employees and might, therefore, be counted as employees subject to full social insurance contributions in the LFS. The legal basis of marginal employment, but also the administrative registration and de-registration procedures are not easily understood, even for labour market experts. This could be the reason why, in summary, the divergence for all employees, between the LFS and the ESR, amounts to only slightly more than 0.5 million persons, while it is close to 2 million for the marginal employees.

For the operationalisation in a survey, the legal definition of registered unemployment comes close to the worst case for a questionnaire designer. The definition, on which the results from the Unemployment Statistics Register are being based, is so complex that even labour market specialists will not have easy access to it. As the LFS is not a survey of labour market specialists, the incoherences found clearly show that it is hardly possible to correctly get hold of the registered unemployed with a population survey. The most reasonable way out would be to micro-link the LFS and the USR in order to have further possibilities to analyse the structure of the registered unemployed, as well as the intersection with the unemployed according to the labour force concept (and the weighting of the monthly samples).

All comparisons of registers and surveys are subject to one further important restriction. One cannot be sure whether each of the registers, on the one hand, and the LFS, on the other, refer to a target population which is identical in size and structure. If absolute figures are being compared (which can hardly be avoided for any meaningful analysis), the results from the LFS are based on a sample, which has been weighted and calibrated using marginals from population statistics. This is problematic in two respects: Firstly, in Germany the sampling frame used for the LFS basically is almost 25 years old, which will lead to significant coverage errors. Unfortunately, these errors are very difficult to quantify. Secondly, the calibration marginals refer to the same census results from 1987 as the sampling frame does, which have been continually updated by population statistics since. The 2001 test survey for the next German census suggests that the figures from the current update of the population statistics overestimate the total population by 1.3 million persons. It is difficult to assess the effects upon the incoherence of the LFS and the various registers under consideration simply for the fact that very little is known about the target population covered by each of the registers. It can be hoped that further insight will be gained from the 2011 population census in Germany, which will not only provide more up-to-date population figures, but at the same time also involve new opportunities to compare the registers (which are used for the compilation of the census results) with the results from the sample survey carried out for the purposes of the census.

53 At the same time, a part of the difference might also be due to specificities of the Employment Statistics Register, e.g. due to discontinual working time, misuse of the legal provisions of marginal employment etc. These aspects are investigated in a register-survey, which is being carried out in parallel to this study.

Despite all these restrictions, it should not be overlooked that the comparisons between the LFS and the various groups of employed persons have proven extremely insightful. Especially the comparisons of the structures by age and sex led to innumerable hints regarding possible improvements in the LFS, as well as the other data sources under consideration.

Turning to the pivotal issue of this report – the comparison of the employment figures from the Labour Force Survey and the Employment Accounts – things still get more complicated. The fact that the EA are based on a large number of methodologically quite heterogeneous sources drastically reduces the starting points for comparative analysis, at least when it comes to the underlying reasons for the differences. The approach chosen in this study, focussing on the reasons for the differences close to the EA's sources, turned out to be fruitful. Using this type of approach, it was possible to not only identify the conceptual differences, but also to further differentiate the methodological differences. By comparing employed persons by status in employment “at the source”, first of all, all the restrictions mentioned before do apply. Furthermore, the risk of the approach is that it makes the estimation approach of the EA seem simpler and more mechanical than it actually is. Particularly the EA's benchmark calculation of the “base year” takes into account many more sources than the ones for the employed persons by status in employment. Nevertheless, the revised version of the reconciliation table at least roughly succeeds in documenting the differences due to incoherencies among the sources as well as the net adjustments applied to the sources by the EA.

Another key finding from the study is that any analysis of incoherence between the LFS and the EA necessitates an in-depth understanding of the estimation methods used by the EA (and the LFS). Furthermore, the decision, which sources to focus on, can only be taken on the basis of the estimation method used in the EA. This at the same restricts the possibilities to use strictly harmonised reconciliation tables in all member states of the ESS. Although, in general terms, the proposal of the Eurostat Task Force on Quality of the LFS for the design of reconciliation table has proven to be reasonable, specific modifications in individual member states might become necessary according to the specific estimation techniques used in the national EA.

In summary, we recommend to consider the following items in further developments:

- The reconciliation table should be used in a flexible way in all ESS member states, in order to maximise its informational value for the situation in each member state.
- Experiences made with the construction of reconciliation tables should be shared among the member states in a workshop, involving both LFS and National Accounts experts.
- The possibilities to micro-link data from the LFS on the one hand and the relevant statistical registers on the other should be enhanced in future revision of the LFS's legal basis in order to improve the possibilities for methodological analyses.
- The German LFS urgently needs improvement regarding the consistency of the intra-annual trends. Besides the introduction of an intra-annual rotation scheme and the fixed reference week, improvements for the weighting scheme used for the estimation of the monthly results also need to be considered.

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