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Job tenure in turbulent times

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Job tenure in turbulent times

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Abbreviations used in the report

BLS	Bureau of Labor Statistics (US)
CEE	central and eastern European (Member States)
EU-LFS	European Union Labour Force Survey
GDP	gross domestic product
ISCED	International Standard Classification of Education
OECD	Organisation for Economic Co-operation and Development

Country codes EU27

AT	Austria	**IT**	Italy
BE	Belgium	**LT**	Lithuania
BG	Bulgaria	**LU**	Luxembourg
CY	Cyprus	**LV**	Latvia
CZ	Czech Republic	**MT**	Malta
DE	Germany	**NL**	Netherlands
DK	Denmark	**PL**	Poland
EE	Estonia	**PT**	Portugal
EL	Greece	**RO**	Romania
ES	Spain	**SE**	Sweden
FI	Finland	**SI**	Slovenia
FR	France	**SK**	Slovakia
HU	Hungary	**UK**	United Kingdom
IE	Ireland		

Note: EU27 countries are included here as the research predates Croatia's accession to the EU on 1 July 2013.

Executive summary

Introduction

Changes in the economic environment over past decades have led to growing concern about decreasing job stability and the disappearance of the 'job for life'. There is a fear that globalisation and technological progress have led to changes in the labour market, which may in turn have reduced job tenure (defined as the length of time a worker has been continuously employed by the same employer). In addition to these potential long-term trends, the recent economic and financial crisis may also have affected job stability.

This study provides a comprehensive picture of the evolution of job tenure between 2002 and 2012. It analyses the entire tenure distribution in terms of mean, short and long tenure using data from the European Union Labour Force Survey (EU-LFS). This is done for the EU27 (minus Malta), by Member State, and for different sociodemographic and job characteristics, examining in particular how tenure evolved before and during the crisis. The link between job tenure and earnings is also investigated.

Policy context

Employment protection law and the volatility of the business cycle both influence job turnover and so help to explain differences in tenure levels across countries. Job tenure is of paramount interest to workers since it can be interpreted as a measure of job stability. Examining the level and structure of job tenure over time enables an assessment of whether job stability has actually decreased (and to what extent) or whether fears about decreasing job tenure and the disappearance of a 'job for life' are overstated.

It is important to distinguish between job stability (taking job tenure as a proxy) and job security as perceived by workers. The latter may be influenced not only by the risk of losing a job but also by the consequences of losing a job, which in turn depends on the chance of re-employment and the level of expected protection in case of unemployment (through unemployment benefits or active labour market policies). At times of high unemployment, jobs may be considered to be more unstable, although this may not be reflected by lower job tenure.

Key findings

- Average job tenure at EU aggregate level increased slightly from 116.5 months in 2002 to 123 months in 2012.
- There are distinct cross-country differences during the pre-crisis period (2002–2007); mean tenure was lowest in Latvia at 86 months and highest in Slovenia at 137 months. The continental European countries (Austria, Belgium, Germany, Luxembourg and the Netherlands) and the Mediterranean countries (except for Spain) had comparably high average tenure, while the central and eastern European (CEE) countries (except for Slovenia) as well as Ireland and the UK were characterised by low average tenure. These cross-country differences appear to be strongly linked to the institutional framework of countries, such as their employment protection legislation.
- During the crisis period (2008–2012), mean tenure increased in the majority of countries against a background of job destruction, affecting those employees with shorter tenures relatively more than those with longer tenures. Seven countries experienced a decrease in mean tenure, 12 experienced an increase and 7 experienced changes of less than 1 month. Those countries hit especially hard by the crisis (Estonia, Greece, Ireland, Italy, Latvia, Portugal and Spain) all had considerable increases in mean tenure.
- The increase in mean tenure since the crisis can be explained by a shift towards relatively more long-tenured jobs. The number of short-tenured jobs fell during the crisis, but the share of long-tenured jobs proved to be relatively stable at EU level. Indeed, very long-term employment relationships became more prevalent over the whole period analysed.

- Four country clusters can be distinguished based on tenure distribution. The continental and some Mediterranean countries have the highest average tenure levels, due to a lower share of short-tenured workers and a higher share of long-tenured workers. The opposite is true for the Baltic states, Denmark, Ireland, Spain and the UK, which have the lowest average tenure levels due to a higher share of short-tenured and lower share of long-tenured workers. Finland and Sweden have a polarised distribution, with high shares of both short- and long-tenured workers, while CEE countries typically have a more compressed tenure distribution, where the shares of short- and long-tenured workers are equally below average.
- For the EU as a whole, mean tenure is higher for men than women, although this gap narrowed between 2002 and 2012. This overall picture again hides important cross-country differences before and during the crisis. A large part of the gender gap in mean tenure can be explained by other factors – for example, women work in sectors where mean tenure is lower, such as the hotels and restaurants industry.
- Further analysis showed that large parts of the increase in tenure (aggregated across EU countries, but also for many individual countries), especially in the pre-crisis period, were due to changes in the age composition of the labour force. This means that if the shares represented by the different age groups had stayed constant, average job tenure would have decreased.
- The job tenure of temporary workers during the crisis adjusted very differently in individual countries. This suggests that the role of temporary employment in national labour markets varies considerably across Member States.
- An analysis of the earnings–tenure relationship suggested a positive link between tenure and the probability of an individual improving their relative position in the earnings distribution in the first nine years in the same job. After that, the chances of advancing in the earnings distribution due to higher tenure decline. The odds of moving up in the earnings distribution compared with staying in the original earnings decile were found to increase by 8% per year at the beginning of a job.

Conclusions

The institutional framework matters: employment protection legislation is strongly linked to cross-country differences in tenure levels.

The evolution of tenure is strongly linked to the business cycle, with tenure typically behaving counter-cyclically. Despite a mixed picture across countries between 2002 and 2008, average job tenure increased in most countries during the recession as short-tenured jobs were disproportionately destroyed and job creation was lower.

An ageing workforce also seems to have contributed to a considerable upward shift in tenure in the pre-crisis period. However, there seems to be an underlying trend towards shorter job tenure. In particular, tenure would have decreased by 2.6 months between 2002 and 2012 even if the demographic structure of the workforce had remained constant. Although the descriptive evidence does not reveal a decline of mean tenure or a decline of the relative importance of long-term employment relationships, analyses controlling for certain sociodemographic and job characteristics provide some evidence of an underlying trend of declining average tenure.

Introduction

Changes in the economic environment in recent decades have led to growing concerns about decreasing job stability. In particular, the potential decline in the prevalence of jobs that last for a long period of time (that is, 'a job for life') has been intensively discussed in both academic research and the media. The fear is that globalisation and technological progress such as advances in communication technologies have induced changes in the labour market, requiring employees to be more flexible. Therefore, workers have to adapt to more frequent transitions between jobs and intermittent spells of unemployment. These changes in the labour market are likely to affect job satisfaction and worker well-being (European Commission, 2001).

Job tenure is of paramount interest to workers in this context since it can be interpreted as a measure of job stability (Neumark, 2000). Job tenure is defined as the length of time a worker has been continuously employed by the same employer. Examining the level and structure of this indicator over time provides an empirical understanding of the evolution of job stability. The analysis of job tenure enables an assessment of whether, and to what extent, a reduction in job stability actually occurred during the past decades or whether fears about decreasing job tenure are overstated.

Apart from long-term trends, the evidence from the recent financial and economic crisis suggests the labour turnover rate was strongly affected, with potentially severe consequences for job tenure. The crisis has led to a large and persistent increase in unemployment in many European countries, but also to a divergent development of the labour markets across the European Union. Many workers in the EU have experienced a strong decrease in job stability, and inflows into non-employment due to dismissal have increased. These inflows have been shown to differ strongly between worker groups, such as old and young workers (Eurofound, 2014). Since worker turnover is closely connected with length of time in a job, it is expected that the Great Recession also had a prolonging effect on job tenure.

While there is research on job tenure in the pre-crisis period across European countries (Auer and Cazes, 2000; Cazes and Tonin, 2010), the impact of the crisis on job tenure has not, to the authors' knowledge, been examined at European level. This study therefore seeks to fully exploit the richness of the micro data from the EU Labour Force Survey (EU-LFS) from 2002 to 2012 to examine how job tenure has evolved across EU countries in the pre-crisis and crisis periods.

Both long-term trends and more recent developments such as the Great Recession may have adversely affected the job tenure of different population subgroups, so analysing tenure at the aggregate level may mask changes for subgroups. To reveal variation in job stability (that is, tenure) within each group, the study also investigates the effects on job tenure across worker groups and across job types. Changes are analysed at the EU aggregate level as well as for specific countries, with an initial focus on comparing mean job tenure across countries and subgroups of the population. The aim is to create a full picture of the changes in job stability across countries and subgroups, taking a longer-term perspective (2002–2012) and looking in more detail at the evolution during the recent financial and economic crisis.

As well as mean tenure, the analysis of the distribution of tenure also looks at short and long tenure. This makes it possible to investigate whether there are specific developments at the extremes of the job tenure distribution that may not be visible when looking only at average tenure. Focusing on the extremes of the distribution also makes it possible to look for signs of polarisation in this context, that is, whether there is a tendency towards dual or segmented labour markets (Boeri, 2011).

A further issue of great interest in the context of job loss and job tenure is the link between job tenure and income. A worker who loses a job that they have held for some time will have zero tenure when eventually starting a new job. This means that the wage premium accumulated during the previous job, which is measured by the earnings–tenure relationship, will disappear. Involuntary dismissals increased sharply during the crisis (Eurofound, 2014), so many former employees lost out on the tenure premium, thus increasing the aggregate costs of job loss during the recession.

Because this issue is so important, the analysis investigates the earnings–tenure relationship. In doing so, it relies on a variable for income that divides the income distribution into deciles (that is, each decile contains 10% of the individuals for whom a wage is observed). Therefore, this analysis is concerned with the relative position of an individual in the income distribution; relative income has been shown to be a crucial aspect of individual utility and happiness (Clark et al, 2008).

The report is structured as follows. Chapter 1 provides an overview of the existing literature on job tenure and its determinants. Chapter 2 presents analyses of the evolution of job tenure, providing an overview of both trends and cyclical features for the EU at the aggregate level and for specific countries for the period 2002 to 2012. Chapters 3 and 4 focus on differences in job tenure in this context between sociodemographic groups and job types, respectively. Chapter 5 provides a regression analysis that allows compositional effects to be controlled for. Chapter 6 discusses the relationship between job tenure and income. Finally, Chapter 7 summarises the main results and presents the study's conclusions.

Overview of the literature 1

There is an extensive academic literature on job tenure. Most studies investigate whether the prevailing feeling of declining job stability among workers in recent years can be verified empirically. Trends in job tenure and its evolution before the financial and economic crisis have been analysed by researchers for various countries separately. Only a few have examined changes across countries and even fewer have focused on the development of tenure across countries and sociodemographic groups or job characteristics.

An influential contribution to this line of literature is a study by Auer and Cazes (2000), who analysed tenure in the 1990s for 14 EU countries, Japan and the USA. They found that mean tenure remained stable in most countries and increased only slightly in a few countries during the observation period. According to the study, mean tenure is stable at different levels across countries. The authors argued that these country-specific differences are due to heterogeneous labour market institutions and workers' labour market behaviours. Their analysis shows that mean tenure was comparably high for Mediterranean countries and low for Denmark, the Netherlands, the UK and the USA. Examining data for eight EU countries, Japan, Russia and the USA for the mid-1990s, Burgess (1999) found that the UK and the USA had relatively low-tenured working relationships. These results suggest that tenure is generally low in countries that are characterised by flexible labour markets.

When looking at longer-term trends, it becomes apparent that inter-country differences are relatively stable over time. A study by Cazes and Tonin (2010) found similar patterns across EU countries between 1996 and 2006. Their descriptive evidence from 24 EU countries (EU28 less Austria, Bulgaria, Croatia and Romania) confirms that mean tenure remained constant across countries and over time. In addition, the study identifies Estonia and Latvia as countries with relatively short mean tenures and Slovenia as a country with comparably long mean tenure. Information on these countries was not available in previous studies.

Evidence from Farber (2010) contradicts the findings of Auer and Cazes (2000) on the evolution of tenure in the USA over time. Using data from the US Current Population Survey (CPS), the author concluded that mean tenure had been decreasing in the USA between 1974 and 2008. The driving force for this result appeared to be the private sector. Employees in the public sector, in contrast, experienced a marginal increase in mean tenure instead of a decline over time.

To understand some of the factors leading to these cross-country differences, it is important to note that job tenure is strongly linked to the labour turnover rate, which measures worker mobility based on the entries into new employment relationships and exits from existing ones. Both are determined by labour market institutions.

Labour markets lacking dynamism are associated with high tenure, whereas the reverse is true for highly dynamic labour markets. Determinants of the dynamics are, for example, the degree of employment protection legislation, unionisation and collective bargaining. If the degree of regulation is low, then companies are able to make short-term decisions on hirings and firings, and workers have more (short-term) job opportunities. This fosters labour market transitions and leads to short job tenures. In less flexible labour markets, however, it is difficult and costly for organisations to fire workers, which results in cautious hiring policies and comparably low levels of labour market transitions. At the same time, workers find it more difficult to find a new job once they are not employed and job-to-job transitions decrease (Boeri, 1999). Hence, less flexible labour markets exhibit longer job tenures. These relationships are shown to hold empirically. Results from Burgess (1999) suggest that employment protection legislation has a positive effect on mean tenure. Furthermore, Boockmann and Steffes (2010) found that labour market institutions play a pronounced role in reducing mobility and thus prolonging tenure.

Other influences on the length of job tenure are differences with respect to worker preferences concerning job and employment types. For example, lifelong employment relationships are more common in some countries, which therefore have low turnover rates and longer job tenure. Female labour market attachment also affects job tenure.

These factors mean that different aggregate job tenure levels are expected when comparing countries. Both short-term changes and longer-term trends in the length of job tenure can play a role in this context. These may be caused by labour market reforms, structural changes or the business cycle. For example, a labour market reform aimed at increasing worker turnover may lead to a long-term trend of declining job tenure. The same effect can be induced by structural change (Bachmann and Burda, 2010).

The changing career patterns of workers may also be important in explaining job tenure in the long run, irrespective of whether they are self-imposed or result from globalisation and technological progress. The general understanding is that there have been increases in job-to-job transitions in the past decades (Stewart, 2002; Gomes, 2010) that must have induced a decline in job tenure.

Furthermore, the business cycle causes variation in job tenure. Job tenure behaves counter-cyclically and therefore moves with the unemployment rate (Auer and Cazes, 2000). It decreases in economic booms when unemployment falls and increases in recessions when unemployment rises. This stylised fact can be explained as follows. During economic upturns, job creation increases. Hence, transitions from unemployment to employment increase, leading to many new job–worker matches. Furthermore, voluntary job-to-job transitions rise as workers use better job opportunities during an upswing in order to improve their professional career status and thus leave their current employment (for the USA, see Shimer, 2005; for Germany, see Bachmann, 2005). The resulting job-to-job and unemployment-to-employment transitions lead to a large number of workers with a new job, which by definition has zero tenure. At the same time, layoffs are reduced, which increases job tenure. However, the negative impact of voluntary quits and new job–worker matches on job tenure appears to dominate the positive effect of the reductions of layoffs on average. Therefore, the length of job tenure is expected to decline during booms.

The opposite picture is found during recessions, when job tenure tends to increase. Exit flows from employment increase as organisations dismiss workers (Eurofound, 2014). Importantly, workers along the tenure distribution are affected differently, with those who have little seniority being more likely to lose their job during recessions than high-tenured workers (Abraham and Medoff, 1984; Jovanovic, 1979). Furthermore, the number of voluntary quits falls because career opportunities narrow. In addition, the flows to employment decline because labour market prospects are worsening. As a result, tenure increases in economic downturns.

The Bureau of Labor Statistics (BLS) at the US Department of Labor provides evidence that the recent economic crisis affected job tenure in the USA, as predicted by theory, again suggesting that tenure behaves counter-cyclically. The BLS reported that median tenure increased between 2006 and 2014 (BLS, 2014). This applies to all age groups and to both women and men. The findings also suggest that job tenure rose across economic sectors, although by different degrees.

The literature identifies distinct patterns and trends in the relationship between sociodemographic characteristics and mean tenure before the crisis, which hold for the majority of EU countries. Farber (2010), as well as Auer and Cazes (2000), found that on average the gap in mean tenure between men and women shrank over time. While mean tenure for men changed little or decreased slightly, mean tenure for women increased. An important explanatory factor for this development is women's changing career patterns. Over time, women have acquired more human capital (that is, there are now more high-skilled women in the labour force) and childcare has been improved in many countries, which facilitates women's labour force participation.

No clear pattern in the development of mean tenure by age group emerges in Europe for the period from 1996 to 2006 (Cazes and Tonin, 2010). Young workers did not experience a systematic decline, except for those in the central and eastern European (CEE) countries. In contrast, mean tenure of young workers increased in Ireland and the Netherlands. Varying trends are also found for prime-age and older workers across Europe. After controlling for age, however, Cazes and Tonin reported some reduction in average tenure in the majority of the EU countries. Hence, demographic change is important and should be taken into account when studying job tenure.

Results on the evolution of mean tenure with respect to skills differ. Burgess (1999) found that tenure varies little across skill levels. In contrast, Boockmann and Steffes (2010), studying male workers in Germany, reported that blue-collar workers tend to select themselves into long-tenure organisations. Thus, blue-collar workers experience, on average, higher tenures than white-collar workers. Also, Auer and Cazes (2000) provided evidence that a low level of educational attainment is accompanied by higher tenures in most EU countries. One explanation for this finding is that high-skilled workers tend to change job positions more often than low-skilled workers in order to improve their position in the labour market. However, the result implying little difference across skill groups may arise because tenure could be mainly affected by the field of activity or specific job tasks rather than the skill level.

The relationship between job characteristics and tenure has also been examined. This is of primary interest in the context of job stability because temporary contracts are increasingly prevalent in the EU. However, this does not necessarily imply any immediate effects on mean tenure since temporary contracts are designed differently across countries with respect to termination time and prolongation.

Auer and Cazes (2000), for example, reported that some countries have high proportions of temporary employment and high mean tenure, specifically Finland, Greece, Portugal and Sweden. The reverse (that is, low proportions of temporary work and low mean tenure) was found for Denmark, Ireland and the UK. Furthermore, they found that tenure varies considerably across occupations and industries. Concerning occupation, they reported that higher-skilled occupations such as legislators, senior officials and managers have the longest tenures. Short tenures are most common in manual jobs and among service and sales workers. Individuals in the electricity, gas and water supply sectors and in public administration experience the highest mean tenures, whereas workers in the service sector (that is, hotels and restaurants, and wholesale and retail trade) have relatively low tenures.

Analysis of levels and changes in tenure for workers with short- and long-tenured jobs provides insights on the distributional pattern of tenure and thus allows the capture of changes in the event of increasing polarisation; such a perspective is not possible when considering mean tenure. Auer and Cazes (2000) found that countries with a low percentage of workers with short tenure (less than one year) are also characterised by a high percentage of workers with long tenure. Belgium, Greece, Italy and Japan, for instance, belong to this group. The opposite is also true, that is, countries with a high proportion of workers with short tenures have the lowest proportion of workers with longer tenures. Examples are Denmark, the UK and the USA. Auer and Cazes (2000) identified some variation in the distribution of employment by class of tenure between 1991 and 1998. These changes were most visible for the Netherlands and Spain. The Netherlands experienced a sharp decline in the percentage of short-tenured workers, while the respective proportion in Spain rose until 1995 and declined afterwards.

The literature has also investigated the relationship between tenure and wage. The theory, as well as empirical findings, suggests that this relationship is positive and thus earnings rise as tenure increases. Nonetheless, the link is more pronounced in the USA (Altonji and Shakotko, 1987; Topel, 1991; Altonji and Williams, 2005) than in Europe (Dustmann and Meghir, 2005; Beffy et al, 2006; Bagger et al, 2014). In the context of the present study, the earnings–tenure relationship is particularly relevant because a declining trend in job tenure would imply that workers, on average, do not benefit from wage increases accompanied by longer job tenure.

To summarise, previous studies imply that job tenure at country level remained relatively stable in Europe before the Great Recession. However, an analysis of tenure for different worker subgroups indicates some variation within the labour force over time, which is not visible at aggregate country level.

Job tenure in Europe 2

This chapter investigates the distribution of tenure and specifically mean tenure for the period 2002 to 2012 in the EU as well as in individual Member States. Data on job tenure is gathered for all EU27 countries with the exception of Malta. It focuses on mean tenure as the most condensed measure for examining the development of tenure in general. Nevertheless, mean tenure might remain stable despite many workers experiencing a change in their tenure levels. For that reason, changes in the share of short-tenured and long-tenured workers are also analysed, where short tenure refers to the 10th percentile and long tenure to the 90th percentile of the EU aggregate tenure distribution.

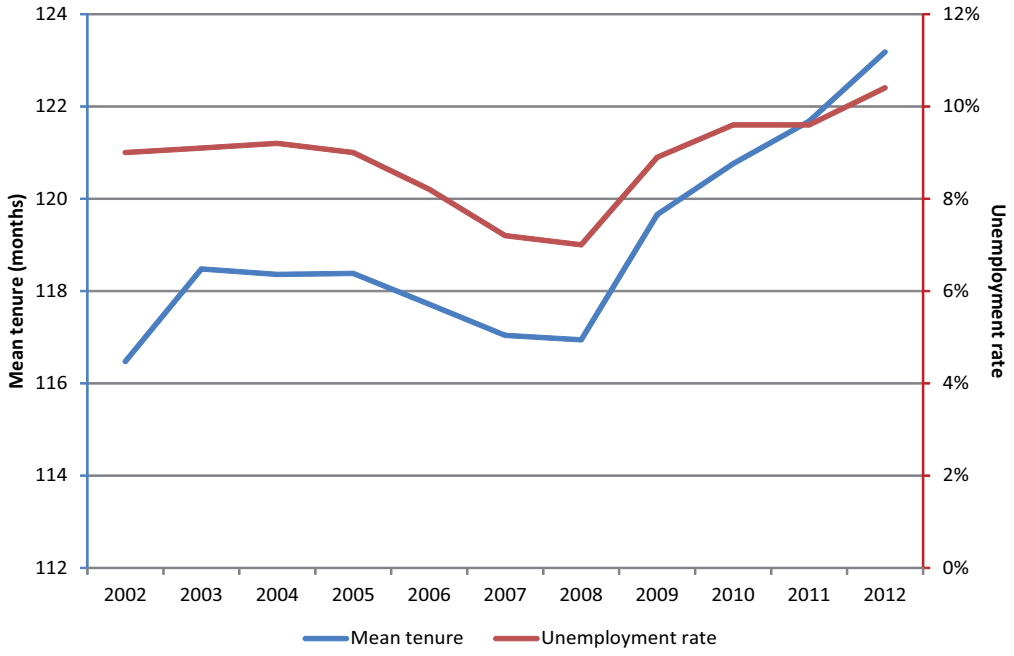
The analysis begins by looking at the EU aggregate level and then moves to examine individual countries. To keep the analysis precise, the focus is either on the evolution of tenure over time (for example, at EU aggregate level or for specific countries) or on country differences for selected years or different periods. Both dimensions are highly relevant, as countries differ considerably from each other in terms of mean tenure due to their labour market institutions, macroeconomic environment, workforce composition and cultural background. At the same time, these determinants may change over time for each country. As long as these changes are temporary, such as an increase in mean tenure caused by a recession, they might be negligible. However, structural changes in tenure caused by, for example, a labour market reform are of key interest.

Tenure at EU aggregate level

Figure 1 shows the evolution of mean tenure and the unemployment rate in the EU between 2002 and 2012, including all EU27 countries apart from Malta. In 2002, mean tenure is 116.5 months (almost 10 years). From 2003 to 2005, it is somewhat higher at 118 months, only to fall to its previous level by 2008. Between 2008 and 2012, which covers the period of the financial crisis, mean tenure increases continuously, reaching its highest level of 123 months in 2012.

There is clearly a correlation between average tenure and the unemployment rate. The correlation coefficient is 0.78 (statistically significant at the 1% significance level). As discussed in Chapter 1, such a correlation may emerge during a recession when short-tenured jobs are destroyed or no new (and thus short-tenured) jobs are created. As the economy recovers, workers are re-hired, thereby reducing mean tenure, as these workers have zero tenure by definition.

Figure 1: Mean tenure and unemployment rate in the EU, 2002–2012

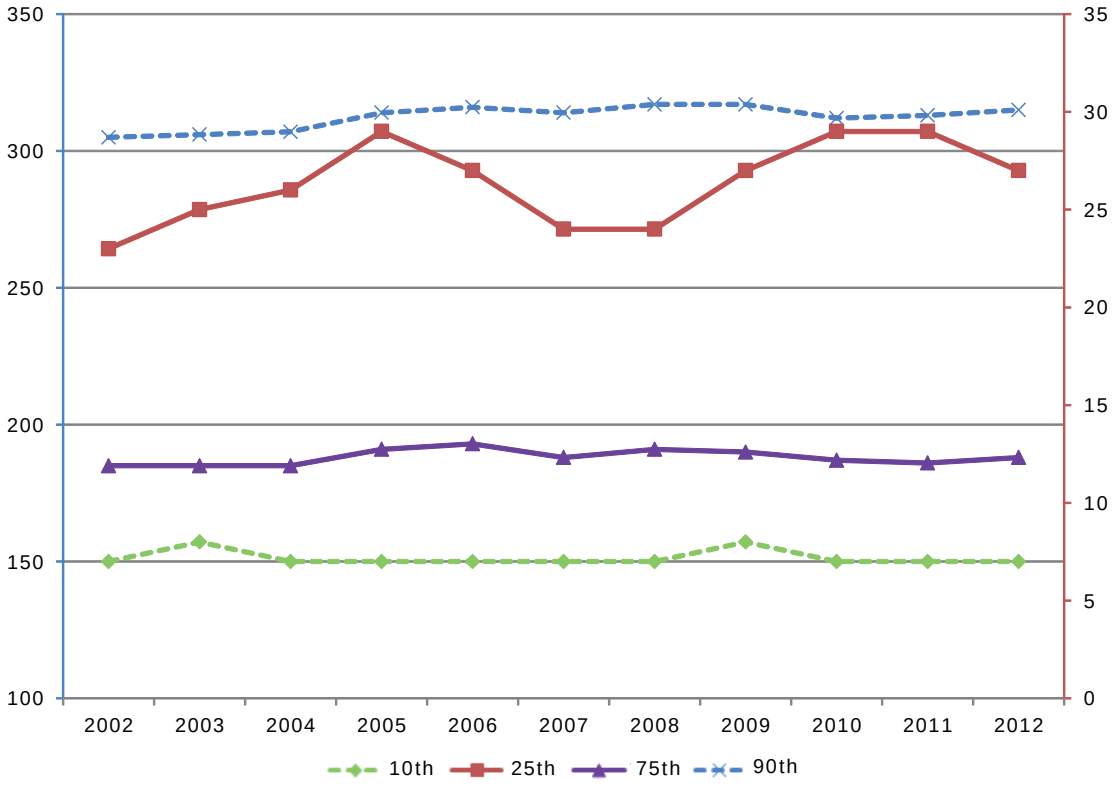


Notes: Mean tenure is plotted against the primary axis, which starts at 112 months to make the variation visible; the unemployment rate is plotted against the secondary axis.
Source: *Eurostat, EU-LFS, authors' calculations*

To make potential changes in the distribution more evident, the evolution of different percentiles of the tenure distribution over time is shown in Figure 2. In this context, a specific percentile (for example, the 10th percentile) indicates the number of tenure months below which the corresponding percentage of workers (for example, 10%) lie in terms of their tenure. The 10th percentile is very stable over time and varies between seven and eight months (that is, 10% of workers have tenure of less than seven or eight months). In contrast, the 25th percentile varies quite substantially. It increases from 23 months in 2002 to 29 months in 2005, only to decrease to 24 months again by 2008. This means that in 2008, 25% of all workers in the EU had tenure of 24 months or less. During the recession, the 25th percentile once again increases, reaching 29 months, which shows that during the crisis there were relatively fewer short-tenured workers. This may have been caused by the destruction of short-tenure jobs or less job creation, or both.

Unlike the lower percentiles of tenure distribution, the 75th and the 90th percentiles show less variation over time and a slightly upward sloping trend (Figure 2). The impression of an upward sloping trend is mainly driven by developments from 2002 until 2005. During this period, the 75th and 90th percentiles increase from 185 to 191 months and from 305 to 314 months, respectively. After 2005, both percentiles are surprisingly stable around these limits. The lower variation in relative terms compared with short-tenured jobs (for example, the 10th or 25th percentiles) is enhanced by the fact that the overall tenure distribution is much less dense for long-tenured jobs.

Figure 2: Change in percentiles of the tenure distribution (in months), 2002–2012



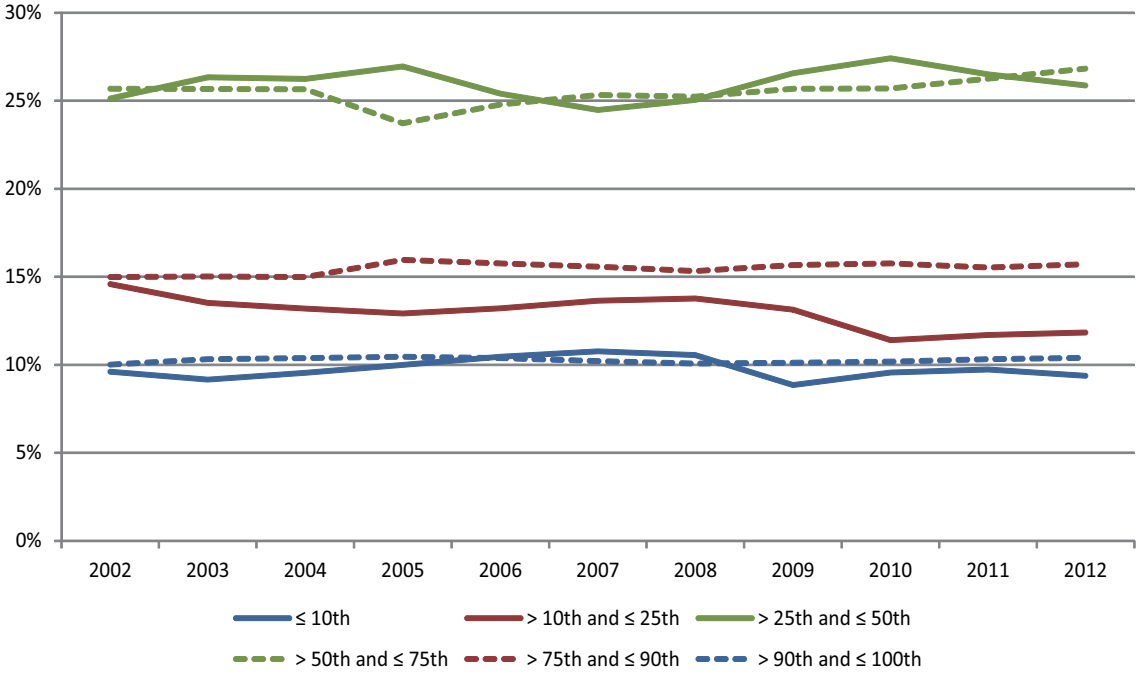
Notes: The 75th and 90th percentiles are plotted against the primary axis, which starts at 100 months to make the variation visible. The 10th and 25th percentiles are plotted against the secondary axis.
Source: *EU-LFS, authors' calculations*

Along the same lines, differences in variation between the 10th and 25th percentiles do not necessarily imply that workers with tenure between these percentiles were mainly affected. Instead, the distribution of tenure is extremely dense for very low tenure levels. Stated differently, many more workers have tenure of 5 or 6 months than have tenure of 300 or 301 months.

Because of this difficulty in interpretation when concentrating on the development of different percentiles of tenure, an alternative approach is to turn the analysis around and instead focus on the evolution of the share of workers with tenure below specific percentiles in 2002. This enables a more direct interpretation of which parts of the tenure distribution saw changes.

Figure 3 fixes the percentiles in 2002 and shows how the share of workers with tenure below the limit in each band develops over time. For example, the 10th percentile of the tenure distribution in the EU is 7 months in 2002 (Figure 2). However, in 2003 only 9.2% of all workers have tenure of 7 months or less, while this share rises to 10.8% in 2007 (Figure 3). Note that if the tenure distribution had stayed the same over the entire observation period, one would expect flat lines, with 10% of all workers having tenure below the 10th and above the 90th percentile, 15% of workers having tenure between the 10th and the 25th percentile as well as the 75th and the 90th percentile, respectively, and 25% of all workers with tenure levels between the 25th and the 50th as well as the 50th and the 75th percentiles.

Figure 3: Distribution of workers according to percentiles, 2002–2012



Notes: The percentiles are based on the tenure distribution across the entire EU in 2002. The share of workers with tenure below the 10th percentile does not exactly equal 10% in 2002 because the tenure distribution is too dense. Stated differently, the true 10th percentile lies between 7 and 8 months.
Source: *EU-LFS, authors' calculations*

Interestingly, the tenure distribution appears to remain relatively stable above the 75th percentile. The share of workers with tenure above the 90th percentile is 10% over the entire observation period, while the share of workers between the 75th and the 90th percentile shows a significant peak only in 2005, when the share rises to almost 16%. In contrast, there is much more movement in the lower part of the tenure distribution. The share of short-tenured workers – for example, those with tenure equal to or below the 10th percentile – behaves cyclically; it falls below 10% during recessions (2003 and 2009), but recovers quickly again.

At the same time, the share of workers between the 10th and the 25th percentiles shows a similar cyclical pattern, but shifts in the distribution are more persistent. That is, the share of workers does not reach its 2002 level of 15% again

from 2003 until 2007, and the share further decreases to 11.4% until 2010. Additionally, compared with the share of workers with tenure below the 10th percentile, there appears to be a time lag in the reaction of the share of workers with tenure between the 10th and 25th percentiles.

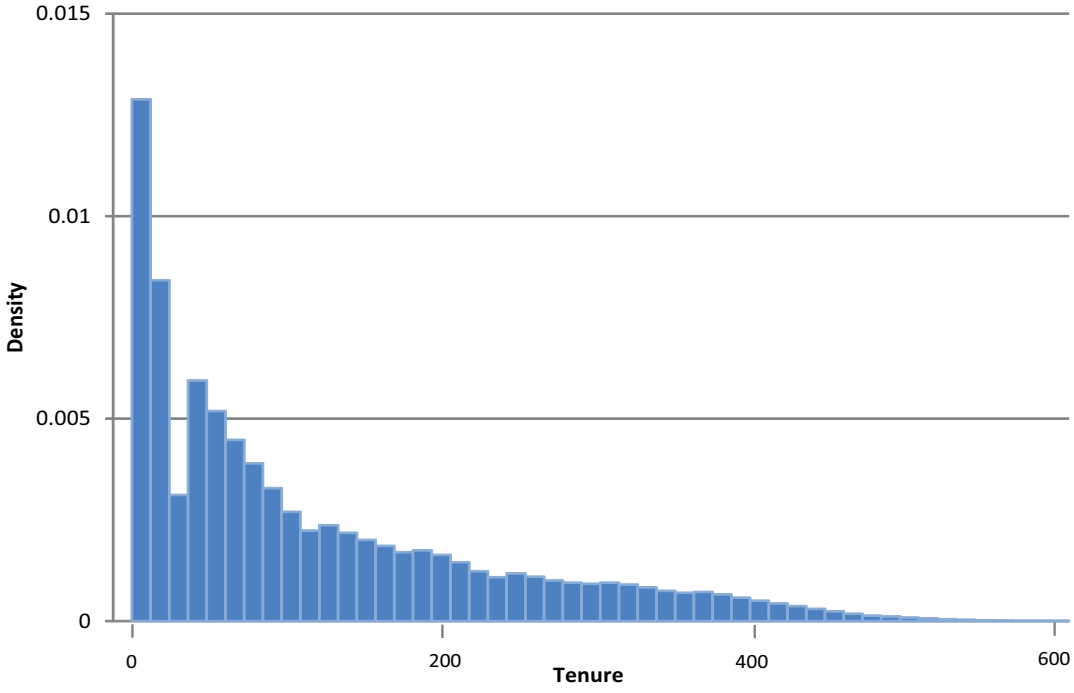
Lastly, in the early years of the observation period (2002–2007), the share of workers with tenure between the 25th and 50th percentiles and the share of workers with tenure between the 50th and the 75th percentiles mirror each other. If one of the two shares is below 25%, the other share is above and vice versa. This pattern changes with the beginning of the financial crisis, with both shares now being above 25%.

Indeed, the fact that there are fewer short-tenured workers (that is, workers with tenure below the 25th percentile) from 2008 onwards is outweighed by more workers with tenure between the 25th and the 90th percentiles (Figure 3). Note that these patterns can either be explained by a higher number of medium- and long-tenured workers in absolute terms or in relative terms. A higher number in absolute terms could be explained by an ageing workforce, which leads mechanically to higher tenure levels. However, this does not explain why a change occurs in the patterns from 2008 onwards. A higher share in relative terms may be caused by the destruction of short-tenured jobs or less job creation.

To gain deeper insights into how the distribution of tenure changed during the financial crisis, Figure 4 and Figure 5 show histograms of tenure for all EU Member States in the pre-crisis and crisis periods, respectively. Their similarity indicates that the aggregate distribution of job tenure is very similar for the two periods.

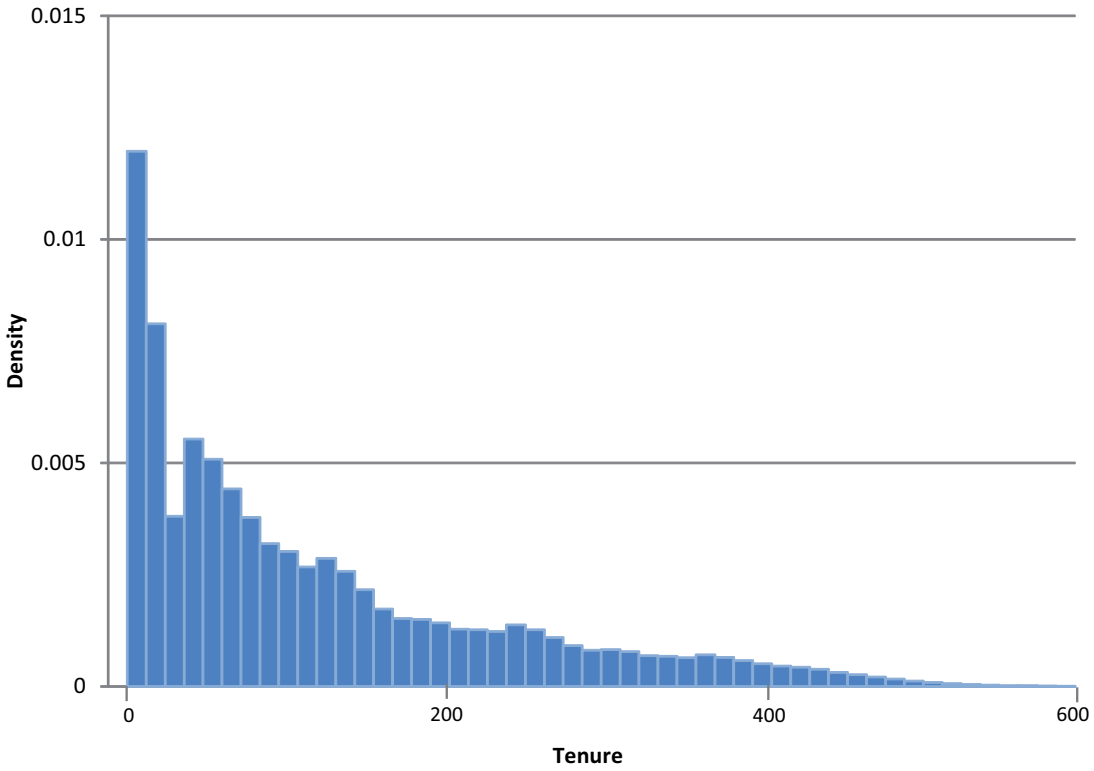
The remainder of this report therefore concentrates on disaggregate analyses, by focusing on individual countries as well as specific worker and job types. It becomes apparent, however, that the density of short-tenured jobs is large but declines sharply as job duration increases. A direct comparison of the pre-crisis period (Figure 4) and the crisis period (Figure 5) suggests that little has changed with respect to tenure distribution.

Figure 4: Distribution of tenure during the pre-crisis period



Notes: Each bar represents intervals of 12 months; the first bar represents tenure between 1 and 12 months, the second bar represents tenure between 13 and 24 months, and so on. The relatively low density for the third bar is an artefact of the survey design, which is explained in the annex.
Source: *EU-LFS, authors' calculations*

Figure 5: Distribution of tenure during the crisis period



Notes: Each bar represents intervals of 12 months; the first bar represents tenure between 1 and 12 months, the second bar represents tenure between 13 and 24 months, and so on. The relatively low density for the third bar is an artefact of the survey design, which is explained in the annex.
Source: *EU-LFS, authors' calculations*

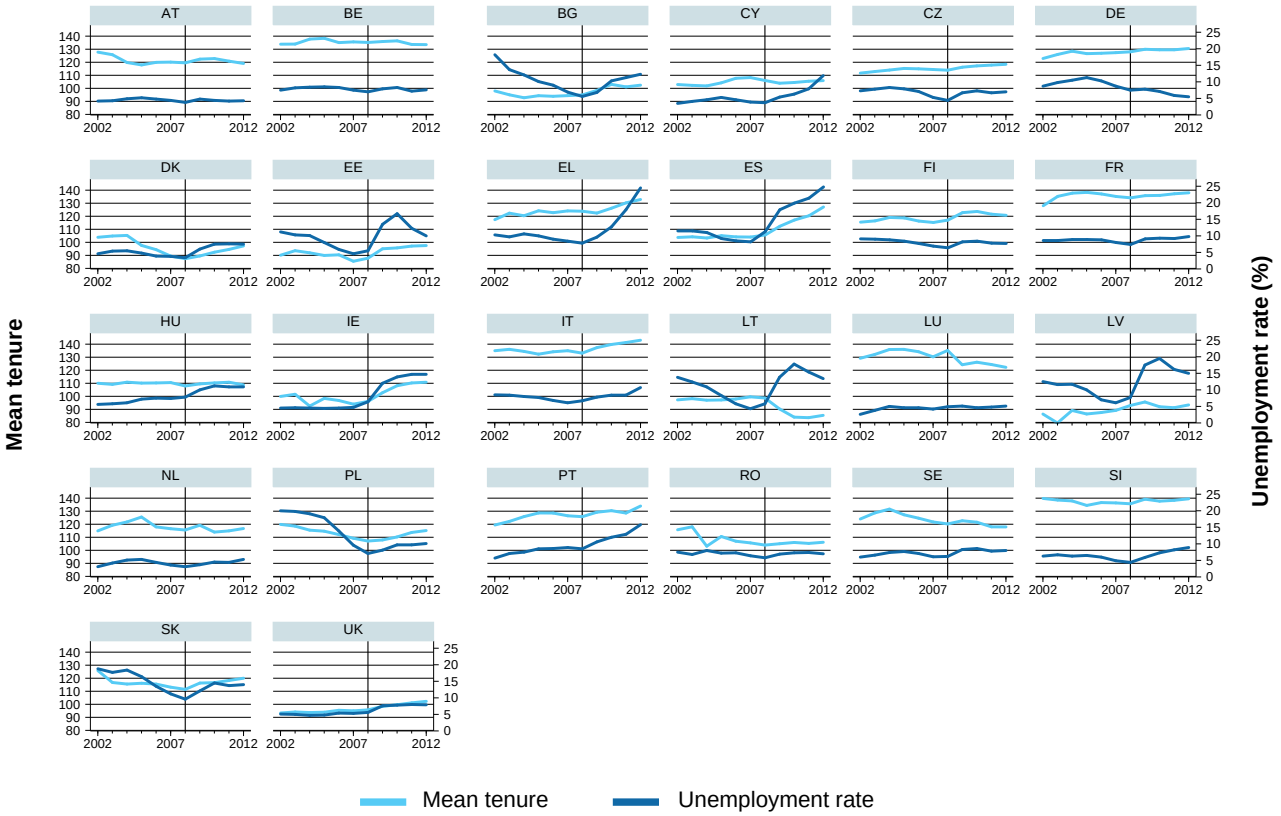
Tenure across EU countries

This section examines differences in the evolution of tenure across EU Member States (apart from Malta, for which no data are available for the period covered).

Analysis of mean tenure

As a first step, Figure 6 shows mean tenure and the unemployment rate by country and year in order to separate long-term trends in mean tenure from the cyclical component. Insofar as the development of mean tenure was purely cyclical, both lines should move relatively closely together. Mean tenure and the unemployment rate are positively and statistically significantly correlated (at least 10% significance level) in Belgium, Estonia, Greece, Ireland, Italy, Poland, Portugal, Slovakia, Spain and the UK. For these countries, the correlation is stronger in the crisis period except in Estonia and the Netherlands, where the correlation is more visible in the pre-crisis period.

Figure 6: Mean tenure (in months) and unemployment rate (%) by Member State, 2002–2012



Notes: Mean tenure is plotted against the primary axis, which starts at 80 months to make the variation visible. The unemployment rate is plotted against the secondary axis.
Source: *EU-LFS, authors' calculations*

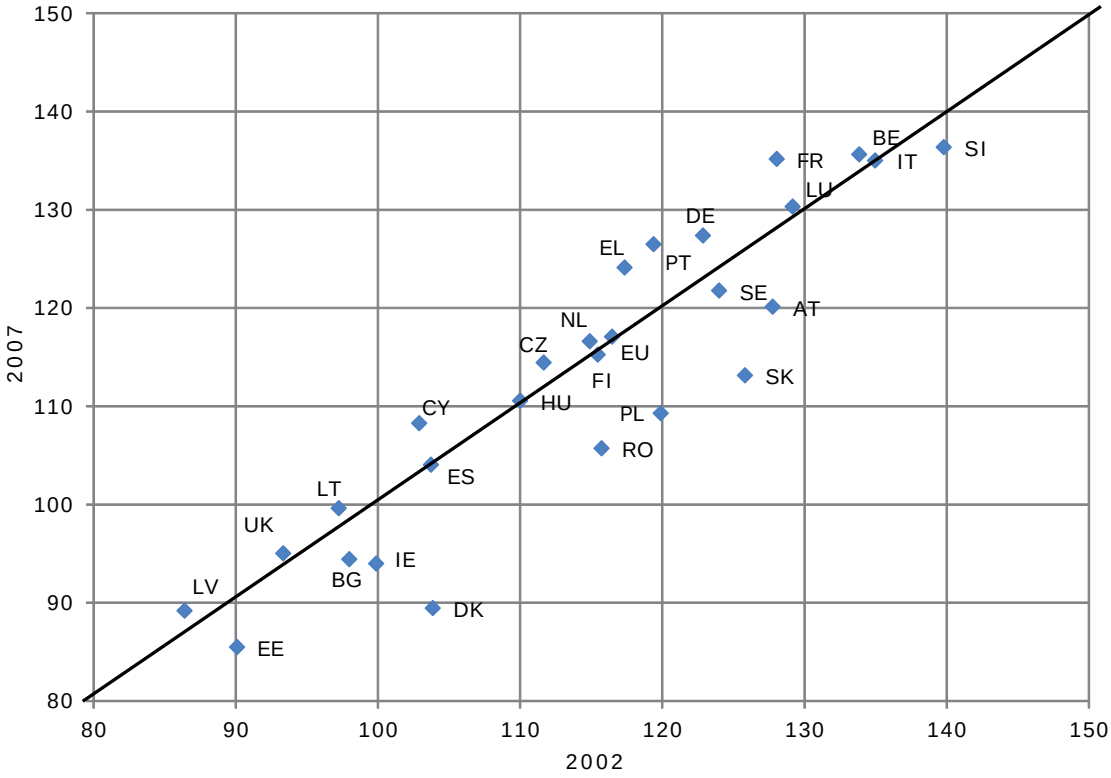
Figure 7 plots mean tenure in 2002 and 2007 by country. Countries above the 45 degree line show an increase in mean tenure during the pre-crisis period, while countries below this line have decreasing mean tenure levels. Figure 8 corresponds to Figure 7, but shows mean tenure levels in 2007 and 2012, thereby focusing on tenure growth during the crisis period.

During the pre-crisis period (Figure 7), the 26 countries are about equally split with regard to increases and decreases in mean tenure:

- 12 countries have a higher level of mean tenure in 2007 compared with 2002;
- 10 countries have a lower level;
- 4 countries have basically no change.

Cyprus, France, Greece, Germany and Portugal show the most notable increases. While Cyprus, Greece and Portugal experience an increase in unemployment, which most probably explains the increase in mean tenure, France and Germany have stable or rather decreasing unemployment rates (Figure 6). Since labour market reforms leading to lower turnover and hence increased tenure levels are not a likely explanation in the case of these two countries (for example, Germany passed large-scale reforms during the observation period aimed at labour market liberalisation and, if anything, a decrease in mean tenure), an ageing workforce is another possible cause. This proposition is confirmed by the shift–share analysis in the next chapter.

Figure 7: Mean tenure (in months) by Member State, 2002 and 2007



Source: *EU-LFS, authors' calculations*

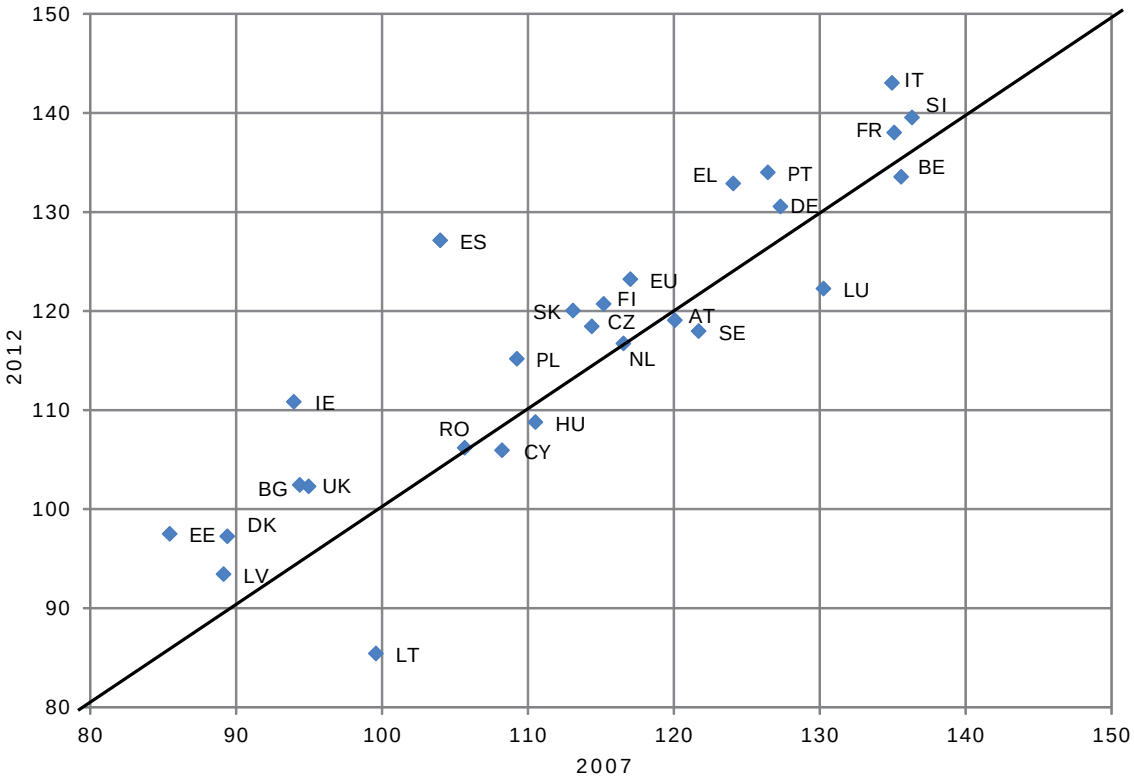
Among the countries with a lower level of mean tenure in 2007 compared with 2002, Denmark and some CEE countries (Poland, Romania and Slovakia) show large differences of more than 10 months. For Poland, Romania and Slovakia, this difference is again easily explained by strong decreases in the unemployment rate, which almost all CEE countries experience during the pre-crisis period (Figure 6). In this context, it is interesting that Latvia and Lithuania both show important reductions in their unemployment rates but slightly increasing tenure levels at the same time. One explanation for this counter-intuitive result is that labour turnover, also in terms of voluntary job-to-job transitions, was generally very high, thereby leading to low mean tenure levels and making the cyclical component as a determinant of mean tenure less important. This reasoning is in line with Eamets et al (2003), who characterised the Baltic states (Estonia, Latvia and Lithuania) as countries with very flexible labour markets fostering (voluntary) worker turnover. Note that in this context, Latvia has the lowest pre-crisis level of mean tenure among all EU Member States (Figure 7).

At first glance, Figure 7 gives the impression that average tenure is decreasing rather than increasing from 2002 until 2007. While the number of countries on both sides of the line is similar, the decreases are larger in magnitude. However, the majority of these decreases can be easily explained by improving labour market conditions in the CEE countries, which led to a reduction in mean tenure as previously non-employed workers have zero tenure by definition.

In general, the observed changes in mean tenure can be plausibly explained by the evolution of the unemployment rate or by an ageing workforce. Therefore, underlying trends in mean tenure appear to be relatively stable in the EU. Although this type of analysis does not allow structural changes in tenure to be excluded altogether, there is at least no supporting evidence in favour of such structural changes.

Figure 8 clearly shows that tenure basically increases across all EU countries during the crisis period. A total of 17 countries have a higher mean tenure in 2012 compared with 2007, and some of those countries with notable reactions in the unemployment rate also experience some of the most sizeable increases (Estonia, Bulgaria, Greece, Ireland, Italy, Portugal or Spain). The Netherlands has no change in its mean tenure levels, which can be explained by zero or only slight increases in the unemployment rate during the crisis period.

Figure 8: Mean tenure (in months) by Member State, 2007 and 2012



Source: *EU-LFS, authors' calculations*

Increases in the unemployment rate and decreases in mean tenure are both relatively small in the seven countries that had lower mean tenure in 2012 than in 2007. The only significant decreases in mean tenure can be observed in Lithuania and Luxembourg. While Luxembourg was hardly hit by the crisis, the opposite is true for Lithuania (Figure 6). Surprisingly, in terms of timing, the reduction in mean tenure in Lithuania ends at exactly the same time as unemployment reaches its peak. Stated differently, in contrast to all other EU Member States, job destruction in Lithuania appears to have affected long-tenured workers proportionally more than short-tenured workers. This could be explained, for example, by a labour market reform in reaction to the crisis that is targeted at early retirement or enables employers to more easily dismiss older workers. Indeed, in 2009, a law was enforced in Lithuania allowing companies to fire employees up to three years instead of five years before they became entitled to the old age pension (Masso and Krillo, 2011). Furthermore, it is in line with Lithuania displaying extremely high flows from employment to non-employment, which were due to (early) retirement in the crisis period (Eurofound, 2014).

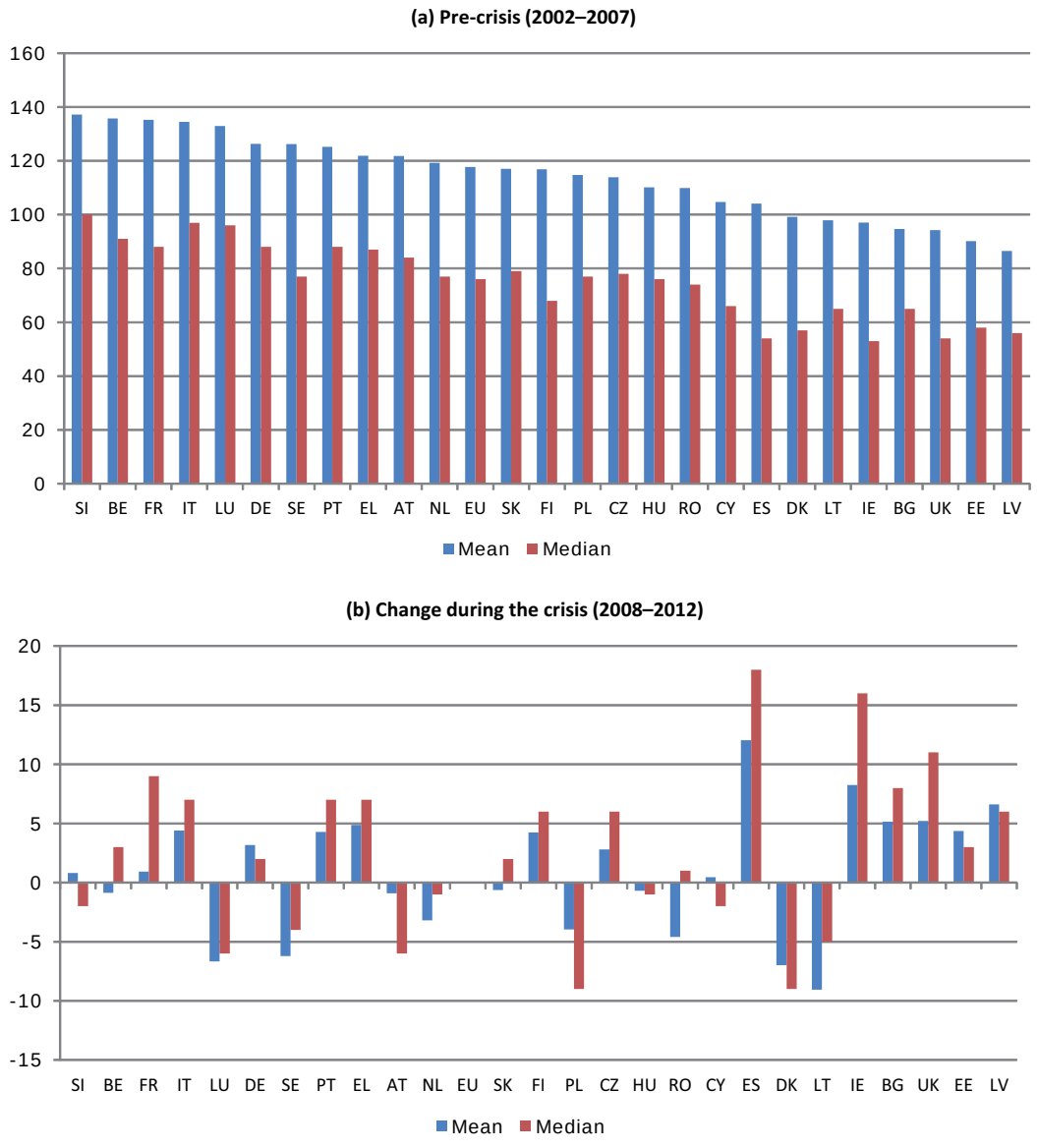
The discussion so far has been on the evolution of mean tenure. However, countries differ not only in terms of the development of mean tenure but also in its initial level. Figure 9 shows the change in average tenure by country for 2002–2007 and the level of change in 2008–2012. It also shows the median tenure, which is defined as 'the middle of the tenure distribution' (that is, 50% of workers have lower tenures and 50% of workers have higher tenures) in order to test the robustness of the conclusions obtained by using mean tenure as the main outcome variable.

EU Member States display considerable variation in terms of mean and median tenure during the pre-crisis period: mean tenure is lowest in Latvia with 86 months (7 years) and highest in Slovenia with 137 months (11.5 years). Median tenure is lower than mean tenure in all countries because the distribution of tenure is right-skewed, that is, many workers have low tenure (see also Chapter 1).

The continental European countries (Austria, Belgium, Germany, Luxembourg and the Netherlands) and the Mediterranean countries show comparably high average tenure, while the CEE countries plus Ireland and the UK are characterised by low average tenure. Slovenia and Spain are notable exceptions to this pattern; Spain has a lower average tenure than the other Mediterranean countries, and Slovenia has an extremely high average tenure compared with the other CEE countries.

The Scandinavian countries do not constitute a uniform group, but are instead scattered across the distribution. Workers in Sweden are on average relatively high-tenured, while the opposite is the case in Denmark.

Figure 9: Mean and median tenure (in months) by country before the crisis and change during the crisis in EU Member States

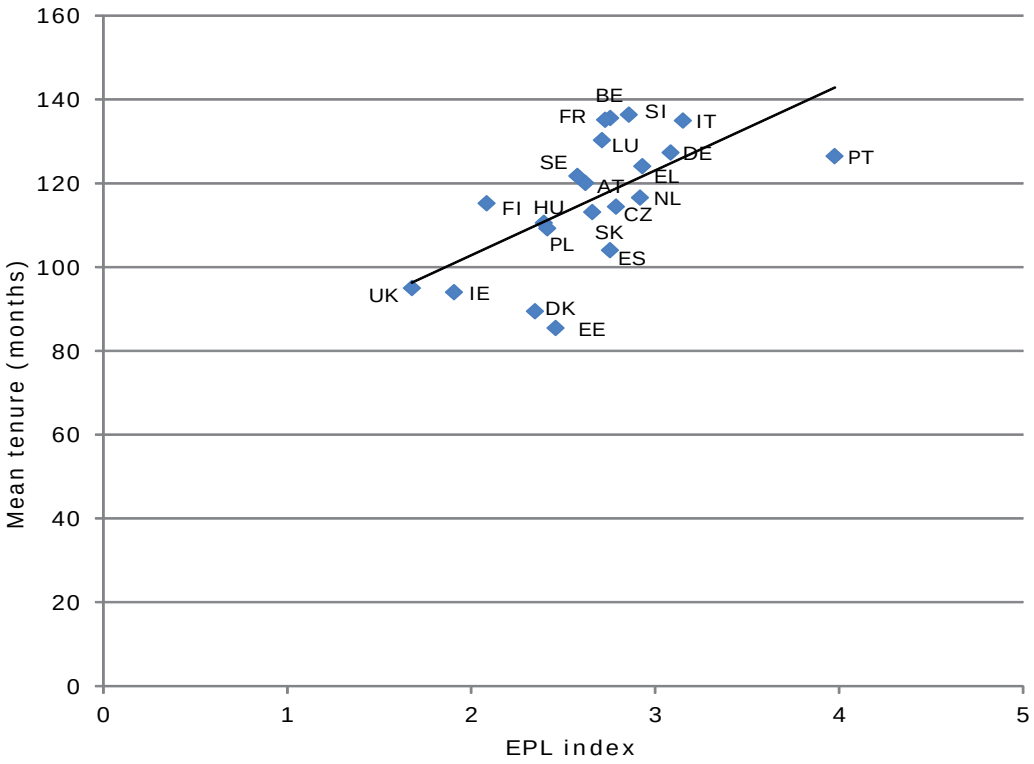


Source: *EU-LFS, authors' calculations*

Cazes and Tonin (2010) draw a similar picture for mean tenure across the EU24 countries (EU28 less Austria, Bulgaria, Croatia and Romania) prior to the crisis. Using Eurostat data for the years 1999 to 2006, they find, for example, that Latvia had the lowest and Slovenia had the highest mean tenure. Furthermore, their results are in line with the regional distribution of mean tenure across the EU found in this study.

The cross-country pattern of average tenure in the pre-crisis period broadly fits the diversity of labour market institutions across the EU (Figure 10). For example, Ireland and the UK have relatively low levels of employment protection legislation and mean tenure, while the opposite was true for Portugal. However, labour market institutions such as employment protection legislation are not the only determinants of mean tenure, as is clear from a comparison of Estonia and Poland, which have similar employment protection legislation (EPL) indices but very different mean tenure levels. Still, the correlation coefficient of mean tenure and EPL index is 0.62 and is statistically significant at the 1% level.

Figure 10: Relationship between mean tenure (in months) and EPL index for Member States, 2007



Notes: The EPL index measures the strictness of regulation of individual and collective dismissal of employees on regular contracts. It includes items such as the notification procedures, the length of the notification period and severance pay depending on tenure, as well as general difficulty of dismissal.
The EPL index was not available for the missing countries; 2008 values were used for Estonia, Luxembourg and Slovenia.
Source: *EU-LFS, OECD (EPR_V2), authors' calculations*

In addition to structural, long-term differences in mean tenure between countries, tenure is heavily influenced by cyclical shocks (Chapter 1). This cyclical component of average tenure is likely to interact with the institutional setting in a country. In a flexible labour market with a low degree of employment protection legislation or a high share of temporary workers, companies will react quickly to the economic situation and mean tenure should move closely with the unemployment rate. In contrast, in labour markets with a high degree of employment protection legislation or a low share of temporary workers, companies will smooth their hiring behaviour over the business cycle, and mean tenure will, if at all, react with a certain time lag. Other components of a country's institutional design, next to employment protection legislation or the prevalence of temporary contracts, may also interact with cyclical shocks and thereby determine tenure.

Figure 9b shows the difference between mean tenure during the crisis (2008–2012) and mean tenure in the pre-crisis period (2002–2007). According to the discussion above, these differences are a mixture of long-term trends governing mean tenure and the cyclical component, which also differs between countries, depending on the institutional setting and the depth of the crisis. Given the variety of determinants of mean tenure, it is not surprising that the change in mean tenure during the crisis differs considerably between countries. Concentrating on mean (and not median) tenure and ignoring changes less than 1 month (relevant to 7 countries), 7 countries experience a decrease in mean tenure, while 12 countries show higher tenure levels during the crisis than before. The countries that were hit especially hard by the crisis (Estonia, Greece, Ireland, Italy, Latvia, Portugal and Spain) all show considerable increases in mean tenure. However, Germany, where unemployment hardly increased at all, also shows an increase in mean tenure, while Lithuania, where unemployment rose sharply, experiences a significant reduction in mean tenure.

Analysis of short- and long-tenured jobs

Average tenure is only one snapshot of the distribution of tenure in each country, so it is useful to analyse another measure of mean tenure: the share of short-tenured and long-tenured workers in each country. Differences in these shares help to explain differences in the evolution of average tenure. Like the analysis of mean tenure, the initial focus is on country differences that change more slowly, by comparing averages over the periods 2002–2007 and 2008–2012 to each other. A second step focuses on the year-to-year evolution of mean tenure.

Before turning to the results, note that short tenure is defined in such a way that a share of short-tenured jobs of 10% in 2002 constitutes the EU average. A share below 10% in a specific country thus points to fewer short-tenured jobs compared with the EU average and vice versa (see Box 1).

Box 1: Definition of long-tenured and short-tenured jobs

Long- and short-tenured jobs are defined based on a data-driven approach. Short-tenured jobs are defined as having tenure smaller than the 10th percentile of the tenure distribution of the EU aggregate in 2002. Similarly, long-tenured jobs are defined as having tenure equal to or exceeding the 90th percentile of the same distribution. This definition of long- and short-tenured jobs is fixed for the entire analysis of both the pre-crisis and crisis periods.

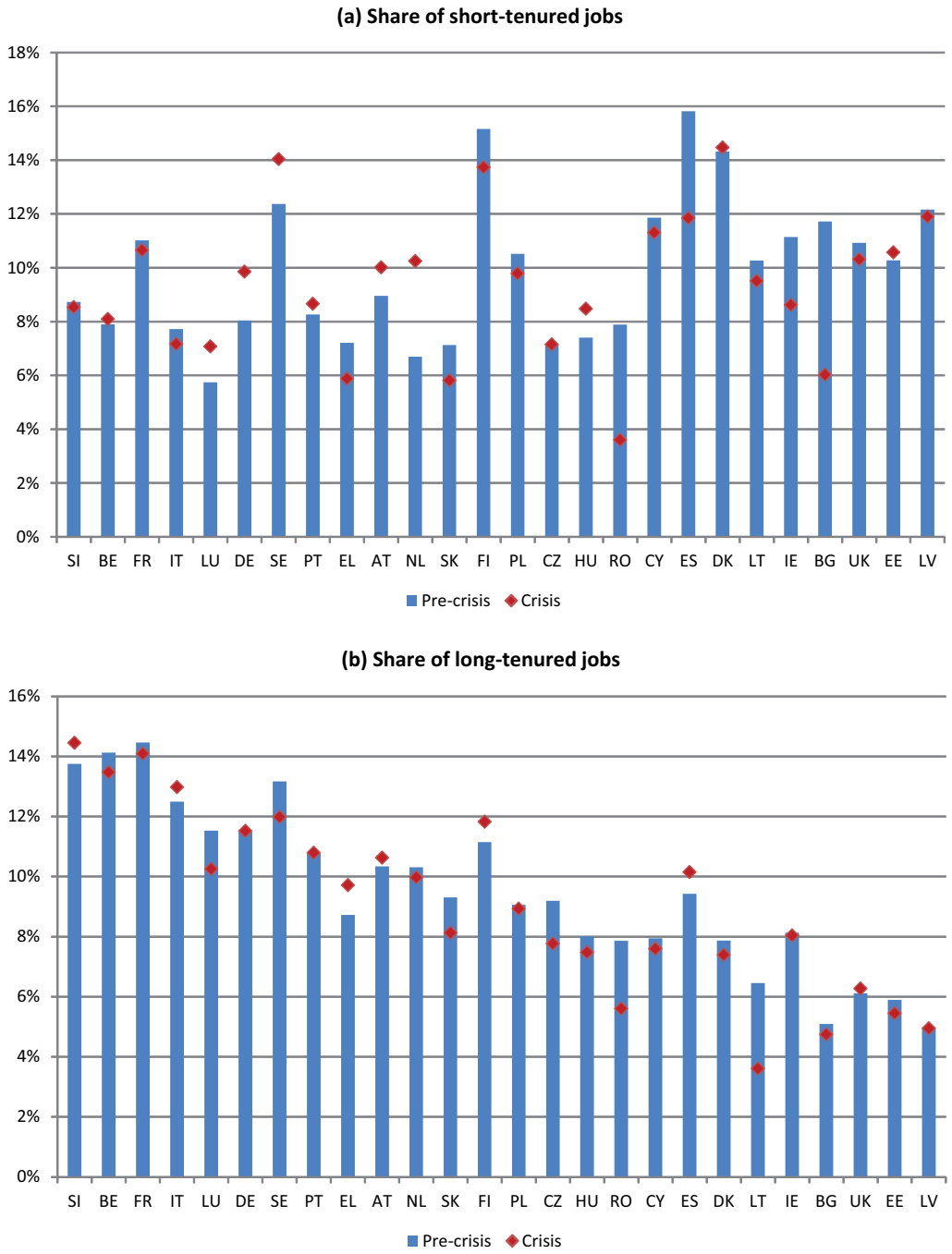
The 10th percentile is 7 months and the 90th percentile is 304 months (12 years and 4 months). Stated differently, 10% of all workers in Europe in 2002 had a tenure lower than 7 months, and another 10% had tenure equal to or exceeding 303 months. The tenure of the remaining 80% of workers are somewhere in the middle.

The advantage of this approach is that it allows an analysis of whether the share of workers of a specific group in short-tenured or long-tenured jobs was below or above the EU average in 2002. This is true for countries, individual years, sociodemographic characteristics and job characteristics. For example, if the share of women in short-tenured jobs (that is, jobs with tenure less than 7 months) in 2002 equals 15%, the interpretation is that this share is 50% above the EU average. Additionally, it is possible to study developments over time (from 2002 onwards) at the EU aggregate level as well as for individual countries or groups.

Figure 11 shows the share of short- and long-tenured jobs in each country for both the pre-crisis and crisis periods. The countries are sorted according to mean tenure during the pre-crisis period in descending order. In general, those countries with high mean tenure tend to be characterised by a low share of short-tenured and a high share of long-tenured workers. The opposite is true for countries with low mean tenure. Interestingly, the relationship is more pronounced for the share

of long-tenured workers, that is, long-tenured workers appear to have a stronger influence on mean tenure than short-tenured workers.[1]

Figure 11: Share of short- and long-tenured jobs by Member State before and during the crisis



Note: Countries are sorted in order of their pre-crisis mean tenure level.
Source: *EU-LFS, authors' calculations*

[1] Given that the tenure distribution is heavily right-skewed and the mean, not the median, is used in the analysis, this result is not surprising from a statistical perspective.

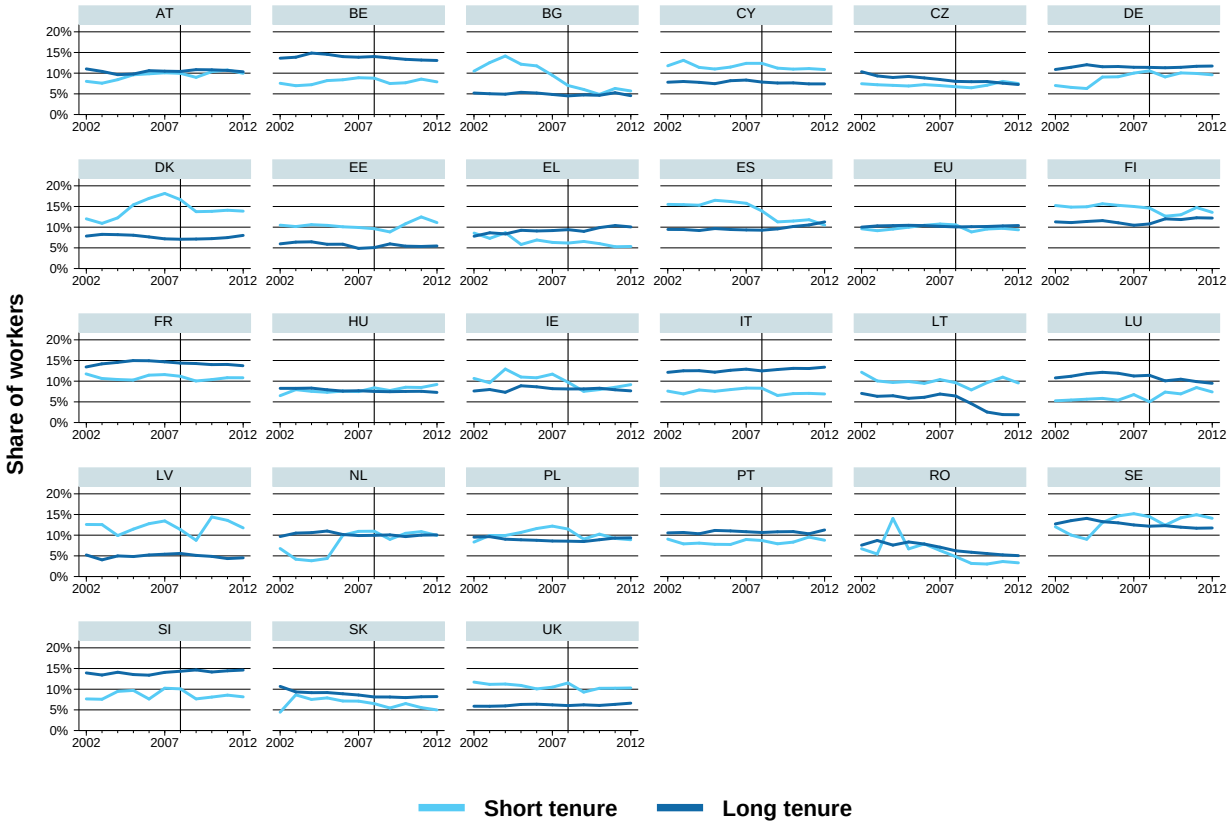
The continental European countries and the Mediterranean countries (except for Greece and Spain, but including Slovenia) therefore achieve their above-average mean tenure levels through a combination of a low share of short-tenured and a high share of long-tenured workers.[2] The opposite is true for the Baltic countries, Denmark, Ireland, Spain and the UK, which have a high share of short-tenured and a low share of long-tenured workers.

The Scandinavian countries (except for Denmark) have high shares of short- and long-tenured workers at the same time. And the remaining CEE countries (the Czech Republic, Hungary, Poland, Romania and Slovakia) and Greece appear to have a more compressed tenure distribution since their share of short- and long-tenured workers is equally below the EU average.

These four groups of countries, defined according to their pre-crisis shares of short- and long-tenured workers, are used to structure the discussion in the remainder of this chapter.

Figure 11 compares countries by averaging the share of short- and long-tenured workers over the periods 2002–2007 and 2008–2012 respectively. While this method highlights country differences, it may hide some important variation over time. Figure 12 shows how the two shares have developed over time, separately for each country, revealing interesting patterns.

Figure 12: Share of short- and long-tenured jobs (%) by Member State, 2002–2012



Note: The percentiles are taken from the tenure distribution across the entire EU in 2002.
Source: *EU-LFS, authors' calculations*

[2] The share of short-tenured workers is slightly above average in France. However, due to its extremely high share of long-tenured workers, France is included in the continental country cluster.

First, Germany and the Netherlands are not characterised by below-average shares of short-tenured workers right before the crisis, unlike the impression given by Figure 11. In the beginning of the observation period, around 5% of all workers in both countries are short-tenured. However, these shares actually increase to 10% by 2006. In Germany, a set of structural reforms to the labour market aimed at increasing labour marker flexibility (Agenda 2010) are a likely explanation. In the Netherlands, childcare subsidies were increased, and an earned income tax reform was passed to increase maternal labour supply (Bettendorf et al, 2012), thereby increasing the share of short-tenured (female) workers. In contrast, the remaining continental and Mediterranean countries show relatively stable shares of short- and long-tenured workers over the period 2002 to 2007.

The Baltic countries, Denmark, Ireland, Spain and the UK show equally stable tenure levels, even though, in contrast to the continental and Mediterranean countries, the share of long-tenured workers is below the EU average and the share of short-tenured workers is above. Denmark and Spain constitute important exceptions in this group: Denmark experiences a strong increase in the share of short-tenured workers from 2003 until 2007, while a decline of this share in Spain has already started in 2006 and not in 2008–2009 as might have been expected. The start of the decline in the share of short-tenured workers in Spain in 2006 may be explained by the National Reform Programme, launched in 2005 with the explicit goal of reducing temporary employment (OEP, 2005). Indeed, the share of temporary workers reaches its peak in 2005 during the observation period and decreases continuously afterwards.

The shares of short- and long-tenured workers are above average in Finland and Sweden, and are extremely stable in Finland until 2007. In contrast, the share of short-tenured workers displays an extremely cyclical pattern in Sweden, not only during the crisis, but over the entire observation period.

Finally, the remaining CEE countries and Greece all show below-average shares of short- and long-tenured workers. Despite this similarity, there are some differences in the development over time up to 2007. First, the Czech Republic, Romania and Slovakia show a decreasing trend in the shares of short- and long-tenured workers over the entire observation period. Second, in contrast, both shares are relatively stable in Hungary and Poland. Third, the share of short-tenured workers reaches almost 15% in Bulgaria in 2004, but declines rapidly afterwards and stabilises at 5% from 2010 onwards. This extreme development might be explained by the fact that Bulgaria started its transition from a socialist, centrally planned economy to a free market economy only in the early 2000s (Sitz et al, 2013). And finally, Greece shows a continuous decline in the share of short-tenured workers that is mirrored by a steady increase in the share of long-tenured workers from 2002 until 2012. Interestingly, 2008 does not constitute a visible break in these time series (Figure 12).

Turning to the crisis period (2008–2012), it appears that, very generally, a shift towards relatively more long-tenured jobs takes place (Figure 11). This shift is not due to an increase in long-tenured jobs, but is mainly caused by a decrease in the share of short-tenured workers and can be observed clearly in Bulgaria, Greece, Ireland and Spain. As these countries were hit especially hard by the economic crisis, one likely explanation is job destruction, which was concentrated in short-tenured jobs. These developments also explain the sharp rise in average tenure during the crisis in, for example, Ireland and Spain.

Figure 11a suggests that, at the same time, some continental countries (Austria, Germany, Luxembourg and the Netherlands) and Sweden experienced considerable increases in the share of short-tenured workers during the crisis period. However, Figure 12 reveals that this increase can either be attributed to re-hires in the later years of the crisis as the economy began to recover again or to increasing shares of short-tenured workers during the pre-crisis period, as is the case for Germany and the Netherlands. Luxembourg is the only country that shows a continuously increasing share of short-tenured workers from 2008 until 2012.

Figure 11b shows that changes in the share of long-tenured workers are much less pronounced, with the exceptions of Lithuania and Romania, which both have a considerable reduction in the share of long-tenured workers. The most likely explanation is that older workers, who are usually long-tenured, left the labour market – either in response to a reform targeted at early retirement (thereby reducing unemployment rates during the crisis) or due to a large cohort reaching retirement age.

Focusing on year-to-year changes, Figure 12 shows that the majority of continental and Mediterranean countries experience a small decrease in the share of short-tenured workers in the early years of the crisis, followed by a quick recovery in the later years. A clear exception is Italy, where the share of short-tenured workers stabilises at a lower level.

The Baltic countries, Denmark, Ireland and the UK show a similar pattern in the share of short-tenured workers: a slight decrease in the share of short-tenured workers is followed by an increase in the second half of the crisis period. This observation is not negligible, given that the majority of these countries were affected severely by the crisis. However, the high degree of flexibility in their labour markets might have supported a quicker recovery. In general, the share of long-tenured workers remains relatively stable. The Scandinavian countries (that is, Finland and Sweden) in this group show a similar pattern during the crisis period.

The remaining CEE countries and Greece deliver the surprising result that the share of short- and long-tenured workers does not react to the beginning of the crisis. Instead, trends that started in the beginning of the observation period continue. Clearly, the reason is not that the countries' labour markets were not affected. More likely, large changes in the unemployment rate had occurred before the crisis hit, reducing the importance of the crisis in terms of changing tenure.

Tables 1 to 4 extend the analysis by focusing on five percentiles of the EU distribution of tenure in 2002, namely the 10th, 25th, 50th, 75th and 90th percentiles. For each country, the share of workers between these percentiles is shown for selected years. Note that the share of workers with tenure below the 10th percentile and the share of workers with tenure equal to or above the 90th percentile are exactly equal to the results presented in Figure 12 and are only included for completeness. The discussion focuses on the remaining percentiles in the middle of the tenure distribution.

Table 1 shows that the continental and Mediterranean countries are all characterised by a low share of short-tenured workers and a high share of long-tenured workers. This is not only true for the tails of the distribution, that is, tenure below the 10th and above the 90th percentiles, but also for the share of workers between the 10th and the 25th as well as between the 75th and the 90th percentiles. Thus, the entire tenure distribution in these countries appears to be shifted to the right compared with the EU average, indicating high mean tenure levels.

France, Germany and Portugal show the most notable increases in mean tenure from 2002 to 2007 that are not linked to the business cycle (Figure 6). Table 1 shows that the entire tenure distribution shifts further to the right in France and Portugal, that is, the share of workers with tenure below the median decreases from 2002 until 2007, while the share of workers with tenure above the median increases. Interestingly, the decrease or increase is of similar magnitude along all points of the distribution, hinting at an ageing workforce. Indeed, as the discussion of the shift–share analysis according to age in Chapter 4 shows, tenure growth in these countries during the pre-crisis period is exclusively caused by shifts in the age groups. Generally, the same observations can be made for Germany, with the exception that the share of workers with tenure below the 10th percentile actually increases; this is most probably caused by large-scale labour market reforms.

Table 1: Distribution of tenure (%) in continental and Mediterranean countries in selected years

	Percentile	2002	2007	2009	2012
EU	≤ 10th	9.61	10.77	8.86	9.37
	> 10th and ≤ 25th	14.58	13.64	13.13	11.84
	> 25th and ≤ 50th	25.13	24.47	26.56	25.87
	> 50th and ≤ 75th	25.68	25.33	25.68	26.82
	> 75th and ≤ 90th	14.98	15.57	15.66	15.71
	> 90th and ≤ 100th	10.02	10.21	10.12	10.40
AT	≤ 10th	8.03	10.10	8.99	9.97
	> 10th and ≤ 25th	11.50	13.78	14.05	14.21
	> 25th and ≤ 50th	26.30	24.90	25.48	25.82
	> 50th and ≤ 75th	25.78	23.96	23.55	23.81
	> 75th and ≤ 90th	17.35	16.78	17.09	15.86
	> 90th and ≤ 100th	11.04	10.49	10.85	10.34
BE	≤ 10th	7.55	8.91	7.50	7.90
	> 10th and ≤ 25th	13.09	11.45	11.77	12.04
	> 25th and ≤ 50th	23.39	22.74	24.80	24.91
	> 50th and ≤ 75th	24.53	25.00	24.78	25.47
	> 75th and ≤ 90th	17.82	18.05	17.46	16.61
	> 90th and ≤ 100th	13.62	13.86	13.69	13.07
DE	≤ 10th	7.02	10.02	9.10	9.60
	> 10th and ≤ 25th	14.80	12.37	13.36	13.35
	> 25th and ≤ 50th	24.30	22.23	22.27	23.73
	> 50th and ≤ 75th	28.25	25.56	25.04	23.56
	> 75th and ≤ 90th	14.74	18.39	18.91	18.02
	> 90th and ≤ 100th	10.89	11.43	11.32	11.73
FR	≤ 10th	11.76	11.59	10.04	10.83
	> 10th and ≤ 25th	12.94	11.14	10.98	10.33
	> 25th and ≤ 50th	24.19	20.97	22.22	21.41
	> 50th and ≤ 75th	21.67	24.56	25.71	26.54
	> 75th and ≤ 90th	16.02	17.05	16.78	17.15
	> 90th and ≤ 100th	13.43	14.68	14.27	13.74
IT	≤ 10th	7.60	8.34	6.55	6.92
	> 10th and ≤ 25th	11.33	10.07	10.04	8.72
	> 25th and ≤ 50th	21.42	23.45	24.24	22.84
	> 50th and ≤ 75th	28.03	26.19	27.77	29.39
	> 75th and ≤ 90th	19.47	19.04	18.58	18.74
	> 90th and ≤ 100th	12.14	12.91	12.83	13.39
LU	≤ 10th	5.26	6.76	7.37	7.40
	> 10th and ≤ 25th	12.51	9.75	12.90	11.87
	> 25th and ≤ 50th	24.51	25.59	26.44	27.36
	> 50th and ≤ 75th	28.97	27.78	25.44	27.34
	> 75th and ≤ 90th	17.95	18.86	17.77	16.55
	> 90th and ≤ 100th	10.80	11.25	10.08	9.49
NL	≤ 10th	6.78	10.93	8.99	9.96
	> 10th and ≤ 25th	16.34	12.63	13.11	12.99
	> 25th and ≤ 50th	27.32	23.98	25.67	27.85
	> 50th and ≤ 75th	25.34	27.48	27.80	26.12
	> 75th and ≤ 90th	14.54	15.07	14.35	13.03
	> 90th and ≤ 100th	9.68	9.91	10.08	10.06

	Percentile	2002	2007	2009	2012
PT	≤ 10th	9.06	8.97	7.93	8.78
	> 10th and ≤ 25th	15.08	12.10	12.12	9.62
	> 25th and ≤ 50th	23.94	22.28	23.80	23.59
	> 50th and ≤ 75th	25.66	28.38	27.12	27.11
	> 75th and ≤ 90th	15.71	17.43	18.20	19.63
	> 90th and ≤ 100th	10.56	10.84	10.83	11.27
SI	≤ 10th	7.66	10.24	7.66	8.16
	> 10th and ≤ 25th	10.93	10.65	12.09	9.95
	> 25th and ≤ 50th	20.75	21.85	22.80	23.09
	> 50th and ≤ 75th	26.51	25.09	24.94	27.05
	> 75th and ≤ 90th	20.20	18.09	17.85	17.13
	> 90th and ≤ 100th	13.94	14.08	14.66	14.63

Notes: The percentiles are taken from the tenure distribution across the entire EU in 2002. At the EU aggregate level, the share of workers with tenure below the 10th percentile does not exactly equal 10% in 2002 because the tenure distribution is too dense. Stated differently, the true 10th percentile lies between 7 and 8 months.
Source: *EU-LFS, authors' calculations*

Table 2 shows the share of workers at the defined percentiles for the group of countries characterised by a high share of short-tenured and a low share of long-tenured workers in 2002 – the Baltic states, Cyprus, Denmark, Ireland, Spain and the UK. While Denmark, Ireland and the UK show tenure distributions that are a mirror image of the distributions in the continental and Mediterranean countries (that is, the entire distribution is shifted to the left compared with the EU average), the situation is somewhat different in the remaining countries in this group. The Baltic states are all characterised by extremely low shares of long-tenured workers, but the share of short-tenured workers is only slightly above the EU average. Instead, most workers have tenure levels between the 25th and the 75th percentiles; in other words, the distribution is not shifted to the left, but compressed from above. Finally, Spain simply has an extremely high share of workers below the 25th percentile. The shares at the remaining percentiles are somewhat below average, but there is no tendency towards a very low share of long-tenured workers.

Table 2: Distribution of tenure (%) in the Baltic states, Cyprus, Denmark, Ireland, Spain and the UK in selected years

	Percentile	2002	2007	2009	2012
EU	≤ 10th	9.61	10.77	8.86	9.37
	> 10th and ≤ 25th	14.58	13.64	13.13	11.84
	> 25th and ≤ 50th	25.13	24.47	26.56	25.87
	> 50th and ≤ 75th	25.68	25.33	25.68	26.82
	> 75th and ≤ 90th	14.98	15.57	15.66	15.71
	> 90th and ≤ 100th	10.02	10.21	10.12	10.40
DK	≤ 10th	12.03	18.16	13.76	13.88
	> 10th and ≤ 25th	17.06	19.84	19.94	16.38
	> 25th and ≤ 50th	28.43	24.18	30.31	29.75
	> 50th and ≤ 75th	19.76	19.84	18.80	21.06
	> 75th and ≤ 90th	14.85	10.80	10.06	10.91
	> 90th and ≤ 100th	7.84	7.18	7.14	8.02
CY	≤ 10th	11.79	12.38	11.22	10.88
	> 10th and ≤ 25th	15.49	14.09	16.76	14.20
	> 25th and ≤ 50th	24.50	25.12	26.81	29.49
	> 50th and ≤ 75th	28.49	25.34	23.05	23.22
	> 75th and ≤ 90th	11.92	14.73	14.53	14.80
	> 90th and ≤ 100th	7.81	8.33	7.62	7.41

	Percentile	2002	2007	2009	2012
EE	≤ 10th	10.49	9.93	8.86	11.11
	> 10th and ≤ 25th	16.46	18.06	15.61	16.12
	> 25th and ≤ 50th	28.35	32.81	33.80	27.63
	> 50th and ≤ 75th	30.20	26.26	24.86	26.69
	> 75th and ≤ 90th	8.53	8.07	10.91	12.99
	> 90th and ≤ 100th	5.97	4.88	5.96	5.46
ES	≤ 10th	15.52	15.78	11.29	10.50
	> 10th and ≤ 25th	17.19	17.08	14.35	10.69
	> 25th and ≤ 50th	22.76	24.50	27.72	24.42
	> 50th and ≤ 75th	22.48	19.45	22.73	27.38
	> 75th and ≤ 90th	12.58	13.85	14.31	15.72
	> 90th and ≤ 100th	9.46	9.33	9.59	11.28
IE	≤ 10th	10.67	11.71	7.55	9.18
	> 10th and ≤ 25th	16.61	18.53	14.09	11.07
	> 25th and ≤ 50th	31.45	27.36	33.74	27.90
	> 50th and ≤ 75th	21.17	25.02	26.60	32.32
	> 75th and ≤ 90th	12.49	9.20	9.89	11.88
	> 90th and ≤ 100th	7.62	8.19	8.13	7.66
LT	≤ 10th	12.17	10.39	7.89	9.56
	> 10th and ≤ 25th	12.94	12.15	13.54	15.98
	> 25th and ≤ 50th	28.29	32.75	38.30	31.05
	> 50th and ≤ 75th	29.72	26.53	24.45	28.31
	> 75th and ≤ 90th	9.84	11.28	11.24	13.20
	> 90th and ≤ 100th	7.05	6.89	4.57	1.90
LV	≤ 10th	12.60	13.45	8.77	11.76
	> 10th and ≤ 25th	15.03	15.15	14.52	15.02
	> 25th and ≤ 50th	31.98	29.51	33.04	29.24
	> 50th and ≤ 75th	26.77	27.15	26.24	27.06
	> 75th and ≤ 90th	8.40	9.33	12.32	12.38
	> 90th and ≤ 100th	5.22	5.41	5.11	4.53
UK	≤ 10th	11.72	10.49	9.30	10.30
	> 10th and ≤ 25th	19.13	17.80	15.07	13.12
	> 25th and ≤ 50th	27.65	27.37	31.62	29.88
	> 50th and ≤ 75th	23.40	26.24	25.59	28.02
	> 75th and ≤ 90th	12.22	11.89	12.19	12.05
	> 90th and ≤ 100th	5.89	6.22	6.22	6.63

Notes: The percentiles are taken from the tenure distribution across the entire EU in 2002. At the EU aggregate level, the share of workers with tenure below the 10th percentile does not exactly equal 10% in 2002 because the tenure distribution is too dense. Stated differently, the true 10th percentile lies between 7 and 8 months.
Source: *EU-LFS, authors' calculations*

Between 2002 and 2007, Denmark experienced one of the most notable decreases in mean tenures, which cannot directly be explained by the business cycle (Figure 6). Table 2 shows that this change in mean tenure can be explained by a further increase in the share of workers below the 25th percentile and an additional decrease in the share of workers above the 75th percentile. Thus, the tenure distribution in Denmark, which was already quite extreme in 2002, shifted further to the left until 2007.

The remaining CEE countries as well as Greece are characterised by a low share of short- and long-tenured workers alike (Table 3). This is true for workers with tenure below the 10th percentile and above the 90th percentile, but also for workers with tenure between the 10th and 25th and between the 75th and 90th percentiles. Consequently, the share of workers in the middle of the distribution, for example between the 25th and the 75th percentiles, is significantly above the EU average in 2002. The heterogeneous development of the share of long-tenured and short-tenured workers from 2002 to 2007 discussed above can equally be applied to the share of workers below the 25th and above the 75th percentiles.

Table 3: Distribution of tenure (%) in the CEE countries and Greece in selected years

	Percentile	2002	2007	2009	2012
EU	≤ 10th	9.61	10.77	8.86	9.37
	> 10th and ≤ 25th	14.58	13.64	13.13	11.84
	> 25th and ≤ 50th	25.13	24.47	26.56	25.87
	> 50th and ≤ 75th	25.68	25.33	25.68	26.82
	> 75th and ≤ 90th	14.98	15.57	15.66	15.71
	> 90th and ≤ 100th	10.02	10.21	10.12	10.40
BG	≤ 10th	10.49	9.49	6.07	5.70
	> 10th and ≤ 25th	11.36	13.01	13.49	11.52
	> 25th and ≤ 50th	32.10	32.13	32.23	31.73
	> 50th and ≤ 75th	28.44	28.60	32.15	34.94
	> 75th and ≤ 90th	12.41	11.92	11.32	11.55
	> 90th and ≤ 100th	5.21	4.85	4.74	4.56
CZ	≤ 10th	7.46	7.01	6.47	7.49
	> 10th and ≤ 25th	13.81	12.30	11.68	9.87
	> 25th and ≤ 50th	27.46	27.96	28.86	27.54
	> 50th and ≤ 75th	29.40	30.79	29.73	30.70
	> 75th and ≤ 90th	11.52	13.47	15.32	17.14
	> 90th and ≤ 100th	10.35	8.47	7.94	7.26
EL	≤ 10th	8.55	6.30	6.53	5.32
	> 10th and ≤ 25th	11.53	11.31	11.28	8.40
	> 25th and ≤ 50th	26.40	26.39	27.12	25.13
	> 50th and ≤ 75th	26.85	27.57	28.04	31.91
	> 75th and ≤ 90th	18.86	19.26	18.07	19.20
	> 90th and ≤ 100th	7.80	9.16	8.97	10.04
HU	≤ 10th	6.50	7.49	7.74	9.21
	> 10th and ≤ 25th	12.73	12.94	13.40	13.18
	> 25th and ≤ 50th	29.44	28.45	29.40	28.04
	> 50th and ≤ 75th	30.64	29.48	28.01	28.45
	> 75th and ≤ 90th	12.42	13.95	13.98	13.83
	> 90th and ≤ 100th	8.27	7.70	7.47	7.29
PL	≤ 10th	8.34	12.20	9.05	8.90
	> 10th and ≤ 25th	12.08	15.54	16.13	13.01
	> 25th and ≤ 50th	24.82	23.83	28.98	29.18
	> 50th and ≤ 75th	29.02	24.99	23.12	24.50
	> 75th and ≤ 90th	16.21	14.84	14.25	15.04
	> 90th and ≤ 100th	9.53	8.60	8.48	9.37

	Percentile	2002	2007	2009	2012
RO	≤ 10th	6.73	6.31	3.18	3.32
	> 10th and ≤ 25th	12.75	11.55	10.11	7.92
	> 25th and ≤ 50th	26.33	33.56	38.14	36.90
	> 50th and ≤ 75th	29.00	28.18	30.24	34.87
	> 75th and ≤ 90th	17.61	13.29	12.45	11.92
	> 90th and ≤ 100th	7.59	7.11	5.88	5.06
SK	≤ 10th	4.44	7.12	5.45	4.99
	> 10th and ≤ 25th	11.42	13.71	11.45	10.18
	> 25th and ≤ 50th	26.23	28.35	30.19	29.19
	> 50th and ≤ 75th	31.76	28.19	29.97	31.60
	> 75th and ≤ 90th	15.46	14.04	14.83	15.82
	> 90th and ≤ 100th	10.69	8.60	8.11	8.23

Notes: The percentiles are taken from the tenure distribution across the entire EU in 2002. At the EU aggregate level, the share of workers with tenure below the 10th percentile does not exactly equal 10% in 2002 because the tenure distribution is too dense. Stated differently, the true 10th percentile lies between 7 and 8 months.
Source: *EU-LFS, authors' calculations*

Lastly, Table 4 shows that an above-average share of workers in Finland and Sweden are long- and short-tenured. However, this is mainly true for workers with tenure below the 10th and above the 90th percentiles, while the share between the 10th and 25th as well as the 75th and 90th percentiles is below average.

Table 4: Distribution of tenure (%) in Finland and Sweden in selected years

	Percentile	2002	2007	2009	2012
EU	≤ 10th	9.61	10.77	8.86	9.37
	> 10th and ≤ 25th	14.58	13.64	13.13	11.84
	> 25th and ≤ 50th	25.13	24.47	26.56	25.87
	> 50th and ≤ 75th	25.68	25.33	25.68	26.82
	> 75th and ≤ 90th	14.98	15.57	15.66	15.71
	> 90th and ≤ 100th	10.02	10.21	10.12	10.40
FI	≤ 10th	15.24	15.01	12.66	13.58
	> 10th and ≤ 25th	14.63	15.08	14.54	14.70
	> 25th and ≤ 50th	21.58	21.33	23.29	22.75
	> 50th and ≤ 75th	22.13	22.59	21.85	22.43
	> 75th and ≤ 90th	15.14	15.53	15.63	14.33
	> 90th and ≤ 100th	11.29	10.47	12.01	12.21
SE	≤ 10th	12.05	15.20	12.41	14.10
	> 10th and ≤ 25th	13.13	13.32	13.66	14.24
	> 25th and ≤ 50th	25.22	21.05	23.47	23.56
	> 50th and ≤ 75th	21.30	23.44	24.45	24.10
	> 75th and ≤ 90th	15.57	14.51	13.69	12.25
	> 90th and ≤ 100th	12.73	12.48	12.31	11.75

Notes: The percentiles are taken from the tenure distribution across the entire EU in 2002. At the EU aggregate level, the share of workers with tenure below the 10th percentile does not exactly equal 10% in 2002 because the tenure distribution is too dense. Stated differently, the true 10th percentile lies between 7 and 8 months.
Source: *EU-LFS, authors' calculations*

An interesting question when considering changes in the tenure distributions is whether the countries are more or less similar to each other in 2012 compared with 2002, and to what extent the crisis reinforces or mitigates general trends.

In the group of continental and Mediterranean countries, Austria, Belgium and the Netherlands move towards the EU average during the observation period. In Austria and the Netherlands, the share of short-tenured workers (that is, below the 25th percentile) increases. While the crisis further supports this development, the general trend is already visible from 2002 until 2007. Belgium has a lower share of long-tenured workers (that is, above the 75th percentile) in 2012 compared with 2002, but the decrease takes place mostly during the crisis period and thus is more likely to be temporary. In contrast, France, Italy and Portugal move further away from the EU average by continuously increasing shares of long-tenured and decreasing shares of short-tenured workers. This trend is already present in the pre-crisis period and further amplifies during the crisis (Table 1).

The Baltic countries, Ireland, Spain and the UK are initially all characterised by a high share of short-tenured and a low share of long-tenured workers. Not surprisingly, these countries all move towards the EU average during the crisis as the share of short-tenured workers decreases (Table 2). Lithuania is an important exception, where job destruction took place primarily for long-tenured workers. In Denmark and Estonia, however, the movement in the tenure distribution towards the EU average is only present during the crisis. From 2002 until 2007, the tenure distributions actually become more polarised, with a further increase in the share of workers with tenure below the 25th percentile and an additional decrease in the share of workers with tenure above the 75th percentile.

The majority of the CEE countries (Bulgaria, the Czech Republic, Romania and Slovakia) move further away from the EU average, with decreasing shares of long-tenured workers. The crisis reinforces this trend by additionally decreasing the share of short-tenured workers. Thus, when comparing 2012 with 2002, the share of workers with tenure at both ends of the EU tenure distribution is even lower. In contrast, Hungary and Poland become more similar to the EU average, mainly due to an increase in the share of short-tenured workers that starts in the pre-crisis period and is sustained during the crisis years.

Greece actually moves closer to the group of Mediterranean countries by showing decreasing shares of short-tenured and increasing shares of long-tenured workers during the pre-crisis period. The crisis mitigates this development to some extent, but the general trend is still visible (Table 3).

Summary

The distribution of tenure shows great diversity among countries in the pre-crisis period. Possible reasons for diverging pre-crisis levels include:

- compositional effects in terms of the workforce or industry structure;
- different labour market institutions;
- varying preferences of workers in terms of the ‘lifetime employment relationship’.

In terms of labour market institutions, employment protection legislation and, more generally, labour market flexibility appear to be especially important. Furthermore, differences in mean tenure are closely related to the share of long-tenured jobs.

During the crisis period, mean tenure increased for the majority of countries and especially for those countries that experienced a sharp peak in unemployment. The main reason appears to be a reduction in the share of short-tenured jobs, caused by job destruction as well as diminished job creation. To the extent that it is possible to remove cyclical effects from the development of mean tenure, but not taking into account compositional effects, there appears to be no evidence that mean tenure decreased in Europe during the period 2002 to 2012. However, the analysis of the entire tenure

distribution and its development over time has delivered the first hints that, especially for the continental and Mediterranean countries, demographic change may be an important driver of increases in mean tenure. Consequently, stable or increasing trends in tenure overall might be negative for a fixed age group. Chapter 3 deals with these issues in detail.

Differences in mean tenure across Europe are caused by four distinctive tenure distributions, which are partly rooted geographically. The continental and Mediterranean countries are mostly characterised by a low share of short-tenured and a high share of long-tenured jobs. The opposite is true for the Baltic states, Denmark, Ireland, Spain and the UK, which have a high share of short-tenured and a low share of long-tenured workers. Finland and Sweden show relatively polarised tenured distributions, with a high share of both short- and long-tenured workers. And the CEE countries in general have few workers at both ends of the tenure distribution.

These patterns are not only true when defining short- and long-tenured jobs as workers with tenure below the 10th and above the 90th percentiles, but also more generally when analysing the share of workers below the 25th and above the 75th percentiles. The crisis does decrease these differences to some extent, but there are no signs that the tenure distributions of the EU Member States generally become more similar to each other. Only some of the smaller continental countries (Austria, Belgium and the Netherlands) as well as Hungary and Poland appear to move structurally towards the EU average.

Tenure by sociodemographic characteristics 3

This chapter examines the relationship between tenure and three sociodemographic characteristics: gender, age and skill level.

Gender

Analysis of mean tenure

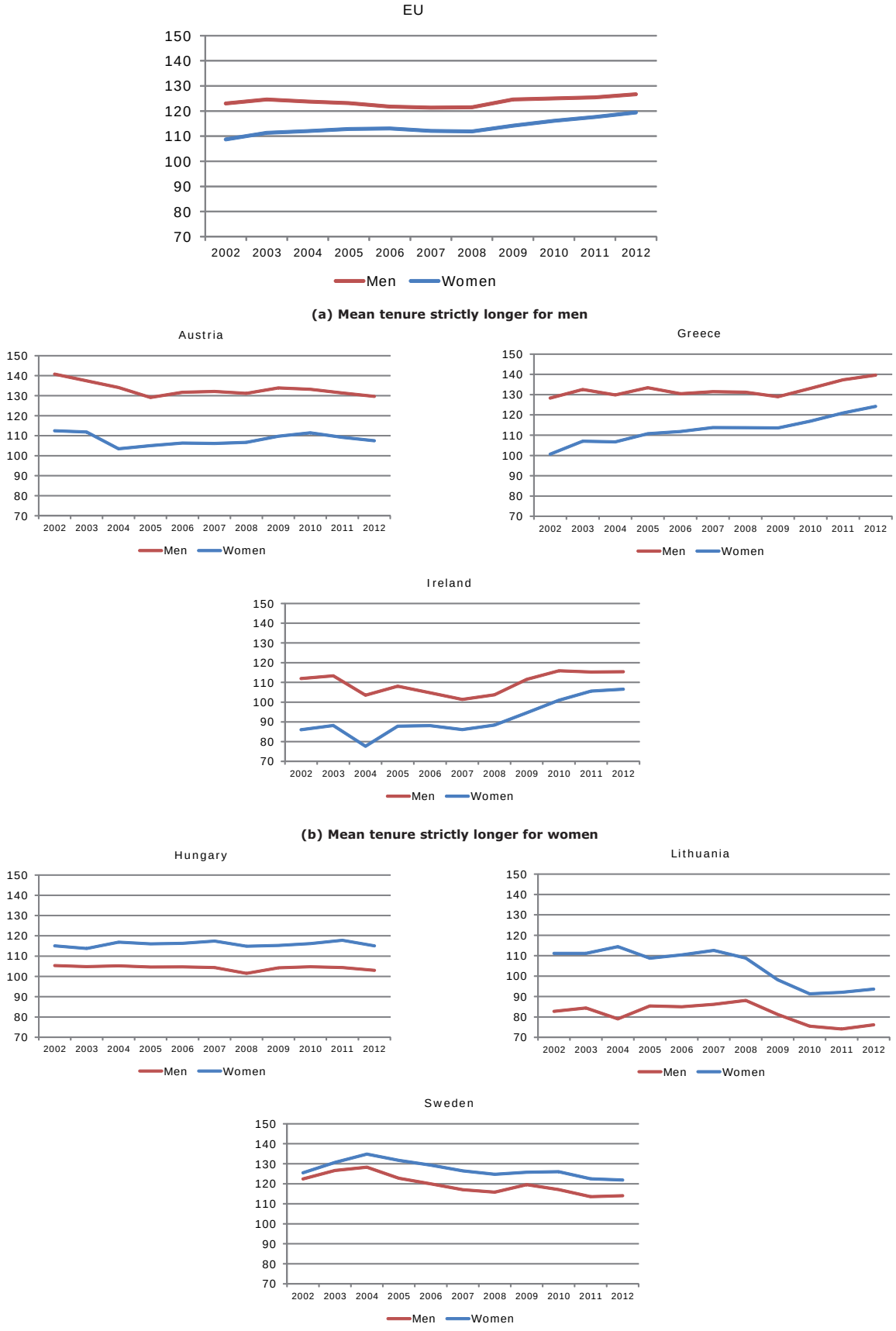
The analysis starts by looking at the evolution of mean tenure for female and male workers over the years 2002 to 2012 for the EU on aggregate and for specific countries (Figure 13).

The mean tenure of male workers is somewhat longer than that of female workers when aggregating data for the EU countries, but the difference declines over time. Auer and Cazes (2000) reported that the tenure gap between men and women had already started to narrow in the 1990s. This trend continued into the millennium and may be explained by the changing career pattern of women.

Apart from this long-term trend, there is an upward trend in mean tenure during the crisis between 2008 and 2012 for both men (roughly 5 months) and women (roughly 7.5 months). Another interesting finding is that mean tenure seems to increase slightly earlier for men in the initial year of the crisis (when more male-dominated sectors were affected) and vice versa thereafter. However, a country-specific perspective indicates that the level of mean tenure and its evolution over time diverge fundamentally across selected countries.

To examine the diverse country developments in the tenure gap, a distinction is made between countries where mean tenure is longer for women (Hungary, Lithuania and Sweden) and countries where it is longer for men (Austria, Greece and Ireland) in Figure 13. The longer mean tenure for women is rather puzzling, but one possible explanation is the difference in women's labour force participation across countries. The idea is that higher participation of women may coincide with relatively high mean tenures among women in these countries, because a higher participation usually implies fewer interruptions in terms of job change during a career (for example, due to child rearing). Either parental leave is shorter in general (thereby ensuring that women return to their original employer) or the institutional set-up means that women may opt to return to their job even after longer breaks. Other countries where higher mean tenures are found for women than for men (not shown in Figure 13) are Bulgaria, Latvia and Poland. All these are CEE countries where women traditionally had a higher labour market attachment. In contrast, countries where men have a higher mean tenure, such as Austria or Ireland but also Germany, Luxembourg or the Netherlands (not shown in Figure 13), show lower female labour force participation.

Figure 13: Mean tenure (in months) by gender for the EU and selected Member States, 2002–2012



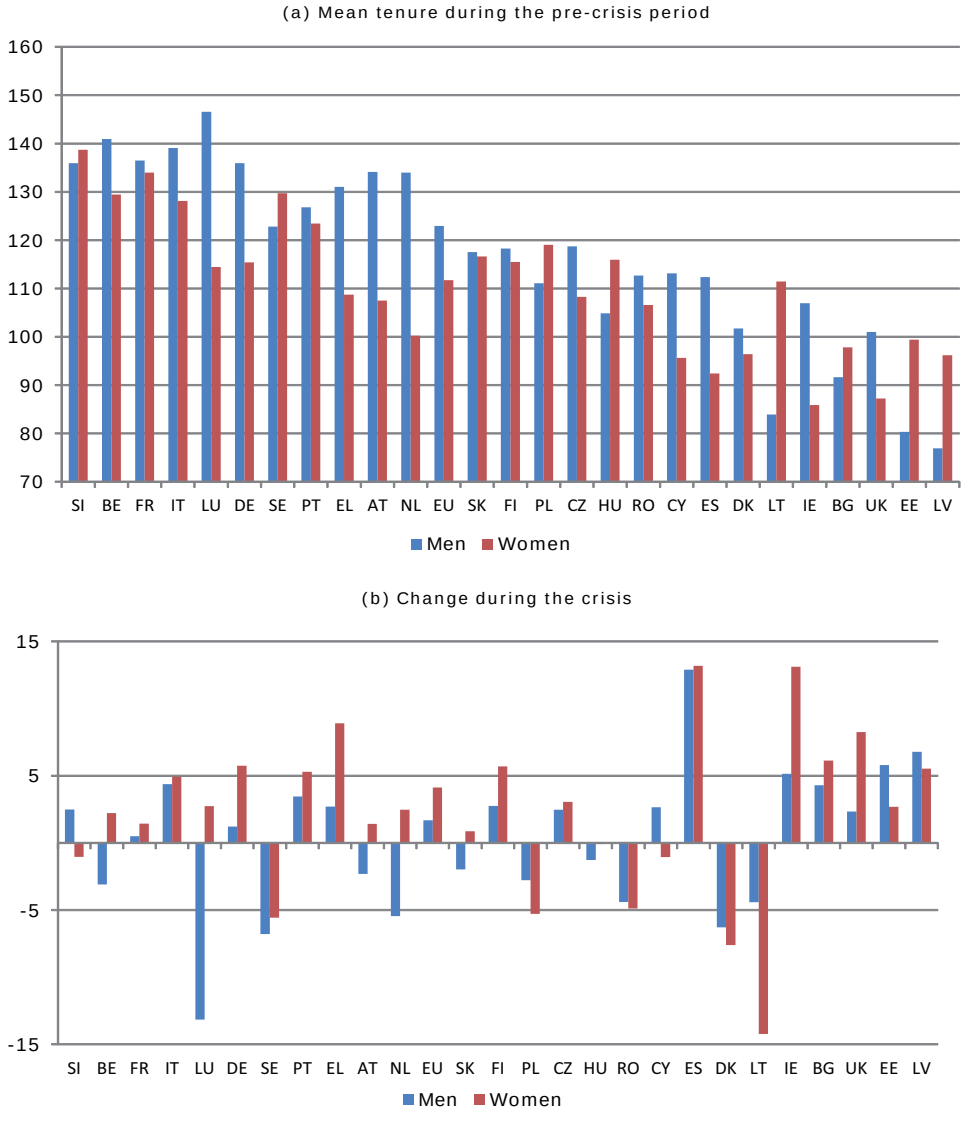
Note: The vertical axis (months) starts at 70 months to make the variation visible.
Source: *EU-LFS, authors' calculations*

Figure 14 shows mean tenure for both men and women in all EU countries (except Malta) in the pre-crisis period (14a) and the change during the crisis (14b). The figure provides descriptive evidence that mean tenure is slightly higher for men compared with women aggregated across the EU. Averaging over EU countries indicates that mean tenure increases for both men (from 123 to 125 months) and women (from 112 to 116 months) during the crisis.

In the pre-crisis period (Figure 14a), mean tenure is much longer for male workers in countries such as Austria, Cyprus, Germany, Greece, Ireland, Luxembourg, the Netherlands, Spain and the UK. For a few countries, mean tenure is longer among female workers, namely in the Baltic states, Hungary, Poland and Sweden.

Overall, mean tenure for both men and women increases during the crisis (Figure 14b), although this development is highly country-specific (see the next section). The most remarkable increase is seen for Spain, where mean tenure increases from 92 to 106 months for women and from 112 to 125 months for men. Spain had many short-tenured workers who likely suffered the most from job destruction and encountered difficulties entering new jobs during the crisis. This might explain the sharp rise in mean tenure after 2007 for both sexes. In contrast, pronounced decreases of mean tenure during the crisis are apparent for men in Luxembourg (147 to 133 months) and for women in Lithuania (111 to 97 months).

Figure 14: Mean tenure (in months) before the crisis and change during the crisis, by gender



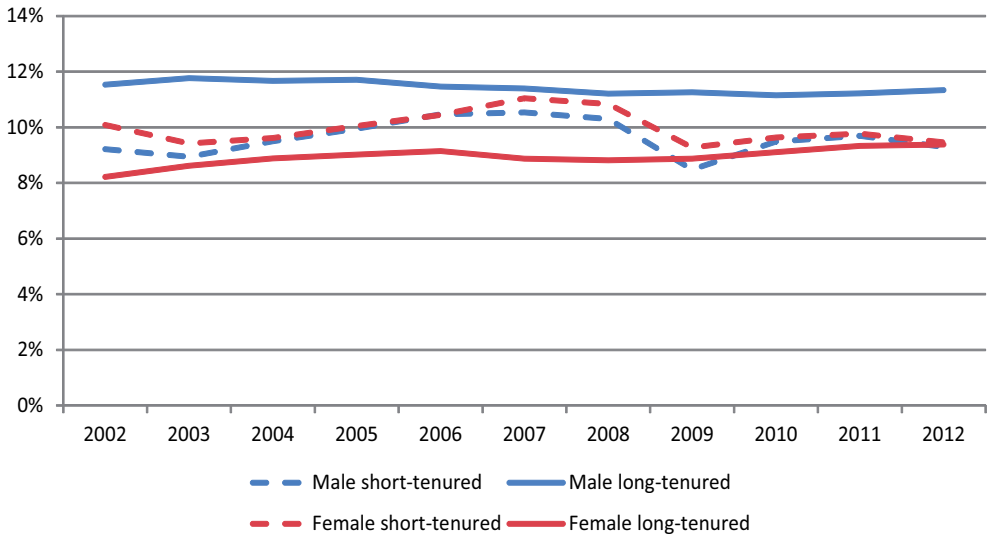
Note: The vertical axis starts at 70 months in (a) to make the variation visible.
Source: *EU-LFS, authors' calculations*

Analysis of short- and long-tenured jobs

The investigation of short- or long-tenured jobs in particular is useful to gain a better understanding of the overall development of tenure. Figure 15 provides an overview of how the share of short- and long-tenured jobs has evolved over time for men and women in the EU. The share of men with long-tenured jobs is larger (about 11%) than of women (about 9%). The development of shares of long-tenured jobs over time is not very pronounced, but differs between the sexes: while men show a small decrease over time, a slightly increasing trend is apparent for women.

In terms of short-tenured jobs, the shares for women and men behave very much the same but exhibit more variation over time compared with the shares of long-tenured jobs (Figure 15). This variation seems to be more closely related to cyclical change, and, indeed, there is a remarkable drop in the share of short-tenured jobs for both men and women at the beginning of the financial crisis (between 2007 and 2009).

Figure 15: Share of short- and long-tenured jobs by gender, 2002–2012



Note: The percentiles are taken from the tenure distribution across the entire EU in 2002.
Source: *EU-LFS, authors' calculations*

To conclude, mean tenure is somewhat longer for men when aggregating across EU countries. However, this picture reverses for numerous countries when taking a country-specific perspective. One important explanation for this phenomenon is the difference in female labour force participation across countries, where higher participation rates coincide with lower turnover rates and higher mean tenure. Generally, men in the Baltic states have mean tenures that are particularly low.

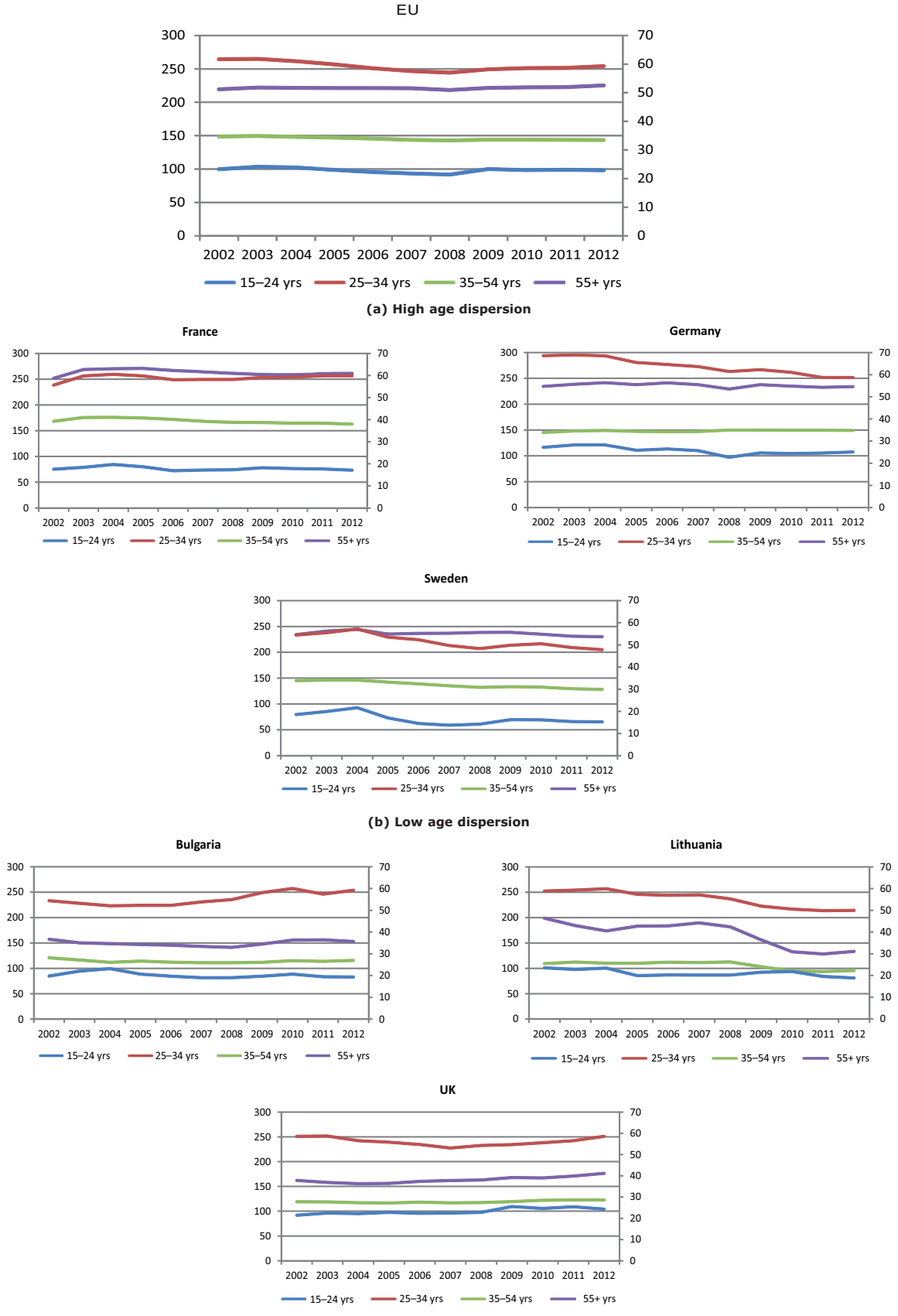
This analysis also establishes that, for both men and women, the share of short-tenured jobs decreased remarkably during the crisis, and the share of long-tenured jobs remained relatively stable over time. This may be explained by a disproportionately high destruction of short-tenured jobs and fewer labour market entries.

Age

Analysis of mean tenure

There is a strong positive correlation between tenure and age. This correlation is to a large extent driven by a mechanical relationship, which means that one further year of tenure is by definition one further year of age (although not vice versa). This is the most relevant explanation for the differences in tenure means across age groups seen in Figure 16. As a consequence, mean tenure is systematically higher for older age groups than for younger age groups. The change over time, however, is not very pronounced when aggregating over EU countries. The oldest age group (55 years and older) has a slight increase in mean tenure during the crisis (2008–2012), while the next oldest age group (35–54 years) has a slight decrease in mean tenure. The mean tenure of the two youngest age groups (15–24 and 25–34 years) remains constant over time.

Figure 16: Mean tenure (in months) by age group in selected Member States, 2002–2012

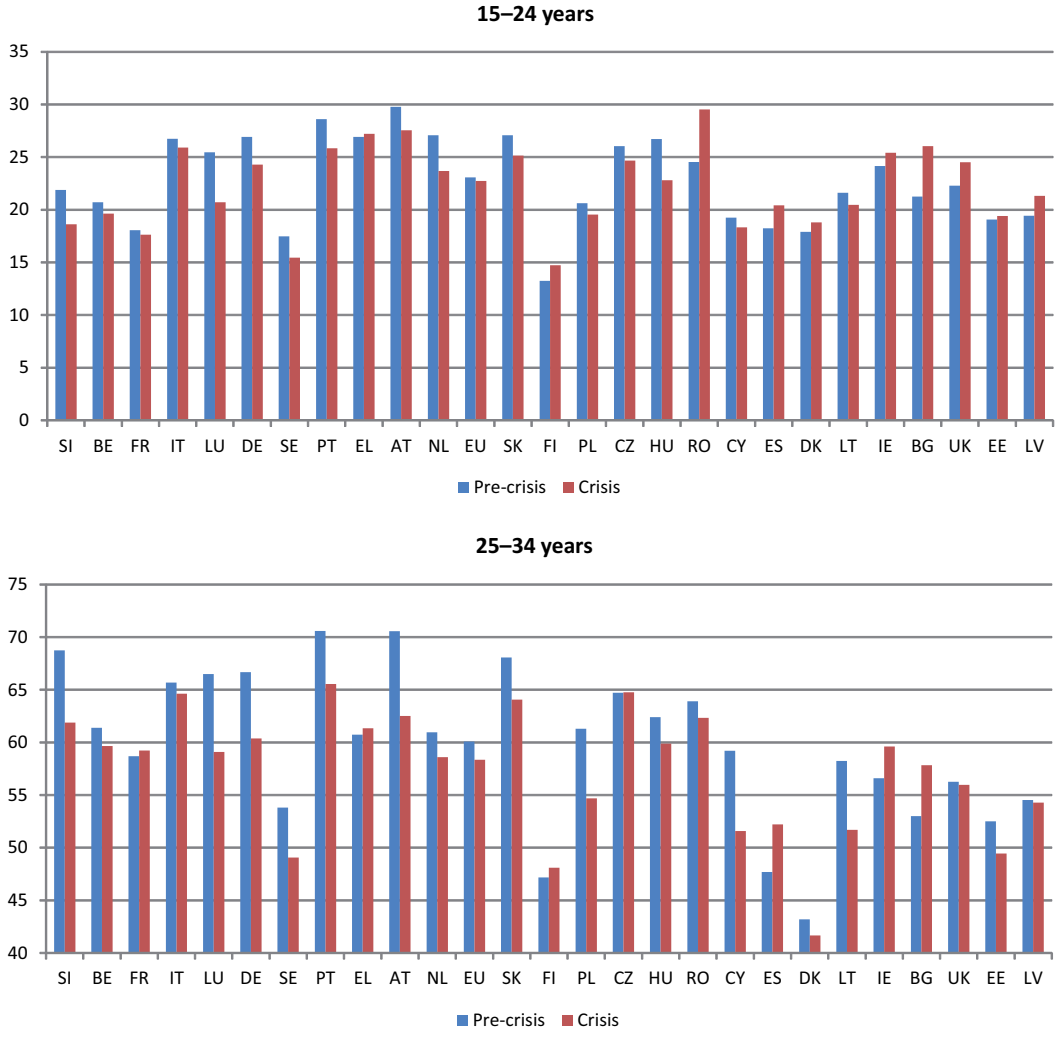


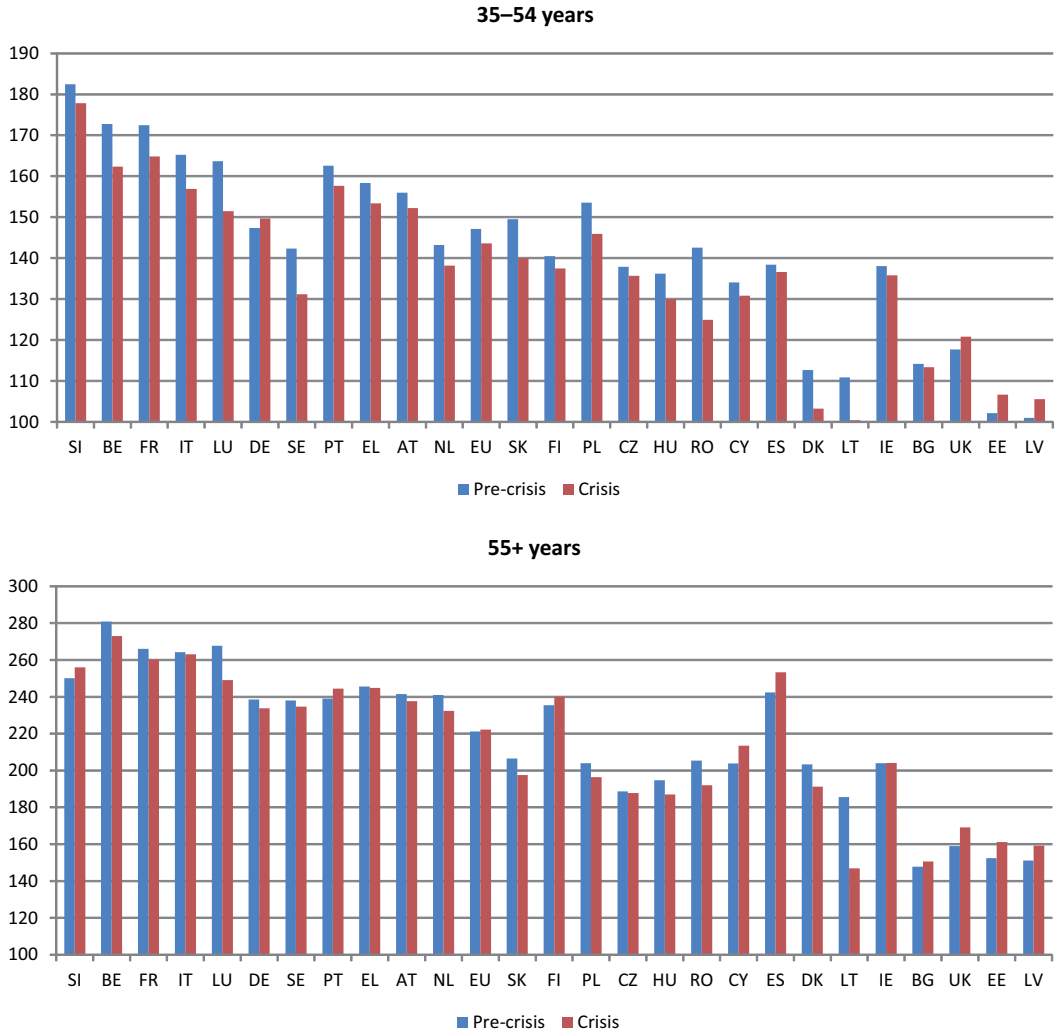
Notes: To make the variation visible in all age groups, mean tenure for the 35–54 and 55+ years age groups is plotted against the primary axis, while mean tenure for the 15–24 and 25–34 years age groups is plotted against the secondary axis.
Source: *EU-LFS, authors' calculations*

EU countries differ substantially in the dispersion of mean tenure among age groups. Figure 16 distinguishes between countries with a large and low dispersion in mean tenure. France, Germany and Sweden have a large dispersion; for these, the oldest age group (55+ years) has mean tenures of roughly 250 months, but those of the second oldest age group (35–54 years old) are approximately 100 months lower (Figure 16a). Figure 16b shows Bulgaria, Lithuania and the UK, which have a particularly low dispersion in mean tenure across age groups. One possible difference between low- and high-dispersion countries is the degree of job mobility and job security. In high-dispersion countries, job changes seem less frequent and thus tenure is more strongly related to age. Most importantly, the prime age group of workers (aged 35–54 years) seems to show a declining structural trend over calendar time when examining the EU aggregate (Figure 16a).

Highlighting the importance of the crisis for the evolution of mean tenure, Figure 17 provides country-specific levels of mean tenure before and during the crisis by different age groups. Countries with large mean tenures among older workers (55+ years) before the crisis are Belgium, Luxembourg France, Italy and Slovenia (mean tenure greater than 250 months). Countries with relatively low mean tenures among older workers are the Baltic states (Estonia, Latvia and Lithuania) and the UK (roughly 150 months). For the youngest age group (15–24 years), the highest tenures are apparent in Austria, Greece, Italy, Portugal and Slovakia (all greater than 25 months both before and during the crisis), while mean tenure in this age group was very low in Finland and Sweden (roughly 15 months). These findings are in line with the results of Cazes and Tonin (2010) for age-specific mean tenure across the EU24 countries (EU28 less Austria, Bulgaria, Croatia and Romania) before the crisis.

Figure 17: Mean tenure (in months) by age group, before and during the crisis





Note: To make the variation visible, values on the vertical axis start at 40 months for the 25–34 age group and 100 months for the 35–54 and 55+ age groups.
Source: *EU-LFS, authors' calculations*

Comparing the pre-crisis period to the crisis period suggests that changes in mean tenure are small in all age groups when aggregating data across EU countries (Figure 17). However, there are specific countries that deviate from this aggregated perspective. In Bulgaria and Romania, the youngest workers (15–24 years) saw a large relative increase in mean tenure (greater than 20%). One possible explanation for this increase is the tremendous job loss among young workers during the crisis. Also, both countries altered the regulations for atypical working contracts during the crisis and in particular for young people (Clauwaert and Schönman, 2012), which might have caused the observed increases in mean tenure for young workers.

In several countries, however, changes between the pre-crisis and crisis periods materialised in a decrease of mean tenure (examples are Austria, Hungary and the Netherlands). Among older workers (55 years and over), increases in mean tenure during the crisis were relatively large (about 5%) in Cyprus, Spain and the UK, but in several (mostly small) countries such as Lithuania, Luxembourg and the Netherlands, mean tenure decreased for this age group during the crisis. In Lithuania, the fall in older workers' mean tenure was high and might be responsible for the exceptional decrease in mean tenure for the country as a whole during the crisis. As mentioned above, explanations for this phenomenon include a reform targeting early retirement or legislation simplifying the dismissal of older workers. In addition, because

Lithuania's population is small, mean tenure in terms of age categories is sensitive to changes in a small part of the population.

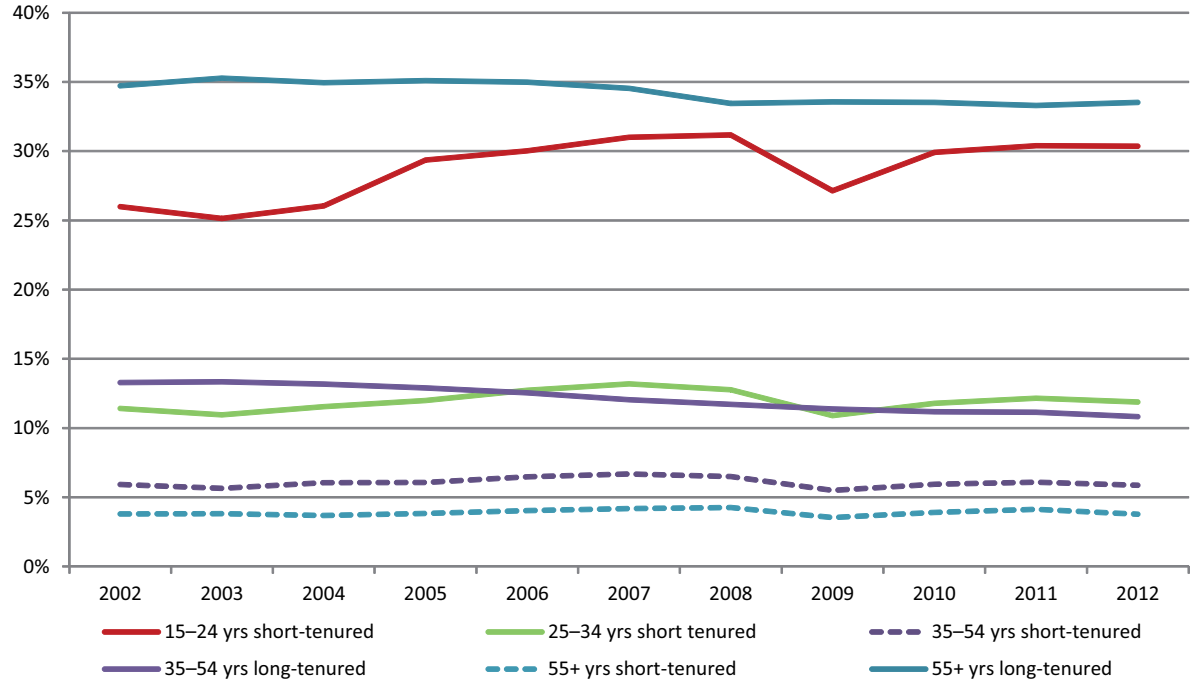
Analysis of short- and long-tenured jobs

When assessing the share of short- and long-tenured jobs by age group (Figure 18), the definition of long tenure used in this report (above the 90th percentile, which corresponds to 305 months) rules out the existence of such jobs for the two youngest age groups (that is, 15–24-year-olds and 25–34-year-olds). The youngest age group (15–24 years) unsurprisingly shows a high share of short-tenured jobs. However, this share dropped substantially at the beginning of the crisis (between 2008 and 2009), indicating a massive destruction of short-tenured jobs, and recovered thereafter. For workers aged 55 years and over, two extremes are evident:

- a very low share of short-tenured jobs (less than 5%);
- a very high share of long-tenured jobs (greater than 30%).

This latter share of long-tenured jobs among older workers decreases slightly over time but is generally stable.

Figure 18: Share of short- and long-tenured jobs by age group, 2002–2012



Notes: Percentiles are taken from the tenure distribution across the entire EU in 2002. Data series are absent for long-tenured 15–24-year-olds and 25–34-year-olds as such jobs do not exist for these age groups according to the definition of long tenure used.
Source: *EU-LFS, authors' calculations*

Shift–share analysis

Table 5 shows the results from a shift–share analysis, which provide a more precise description of the underlying mechanisms. (See Box 2 for an explanation of shift–share analysis.)

Box 2: Shift–share analysis

The aim of the shift–share analysis in the context of this report is to examine to what extent differences in tenure over time are due to compositional effects such as differences in the sectoral composition or the age structure of workers. To do this, the total difference over time is broken down into two components: (1) those that are due to differences in the distribution of groups (for example, sectors, age groups, contract types), holding mean tenure within groups constant; and (2) those that are due to differences within groups (for example, differences in job tenure within age groups), holding the distribution of groups constant. Put more formally:

$$\Delta Tenure = \sum_i \Delta Share_i * \overline{Tenure_i} + \sum_i \overline{Share_i} * \Delta Tenure_i$$

where $\Delta Tenure$ is the difference in mean tenure over time or between countries, i denotes the group and $Share_i$ denotes the share of this group in the total workforce. The first term on the right gives the difference in mean tenure attributable to shifts in employment shares between groups with different tenure. The second term on the right reports the difference in mean tenure within each group. A bar denotes a mean over time or across countries.

First, for both the pre-crisis (2002–2007) and the crisis periods (2007–2012),[4] the isolated increase of mean tenure in the EU attributed to a compositional change is large (total change of 9.3 months), being over 4 months in the pre-crisis period and over 5 months in the crisis period (Table 5). This suggests that, during both periods under observation, the increase in mean tenure is related to a change in the share of age groups. In this specific case, and taking into account demographic change in terms of higher life expectancy and lower birth rates, the share of older workers has increased and seems to be a driving force for a higher mean tenure.

Interestingly, the contribution to the overall change in mean tenure in the EU (0.57 months) from factors other than an ageing population was strongly negative (-3.6 months) in the pre-crisis period (Cazes and Tonin (2010) report similar results). Aside from the crisis period, there seems to be a long-term trend towards shorter tenures. This decrease during the pre-crisis period, when separated from compositional effects, is strongly driven by countries such as Austria (-12 months), Denmark (-13 months), Romania (-19 months) and Slovakia (-16 months). During the crisis, however, mean tenure isolated from 'mechanical effects' (that is, compositional aspects due to ageing) increases in the EU by about 0.9 months. This increase can be ascribed to factors other than ageing populations and is particularly driven by countries such as Bulgaria (6 months), Estonia (9 months), Ireland (6 months), Spain (9 months) and the UK (7 months).

[4] Interacting the full model with the crisis dummy is the most efficient way to draw on the full sample while estimating virtually two different models (that is, for the pre-crisis period and the crisis period). Differences between groups (for example, between age or skill groups) are referred to as the 'unexplained difference' that remains after controlling for several observable sociodemographic variables and job characteristics. Please note that for readability of Tables 10 to 12, all base coefficients are reported in the first column while respective interactions are reported in the second column. The first row of the table provides results for the reference group (that is, the intercept, first column) and the aggregate change of tenure during the crisis (that is, the coefficient of crisis dummy, second column).

Table 5: Shift–share analysis of change in tenure (in months), according to age

	2002–2007			2007–2012			2002–2012		
	Due to changing composition	Due to change within groups	Total change	Due to changing composition	Due to change within groups	Total change	Due to changing composition	Due to change within groups	Total change
EU	**4.19**	**-3.62**	**0.57**	**5.21**	**0.93**	**6.14**	**9.29**	**-2.58**	**6.71**
AT	4.32	-11.98	-7.66	2.32	-3.37	-1.05	6.81	-15.52	-8.71
BE	7.45	-5.70	1.75	4.49	-6.57	-2.08	11.87	-12.20	-0.33
BG	3.55	-7.13	-3.59	2.32	5.70	8.02	6.16	-1.73	4.44
CY	3.15	2.18	5.33	1.80	-4.14	-2.34	4.87	-1.87	3.00
CZ	2.36	0.40	2.76	5.15	-1.15	4.00	7.53	-0.77	6.75
DE	4.26	0.23	4.49	3.92	-0.74	3.18	8.16	-0.49	7.66
DK	-1.54	-12.91	-14.45	2.72	5.09	7.82	1.45	-8.08	-6.63
EE	-1.50	-3.12	-4.63	3.05	8.98	12.03	1.60	5.80	7.40
EL	8.03	-1.30	6.73	8.47	0.28	8.75	16.78	-1.30	15.48
ES	4.29	-4.01	0.28	14.19	8.89	23.08	18.55	4.81	23.36
FI	4.88	-5.12	-0.24	2.77	2.68	5.46	7.70	-2.48	5.22
FR	5.18	1.91	7.09	5.89	-3.05	2.84	10.67	-0.74	9.93
HU	5.26	-4.73	0.53	4.94	-6.70	-1.76	10.36	-11.59	-1.23
IE	1.80	-7.71	-5.91	10.80	6.04	16.84	13.29	-2.36	10.93
IT	7.39	-7.39	0.00	10.13	-2.10	8.03	17.71	-9.67	8.04
LT	3.41	-1.06	2.35	4.99	-19.18	-14.19	8.55	-20.40	-11.84
LU	7.96	-6.84	1.12	3.74	-11.78	-8.04	11.51	-18.43	-6.92
LV	1.67	1.09	2.76	3.72	0.51	4.23	5.35	1.63	6.98
NL	5.88	-4.20	1.68	-1.01	1.14	0.13	4.87	-3.06	1.80
PL	-2.33	-8.31	-10.64	7.27	-1.37	5.90	4.52	-9.26	-4.74
PT	6.55	0.53	7.08	8.78	-1.28	7.50	15.30	-0.72	14.58
RO	9.31	-19.35	-10.04	4.79	-4.32	0.47	14.33	-23.90	-9.57
SE	3.45	-5.72	-2.27	1.13	-4.92	-3.79	4.54	-10.60	-6.06
SI	2.93	-6.38	-3.45	9.46	-6.29	3.16	12.05	-12.34	-0.29
SK	2.90	-15.61	-12.71	8.84	-1.94	6.90	13.12	-18.92	-5.81
UK	3.81	-2.16	1.65	0.69	6.59	7.28	4.58	4.35	8.93

Source: *EU-LFS, authors' calculations*

The shift–share analysis also reveals that the increase in mean tenure in Germany during the crisis is driven by the ageing of the labour force. This explains why mean tenure rises even though the unemployment rate was unaffected by the crisis (see Chapter 2).

The conclusions with respect to tenure and age groups are as follows. First, older age groups have much longer tenures, which to a large extent is due to the strong positive correlation between tenure and age (that is, the mechanical effect). Second, the share of short-tenured jobs decreased strongly across all age groups during the crisis. This might explain why overall mean tenure increased remarkably during the crisis. However, the shift–share analysis yields the important finding that large parts of the increase in tenure (aggregated across EU countries), especially in the pre-crisis period, were due to changes in the age composition of the labour force. In other words, apart from the crisis, the compositional aspect from a growing share of older workers is relevant when explaining why there is an increasing overall tenure. Thus, the results of the analysis suggest that:

- exogenous impacts of the crisis may be responsible for a considerable increase in tenure;
- there seems to be a long-term trend towards shorter job tenure.

Skill level

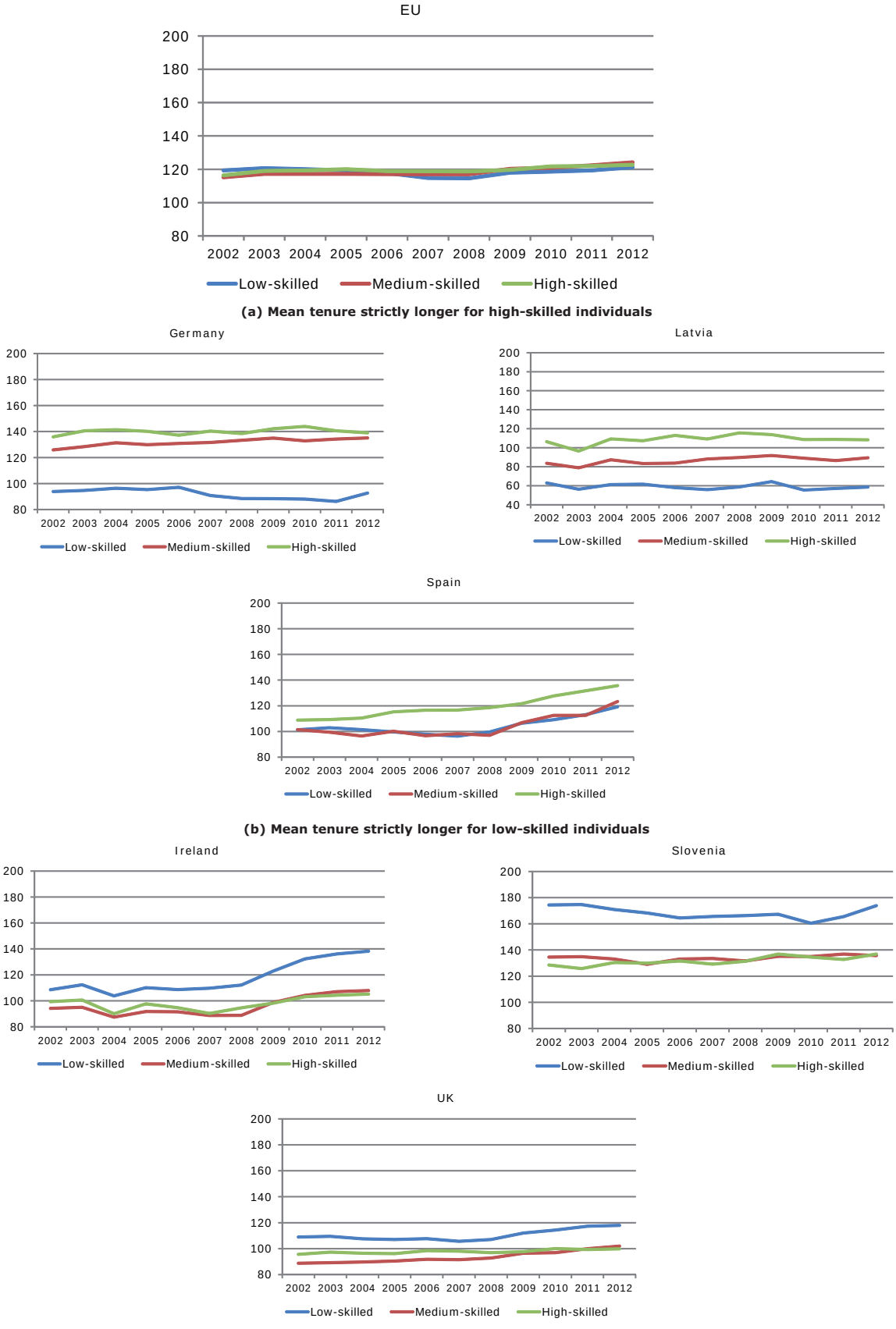
Analysis of mean tenure

The analysis next assesses mean tenure for different skill levels for the EU aggregate and specific countries. Skill level is classified based on the International Standard Classification of Education (ISCED), where low-skilled workers are defined as those with a lower secondary education or less (ISCED 0–2); medium-skilled workers have completed upper secondary education (ISCED 3–4); and high-skilled workers have completed the first or second stage of a third-level education (ISCED 5–6).

This analysis reveals a variety of patterns that deserve some discussion. First, changes in mean tenure over time do exist for specific countries. While tenure profiles are more or less flat across skill levels for countries such as Germany, Latvia and the UK, there is a considerable increase in the respective mean tenure for countries such as Ireland and Spain (Figure 19).

However, skill levels seem not to play an important role in terms of changes and, specifically, increases in mean tenure. Thus, there is ambiguity with respect to tenure profiles among skill levels for different countries. For this reason, Figure 19 distinguishes between countries where mean tenure is longest among high-skilled individuals (Germany, Latvia and Spain; Figure 19a) and countries where mean tenure is the longest among low-skilled individuals (Ireland, Slovenia and the UK; Figure 19b). In the former group, the observed pattern supports the view that mean tenure and skill level are positively correlated. In contrast, the latter group of countries suggests a negative correlation between mean tenure and skill level. Thus, it is impossible to postulate a rule based on this observation that holds equally for all countries in this respect. Potential explanations are differences in employment protection legislation, the overall structure of the economy and historical cultures across national labour markets affecting the relationship between skill and mean tenure. In countries where mean tenure is strictly longer for low-skilled workers (Figure 19b), increases in mean tenure during the crisis are more pronounced for low-skilled workers.

Figure 19: Mean tenure (in months) by skill level, EU and selected Member States, 2002–2012

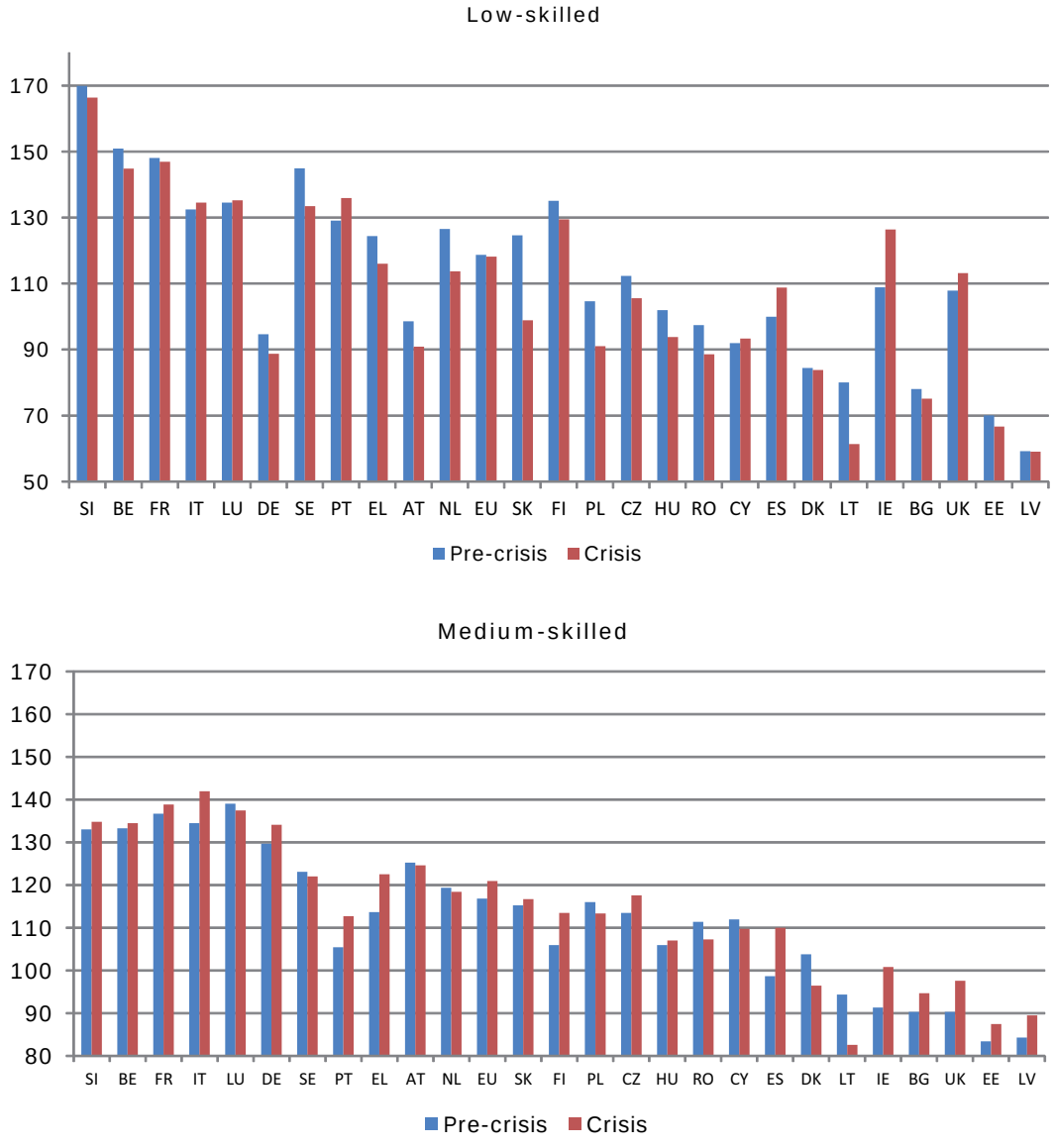


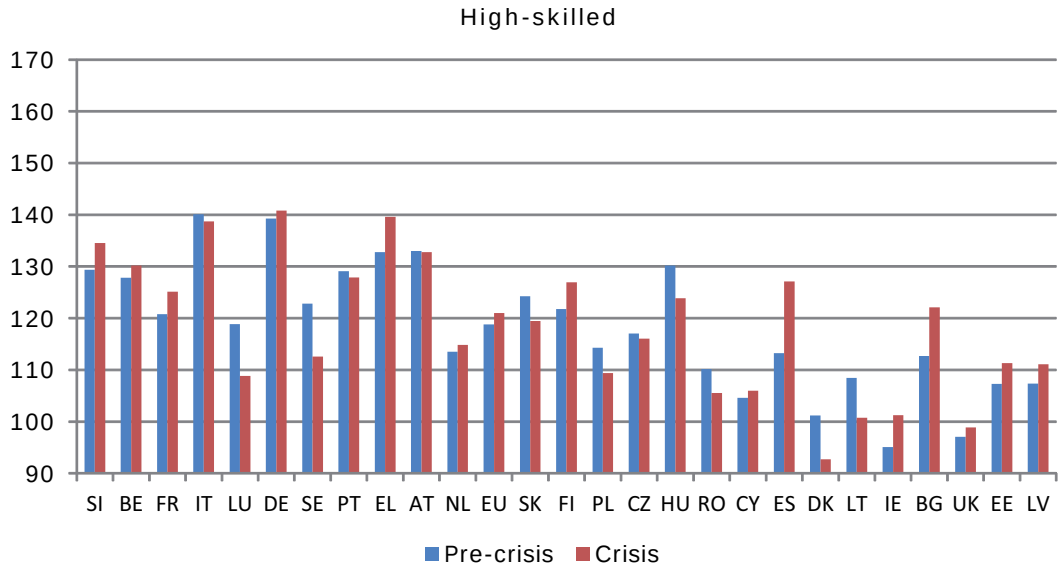
Note: The vertical axis starts at 80 months (40 months in the case of Latvia) to make the variation visible.
Source: *EU-LFS, authors' calculations*

Comparing the pre-crisis period with the crisis period suggests that when aggregating data across EU countries, there are no changes in mean tenure for low-skilled individuals and small changes for medium- and high-skilled individuals (Figure 20). However, Figure 20 suggests that tenure decreased during the crisis in 18 countries for low-skilled workers but only in 9 countries for medium-skilled workers. So again, taking the country-specific perspective reveals different patterns on a less aggregated level.

- Among low-skilled individuals, mean tenure increased remarkably in Ireland (16%) and Spain (9%).
- Among medium-skilled individuals, increases are most pronounced for Spain (12%), Ireland (10%), Greece (8%), the UK (8%), Portugal (7%) and Italy (6%).
- Among high-skilled individuals, increases are most pronounced for Spain (12%), Bulgaria (8%) and Greece (5%).

Figure 20: Mean tenure (in months) by skill level (annual information)





Note: The vertical axis starts at values above 0 to make the variation visible.
Source: *EU-LFS, authors' calculations*

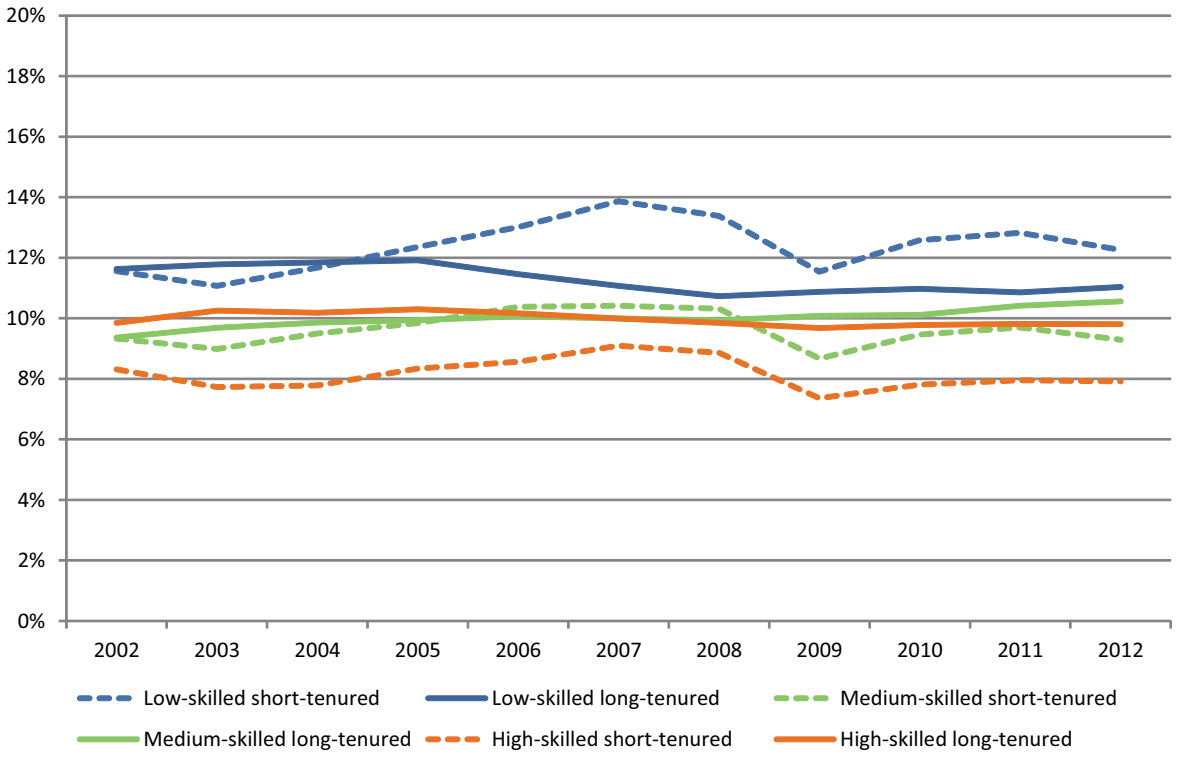
Changes in mean tenure among medium-skilled individuals are highly relevant because this group makes up the largest number of individuals by far. Thus, changes in mean tenure among medium-skilled individuals indicate labour market dynamics that are relevant to a large share of the population. In this context, it is not surprising that increases in mean tenure among medium-skilled individuals are large in countries that experienced considerable economic downturns during the crisis.

Analysis of short- and long-tenured jobs

When examining the shares of short- and long-tenured workers at the EU aggregate level, low-skilled workers show the highest shares for both of these subgroups, while high-skilled individuals have relatively low shares (Figure 21). Thus, the tenure distribution seems to be somewhat polarised for low-skilled individuals. One potential explanation is that specific types of low-skilled workers have very long-tenured jobs, while other types move in and out of the labour market frequently and so are particularly short-tenured. This suggests that the defining worker characteristic affecting tenure is not the skill level, but rather the field of activity and the specific task in the job.

Furthermore, while the share of short-tenured jobs decreased substantially across all skill levels at the onset of the crisis (2008–2009), the share of long-tenured jobs remained relatively unchanged over time. This finding suggests that, on the one hand, relatively more short-tenured jobs were destroyed during the crisis and, on the other hand, that there were fewer entries to the labour market.

Figure 21: Share of short- and long-tenured jobs by skill level, 2002–2012



Note: Percentiles are taken from the tenure distribution across the entire EU in 2002.
Source: *EU-LFS, authors' calculations*

Two important conclusions can be drawn. First, simple descriptive statistics such as the plotted means do not show clearly whether high- or low-skilled individuals have longer tenures. This aspect requires more detailed study controlling for socioeconomic variables and job characteristics within the framework of the econometric analysis adopted for this project. Second, countries where changes in mean tenure among medium-skilled individuals are large seem to belong to a group of countries that suffered a strong negative impact during the financial crisis. The group of medium-skilled individuals is typically large, and increases in mean tenure in this group indicate large-scale job loss that is likely to be strongly related to the financial crisis.

Tenure by job characteristics 4

This chapter analyses differences in the level and the development of mean tenure according to job characteristics:

- contract type;
- occupation;
- economic sector.

Cross-country differences in the prevalence of temporary contracts may explain cross-country differences in the development of mean tenure. Different occupations and economic sectors were affected by the crisis by different degrees, possibly explaining diverging trends in mean tenure across countries.

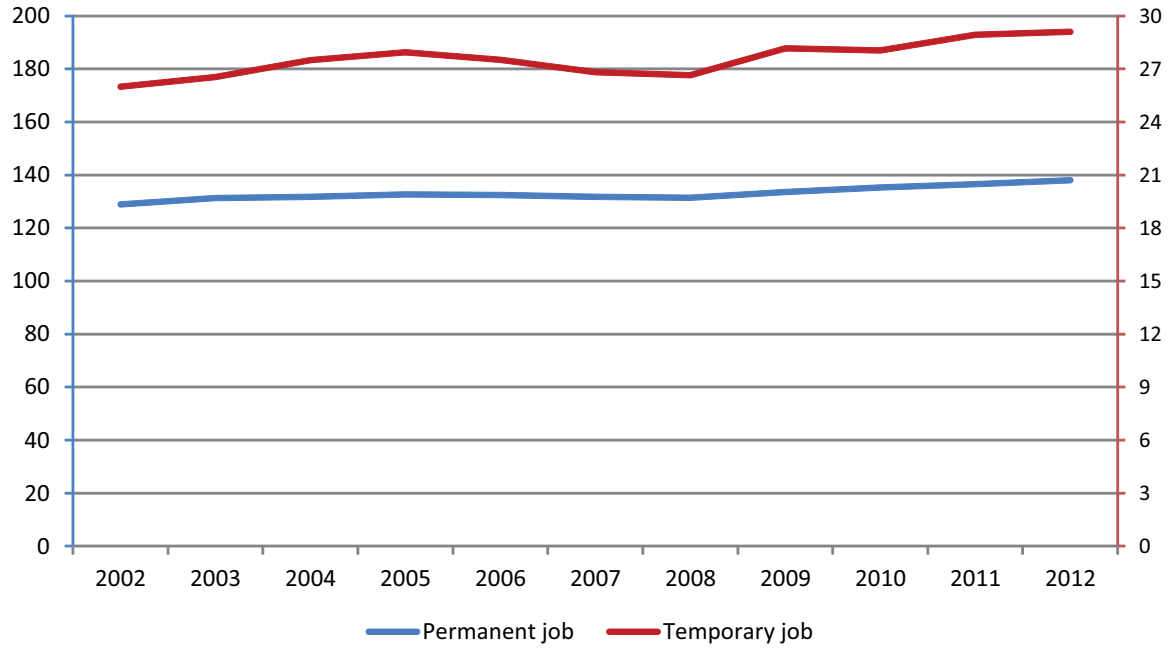
Permanent and temporary employment

The increasing importance of temporary employment in recent decades means it is of great interest to analyse how this development is linked to the evolution of tenure in Europe.

Analysis of mean tenure

Figure 22 shows that average tenure is much higher for workers with a permanent contract than for those with a temporary contract. This relationship is as expected because permanent employees are by definition more likely to remain in their current employment relationship and are therefore characterised by higher tenure. In addition, temporary contracts are used in many EU Member States as a probation period for newly hired workers.

Figure 22: Mean tenure (in months) by contract type, 2002–2012



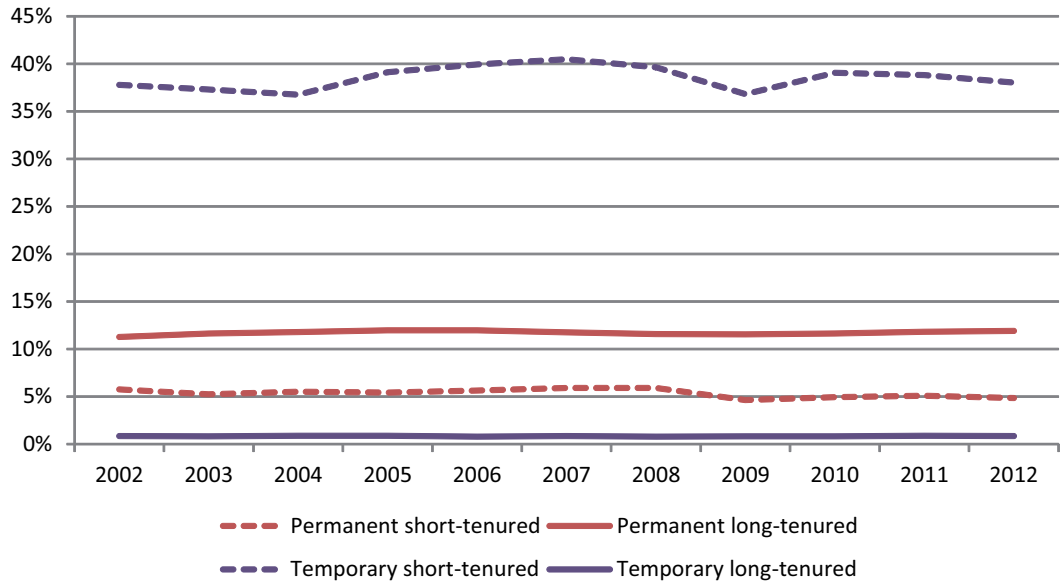
Notes: Permanent jobs are plotted against the primary axis. Temporary jobs are plotted against the secondary axis.
Source: *EU-LFS, authors' calculations*

Average tenure remains relatively stable during the pre-crisis period for temporary and permanent workers alike (Figure 22). However, the mean tenure of permanent workers increases with the beginning of the crisis in 2008–2009, growing from 131 months in 2008 to 138 months in 2012. At the same time, the mean tenure of temporary employees behaves counter-cyclically, increasing during recessions and decreasing during booms. However, overall changes are small in absolute terms; between 2007 and 2012, the mean tenure of temporary workers increases by only 2 months. Note that absolute increases are more important than relative increases when comparing the development of mean tenure of temporary and permanent workers in response to the business cycle, because to the extent that the underlying mechanism is the same (that is, destruction of short-tenured jobs and less job creation), then the absolute increase in mean tenure should be similar.

Analysis of short- and long-tenured jobs

To shed more light on these issues, this section examines the share of short- and long-tenured workers among both contract types and then looks at country-specific trends in temporary employment. As shown in Figure 23, temporary workers are much more likely to have a short-tenured job because temporary contracts end after a certain time and are not always renewed. The share of short-tenured jobs among those in temporary employment increases before the crisis and drops back to its initial level in 2009, only to start increasing again. At the same time, the share of short-tenured workers among those in permanent employment, at 5%, is below the average share of short-tenured jobs. It is stable before the crisis and then shows a relatively sustained decrease at the beginning of the crisis.

Figure 23: Share of short- and long-tenured jobs by contract type, 2002–2012



Source: *EU-LFS, authors' calculations*

Unlike temporary employment, the share of short-tenured jobs in permanent employment does not increase again in the later years of the crisis period. Job loss of short-tenured, permanent workers is therefore apparently more persistent than job loss of short-tenured, temporary workers. Stated differently, newly created jobs are more likely to be temporary. Therefore, temporary employment generally has a strong cyclical component, which implies considerable job loss during an economic downturn, but also a quick recovery.

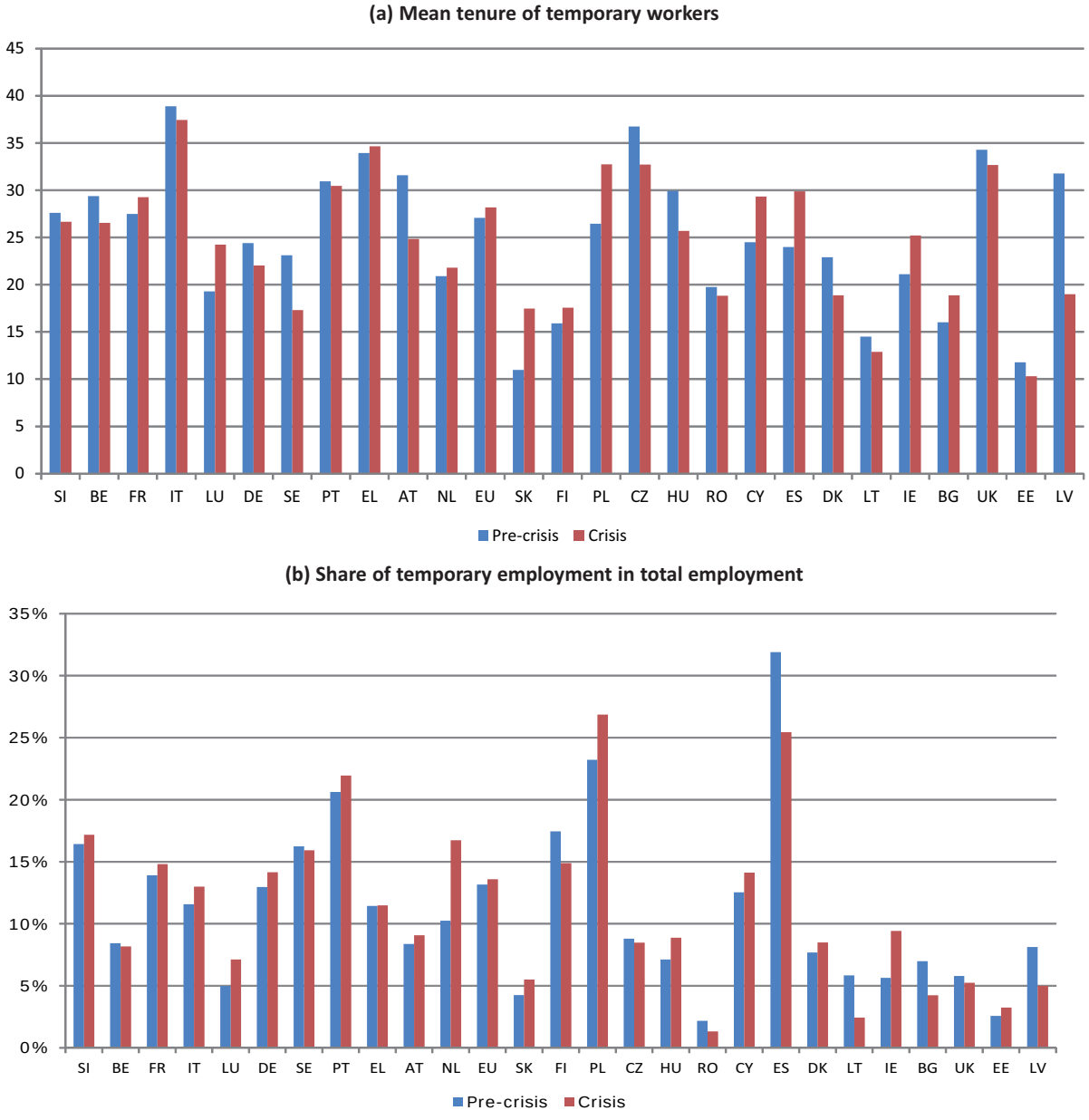
The share of long-tenured workers is, as expected, very low for temporary jobs (Figure 23). The fact that there are some long-tenured, temporary workers at all can be explained by the legislative background in certain EU Member States that does not restrict the repeated extension of temporary contracts. Hence, workers may have long-tenured jobs while holding a temporary contract. Note that the share of this group does not change at all at the beginning of the crisis.

The same is true for the share of long-tenured workers in permanent employment, although the level is considerably higher at 12% (Figure 23). One possible explanation for the share of long-tenured jobs remaining stable during the entire observation period is that job loss was more prevalent among short-tenured workers than among long-tenured workers. Since long-tenured workers have accumulated more company-specific human capital, it makes sense from the company's perspective to lay off short-tenured workers first (Jovanovic, 1979).

Mean tenure of temporary workers

Figure 24a shows the mean tenure of temporary workers by country in the pre-crisis and the crisis periods. Note that the countries are sorted in descending order of their pre-crisis mean tenure level (for all workers). By focusing exclusively on temporary employment, considerable variation across countries and time periods becomes apparent. However, there is no direct relationship between mean tenure levels for all workers and for temporary workers. This may be because the duration of temporary employment is limited in many European countries.

Figure 24: Mean tenure (in months) of temporary workers and share of total employment by country, before and during the crisis



Source: *EU-LFS, authors' calculations*

In Austria, the Czech Republic, Greece, Italy and the UK, the mean tenure of temporary workers is comparably high at around three years. In contrast, temporary workers have especially low mean tenure in Estonia, Lithuania and Slovakia. One reason for this could be that these countries have temporary contracts with exceptionally low durations compared with other countries. Estonia, Lithuania and Slovakia also have very low shares of temporary employment among total employment (Figure 24b), implying that temporary contracts are rare, and given that a worker is temporarily employed, this status changes quickly. At the same time, countries with the highest shares of temporary employment (Poland, Portugal and Spain) are characterised by average levels of mean tenure among temporary workers.

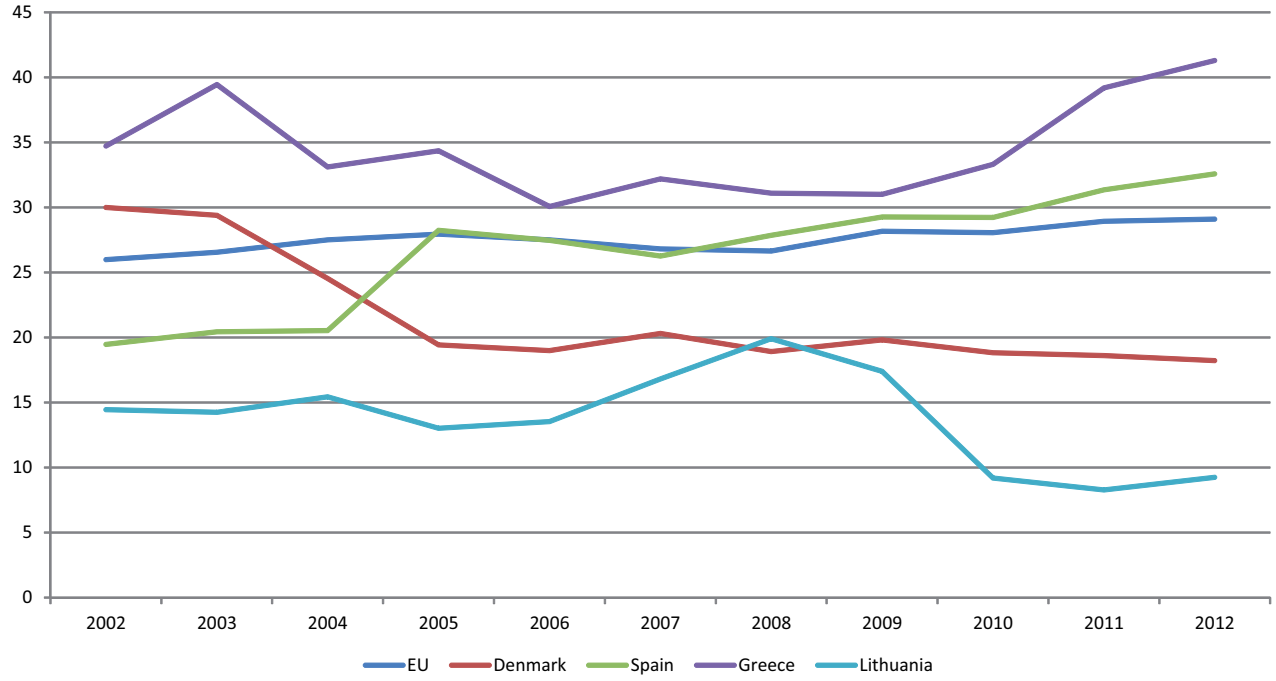
In general, temporary employment appears to be less common in the CEE countries (except for Poland). Auer and Cazes (2000) found a comparable distribution of temporary employment across the EU. This points towards a positive relationship between employment protection legislation and the prevalence of temporary employment; in many countries with strict employment protection legislation (for example, Portugal), companies use temporary employment to ensure flexibility over the business cycle.

However, the results do not directly confirm the hypothesis that temporary workers are necessarily the first to lose their job when a crisis hits the economy. While the share of temporary workers is indeed strongly reduced during the crisis in Spain, for example, Portugal actually shows an increase in this share (Figure 24b). The share of temporary workers also increases in Poland during the crisis. This result is less counter-intuitive because the crisis was not as severe in Poland as in Portugal; this implies that companies may have re-hired temporary workers more quickly, thereby actually increasing the average share of temporary employment over the entire period.

No clear relationship can be established between the pre-crisis mean tenure level and the share of temporary employment prior to the crisis or its change during the crisis. In total, 11 countries experience an increase and 15 countries show a decrease in mean tenure levels (Figure 24a). This result is not too surprising because among temporary workers there is no clear rule as to which workers should be the first to lose their job. Company-specific human capital accumulation should not differ significantly given the limited variation in tenure within temporary employment. Additionally, country-specific labour legislation governing temporary employment should play a key role. If, for example, workers have to receive a permanent contract after a certain amount of time, companies might be inclined to fire temporary workers close to this limit first in order to maintain a certain degree of flexibility during a recession.

This ambiguity in the development of mean tenure during a recession is also apparent when focusing on year-to-year changes for selected countries (Figure 25). Temporary workers in Denmark experience a sharp decline in mean tenure from 2002 until 2005, followed by relative stability until 2012. In contrast, mean tenure of temporary employment increases in Spain over the entire period from 2002 to 2012. Taken together with the development of the share of temporary employment shown in Figure 24b, this implies that many short-tenured temporary workers in Spain lost their job during the crisis. In Denmark, mean tenure for permanent workers increases, which is not the case for temporary workers. Thus, companies apparently did not use temporary employment to adjust to decreasing demand during a crisis in Denmark, but used permanent employment instead. In other countries, temporary and permanent employment behave alike in terms of mean tenure. In Greece, mean tenure levels for both employment types behave counter-cyclically (that is, mean tenure levels decrease during a boom and increase during a recession). The opposite is true in Lithuania, where both types of employment behave pro-cyclically (Figure 25).

Figure 25: Mean tenure (in months) of temporary workers in the EU and selected Member States, 2002–2012



Source: *EU-LFS, authors' calculations*

Shift–share analysis

The shift–share analysis allows the extent to which observed changes in aggregate mean tenure are caused by changing mean tenure levels of permanent and temporary workers or by a changing composition of the two contract types to be studied. The results for the EU aggregate (Table 6) show that average tenure for given shares increase slightly by 2.6 months between 2002 and 2007, but that the changing composition of temporary and permanent workers counteracts this increase. This negative share component shows that temporary contracts became more common, reducing overall tenure. During the crisis, the share component is negligible and tenure for a given share composition increases quite strongly (Table 6).

This surprising last result is also confirmed when analysing the development for individual countries. While the sign differs, a changing composition of contract types (that is, more or less temporary employment) is relatively unimportant for the majority of countries in explaining overall changes in mean tenure during the crisis. The only exceptions are Spain, where falling shares of temporary employment contribute to increasing mean tenure levels, and the Netherlands, where an increasing share of temporary employment causes a reduction in mean tenure. Instead of compositional effects, actual changes in mean tenure for the two contract types dominate the development. In this context, it is worth mentioning that the increase in the share of temporary workers in the Netherlands during the crisis was extraordinary (Figure 24b) and probably related to an accelerated move of the nation's economy from an industry-oriented to a more service-oriented economy (Gielen and Schils, 2014). In total, 20 out of the 26 analysed countries experience an increase in mean tenure during the crisis, holding the shares of contract types constant (Table 6).

Table 6: Shift–share analysis of change in mean tenure (in months), according to contract type

	2002–2007			2007–2012			2002–2012		
	Due to changing composition	Due to change within groups	Total change	Due to changing composition	Due to change within groups	Total change	Due to changing composition	Due to change within groups	Total change
EU	**-2.06**	**2.64**	**0.57**	**0.45**	**5.69**	**6.14**	**-1.62**	**8.33**	**6.71**
AT	-1.31	-6.35	-7.66	-0.43	-0.62	-1.05	-1.73	-6.98	-8.71
BE	-0.89	2.63	1.75	0.49	-2.57	-2.08	-0.41	0.08	-0.33
BG	1.07	-4.66	-3.59	1.19	6.83	8.02	2.29	2.14	4.44
CY	-3.48	8.81	5.33	-1.83	-0.51	-2.34	-5.16	8.15	3.00
CZ	-0.26	3.02	2.76	-0.28	4.28	4.00	-0.57	7.32	6.75
DE	-2.45	6.94	4.49	0.22	2.96	3.18	-2.25	9.92	7.66
DK	-2.51	-11.93	-14.45	0.31	7.50	7.82	-2.19	-4.44	-6.63
EE	0.17	-4.80	-4.63	-1.15	13.18	12.03	-1.14	8.54	7.40
EL	0.94	5.79	6.73	0.90	7.85	8.75	1.75	13.72	15.48
ES	2.35	-2.07	0.28	6.98	16.10	23.08	10.13	13.23	23.36
FI	1.01	-1.25	-0.24	1.95	3.51	5.46	3.03	2.19	5.22
FR	-1.09	8.18	7.09	-0.24	3.08	2.84	-1.32	11.25	9.93
HU	0.16	0.37	0.53	-1.87	0.11	-1.76	-1.63	0.40	-1.23
IE	-3.65	-2.26	-5.91	-0.89	17.73	16.84	-4.58	15.51	10.93
IT	-3.38	3.39	0.00	-0.70	8.74	8.03	-4.04	12.08	8.04
LT	3.61	-1.26	2.35	0.79	-14.98	-14.19	4.43	-16.28	-11.84
LU	-2.68	3.80	1.12	-1.21	-6.83	-8.04	-3.80	-3.12	-6.92
LV	4.15	-1.39	2.76	-0.35	4.58	4.23	3.88	3.10	6.98
NL	-5.09	6.77	1.68	-6.95	7.07	0.13	-11.57	13.38	1.80
PL	-14.62	3.98	-10.64	1.44	4.46	5.90	-13.12	8.38	-4.74
PT	-0.49	7.57	7.08	1.89	5.61	7.50	1.30	13.29	14.58
RO	-0.66	-9.39	-10.04	-0.07	0.54	0.47	-0.73	-8.84	-9.57
SE	-0.70	-1.57	-2.27	1.41	-5.19	-3.79	0.56	-6.61	-6.06
SI	-4.93	1.48	-3.45	1.70	1.46	3.16	-3.31	3.03	-0.29
SK	-6.32	-7.18	-12.71	-1.77	8.67	6.90	-8.50	1.29	-5.81
UK	0.30	1.36	1.65	-0.08	7.36	7.28	0.22	8.71	8.93

Source: *EU-LFS, authors' calculations*

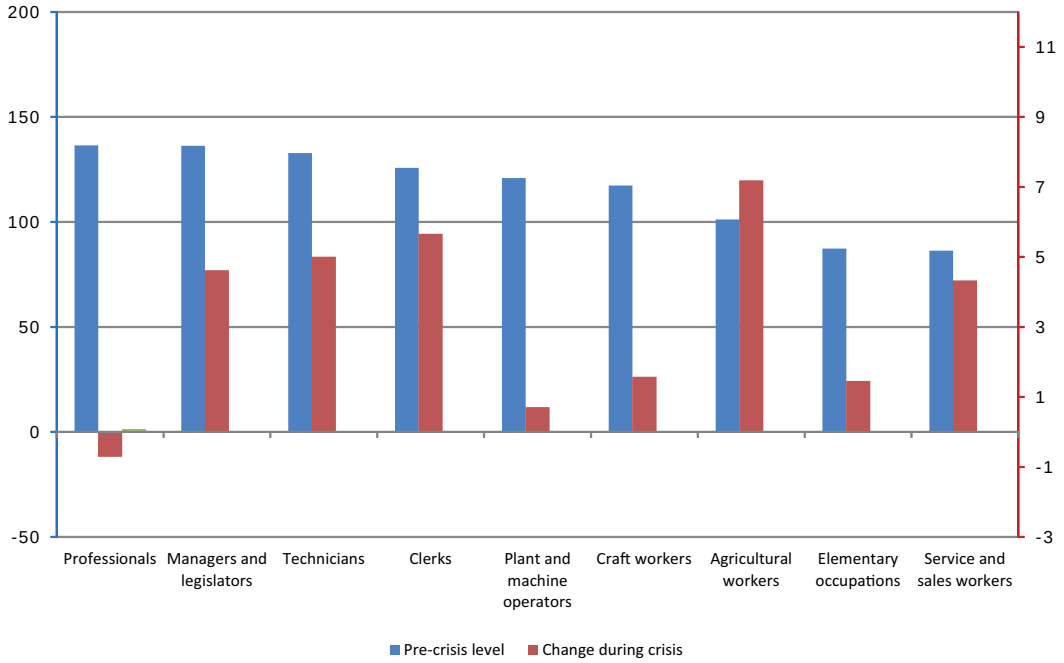
Occupation

Analysis of mean tenure

As expected, different occupations display strong differences with respect to average tenure (Figure 26). Pre-crisis mean tenure at the EU aggregate level varies from about 86 months for service and sales workers to 136 months for professionals, and managers and legislators. Some of this variation could be attributed to the type of worker in the specific occupation; for example, the high share of temporary (seasonal) workers in agricultural occupations implies lower mean tenure. Auer and Cazes (2000) found similar results for the 1990s.

The changes in the means during the crisis are equally heterogeneous across occupations. Although agricultural occupations experience a relatively large increase (7 months) in tenure during the crisis, mean tenure for professionals decreases slightly (1 month). Mean tenure increases by 4–6 months for managers and legislators, technicians, clerks and service and sales workers, while craft workers, plant and machine operators and those in elementary occupations experience an increase of only 1–2 months.

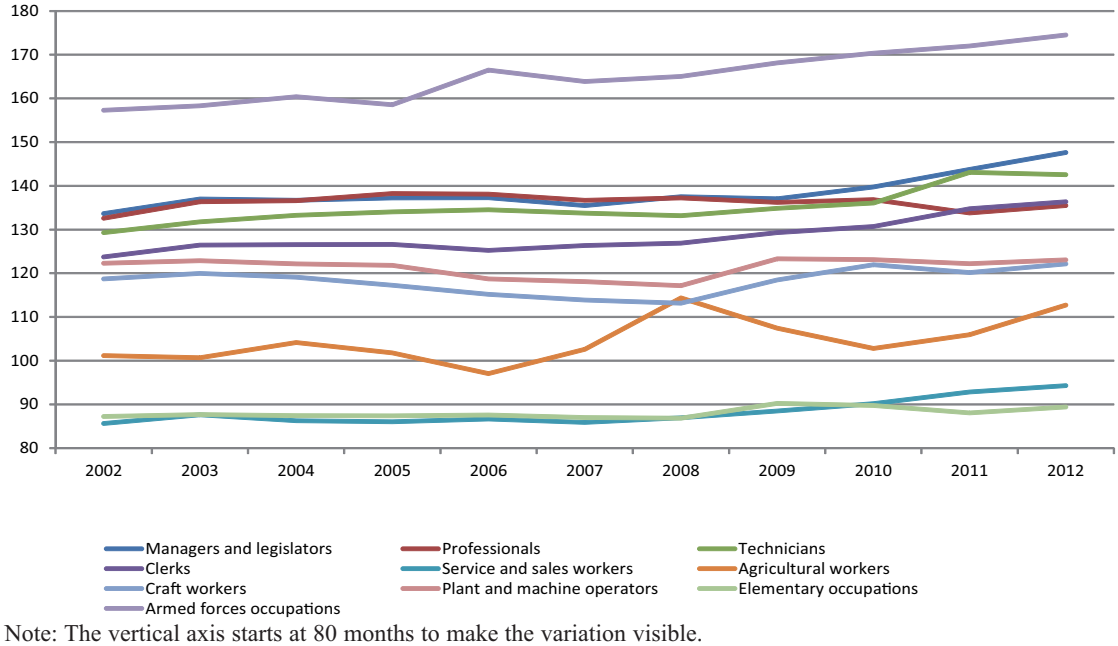
Figure 26: Mean tenure (in months) by occupation, before and during the crisis



Note: The primary axis refers to the pre-crisis level, while the secondary axis refers to the change during the crisis.
Source: *EU-LFS, authors' calculations*

The basic conclusions drawn from Figure 26 are confirmed by Figure 27, which shows the year-to-year variation in mean tenure for each occupation. Apart from professionals, all occupations show an increasing trend in mean tenure over the entire observation period. Although the majority of occupations are characterised by stable or even increasing tenure levels in the pre-crisis period, this is not the case for craft workers and plant and machine operators. The underlying trend for these occupations appears to be negative, and the overall increase in mean tenure from 2002 until 2012 is exclusively caused by the crisis.

Figure 27: Mean tenure (in months) by occupation, 2002–2012



Note: The vertical axis starts at 80 months to make the variation visible.
Source: *EU-LFS, authors' calculations*

Shift–share analysis

Turning to the question as to what extent shifts in the composition of occupations or changes in average tenure (while holding shares constant) dominate the aggregate change in mean tenure, it appears that both components are of similar importance during the pre-crisis period (Table 7). That is, mean tenure grows slightly for a given composition of occupations between 2002 and 2007, but shifts in the composition of occupations reduces this increase somewhat. This implies that occupations with low mean tenure gained importance. During the crisis, in contrast, mean tenure increases considerably and the changing composition of occupations has almost no impact.

Table 7: Shift–share analysis of change in mean tenure (in months), according to occupation

	2002–2007			2007–2012			2002–2012		
	Due to changing composition	Due to change within groups	Total change	Due to changing composition	Due to change within groups	Total change	Due to changing composition	Due to change within groups	Total change
EU	**-0.20**	**0.77**	**0.57**	**-0.08**	**6.22**	**6.14**	**-0.58**	**7.29**	**6.71**
AT	-0.49	-7.17	-7.66	0.26	-1.31	-1.05	0.26	-8.97	-8.71
BE	-0.47	2.22	1.75	-0.31	-1.77	-2.08	-0.95	0.62	-0.33
BG	-3.41	-0.18	-3.59	-0.39	8.41	8.02	-4.83	9.27	4.44
CY	1.08	4.25	5.33	-0.75	-1.58	-2.34	1.58	1.42	3.00
CZ	1.01	1.75	2.76	-1.42	5.41	4.00	-0.30	7.05	6.75
DE	-0.14	4.63	4.49	-0.48	3.66	3.18	-0.48	8.15	7.66
DK	-0.85	-13.60	-14.45	-0.19	8.01	7.82	-1.21	-5.42	-6.63
EE	0.53	-5.16	-4.63	1.46	10.57	12.03	1.93	5.47	7.40
EL	0.23	6.49	6.73	-0.09	8.84	8.75	-0.67	16.15	15.48
ES	0.65	-0.37	0.28	2.64	20.45	23.08	2.35	21.01	23.36
FI	-0.23	-0.01	-0.24	-0.58	6.04	5.46	-1.00	6.21	5.22
FR	-0.34	7.43	7.09	0.90	1.94	2.84	-0.58	10.51	9.93
HU	0.48	0.05	0.53	-0.52	-1.24	-1.76	-0.28	-0.94	-1.23
IE	-0.84	-5.08	-5.91	-0.31	17.16	16.84	-0.61	11.54	10.93
IT	-0.93	0.93	0.00	-1.19	9.22	8.03	-1.41	9.45	8.04
LT	1.06	1.29	2.35	3.48	-17.67	-14.19	4.52	-16.37	-11.84
LU	0.56	0.56	1.12	-4.32	-3.73	-8.04	0.39	-7.31	-6.92
LV	1.56	1.33	2.76	0.11	3.44	4.23	1.75	5.24	6.98
NL	-1.15	2.83	1.68	-4.39	4.52	0.13	-5.64	7.44	1.80
PL	-0.20	-10.44	-10.64	0.36	5.53	5.90	-0.29	-4.45	-4.74
PT	0.10	6.98	7.08	1.76	5.74	7.50	0.89	13.70	14.58
RO	-3.76	-7.55	-10.04	-1.58	2.05	0.47	-6.35	-5.06	-9.57
SE	-0.06	-2.21	-2.27	-0.07	-3.72	-3.79	-0.55	-5.51	-6.06
SI	-0.40	-3.05	-3.45	-1.48	4.64	3.16	-2.59	2.30	-0.29
SK	-0.60	-12.11	-12.71	-1.13	8.03	6.90	-1.90	-3.90	-5.81
UK	0.09	1.56	1.65	-0.16	7.44	7.28	0.18	8.75	8.93

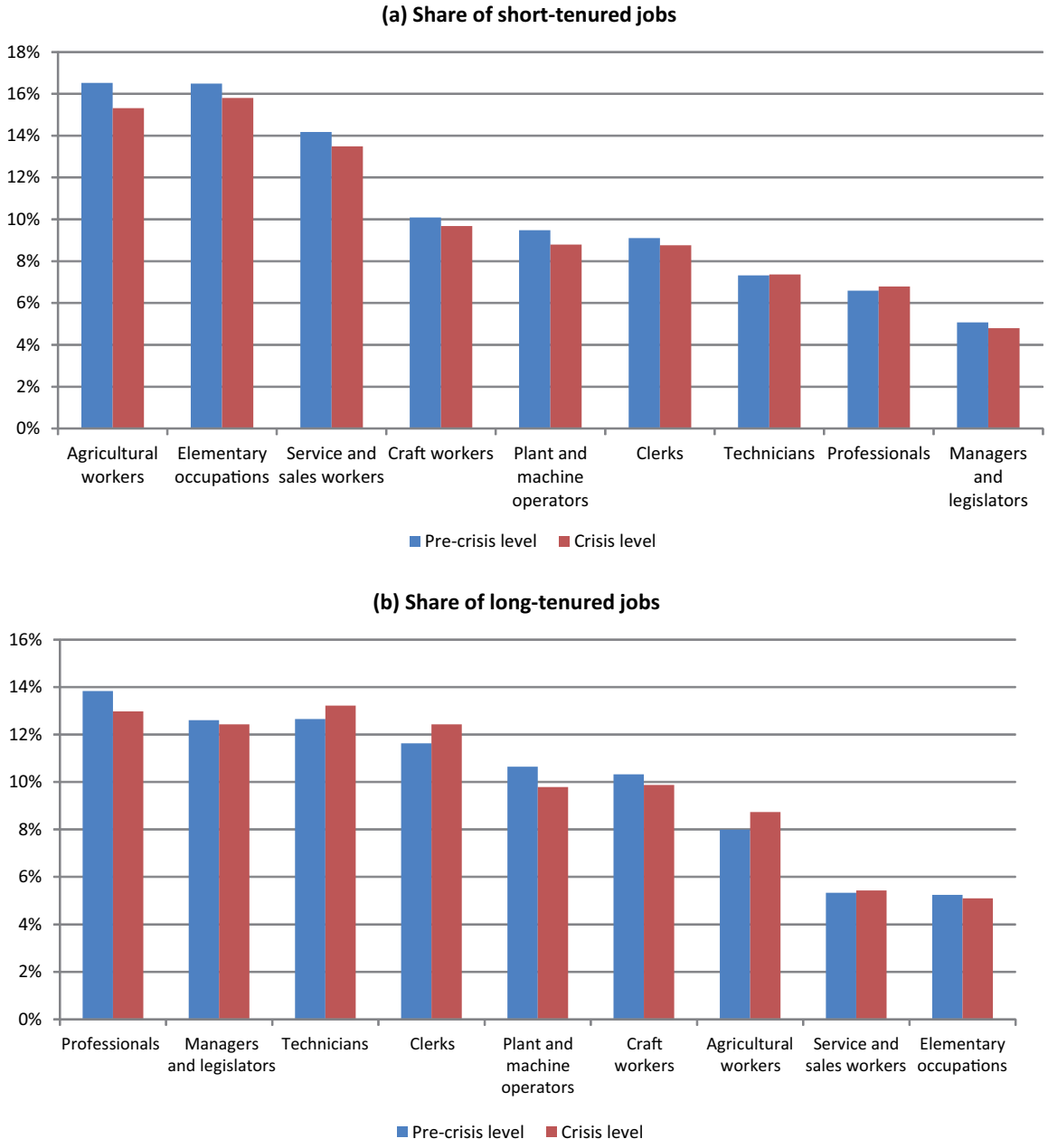
Source: *EU-LFS, authors' calculations*

Analysis of short- and long-tenured jobs

For a more detailed analysis of whether short-tenured workers were more severely affected by the crisis, the share of short- and long-tenured jobs in the different occupations was investigated (Figure 28). The shares of short-tenured jobs among total employment show that those occupations with low mean tenure are also characterised by a high share of short-tenured workers. Agricultural workers, elementary occupations, and service and sales workers have a high share of short-tenured jobs, while professionals and managers and legislators have a very low share (Figure 28a). The reverse holds for long-tenured workers (Figure 28b).

During the crisis, the share of short- and long-tenured workers changes only marginally. Most occupations experience an increase in the share of long-tenured jobs and a decrease in the share of short-tenured jobs (Figure 28b). The share of short-tenured and long-tenured workers decreases by a similar magnitude for elementary occupations, service and sales workers, craft workers, and plant and machine operators. For professionals, the effect of the crisis appears to be the reverse, with the share of long-tenured jobs decreasing and the share of short-tenured jobs increasing. A possible explanation is that long-tenured jobs, which were more common than short-tenured jobs to begin with, were lost at the beginning of the crisis. Insofar as some companies started to hire again in the later years of the crisis, the increase in the share of short-term workers is also plausible.

Figure 28: Share of short- and long-tenured jobs by occupation, before and during the crisis



Note: Occupations are sorted in order of their pre-crisis mean tenure. The shares are calculated separately by occupation.
Source: *EU-LFS, authors' calculations*

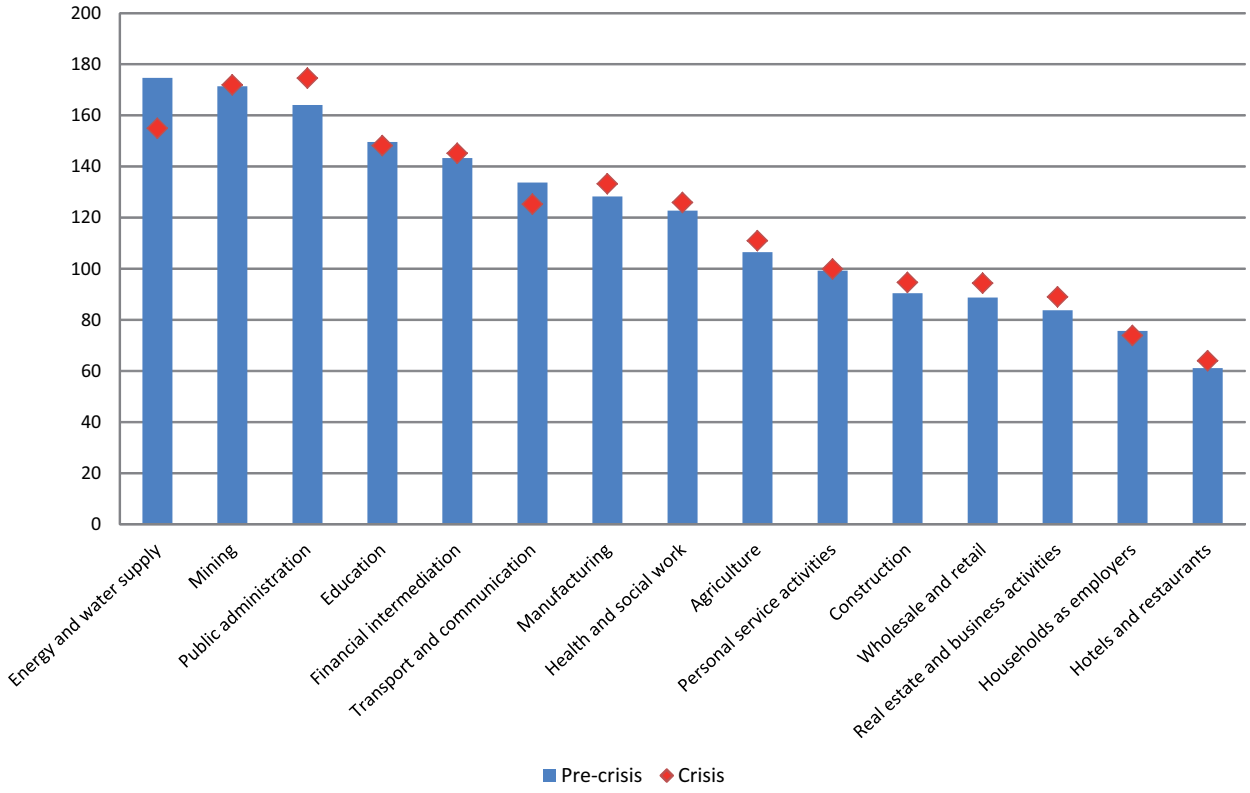
Economic sector

Analysis of mean tenure

With their differing sensitivity to business cycle conditions, economic sectors are likely to have differences in job tenure. Figure 29 shows mean tenure across economic sectors before and during the crisis. There are indeed extremely large differences in tenure between sectors, ranging from a mean tenure of 61 months for hotels and restaurants to 174 months for energy and water supply. This finding also seems to hold in earlier time periods: Auer and Cazes (2000) reported comparable magnitudes of mean tenure for various economic sectors for the 1990s.

A large part of these differences might be attributed to a difference in the worker structure within these sectors. For example, the mining sector tends to be occupied largely by men in permanent employment, which may cause at least some part of the high mean tenure of 171 months. Job characteristics also play a role. For example, the high mean tenure in public administration may be due to high employment protection within the sector. Farber (2010) found a similar result.

Figure 29: Mean tenure (in months) by economic sector, before and during the crisis



Source: *EU-LFS, authors' calculations*

The changes in mean tenure during the crisis also vary strongly between sectors. While most sectors show a modest increase in mean tenure, energy and water supply and transport and communication show significant decreases. Other sectors experience no change during the crisis, including education, personal service activities and mining; these are all sectors that are largely unaffected by the business cycle.

Shift–share analysis

Similar to the results obtained from the analysis of occupations (see the previous section), the shift–share analysis reveals that shifts in the composition of economic sectors decreased mean tenure, while tenure within economic sectors increased on average during the pre-crisis period (Table 8). During the crisis, compositional effects in terms of economic sectors have a positive, but very small, impact on the growth of mean tenure. Instead, mean tenure across economic sectors grew considerably. This implies that overall tenure would have increased strongly even if the composition of economic sectors had not changed.

Table 8: Shift–share analysis of change in mean tenure (in months), according to economic sector

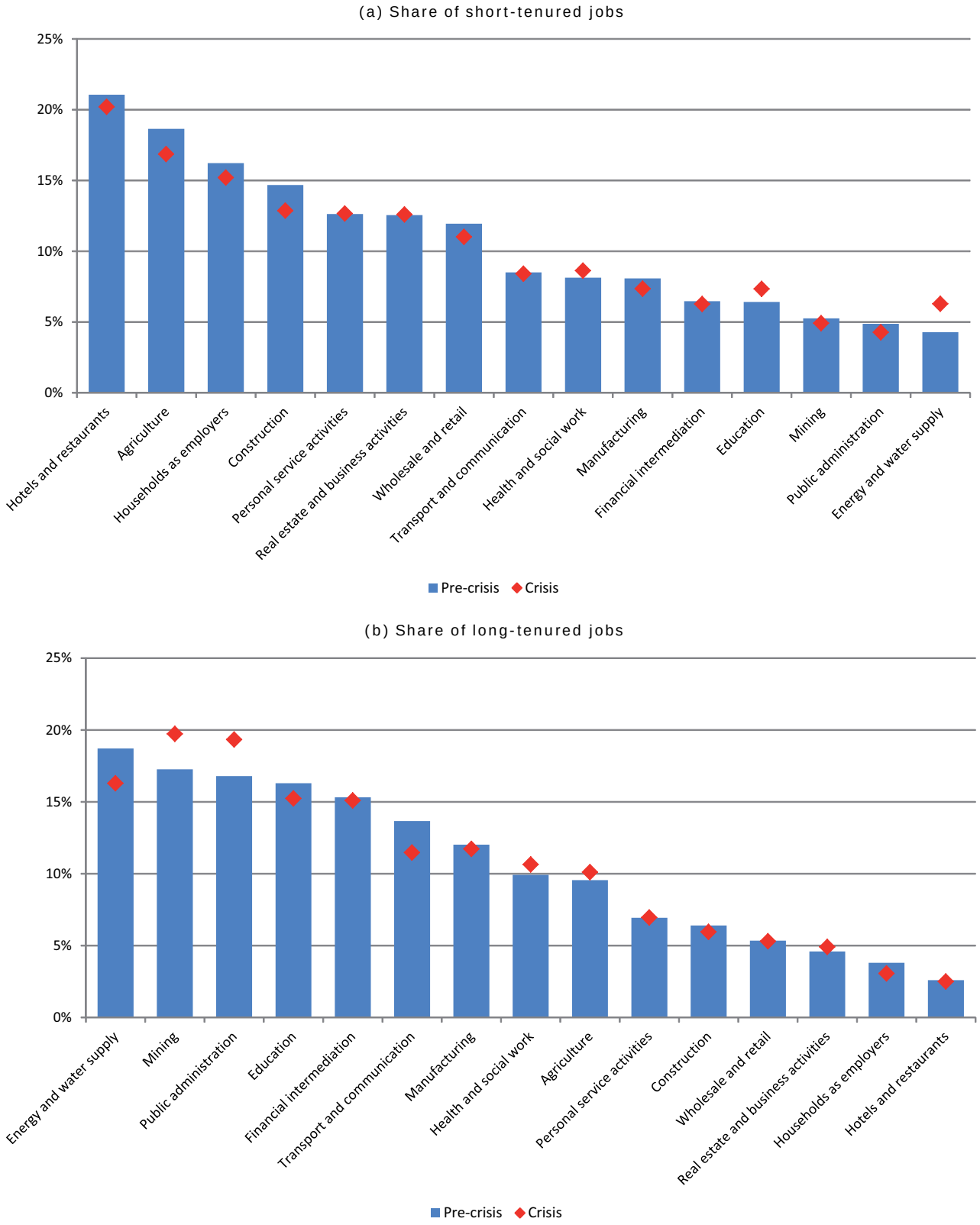
	2002–2007			2007–2012			2002–2012		
	Due to changing composition	Due to change within groups	Total change	Due to changing composition	Due to change within groups	Total change	Due to changing composition	Due to change within groups	Total change
EU	**-1.52**	**2.09**	**0.57**	**0.78**	**5.36**	**6.14**	**-0.85**	**7.56**	**6.71**
AT	-1.44	-6.22	-7.66	0.81	-1.86	-1.05	-0.70	-8.01	-8.71
BE	-0.58	2.33	1.75	-0.11	-1.97	-2.08	-1.16	0.83	-0.33
BG	-3.53	-0.06	-3.59	0.13	7.90	8.02	-3.96	8.40	4.44
CY	-1.03	6.36	5.33	-2.78	0.44	-2.34	-3.43	6.42	3.00
CZ	-1.91	4.67	2.76	0.85	3.15	4.00	-1.12	7.87	6.75
DE	-1.69	6.18	4.49	-0.05	3.23	3.18	-1.63	9.29	7.66
DK	-2.01	-12.44	-14.45	1.03	6.79	7.82	-0.96	-5.67	-6.63
EE	-1.40	-3.31	-4.63	2.33	9.72	12.03	0.27	7.21	7.40
EL	0.51	6.22	6.73	1.97	6.77	8.75	1.43	14.05	15.48
ES	-1.27	1.55	0.28	5.31	17.77	23.08	3.65	19.71	23.36
FI	-1.08	0.84	-0.24	-0.01	5.46	5.46	-1.30	6.51	5.22
FR	-0.76	7.85	7.09	0.74	2.10	2.84	0.03	9.90	9.93
HU	-1.92	2.45	0.53	2.12	-3.88	-1.76	-0.13	-1.10	-1.23
IE	-1.37	-4.54	-5.91	3.79	13.05	16.84	2.13	8.80	10.93
IT	-4.93	4.93	0.00	-0.13	8.17	8.03	-4.33	12.37	8.04
LT	-3.27	5.62	2.35	1.69	-15.90	-14.19	-0.81	-11.05	-11.84
LU	-1.71	2.83	1.12	0.47	-8.51	-8.04	-1.28	-5.64	-6.92
LV	-4.18	6.86	2.76	4.87	-0.64	4.23	0.42	6.53	6.98
NL	-0.94	2.62	1.68	-1.56	1.69	0.13	-2.42	4.22	1.80
PL	-2.54	-8.10	-10.64	0.48	5.42	5.90	-1.91	-2.83	-4.74
PT	-0.87	7.96	7.08	2.10	5.40	7.50	1.42	13.16	14.58
RO	-4.46	-5.59	-10.04	-1.99	2.46	0.47	-6.61	-2.97	-9.57
SE	-1.16	-1.11	-2.27	-0.47	-3.31	-3.79	-1.07	-4.99	-6.06
SI	-1.97	-1.50	-3.45	0.40	2.78	3.16	-2.03	1.74	-0.29
SK	-3.72	-8.99	-12.71	0.86	6.04	6.90	-3.03	-2.78	-5.81
UK	-0.45	2.10	1.65	-0.38	7.66	7.28	-1.04	9.97	8.93

Source: *EU-LFS, authors' calculations*

Analysis of short- and long-tenured jobs

To investigate further whether short-tenured or long-tenured jobs were affected during the crisis, their shares across sectors are shown in Figure 30. The pre-crisis picture from the analysis of mean tenure is largely confirmed, with the share of short-tenured jobs being lowest in energy and water supply, mining, public administration, education and financial intermediation. Sectors with low shares of short-tenured jobs are simultaneously characterised by a high share of long-tenured jobs.

Figure 30: Share of short- and long-tenured jobs by economic sector, before and during the crisis



Notes: Economic sectors are sorted in order of their pre-crisis mean tenure. The shares are calculated separately by sector.
Source: *EU-LFS, authors' calculations*

As already suggested by the analysis of the change in mean tenure, the reaction of short- and long-tenured jobs to the crisis varies significantly between sectors.

First, the hypothesis that short-tenured jobs were cut during the crisis in financial intermediation and real estate and business activities cannot be confirmed. For real estate and business activities, the share of short-tenured jobs remains constant, while for financial intermediation there is a very slight increase. Thus, the increase in mean tenure observed for these two sectors is caused mainly by a shift in the middle of the tenure distribution. Nevertheless, the share of short-tenured workers decreases during the crisis in agriculture, construction and households as employers (Figure 30a).

Second, the share of long-tenured workers changes significantly only for sectors with high mean tenure and consequently with a high share of long-tenured workers in the pre-crisis period. More specifically, the energy and water supply and transport and communication sectors experience a significant reduction in the share of long-tenured workers. In contrast, mining and public administration show an increase in the share of long-tenured workers during the crisis (Figure 30b).

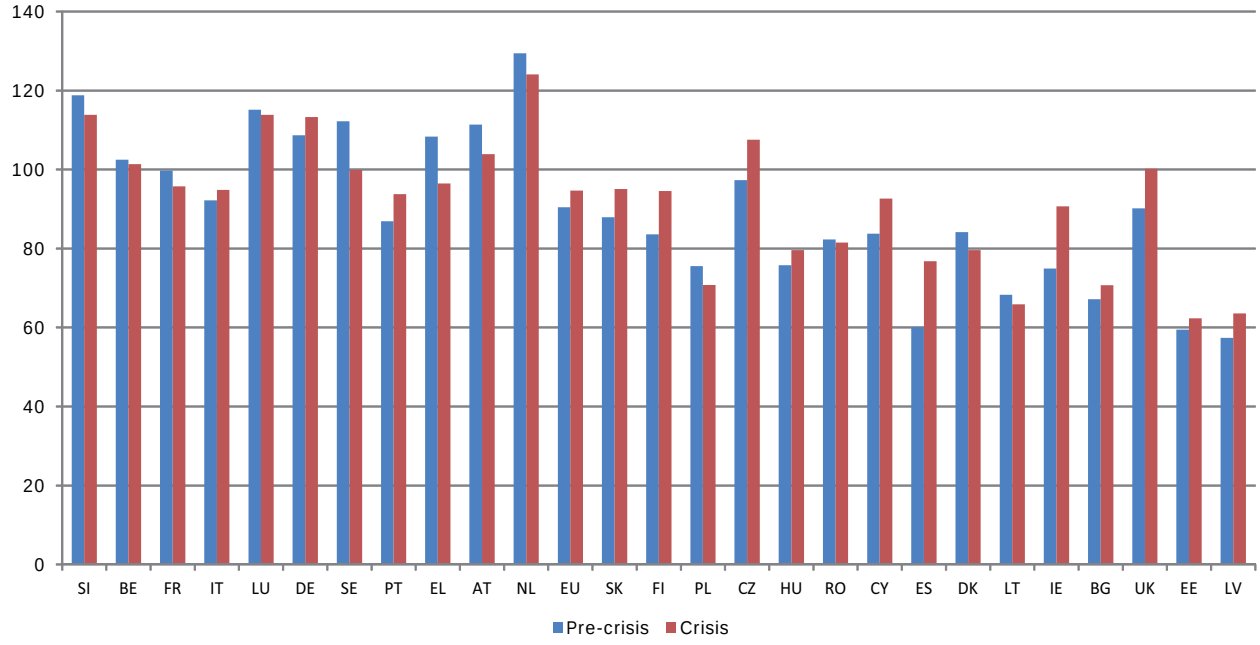
Analysis of three sectors: construction, financial intermediation and manufacturing

To shed more light on the development of mean tenure within individual sectors, country-level information was examined for two sectors that were especially affected by the crisis, namely construction and financial intermediation, as well as manufacturing, which is one of the most important sectors in terms of gross domestic product (GDP) in the majority of EU Member States. For each of these sectors, the following were analysed:

- mean tenure in the pre-crisis and crisis periods for all countries;
- year-to-year changes for selected countries.

Figure 31 shows mean tenure by country for both periods in the construction sector. To enable a direct comparison of the pre-crisis tenure level in the construction sector with that of the entire economy in each country, the countries are sorted in descending order according to the pre-crisis mean tenure level in the entire economy.

Figure 31: Mean tenure (in months) in construction by country, before and during the crisis



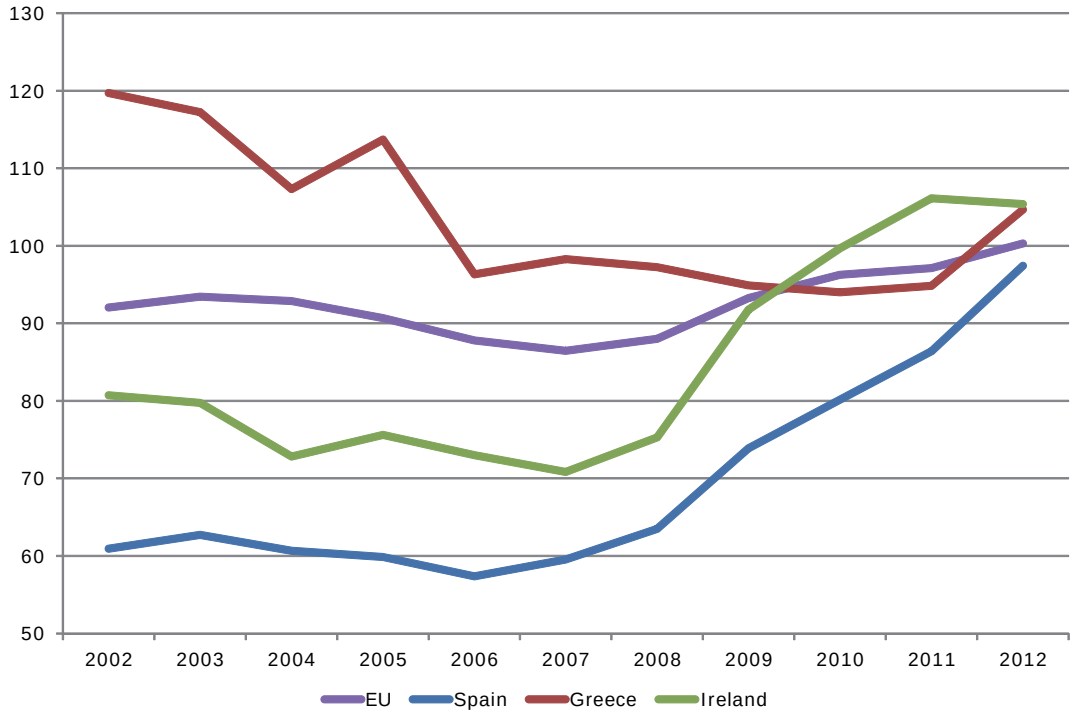
Note: Countries are sorted in order of their pre-crisis mean tenure level.
Source: *EU-LFS, authors' calculations*

Generally, the pre-crisis mean tenure in the construction sector corresponds broadly to the level in the economy for the majority of countries. The exceptions are Belgium, France, Italy and Portugal, with comparably low tenure in the construction sector compared with the entire economy, while the opposite is true for the Czech Republic, the Netherlands and the UK.

During the crisis, increases in mean tenure in the construction sector can be observed in roughly half the countries. This is especially true for those countries with a low pre-crisis mean tenure. The most significant increases can be observed for the Czech Republic, Finland, Ireland and Spain. The latter two countries experienced a burst in the housing bubble at the beginning of the crisis, which easily explains the increase in mean tenure. In contrast, Greece and Sweden showed sizeable decreases in mean tenure of construction workers, which in the Greek case was due to a drop that preceded the crisis (see the discussion below relating to Figure 32).

Figure 32 shows annual changes in mean tenure of construction workers for selected countries (Greece, Ireland and Spain). The construction sectors in Ireland and Spain were heavily affected during the crisis, so mean tenure increases continuously for both countries during the crisis. The result for Greece obtained in the comparison of the pre-crisis and crisis periods is confirmed in Figure 32, which shows that the mean tenure of construction workers is extremely stable or even slightly decreasing during the crisis, with the exception of 2012, when a sudden increase can be observed. Furthermore, mean tenure in the Greek construction industry had fallen before the crisis, which can be seen as a sign of stable growth in this sector before the crisis (Eriotis et al, 2013).

Figure 32: Mean tenure (in months) in construction in the EU and selected Member States, 2002–2012

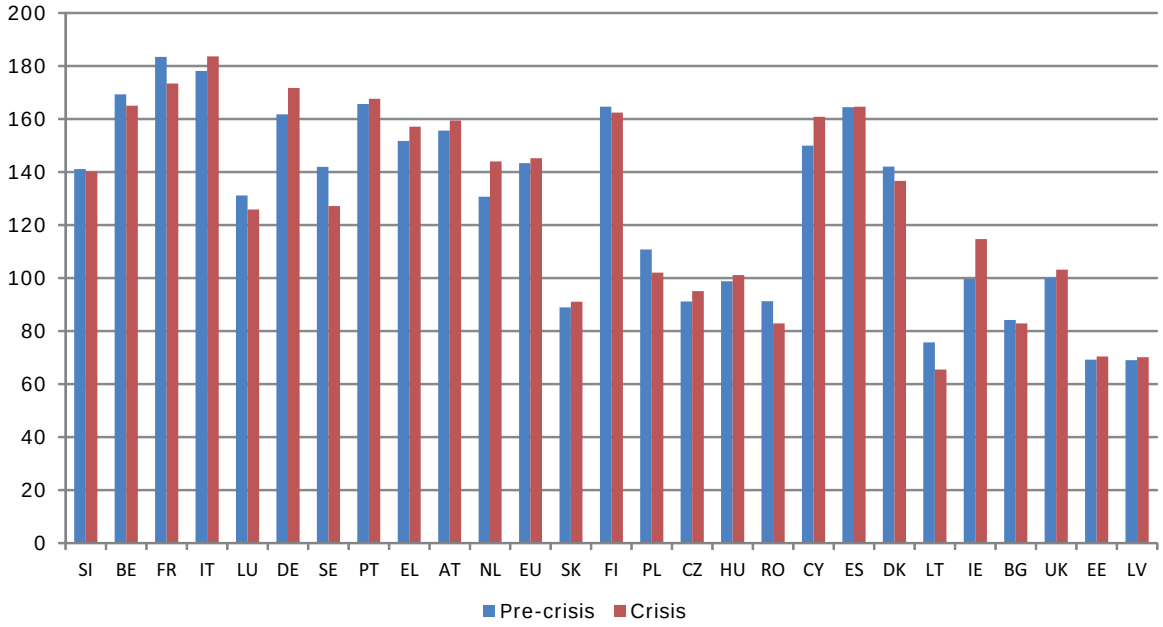


Note: The vertical axis starts at 50 months to make the variation visible.
Source: *EU-LFS, authors' calculations*

Turning to the financial intermediation sector, countries with high mean tenure in the entire economy are usually also characterised by comparably high mean tenure in the financial intermediation industry and vice versa (Figure 33). Important exceptions are Luxembourg and Sweden, which show relatively low mean tenure, and Cyprus, Denmark, Finland and Spain, where mean tenure in the financial intermediation sector is high.

Despite the fact that the crisis actually started as a financial crisis, changes in mean tenure during the crisis in this sector are extremely small. While this does not imply that no job destruction took place, it suggests that the probability of losing a job in the financial intermediation industry was not correlated in any way with tenure. A sizeable increase in mean tenure during the crisis is apparent only in Ireland and the Netherlands, while France, Lithuania and Sweden are the only countries that experience a substantial decrease in mean tenure (Figure 33).

Figure 33: Mean tenure (in months) in financial intermediation by country, before and during the crisis



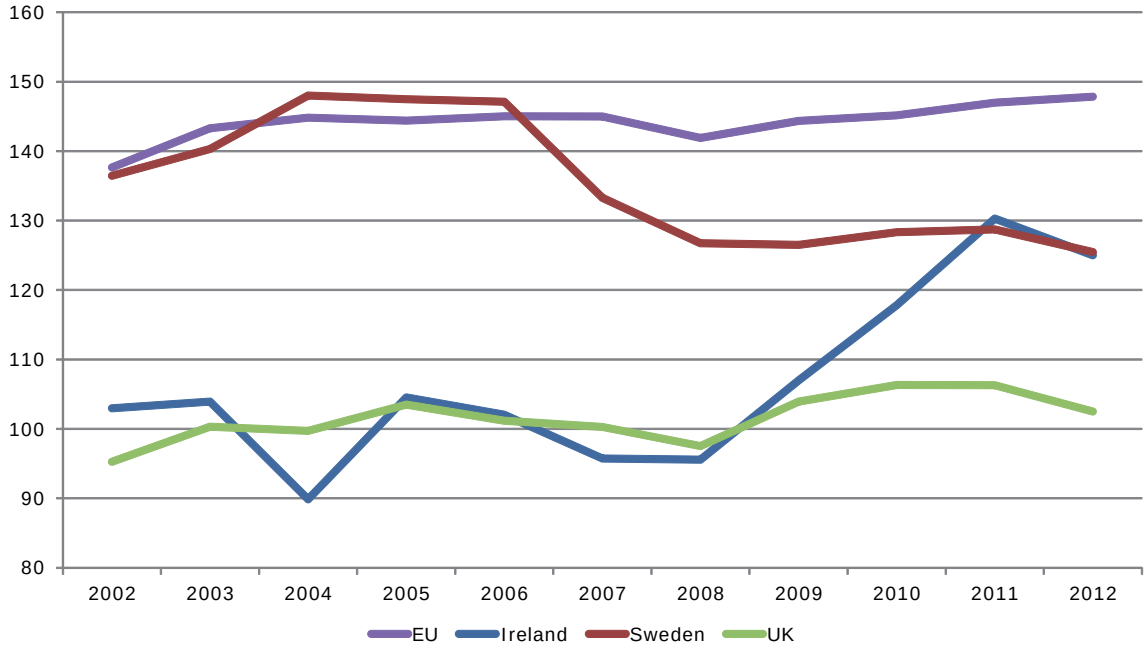
Note: Countries are sorted in order of their pre-crisis mean tenure for the entire economy.
Source: *EU-LFS, authors' calculations*

The very small change in mean tenure between the pre-crisis and crisis periods is especially surprising in the UK, where the financial intermediation sector contributes significantly to GDP. Therefore, Figure 34 shows year-to-year changes for selected countries, including the UK, in order to ensure that the period comparison does not hide important variations. However, this is not the case to an important extent.

Mean tenure in the financial intermediation sector in the UK is relatively stable during the pre-crisis period. Although mean tenure does grow by 9 months between 2008 and 2010, this increase is small given the impact of the crisis on the financial sectors and in comparison to, for example, Ireland, where mean tenure grows significantly (22 months) over the same period. The result for Ireland is unsurprising as the recession hit this country very hard, leading to substantial job losses, in all likelihood mainly among low-tenured workers, and thus to an increase in mean tenure. In contrast, mean tenure levels are decreasing in the sector in Sweden since 2006.

The EU aggregate increases by only 6 months in 2008–2012 (a small increase compared with other economic sectors), confirming the impression that mean tenure in the financial intermediation sector is relatively stable for the majority of countries.

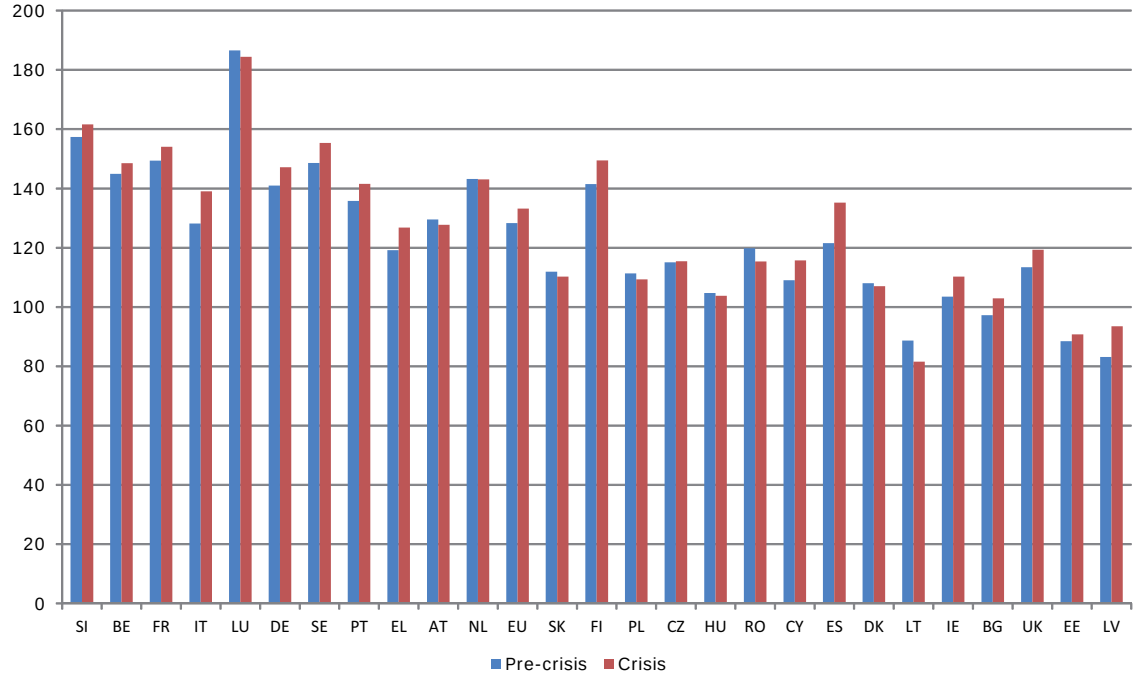
Figure 34: Mean tenure (in months) in the financial intermediation sector for the EU and selected Member States, 2002–2012



Note: The vertical axis starts at 80 months to make the variation visible.
Source: *EU-LFS, authors' calculations*

Figure 35 shows mean tenure in the manufacturing sector by country and period. Cross-country differences in the manufacturing sector correspond almost perfectly to the cross-country differences in the entire economy. Luxembourg is the only exception, with comparably high mean tenure.

Figure 35: Mean tenure (in months) in manufacturing by country, before and during the crisis

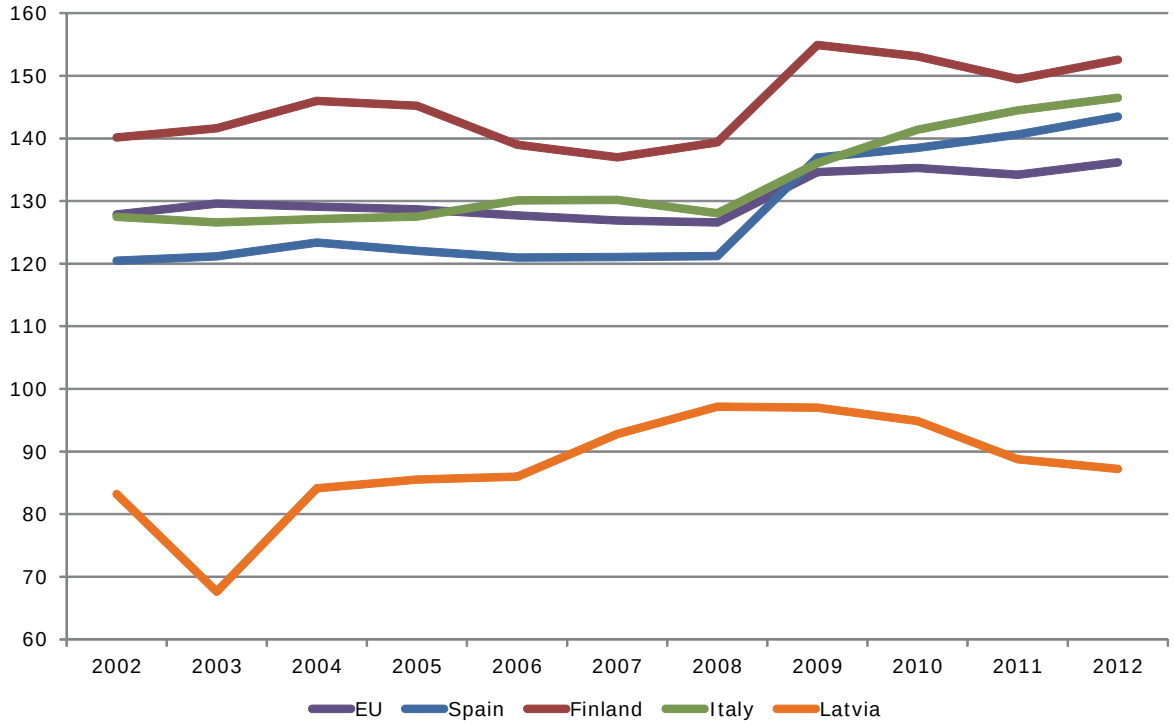


Note: Countries are sorted in order of their pre-crisis mean tenure level for the entire economy.
Source: *EU-LFS, authors' calculations*

The changes in mean tenure in the manufacturing sector between the pre-crisis and crisis periods are small but, for most countries, positive. In the few cases where the change is negative, it is very small. One exception is Lithuania, though the decrease (7 months) is still smaller than that of the entire economy. Sizeable increases in mean tenure in the manufacturing sector are apparent in Finland, Italy, Latvia and Spain.

In terms of annual changes, mean tenure in the manufacturing sector at the EU aggregate level is very stable until 2008 and increases continuously afterwards (Figure 36). This confirms the finding that no country experienced a significant decrease in mean tenure in the manufacturing sector during the crisis. In Italy and Spain, mean tenure levels increase throughout the entire crisis period, while Finland and Latvia show a cyclical pattern, with strong increases at the beginning of the crisis, followed by decreases in later years.

Figure 36: Mean tenure (in months) in manufacturing for the EU and selected Member States, 2002–2012



Note: The vertical axis starts at 60 months to make the variation visible.
Source: *EU-LFS, authors' calculations*

Econometric analysis of tenure 5

This chapter presents regression analysis results on the relationship between tenure and a wide range of sociodemographic and job characteristics while taking country-specific variation into account.

In general, the type of contract (that is, whether a worker has a permanent or temporary contract) is excluded from the analysis so as to focus on country-specific variation of tenure. By doing so, contract types are subsumed under country-specific institutions and thus country dummies must be interpreted in this regard.

The analysis begins by examining the determinants of mean tenure and then proceeds to an analysis of the probability of being short- or long-tenured.

Mean tenure

Regression analysis allows the determinants of mean tenure to be examined while controlling for compositional effects. In this context, differences in mean tenure between specific subgroups are assessed while holding all other factors that may influence tenure constant. In contrast to simple descriptive statistics, this method is able to compute the difference in mean tenure (for example, between men and women) while controlling for a wide range of sociodemographic variables and job characteristics (see Box 3).

Box 3: Linear regression and logit models

In addition to descriptive statistics, such as mean or median tenure, this report uses linear and non-linear multivariate regression analysis. Both the descriptive analysis and the regression analysis study differences in a specific outcome, that is, in mean tenure for subgroups of interest, such as men and women. The most important difference between the two methods is the possibility to control for 'compositional effects' when using multivariate regression analysis, so regression results may differ from simple descriptive statistics. For example, the difference in mean tenure between men and women is 10 months in the descriptive evidence, but it is only about 3 months on average when including additional control variables (see Figure 13 and the regression results in Table 10).

For mean tenure, a linear regression model is used that is based on minimising the sum of squared residuals. The outcome variable y_i in this model is tenure measured in months. Since binary dummy variables are used throughout the analysis, the interpretation of the estimated coefficients is how a discrete change in an explanatory variable changes the outcome. That is, the reported coefficients can be read as changes in mean tenure in months compared with the reference category. For example, the results in Table 10 imply that mean tenure for individuals aged 55 and older is 79 months more than that of the reference group (those aged 35–54 years).

For short and long tenure, however, the main interest is in modelling the probability of individuals being either short- or long-tenured (two separate estimations). The dependent variable (that is, the outcome) is therefore defined as follows:

$$y_i = \begin{cases} 1 & \textit{if short/long-tenured} \\ 0 & \textit{if not short/long-tenured} \end{cases}$$

Logit models (see Greene, 2012) are used to model this binary choice. These allow the probability p_i of being in a specific state (for example, short-tenured) given certain characteristics of an individual to be estimated.

Unlike linear models, estimated coefficients of a logit model do not directly provide marginal effects (that is, how much a marginal change in the explanatory variable changes the probability of the outcome event to happen). For this reason, only the sign of these coefficients can be interpreted and not their magnitude. For example, the results in Table 11 imply that the probability of being short-tenured is lower for individuals aged 55 and older than for the reference group (those aged 35–54 years).

The interpretation of mean tenure obtained from the regression analysis always refers to a reference person with a specific combination of characteristics (Table 9). The reason is that all other explanatory variables are fixed at certain points.

Table 9: Reference category characteristics

Type	Characteristic
Sociodemographic characteristics	Age 35–54 years Male Medium-skilled
Job characteristics	Full-time employment No shift work Medium-sized company (20–49 employees) Occupation: service and sales worker Economic sector: manufacturing
Country	Austria

Estimated coefficients from linear regressions that are fully interacted with the crisis dummy are reported in Table 10.[4] The coefficients in the first column have to be interpreted as differences in mean tenure during the pre-crisis period in comparison with the reference group, which is represented by the intercept (first row). Thus, the reference group has on average a mean tenure level of 160 months. Then, for example, the coefficient -111 for the age group 15–24 years implies that for workers who share the same characteristics as the reference group but are aged 15–24 years instead of 35–54 years, mean tenure is 111 months lower on average.

Similarly, the second column of Table 10 indicates that the reference group registered a decrease in job tenure of 5.6 months during the crisis (see the first row of the table). Therefore, the coefficients in the second column show the difference in the change in mean tenure experienced by the reference group and the group of interest. For example, the coefficient of the interaction term of the crisis dummy and the age group 15–24 years has a value of 1.6. Thus, workers who share the characteristics of the reference group but are aged 15–24 years experience a change in tenure during the crisis that is 1.6 months higher than that experienced by 35–54-year-olds; that is, they register a decrease in tenure of 4 months (-5.6 + 1.6).

One striking result of the regression analysis is that, once everything else is held constant, there remains a sizeable and significant negative impact of the crisis on mean tenure in several European countries. To be more specific, after controlling for sociodemographic variables, job characteristics and countries, the regression results suggest that mean tenure decreases by 5.6 months on average during the crisis in the reference country, Austria.[5] A decline in average tenure

[4] Interacting the full model with the crisis dummy is the most efficient way to draw on the full sample while estimating virtually two different models (that is, for the pre-crisis period and the crisis period). Differences between groups (for example, between age or skill groups) are referred to as the 'unexplained difference' that remains after controlling for several observable sociodemographic variables and job characteristics. Please note that for readability of Tables 10 to 12, all base coefficients are reported in the first column while respective interactions are reported in the second column. The first row of the table provides results for the reference group (that is, the intercept, first column) and the aggregate change of tenure during the crisis (that is, the coefficient of crisis dummy, second column).

[5] For the specific case of a reference person with the aforementioned combination of characteristics, the estimated mean tenure is 159.82 months in the pre-crisis period (the intercept) and 154.16 months during the crisis (the intercept minus the coefficient of the crisis dummy). Stated differently, the mean tenure of middle-aged, medium-skilled men living in Austria, working as full-time service and sales workers (not in shift work) in manufacturing and in a medium-sized company, decreased on average by 5.6 months during the crisis.

during the crisis period was reported in Austria when using descriptive data, although of a much lower magnitude of around 1 month (Figure 8).

For all countries where the interaction term is less than 5.6 months, a negative trend in tenure remains. Only those countries that were hit particularly strongly during the financial crisis show increases in mean tenure greater than 5.6 months (for example, Bulgaria, Ireland, Italy, Latvia, Slovenia, Spain and the UK). For example, the interaction effect for Spain is 9.4, implying that an individual who shares all the characteristics of the reference group (male, middle-aged, medium-skilled, non-shift worker and so on) but who lives and works in Spain (instead of Austria) experienced an increase in mean tenure of 3.8 months (-5.6 + 9.4).

Table 10: Results of regression analysis of mean tenure before and during the crisis (months)

	Base coefficient		Change during crisis	
Reference category (intercept and crisis dummy)	159.82	***	-5.65	***
Age group				
15–24 years	-111.03	***	1.57	***
25–34 years	-82.37	***	1.16	***
35–54 years	ref		ref	
55+ years	78.83	***	2.91	***
Gender				
Male	ref		ref	
Female	-3.11	***	1.79	***
Skill level				
Low-skilled: ISCED 0–2	1.62	***	-2.46	***
Medium-skilled: ISCED 3–4	ref		ref	
High-skilled: ISCED 5–6	-20.47	***	0.19	***
Place of birth				
National	ref		ref	
Born in another EU country	-24.16	***	-3.38	***
Born outside EU	-30.74	***	-0.31	***
Economic sector				
A – Agriculture, forestry and fishing	1.73	***	0.10	***
B – Mining and quarrying	34.41	***	-0.73	***
C – Manufacturing	ref		ref	
D – Electricity, gas and water supply	31.80	***	-18.44	***
E – Construction	-25.47	***	1.79	***
F – Wholesale and retail trade; vehicle repair	-13.63	***	2.18	***
G – Hotels and restaurants	-19.75	***	0.88	***
H – Transport, storage and communications	5.06	***	-9.88	***
I – Financial intermediation	17.20	***	-2.81	***
J – Real estate, renting and business activities	-28.06	***	1.34	***
K – Public administration and defence	22.37	***	4.07	***
L – Education	16.75	***	-4.90	***
M – Health and social work	-3.59	***	-1.14	***
N – Other community, social and personal service activities	-10.41	***	0.14	***
O – Activities of households as employers	-14.77	***	-5.68	***
P – Activities of extraterritorial organisations	-3.42	***	4.55	***

	Base coefficient		Change during crisis	
Reference category (intercept and crisis dummy)	159.82	***	-5.65	***
Occupation				
Armed forces occupations	33.94	***	3.64	***
Managers, senior officials and legislators	19.24	***	1.86	***
Professionals	21.84	***	0.75	***
Technicians and associate professionals	19.02	***	3.13	***
Clerks	13.74	***	3.42	***
Service and sales workers	ref		ref	
Skilled agricultural, fishery and forestry workers	-9.58	***	9.09	***
Craft and related trades workers	9.99	***	1.76	***
Plant and machine operators, and assemblers	-6.51	***	1.88	***
Elementary occupations	-21.93	***	3.41	***
Type of employment				
Full-time employment	ref		ref	
Part-time employment	-23.67	***	0.55	***
Company size				
1–10 employees	-10.97	***	-0.55	***
11–19 employees	-4.44	***	-0.22	***
20–49 employees	ref		ref	
50+ employees	17.26	***	-1.58	***
More than 10 employees, but does not know exactly	-8.20	***	-1.45	***
Work pattern				
No shift work	ref		ref	
Shift work	5.42	***	0.01	
Country				
AT	ref		ref	
BE	5.66	***	1.10	***
BG	-49.20	***	11.23	***
CY	-13.60	***	5.89	***
CZ	-28.88	***	2.63	***
DE	-13.21	***	3.69	***
DK	-36.55	***	-0.73	***
EE	-45.27	***	5.23	***
EL	-0.07	***	4.40	***
ES	-9.66	***	9.39	***
FI	-17.53	***	5.99	***
FR	6.34	***	1.27	***
HU	-25.48	***	0.99	***
IE	-16.49	***	8.51	***
IT	-0.97	***	6.87	***
LT	-39.55	***	-10.76	***
LU	4.15	***	-3.47	***
LV	-42.98	***	7.89	***
NL	-13.95	***	5.36	***

	Base coefficient		Change during crisis	
Reference category (intercept and crisis dummy)	159.82	***	-5.65	***
Country				
PL	-21.82	***	0.40	***
PT	9.20	***	0.33	***
RO	-29.30	***	-0.36	***
SE	-11.84	***	-0.89	***
SI	11.79	***	8.65	***
SK	-16.24	***	-1.20	***
UK	-37.01	***	10.01	***
R squared	0.33			
Number of observations	194,560,458			

Notes: Estimated coefficients are reported.
The reference group (ref) has the characteristics set out in Table 9. Note that the reference individual (first row) has a mean tenure of 159.82 months in the pre-crisis period and a corresponding mean tenure of 154.16 months during the crisis.
* p < 0.10, ** p < 0.05, *** p < 0.01
Source: *EU-LFS, authors' calculations*

These fundamental differences suggest that the development of tenure during the crisis is largely determined at country level and by the corresponding share of temporary employment contracts (which is not part of the model). In addition, most of the countries with an increase in mean tenure have in common the fact that their overall economy suffered disproportionately high impacts from the financial crisis. This is also evident from Figure 6, which shows that those countries with the strongest reaction in the unemployment rate also experienced the most sizeable increases in mean tenure (Greece, Ireland, Italy, Portugal and Spain). This emphasises that country-specific labour market performance, structure and institutions, social security systems and corresponding reforms are relevant in explaining country differences in tenure (see Chapter 2). Aside from the crisis dummy (first row, second column in Table 10) and country-specific interactions (all country coefficients in the second column), all estimated changes (age, skill level, sector and so on) are mean changes that hold for all included countries equally and that are therefore independent of the chosen reference country. For example, looking at differences between women and men (Figure 14), the descriptive statistics suggest that mean tenure for the EU as a whole increases from 123 to 125 months for men and from 112 to 116 months for women and therefore implies a difference of about 10 months between the two sexes. The regression results confirm that mean tenure is larger for men than for women, but this difference amounts only to about 3 months and decreases by roughly 1.8 months during the crisis (Table 10). Thus, the 'unexplained' difference in mean tenure between men and women is substantially smaller than suggested by the descriptive statistics. Controlling for several sociodemographic variables and job characteristics shows that the gender gap in tenure, aside from other factors, is relatively small.

Looking at age groups, the results from the linear regression in Table 10 confirm the descriptive pattern that job tenure is much longer for older workers than for younger workers (see Chapter 3). The estimated coefficients show that mean tenure for younger age groups (15–24 years and 25–34 years) is much lower than for the reference group of prime-age workers (35–54 years) in the pre-crisis period and that this difference narrows slightly during the crisis. For the oldest age group (55 years and over), mean tenure is considerably larger than the reference group.

The regression results are therefore an important extension to the shift–share-analysis presented in Chapter 3 because they suggest that age effects are part of the explanation for overall increasing mean tenure in the descriptive analysis. Stated differently, the underlying negative trend in mean tenure only becomes visible when controlling for the composition of the workforce in terms of age. Possible reasons include an overrepresentation of older workers in jobs with increasing tenure or demographic factors that induce longer tenures. Such factors are controlled for in the regression

framework and yield a general downward trend in mean tenure (that is, the negative coefficient of the crisis dummy plus country interactions) in numerous European countries. Isolating the crisis–tenure relationship from other factors is thus central to revealing a potential structural trend towards shorter tenures (see also the section on age in Chapter 3).

Controlling for various sociodemographic variables, job characteristics and countries reveals that the pre-crisis level of mean tenure is slightly longer for low-skilled workers than for the reference group of medium-skilled workers. For high-skilled workers, mean tenure is substantially lower than in the reference group. This remarkable difference of more than 20 months indicates that mean tenure is much lower among high-skilled individuals when aggregating across EU countries and taking into account several sociodemographic variables and job characteristics. One likely explanation is that high-skilled workers more often look for a new job while still in employment and thus are more likely to move job voluntarily than medium- and low-skilled workers.

The descriptive evidence in the section on skill level in Chapter 3 shows that this negative correlation between mean tenure and skill level is present in some but not all EU countries. For example, mean tenure is longer for low-skilled individuals in a number of countries, such as Ireland and the UK. This country-specific variation may be due to differences in employment protection legislation and, more broadly, general differences in labour market culture. However, the general descriptive finding is that mean tenure does not largely differ by skill level when taking an aggregated perspective (Figure 19). Finally, mean tenure decreases to a similar extent for all three skill groups when comparing the pre-crisis and crisis periods. These changes are substantial for low-skilled individuals but still considerable for medium- and high-skilled individuals.

As for the relationship between mean tenure and economic sector, the differences in tenure between sectors are less pronounced in the results of the econometric analysis than in the descriptive evidence in Chapter 4, but they are still remarkable. Controlling for sociodemographic variables and job characteristics allows such differences to be examined from another perspective because many different characteristics that define a sector are now controlled for. The regression results in Table 10 show that, compared with the reference category of manufacturing, mean tenure is much lower in sectors such as real estate and renting and construction and much larger in public administration, utility supply or mining and quarrying. These differences are thus independent of the composition of the workforce, that is, they are in all likelihood due to sector-specific and unobserved institutional factors.

In general, sector-specific changes in mean tenure during the crisis are considerably smaller when looking at respective interaction terms. Exceptions from this pattern are substantial large decreases in the sectors of utility supply and transportation, which contradict the descriptive figures in Chapter 4, where simple means indicate an increase of mean tenure during the crisis.

Pre-crisis regression results show that mean tenure is particularly low for elementary occupations and relatively large in the armed forces compared with the reference group of service and sales workers. These figures are much larger than the descriptive statistics in Chapter 4. The differences between the descriptive evidence and the regression results are mainly explained by worker heterogeneity that induces selection into different occupations. When comparing the pre-crisis period with the crisis period (using the regression results), the ‘unexplained’ difference in mean tenure is very small irrespective of occupation. This result is noteworthy because it implies that changes in tenure during the crisis seem not to be strongly related to specific types of occupations, but rather to specific types of workers.

Further job characteristics that are controlled for in the regression framework are shift work and part-time work. The regression results indicate that mean tenure for part-time workers is significantly lower than for those who work full-time (the reference group) and amounts to a difference of roughly 24 months. This substantial difference is not surprising given that part-time work often implies a lower degree of labour force attachment, which usually implies more

interruptions of a worker's labour market history. In the case of shift work, the regression results show that mean tenure is about 5 months longer for shift workers compared with the reference group (no shift work). An explanation for this result may be selection of blue-collar workers into long-tenure companies (Boockmann and Steffes, 2010).

Probability of short and long tenure

The same logic as applied in the previous section also applies to the probability of holding a job with short or long tenure; that is, the results from the descriptive evidence presented in previous chapters may well be affected by compositional effects. A regression analysis was therefore performed to examine the probability of holding a short-tenured job and the probability of holding a long-tenured job.

Short-tenured jobs are defined as having tenure less than 7 months, that is, the 10th percentile of the tenure distribution of the EU aggregate in 2002; long-tenured jobs have a job tenure equal to or exceeding 304 months, that is, the 90th percentile of the same distribution (for details of this definition, see Box 1 in Chapter 2).

Probability of short tenure

The coefficients for a logit model (see Box 3) of the probability of being short-tenured are summarised in Table 11. Due to the non-linearity of the estimated logit model, only the sign of the coefficients are interpreted and not their magnitude. In consequence, a negative sign indicates a decreasing probability of being short-tenured and a positive sign indicates an increasing probability.

It is not possible to make any inference on how differences between groups (for example, country, age or skill level) have changed in the crisis period, and therefore nothing can be said about the size of gaps and how they evolved over time. What can be said is whether the probability of being short-tenured increases (positive coefficient) or decreases (negative coefficient) during the crisis compared to the reference group (Table 9). With respect to country-level variation, all interpretations are relative to changes in the reference group, Austria (Table 11, first row, second column), but, again and in contrast to the linear model of mean tenure in the previous section, these interpretations are not possible in absolute terms. Finally, the intercept (Table 11, first row, first column) is difficult to interpret due to the non-linearity of the model, which is why no further discussion is provided.[6]

Country differences in the probability of being short-tenured do exist relative to the reference country, Austria. Bulgaria, Denmark, Finland, Poland, Spain and Sweden are among many countries where short-tenured jobs are more probable than in Austria in the pre-crisis period. In contrast, Greece, Luxembourg and Portugal are countries where short-tenured jobs are less probable during the pre-crisis period than in Austria. As for mean tenure, country-specific variation highlights the fact that labour market structure (including the share of temporary workers), institutions and social security systems are relevant in explaining country differences in tenure and are an important supplement to the descriptive figures given in Chapter 2.

[6] Note that the intercept of the logit model (Table 11 and Table 12) is the log of the odds when all (dummy) variables of the model take the value 0. This is why it is here called the base coefficient of the reference group (and for the sake of consistency with the earlier linear model of mean tenure). Independently, this intercept has no meaningful interpretation and is thus not given further consideration.

Turning to changes during the crisis, the increase in the probability of being short-tenured in the reference country, Austria, is in line with the decrease in mean tenure during the crisis, shown in Table 10. However, workers who share the same characteristics as the reference individual (Table 9) but who live in a country other than Austria mostly exhibit a smaller increase (or a decrease) in the probability of being short-tenured compared with the reference person. Because it is not possible to interpret the magnitude of the coefficients, it is unclear if the increase in the probability of being short-tenured is only smaller or if the reference person in these countries actually experiences a decrease in the probability of being short-tenured. The only countries that show a stronger increase than Austria are Germany, Hungary, Luxembourg and Portugal (Table 11).

Table 11: Results of regression analysis of probability of having a short-tenured job before and during the crisis (%)

	Base coefficient		Change during crisis	
Reference category (intercept and crisis dummy)	-2.967	***	0.088	***
Age group				
15–24 years	1.706	***	0.083	***
25–34 years	0.714	***	0.052	***
35–54 years	ref		ref	
55+ years	-0.586	***	0.030	***
Gender				
Male	ref		ref	
Female	-0.037	***	-0.054	***
Skill level				
Low-skilled: ISCED 0–2	0.061	***	0.059	***
Medium-skilled: ISCED 3–4	ref		ref	
High-skilled: ISCED 5–6	0.222	***	-0.038	***
Place of birth				
National	ref		ref	
Born in another EU country	0.324	***	-0.084	***
Born outside EU	0.418	***	-0.106	***
Economic sector				
A – Agriculture, forestry and fishing	0.532	***	0.025	***
B – Mining and quarrying	-0.306	***	-0.001	
C – Manufacturing	ref		ref	
D – Electricity, gas and water supply	-0.408	***	0.343	***
E – Construction	0.418	***	-0.041	***
F – Wholesale and retail trade; vehicle repair	0.050	***	-0.018	***
G – Hotels and restaurants	0.416	***	0.049	***
H – Transport, storage and communications	0.041	***	0.065	***
I – Financial intermediation	-0.173	***	0.021	***
J – Real estate, renting and business activities	0.304	***	0.051	***
K – Public administration and defence	-0.277	***	0.056	***
L – Education	-0.062	***	0.176	***
M – Health and social work	-0.025	***	0.130	***
N – Other community, social and personal service activities	0.156	***	0.033	***
O – Activities of households as employers	-0.048	***	0.140	***
P – Activities of extraterritorial organisations	-0.019	***	-0.276	***

	Base coefficient		Change during crisis	
Reference category (intercept and crisis dummy)	-2.967	***	0.088	***
Occupation				
Armed forces occupations	-0.970	***	-0.142	***
Managers, senior officials and legislators	-0.549	***	0.016	***
Professionals	-0.327	***	0.023	***
Technicians and associate professionals	-0.286	***	0.006	***
Clerks	-0.129	***	-0.015	***
Service and sales workers	ref		ref	
Skilled agricultural, fishery and forestry workers	0.003	***	-0.003	**
Craft and related trades workers	-0.146	***	-0.005	***
Plant and machine operators, and assemblers	0.069	***	0.001	
Elementary occupations	0.340	***	0.003	***
Type of employment				
Full-time employment	ref		ref	
Part-time employment	0.471	***	0.025	***
Company size				
1–10 employees	0.211	***	-0.012	***
11–19 employees	0.082	***	-0.020	***
20–49 employees	ref		ref	
50+ employees	-0.178	***	0.020	***
More than 10 employees, but does not know exactly	0.445	***	0.053	***
Work pattern				
No shift work	ref		ref	
Shift work	-0.065	***	0.000	
Country				
AT	ref		ref	
BE	-0.004	***	-0.114	***
BG	0.494	***	-0.863	***
CY	0.321	***	-0.178	***
CZ	0.068	***	-0.106	***
DE	0.113	***	0.071	***
DK	0.662	***	-0.258	***
EE	0.390	***	-0.106	***
EL	-0.230	***	-0.283	***
ES	0.546	***	-0.413	***
FI	0.775	***	-0.251	***
FR	0.322	***	-0.169	***
HU	0.043	***	0.031	***
IE	0.156	***	-0.369	***
IT	-0.038	***	-0.222	***
LT	0.387	***	-0.100	***
LU	-0.388	***	0.230	***
LV	0.435	***	-0.144	***
NL	0.253	***	-0.303	***

	Base coefficient		Change during crisis	
Reference category (intercept and crisis dummy)	-2.967	***	0.088	***
Country				
PL	0.488	***	-0.292	***
PT	-0.301	***	0.033	***
RO	0.193	***	-1.027	***
SE	0.480	***	-0.030	***
SI	-0.013	***	-0.366	***
SK	-0.006	***	-0.332	***
UK	0.381	***	-0.307	***
Number of observations	11,714,671			

Notes: Estimated coefficients are reported.
The reference group (ref) has the characteristics set out in Table 9. Note that the reference individual (first row) has a mean tenure of 159.82 months in the pre-crisis period and a corresponding mean tenure of 154.16 months during the crisis.
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$
Source: *EU-LFS, authors' calculations*

The probability of having a short-tenured job is lower for women than the reference group of men in the pre-crisis period after controlling for sociodemographic variables, job characteristics and country differences. During the crisis, workers sharing the same characteristics as the reference person but being women experience a smaller increase (or a decrease) in the probability of being short-tenured compared with the reference person.

The regression results for age groups reflect 'mechanical differences' in tenure, as young workers by definition cannot hold long-tenured jobs (see Chapter 3). The probability of having a short-tenured job in comparison with the reference group (35–54 years) is therefore greater for younger workers (15–24 and 25–34 years) and lower for older workers (55 years and over). These results are in line with the findings from the descriptive statistics and simply imply that older workers more often hold long-tenured jobs and are thus much less likely to hold short-tenured jobs than younger workers. During the crisis, short tenures become more probable in all age groups relative to the reference group of prime-age workers (35–54 years old).

After controlling for sociodemographic variables, job characteristics and countries, the probability of having a short-tenured job is greater for low-skilled and high-skilled individuals than for the reference group of medium-skilled individuals. Workers sharing the same characteristics as the reference person but with a higher skill level experience a smaller increase (or a decrease) in the probability of being short-tenured compared with the reference person. The latter finding could be due to a high rate of job loss among low-skilled individuals during the crisis accompanied by new job take-ups, implying an increase in the number of short-tenured low-skilled workers. Again, it is impossible to tell if the increase in the likelihood of being short-tenured for high-skilled employees is just smaller in magnitude or if these workers actually experienced a decrease in the probability of being short-tenured.

Individuals who work in sectors such as agriculture, construction, hotels and restaurants, or real estate and renting are more likely to be short-tenured than the reference group of manufacturing. In contrast, workers in sectors such as mining, utility supply and public administration are less likely to be short-tenured than those in manufacturing. Again, in those sectors of the economy where employment protection is traditionally high, such as the public sector, the probability of being short-tenured is relatively low. For individuals who share all the characteristics of the reference person but work in sectors other than manufacturing, the increase in the probability of being short-tenured during the crisis is greater than that of the reference person. The only exceptions are construction, wholesale and retail, and extraterritorial organisations.

Similarly, the probability of being short-tenured increases for the majority of occupations during the crisis relative to the reference group of service and sales workers.

In line with the findings above on mean tenure, the probability of being short-tenured is greater among part-time workers than the reference group of full-time workers in the pre-crisis period. During the crisis, the probability of being short-tenured increases for part-time workers compared with the reference person, who is a full-time worker.

With respect to company size, a clear pattern is apparent. Individuals who work in smaller companies have a relatively higher probability of being short-tenured than workers in large companies. One likely explanation for this finding is an overall higher level of job security in larger companies. During the crisis period, however, there is an increased probability of being short-tenured in large companies and a relatively lower probability of being short-tenured in smaller companies compared with the reference person who works in a medium-sized company (20–49 employees).

Probability of long tenure

Estimating the probability of being long-tenured in a logit model gives the coefficients presented in Table 12. As in the previous logit model for the probability of being short-tenured, the same interpretation applies, that is, there is no interpretation of the magnitude (only the sign) and no interpretation of the intercept.

Country differences in the probability of being long-tenured do clearly exist relative to the reference country, Austria, in the pre-crisis period. The regression suggests Belgium, France, Portugal and Slovenia are countries where long-tenured jobs are more likely in the pre-crisis period. But for most EU countries, long-tenured jobs are less probable compared with Austria; this is especially pronounced for Bulgaria, Estonia, Latvia, Lithuania and the UK. Workers who share all characteristics of the reference person but do not live in Austria show greater decreases in the probability of being long-tenured during the crisis in most European countries. The few exceptions of countries where the probability of being long-tenured increases during the crisis (compared with the reference person from Austria) are Finland, Greece, Ireland, Slovenia, Spain and the UK.

Similar to the probability of short tenures, the probability of long tenures develops in very different directions in the short period under investigation. However, this largely confirms the observation that country-specific factors – irrespective of looking at short, long or mean tenure – turn out to be a relevant determinant of tenure among workers. The crisis-induced turbulence caused a considerable number of work contracts to be terminated, but it seems that a combination of crisis effects and country-specific labour market institutions such as employment protection legislation are key in explaining the dynamics with respect to job tenure.[7]

The probability of having a long-tenured job is greater for men (the reference group) than for women after controlling for sociodemographic variables, job characteristics and country. During the crisis, the probability of being long-tenured increased for women relative to men.

For age groups, the regression results for long-tenured jobs reflect mechanical differences in mean tenure, similar to short-tenured jobs. The probability of having a long-tenured job compared with the reference age group (35–54 years) is smaller for 15–24-year-olds and 25–34-year-olds but larger for older workers (55+ years). Young workers are by definition unable to have a long-tenured job because long-tenured jobs are defined in this report as jobs that have lasted

[7] See Chapter 2 for a more detailed discussion of the relationship between tenure and the institutional setting.

for more than 304 months. The negative coefficients for the younger age groups support the fact that long tenures virtually do not exist in these groups. Again, these results are in line with the findings from the descriptive statistics and simply indicate that older workers are more likely to hold long-tenured jobs and are thus much less likely to hold short-tenured jobs compared with younger workers.

The probability of having a long-tenured job is greater for low-skilled individuals than the reference group of medium-skilled individuals. At the same time, this probability is lower for high-skilled workers when comparing them with medium-skilled workers. During the crisis, the probability of being long-tenured decreases to a larger extent for both low-skilled and high-skilled workers compared with the reference person, who is medium-skilled but shares all other characteristics.

Individuals who work in economic sectors such as mining, utility supply, financial intermediation, education and public administration are much more likely to be long-tenured than those in the reference group of manufacturing during the pre-crisis period. In line with the evidence on short tenures, those sectors of the economy where employment protection is traditionally high (for example, the public sector) seem to allow for a higher probability of being long-tenured. Changes during the crisis are very heterogeneous for different sectors and do not follow a clear pattern.

Relative to the reference group of service and sales workers, the probability of being long-tenured in the pre-crisis period is lower for low-qualification jobs such as elementary occupations, machine operators and forestry workers. In contrast, the probability of being long-tenured is greater for managers, professionals, technicians and clerks compared with the reference group. During the crisis, the probability of being long-tenured decreases by less (or increases) in all occupations (without exception) relative to the reference person. However, it is not possible to say whether there was an increase in the probability of being long-tenured.

Table 12: Results of regression analysis of probability of having a long-tenured job before and during the crisis (%)

	Base coefficient		Change during crisis	
Reference category (intercept and crisis dummy)	-1.967	***	-0.064	***
Age group				
15–24 years	-11.427	***	1.011	***
25–34 years	-8.791	***	0.343	***
35–54 years	ref		ref	
55+ years	1.551	***	0.037	***
Gender				
Male	ref		ref	
Female	-0.116	***	0.045	***
Skill level				
Low-skilled: ISCED 0–2	0.218	***	-0.077	***
Medium-skilled: ISCED 3–4	ref		ref	
High-skilled: ISCED 5–6	-0482	***	-0.061	***
Place of birth				
National	ref		ref	
Born in another EU country	-0.571	***	-0.207	***
Born outside EU	-0.742	***	-0.151	***

	Base coefficient		Change during crisis	
Reference category (intercept and crisis dummy)	-1.967	***	-0.064	***
Economic sector				
A – Agriculture, forestry and fishing	0.220	***	0.151	***
B – Mining and quarrying	0.279	***	0.356	***
C – Manufacturing	ref		ref	
D – Electricity, gas and water supply	0.361	***	-0.058	***
E – Construction	-0.634	***	0.013	***
F – Wholesale and retail trade; vehicle repair	-0.501	***	0.049	***
G – Hotels and restaurants	-0.854	***	0.046	***
H – Transport, storage and communications	0.173	***	-0.143	***
I – Financial intermediation	0.421	***	-0.018	***
J – Real estate, renting and business activities	-0.822	***	0.118	***
K – Public administration and defence	0.255	***	0.183	***
L – Education	0.378	***	-0.044	***
M – Health and social work	-0.134	***	0.096	***
N – Other community, social and personal service activities	-0.381	***	0.094	***
O – Activities of households as employers	-0.463	***	-0.153	***
P – Activities of extraterritorial organisations	-0.182	***	0.167	***
Occupation				
Armed forces occupations	0.745	***	0.242	***
Managers, senior officials and legislators	0.540	***	0.048	***
Professionals	0.704	***	0.037	***
Technicians and associate professors	0.586	***	0.077	***
Clerks	0.477	***	0.100	***
Service and sales workers	ref		ref	
Skilled agricultural, fishery and forestry workers	-0.252	***	0.209	***
Craft and related trades workers	0.371	***	0.060	***
Plant and machine operators, and assemblers	-0.015	***	0.028	***
Elementary occupations	-0.599	***	0.117	***
Type of employment				
Full-time employment	ref		ref	
Part-time employment	-0.612	***	0.012	***
Company size				
1–10 employees	-0.255	***	0.010	***
11–19 employees	-0.081	***	-0.006	***
20–49 employees	ref		ref	
50+ employees	0.376	***	-0.029	***
More than 10, but does not know exactly	-0.064	***	0.000	
Work pattern				
No shift work	ref		ref	
Shift work	0.128	***	0.010	***

	Base coefficient		Change during crisis	
Reference category (intercept and crisis dummy)	-1.967	***	-0.064	***
Country				
AT	ref		ref	
BE	0.258	***	-0.100	***
BG	-1.312	***	-0.091	***
CY	-0.344	***	-0.079	***
CZ	-0.600	***	-0.317	***
DE	-0.232	***	-0.086	***
DK	-0.762	***	-0.119	***
EE	-0.958	***	-0.151	***
EL	-0.287	***	0.055	***
ES	-0.091	***	0.008	***
FI	-0.239	***	0.046	***
FR	0.305	***	-0.116	***
HU	-0.596	***	-0.135	***
IE	-0.324	***	0.022	***
IT	-0.113	***	-0.027	***
LT	-0.942	***	-0.774	***
LU	-0.001		-0.117	***
LV	-1.060	***	-0.052	***
NL	-0.262	***	-0.040	***
PL	-0.432	***	-0.082	***
PT	0.067	***	-0.148	***
RO	-0.591	***	-0.490	***
SE	-0.134	***	-0.123	***
SI	0.352	***	0.124	***
SK	-0.312	***	-0.314	***
UK	-1.000	***	0.088	***
Number of observations	11,714,671			

Notes: Estimated coefficients are reported.
The reference group (ref) has the characteristics set out in Table 9. Note that the reference individual (first row) has a mean tenure of 159.82 months in the pre-crisis period and a corresponding mean tenure of 154.16 months during the crisis.
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$
Source: *EU-LFS, authors' calculations*

Supporting the findings on mean tenure earlier in this chapter, the probability of being long-tenured among part-time workers is lower than for the reference group of full-time workers in the pre-crisis period. During the crisis, however, the probability of being long-tenured decreases by less (or increases) compared with the reference person (who is a full-time worker). In contrast, shift workers have a higher probability of being long-tenured in the pre-crisis period compared with non-shift workers (reference group). This difference seems to increase during the crisis because the probability of being long-tenured decreases by less (or increases) for shift workers compared with the reference person, who shares all other characteristics aside from being a non-shift worker.

The clear pattern with respect to company size observed for short-tenured jobs is repeated for long-tenured jobs: individuals who work in smaller companies exhibit a relatively lower probability of being long-tenured than workers in large companies. Specifically, workers in small companies (1–10 and 11–19 employees) are relatively less likely to be long-tenured compared with the reference person, who works in a medium-sized company (20–49 employees), while the opposite is true for large companies (more than 50 employees). The potential explanation for overall higher job security in larger companies appears equally relevant when looking at long-tenured jobs. During the crisis period, the probability for long tenure decreases more in small companies (11–19 employees) and large companies (more than 50 employees) compared with the reference person (20–49 employees). An exception in this respect is very small companies (1–10 employees), where the probability of being long-tenured decreases by less (or increases) than for the reference person (medium-sized company) with otherwise identical characteristics.

Earnings and job tenure 6

The analyses in the preceding chapters show that there is some evidence of a structural trend towards declining job tenure in Europe when controlling for a country's age composition. In other words, the increase in mean tenure suggested by the raw data is mainly driven by demographic change. As older workers are characterised by higher tenure levels, the growing share of older workers in many European countries determines increasing mean tenure levels. At the same time, an individual worker of a specific age will experience a decline in mean tenure. As a natural follow-up to these results, this chapter examines the relationship between tenure and earnings, that is, the question of how earnings increase with the duration of the job of an individual worker.

Introduction

Given a potentially declining structural trend in tenure, the earnings–tenure relationship is important for at least two reasons. First, with declining job tenure, there is a danger that individual workers benefit less from increasing earnings on the job. Second, against the background of the crisis, this investigation becomes particularly relevant since returns to tenure can be seen as another dimension of the cost of job loss (Altonji and Williams, 2005; Jacobson et al, 1993). The reason for this is that a worker who loses a job that they have held for some time will generally start a new job (potentially after a period of unemployment) that by definition has zero tenure. This means that the wage premium accumulated during the previous job, which is measured by the earnings–tenure relationship, will disappear. As involuntary dismissals increased sharply during the crisis (RWI, 2014), earnings for many formerly displaced employees may fall short of the level in their previous job since they lose the tenure premium.

From a theoretical point of view, a positive link between pay and tenure can arise for several reasons. First, workers accumulate company-specific human capital on the job (Neal, 1995). This increases their productivity and hence also their pay. This means that longer tenure has a causal effect on pay.

Second, job mobility plays an important role. Workers with comparatively low wages tend to quit their job to find a better-paying one. Therefore, those workers with higher wages stay in their job, which leads to a positive correlation between tenure and pay (Burdett and Mortensen, 1998). In this case, the direction of causality is the opposite of the case described above, because pay affects job mobility and therefore tenure. However, this holds for only voluntary transitions. As pointed out by Jolivet et al (2006), direct job-to-job transitions are not always voluntary and differ strongly between countries. Wage dispersion between companies also matters for job mobility. If wage dispersion is high in an economy, employed workers have a higher probability of receiving a job offer with higher pay than their current one and therefore are more likely to move to a new job. Therefore, countries with high wage dispersion are likely to have relatively higher wage growth due to mobility between companies and not due to tenure. This channel can potentially offset the positive correlation between pay and tenure.

Third, institutional features of the labour market can have important effects. For example, if companies can offer wage–tenure contracts, which means that they can make a credible promise that workers' pay will rise with time if they stay in the job, turnover is reduced (Stevens, 2004). In such an institutional setting, one should see a positive link between pay and tenure.

A large part of the empirical literature on returns to tenure is US-based and finds positive correlations, but of different magnitudes. The seminal papers of Altonji and Shakotko (1987) and Topel (1991) found returns of 6.6% and 25%, respectively, for 10 years of job tenure. Re-estimations by Altonji and Williams (2005), where they applied new methods and data to the latter papers, suggested that 10-year tenure in the US is associated with 11% higher pay. Using a third method, Buchinsky et al (2010) revealed much larger effects of about 13% higher pay for 2 years of tenure and up to 50% for 10 years of tenure.

Estimates for selected European labour markets are generally lower. For instance, the estimates of Bagger et al (2014) for Denmark are in a similar range to those of Altonji and Shakotko (1987); they found returns to tenure of about 5% for the first five years. After this point, the pay returns to tenure in Denmark still increase, but at a decreasing rate. Beffy et al (2006) applied the same methodology as Buchinsky et al (2010) to French data, and their results exhibited, on average, nearly zero returns to tenure and a modest 2.5% per year for college graduates. Using administrative data from Germany, Dustmann and Meghir (2005) detected overall positive returns to tenure. Given these results, a moderate, positive correlation between pay and tenure is expected in the analyses for this report using the EU-LFS.

Furthermore, Bagger et al (2014) point to a number of heterogeneities. First, at the beginning of a career, pay grows due to job changes, whereas later in the career of an individual worker, acquiring company-specific human capital (an important reason for a positive earnings–tenure relationship) drives wage growth. According to the Organisation for Economic Co-operation and Development (OECD), on-the-job wage growth is particularly relevant in some European countries, such as Austria, Belgium and Spain (OECD, 2006). Altogether this suggests that different pay–tenure profiles can be expected for different age groups. The following analysis sheds light on the second source of pay growth, which may be more relevant for older age groups.

Although Bagger et al (2014) found no differences in the within-company pay–tenure profiles for different levels of educational attainment, the results of Dustmann and Meghir (2005) suggest that returns to tenure for Germany do vary with skill level; returns to company tenure were about 2.5% per year for high-skilled workers and about 4% a year for low-skilled workers for the first five years. Given these different indications in the literature, it is of interest to see whether this study discovers cross-country differences in the returns to tenure for different education groups.

In addition to these age and skill-level heterogeneities, Munasinghe et al (2008) observed that the returns to job tenure were substantially lower for women than for men. They provided descriptive evidence that this might be associated with the higher job turnover of women compared with men. This in turn may be due to women interrupting their early careers more often and changing jobs more frequently than men. Both factors may signal to employers that women are more likely to leave the company irrespective of pay, which is why they pay lower returns to tenure and do not provide as much company-specific training to women as to men. However, Munasinghe et al (2008) relied on US data for 1979 to 1994, and it is not known whether their findings and explanations also apply to the European sample for 2010–2011 in this analysis. Reference is made to this and the potential differences by age and skill level later in this chapter.

Data and methodology

Income deciles and job tenure in years are used to explore the relationship between earnings and tenure; both these variables are available in the EU-LFS dataset. No information on the actual pay of an individual is available, which most of the literature mentioned above used, but instead an individual's position in one of the 10 equally large income classes.[8] This measure is based on the labour income of a respondent's main job (Eurostat, 2011); to make this definition clear, it is henceforth referred to as 'earnings'. This implies that the analysis is concerned with the relative position of an individual in the earnings distribution rather than the absolute level of earnings. This study therefore contributes to the growing literature on relative income, which has been shown to be an important determinant of happiness and utility at the individual level (Clark et al, 2008).

[8] 'Equally large' refers to the number of workers in each class. The income class size in terms of euro might be quite different in each country and for each class.

The econometric analysis of relative earnings using the EU-LFS dataset requires the use of an ordered discrete choice model (see Box 4). Many other papers investigating relative earnings also work with ordered choice models (see McBride, 2001; Caporale et al, 2009). Descriptive evidence on the relative earnings position and tenure is presented below, as well as results from an ordered logit model.

Box 4: The ordered logit model

An ordered logit model is an appropriate econometric tool for analysing ordinal outcomes (see Han and Hausman, 1990; Long, 1997). In the current study, the earnings deciles variable (INCDECIL) in the EU-LFS dataset provides the 10 equally large earnings categories, which are ordered from low earnings to high earnings.

The ordered logit model measures the probability of belonging to a certain decile of the earnings distribution as a series of dummies. The model estimates how the probability of being in a certain decile changes as the explanatory variables vary. This allows questions to be answered such as how much higher is the probability of a man being in a higher income decile compared with a woman when the remaining explanatory variables, such as education, age, job, economic sector and country, are held constant.

As the ordered logit model is a non-linear model by nature, interpretation is not as straightforward as is the case for linear regression models. It generates odds ratios, a common method of interpretation, that presents the odds of an event compared with the status quo.

The exponentiated coefficient, which is displayed in the regression tables in this chapter, denotes the effect on the odds of a unit increase or decrease in a variable. Say, for example, that the exponentiated coefficient of a particular variable (for example, tenure) is 1.20. Then, holding everything else constant, a unit increase in this variable increases the odds of observing an outcome (for example, earnings) in a higher category (for example, earnings decile) versus remaining in the same category (for example, the same earnings decile) by 20%. Accordingly, exponentiated coefficients lower than 1 mean that an increase in the respective variable is associated with a reduction in the odds.

This interpretation is used in this study to gain insight into the relationship between tenure and earnings mobility. Exponentiated coefficients, the odds ratios, are therefore shown in the regression tables.

The variable on earnings deciles has been included in the EU-LFS since 2009. According to Eurostat, it has quality issues (Eurostat, 2011), which become apparent in the form of low response rates for some countries, as well as implausible distributions across deciles. This restricts the current analysis to a subsample of countries, as well as to the time period 2010–2011. This means that the analysis covers the crisis period, but the results may not carry over to economically stable times.

In terms of specific quality issues, the variable is not filled for Sweden. Finland, France and Ireland have a response rate of around 30%, Greece of about 50%, and Portugal and Slovakia of about 60%. Many countries have not yet reported the INCDECIL variable for 2012, including Austria, the Czech Republic, the Netherlands, Slovenia, Spain and the UK. In addition, there is no information on the earning deciles in 2009 for the Netherlands.

Furthermore, a number of countries show a distribution that does not fit to the decile coding; that is, there are deciles that have more or less than 10% of all non-missing observations. This is particularly critical for the INCDECIL data from Estonia, Greece, Luxembourg, Malta,[9] Poland, Slovakia and the UK, which may be due to differences in interview methods. For instance, the degree to which proxy interviews, where a member of the household answers for another member, are applied varies considerably across countries. Household members may not know the income of other household members very well, and therefore proxy interviews can lead to an imprecise measurement of the income variable. But regardless of the reasons for the many missing values or data errors, the respective country samples are no longer representative.

Therefore, countries for which the response rate and/or the distribution are problematic are excluded from the pay–tenure analysis, that is, Estonia, Finland, France, Greece, Ireland, Luxembourg, Malta, Poland, Portugal, Slovakia, Sweden and the UK are dropped from the analysis. In addition, the pay–tenure analysis is limited to the years 2010 and 2011.

Empirical evidence on the earnings–tenure profile

The empirical investigation of the earnings–tenure relationship starts with a presentation of aggregate evidence. The earnings–tenure profile for different ages and skill levels, as well as for gender, is then investigated. Finally, cross-country differences are documented and the analysis assesses whether specific labour market institutions can explain these differences.

Aggregate evidence

This analysis begins with simple descriptive statistics on tenure and relative earnings. As shown in Figure 37 and Table 13, sorting into earnings deciles is associated with differences in tenure. Tenure is, on average, lower in the lower earnings deciles. For instance, in the first earnings decile, average tenure is 5 years, whereas in the seventh earnings decile, it is about 12 years (Table 13).

Table 13: Average tenure by earnings decile

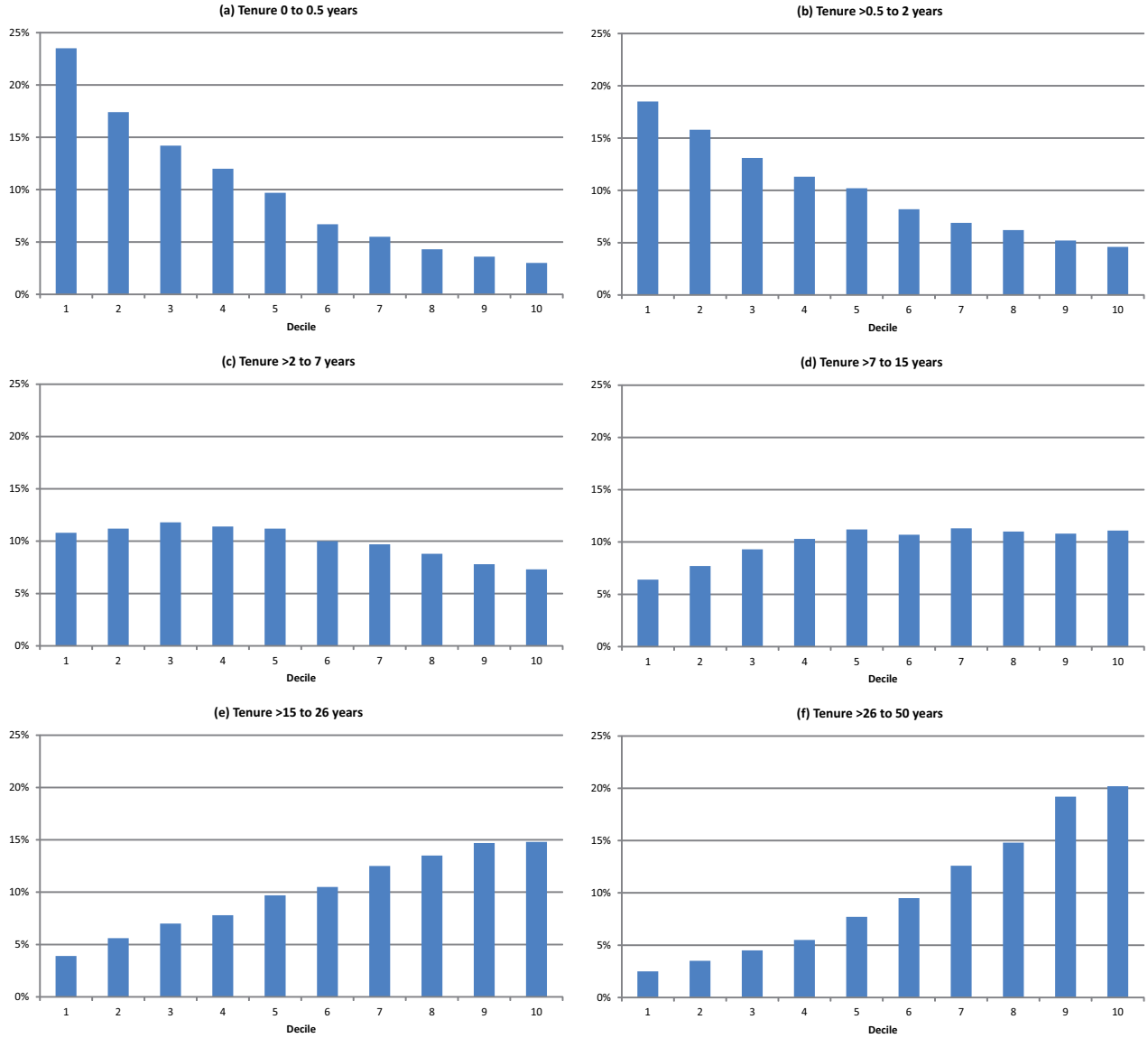
Earnings decile	Mean tenure (in years)
1	5.14
2	6.5
3	7.59
4	8.5
5	9.73
6	11.03
7	12.35
8	13.41
9	14.94
10	15.47
Number of observations	**1,375,262**

Source: *EU-LFS, authors' calculations*

Figure 37 presents the same correlation in a different way – the lower job tenure is, the higher the probability that an individual falls into a lower earnings decile and vice versa. For example, for the lowest tenure class considered (less than or equal to 6 months, Figure 37a), a very high probability of being in a low earnings decile and a very low probability of being in a high earnings decile is seen. For the highest tenure class (greater than 26 to 50 years, Figure 37f), the opposite is the case.

[9] This analysis uses data from 2010–2011, a period during which data for Malta is available, which is not the case for the analysis of tenure in 2002–2012.

Figure 37: Probability of being in an earnings decile by tenure



Source: *EU-LFS, authors' calculations*

The earnings–tenure relationship is now explored in a more rigorous setting, keeping all other observable factors constant and thus controlling for compositional effects. To do this, an ordered logit (see Box 4) is estimated in which tenure and its quadratic, cubic and quartic forms are included, following Altonji and Williams (2005).[10] In addition, several variables are controlled for: age, skill level, gender, marital status, nationality, job and company characteristics (such as part-time and temporary job indicators, company size, occupation and economic sector) and the country.

[10] The odds ratios for the cubic and quartic terms are very close to 1 and hence do not have a strong influence on the earnings–tenure decile relationship. Therefore, only the level and quadratic effect are interpreted here.

With this basic estimation, it is possible to describe an overall tendency for the earnings–tenure relationship. However, this basic estimation implicitly assumes that the intensity of the relationship is the same, and only the level of earnings or tenure is different for certain worker groups. However, this may not be the case. For instance, it could be that certain skill groups have higher returns to tenure. Therefore, the basic estimation is also run for interesting subgroups (such as age and skill level, men and women) separately. With this method, it is possible to assess whether the intensity of the earnings–tenure relationship is different for men and women, younger and older workers, and for workers of different skill levels.

In a final step, the returns to tenure for each country in the sample are estimated.

This methodology yields estimates of the likelihood of moving from a given earnings decile to a higher decile. Odds ratios are presented for this, that is, the odds of moving up the earnings distribution instead of staying in the same earnings decile, given a certain characteristic (for example, being of a certain age), compared with the odds of moving up the earnings distribution instead of staying in the same earnings decile, given a different characteristic (for example, belonging to a different age group).

Confirming the findings from the previous literature, a positive relationship is found between earnings decile and tenure (Table 14). With 1 more year of tenure, the odds of changing into a higher decile increase by the factor of 1.08. In other words, the odds of moving up in the earnings distribution, compared with staying in the original earnings decile, increase by 8%.[11]

However, similar to the findings of other authors, decreasing returns to tenure are detected since the quadratic term reports an odds ratio less than 1. In other words, the returns increase but at a declining rate, and after about 9 years, tenure no longer has an influence on the chances of progressing in the earnings distribution. This is in essence what the peak of the estimation indicates. This suggests that the time span during which within-job wage growth, for instance through human capital accumulation, takes place is limited to the first decade in a job.

Table 14: Tenure–earnings decile estimation: Baseline specification

Tenure in years	1.0840*** (-7.07)
Tenure in years (quadratic)	0.9956*** (-4.18)
15–24 years	0.3077*** (9.22)
25–34 years	0.7477*** (-7.42)
55–64 years	0.8768*** (-3.74)
Low-skilled: ISCED 0–2	0.5887*** (-6.00)
High-skilled: ISCED 5–6	2.0199*** (-9.23)
Female	0.4079*** (-19.62)
Peak	9.07
Pseudo R-squared	0.1806
Number of observations	1,365,182

Notes: Ordered logit estimation based on EU-LFS.
Control variables included, but not shown: marital status, part-time and temporary job indicators, company size, nationality, country, economic sector, occupation, cubic and quadratic term on tenure.
Cubic and quartic are terms also included but not displayed.
t-statistics in parentheses. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.
Source: *EU-LFS, authors' calculations*

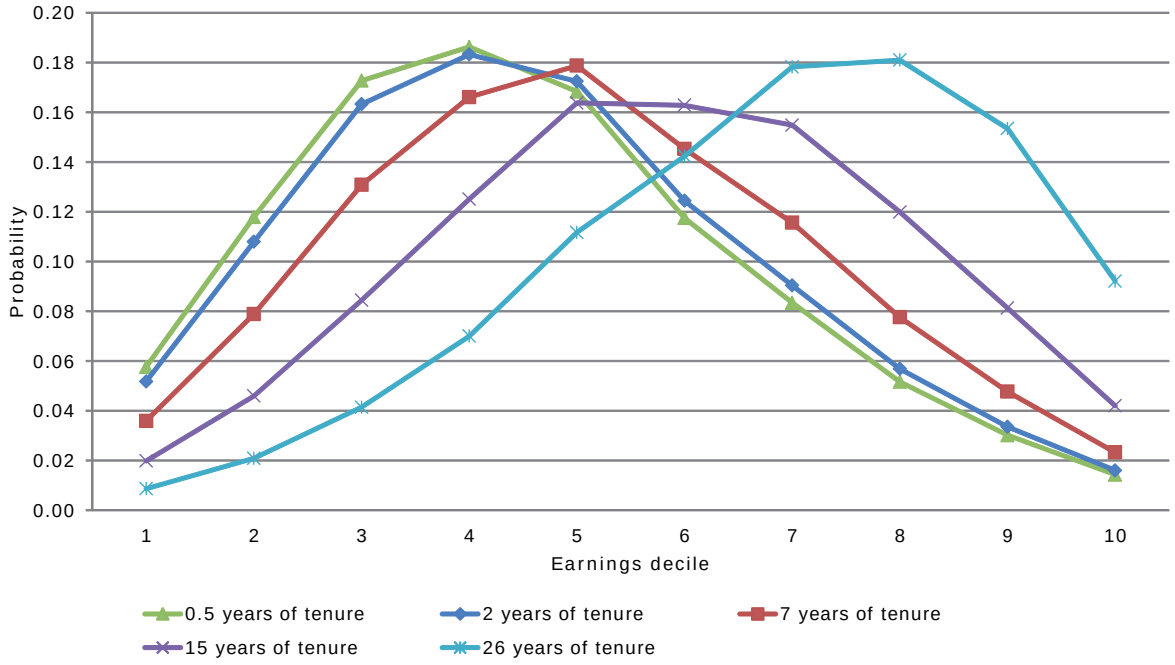
[11] Note that compared with the point estimators in the literature, this is a relatively large effect. However, given the structure of the data, it was not possible to control for the quality of the job or the worker–employee match, which are all aspects that might also be driving the earnings–tenure relationship (Abraham and Faber, 1987). Hence, the estimates given here are likely to be biased upwards.

Differences between worker groups

As expected, there are large differences in earnings between worker groups. For example, Table 14 confirms the findings of the literature indicating that there are large differences among different socioeconomic groups in earnings position irrespective of tenure. For instance, the odds of advancing to a higher earnings decile are lower for young and older age groups than for those aged between 35 and 54 years. The odds of improving one's earnings position are also lower for women than for men – pointing to the well-documented puzzle of the gender wage gap (see, for example, Munasinghe et al, 2008) – and lower for low-skilled workers compared with medium-skilled ones. For high-skilled workers, however, the odds of moving to a higher earnings decile are twice as high as for medium-skilled workers.

The relationship between tenure and earnings decile is further explored with the help of predicted probabilities, which indicate the probability of belonging to a certain earnings decile as tenure changes while all other individual and job characteristics are fixed at the sample average. This produces a clear picture (Figure 38): the probability of being in the lower earnings deciles is much higher given a tenure of 0.5 or 2 years, which represent approximately the bottom 10% and 25% of the tenure distribution, respectively, than for a tenure of 15 and 26 years, which represent the top 75% and 90% of the tenure distribution, respectively.[12]

Figure 38: Predicted probabilities by tenure



Source: *EU-LFS, authors' calculations*

In the context of the crisis, the finding of positive returns to tenure suggests that the costs to the individual and to the overall economy of the job loss of workers with long tenures can be much higher than those with lower tenure. This is because the pay in their next job will most likely be lower since it excludes the tenure premium. With lower individual earnings, tax revenue also falls. As shown in Chapter 2, a sizeable number of jobs with short tenure were destroyed during the crisis. From a tenure perspective, the overall costs of job losses during the crisis may be moderate if re-employment was fast, since previously short-tenured employees will mostly likely continue at their original pay level.

[12] The distribution of tenure differs here from that of the rest of the report since the earnings–tenure analysis is focused on a subsample of countries and only considers 2010 and 2011.

The earnings–tenure relationship for different age and skill levels and by gender is now examined. The effect of tenure on relative earnings varies starkly with age (Table 15). In the youngest age group, highly significant effects of tenure are not detected. This may be because many individuals aged 15–24 years have not been in the labour market for very long (that is, long tenures are not observed for these individuals). Furthermore, as pointed out above, for this age group, job changes are the predominant way of achieving pay growth; therefore, for this age group, pay growth on the job does not play an important role.

In contrast, for those aged 25–35 years, 1 more year of tenure increases the odds of progressing in the earnings distribution rather than staying in the same decile by 14.5% (Table 15). The prime age group (35–54 years) and the near-retirement age group (55–64 years) show increases in the odds of being in a higher earnings deciles of 8.6% and 8.4%, respectively, with each additional year of tenure. Yet the positive effect of tenure on the position in the earnings distribution decreases with the years and fade out after 5, 9 and 8 years of tenure for the 25–34 years, 35–54 years and 55–64 years age groups, respectively. This means that, despite the large effects in the first-order term of tenure for the older age groups, the actual return to tenure is minimal since many of them are past the threshold of 8 or 9 years of job tenure.

Table 15: Tenure–earnings decile estimation by age groups (odds ratio)

	15–24 years	25–34 years	35–54 years	55–65 years
Tenure in years	0.9099 (-0.78)	1.1453*** (-4.66)	1.0862*** (-6.92)	1.0839*** (-6.18)
Tenure in years (quadratic)	1.0747* (-2.07)	0.9871** (-2.81)	0.9952*** (-3.63)	0.9948*** (-4.99)
Peak	0.6551	5.2323	8.6663	7.7003
Pseudo R-squared	0.1577	0.1328	0.1813	0.1915
Number of observations	121,958	284,542	770,791	187,891

Notes: Ordered logit estimation based on EU-LFS.
Control variables included, but not shown: indicator variables for skill level and gender, marital status, part-time and temporary job indicators, company size, nationality, country, economic sector and occupation.
Cubic and quartic terms are also included but not displayed.
t-statistics in parentheses. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.
Source: *EU-LFS, authors' calculations*

For workers with a higher level of educational attainment, the odds of moving to a higher decile with 1 more year of job tenure are larger (Table 16). For instance, the odds of moving to a higher earnings decile increase by 5% for those with a basic educational level (ISCED 0–2) and increase by 13.8% for university graduates (ISCED 5–6). However, this effect is strongest for low tenures because the quadratic term indicates a stronger declining return to tenure over time for the high-skilled than for the low-skilled group. This means that high-skilled workers not only have higher starting earnings (Table 14), but they also reap higher returns to tenure – a result that is in line with economic theory. Cunha et al (2006) argued that 'skills beget skills'. Applied to the context of this analysis, this means that those entering the labour market with a higher educational level are also more likely to acquire additional skills in their jobs – which are rewarded by the market through higher returns to job tenure.

Table 16: Tenure–earnings decile estimation by skill groups (odds ratio)

	ISCED 0–2	ISCED 3–4	ISCED 5–6
Tenure in years	1.0529* (-2.03)	1.0737*** (-6.14)	1.1382*** (-11.87)
Tenure in years (quadratic)	0.9982 (-17.14)	0.9968*** (-19.11)	1.1382*** (-11.87)
Peak	14.0778	11.1483	6.4101
Pseudo R-squared	0.1818	0.1424	0.1561
Number of observations	276,289	759,606	329,287

Notes: Ordered logit estimation based on EU-LFS.
Control variables included, but not shown: indicator variables for skill level and gender, marital status, part-time and temporary job indicators, company size, nationality, country, economic sector and occupation.
Cubic and quartic terms are also included but not displayed.
t-statistics in parentheses. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.
Source: *EU-LFS, authors' calculations*

The returns to tenure appear to be slightly higher for men than for women (Table 17). While the odds of advancing in the earnings distribution compared with remaining in the same decile increase by 9% for men with 1 more year of tenure, the increase is 8.5% for women. Munasinghe et al (2008) argued that weaker ties to employers and jobs may explain this finding; women are more likely to interrupt their career for family reasons, and employers are aware of this weaker labour market attachment. Therefore, employers do not invest as much into training women as into the training of their male colleagues. Consequently, women cannot reap the full benefits of the returns to tenure.

Table 17: Tenure–earnings decile estimation by gender (odds ratio)

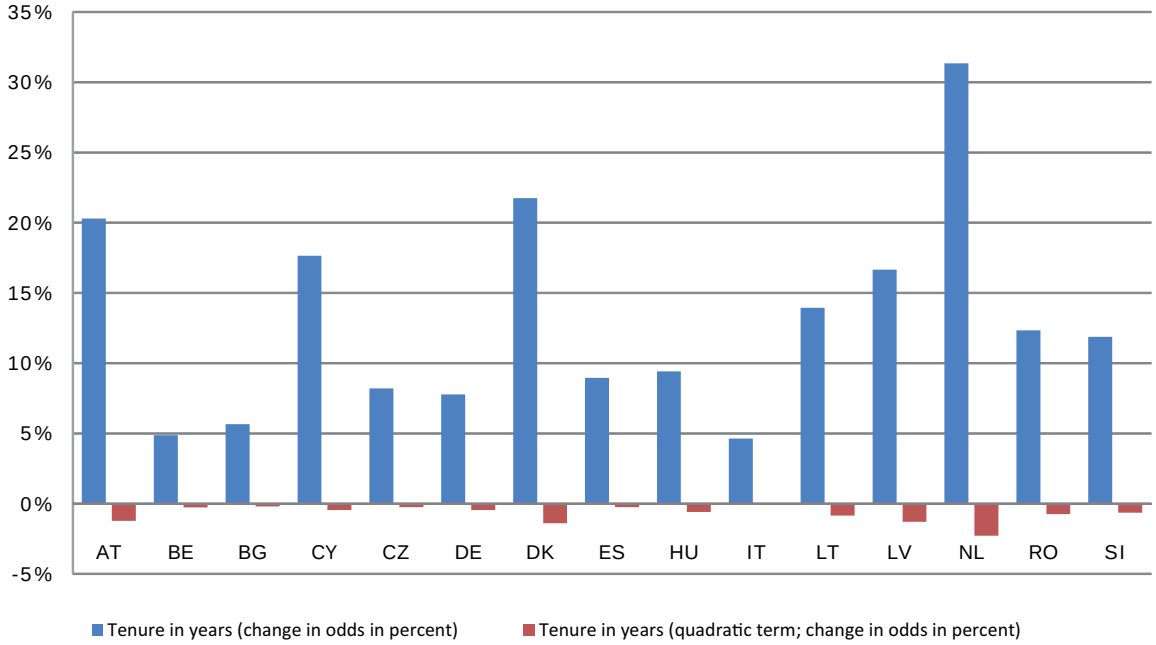
	Men	Women
Tenure in years	1.0903*** (-8.04)	1.0846*** (-5.59)
Tenure in years (quadratic)	0.9951*** (-4.79)	0.9953*** (-3.48)
Peak	8.8536	8.6693
Pseudo R-squared	0.1624	0.1755
Number of observations	709,908	655,274

Notes: Ordered logit estimation based on EU-LFS.
Control variables included, but not shown: indicator variables for skill level and gender, marital status, part-time and temporary job indicators, company size, nationality, country, economic sector and occupation.
Cubic and quartic terms are also included but not displayed.
t-statistics in parentheses. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.
Source: *EU-LFS, authors' calculations*

Cross-country differences

The final step is to look at the differences in the tenure–earnings decile relationship between countries. There are differences in both the level and the quadratic term of the specification (Figure 39 and Table 18). This is also reflected in the turning points of the tenure–earnings decile relationship, which indicate from which point onwards increases in tenure are not associated with upward movements in the earnings distribution any more (Figure 40).

Figure 39: Percentage change in odds due to tenure (level and quadratic term), by country



Source: *EU-LFS, authors' calculations*

In countries such as Austria, Cyprus, Denmark and the Netherlands, the odds of advancing in the earnings distribution with 1 more year of tenure are very high (Figure 39). However, Austria, Denmark and the Netherlands have odds ratios well below 1 for the quadratic term, which indicates that returns to tenure are short-lived in a career. This result is confirmed by the relatively low turning points of the tenure–earnings decile relationship that can be observed in most countries (Figure 40), which indicates the amount of tenure after which the probability of moving up the earnings ladder due to higher tenure starts to decline.

Table 18: Tenure–earnings decile estimation by country (odds ratio)

	AT	BE	BG	CY	CZ
Tenure in years	1.2030*** (-19.67)	1.0488** (-2.66)	1.0566*** (-9.97)	1.1765*** (-26.61)	1.0821** (-2.67)
Tenure in years (quadratic)	0.9877*** (-18.98)	0.9973 (-1.73)	0.9980*** (-3.59)	0.9955*** (-6.68)	0.9975 (-0.94)
Peak	7.4821	8.7539	13.4555	17.8361	15.6950
Pseudo R-squared	0.2439	0.2698	0.1055	0.3153	0.1084
Number of observations	145.761	72.206	20.917	31.572	98.158

	DE	DK	ES	HU	IT
Tenure in years	1.0777*** (-7.82)	1.2175*** (-93.42)	1.0896*** (-11.69)	1.0942*** (-9.23)	1.0464*** (-88.71)
Tenure in years (quadratic)	0.9954*** (-25.58)	0.9860*** (-77.48)	0.9975* (-1.97)	0.9940*** (-5.71)	1.0001*** (-3.29)
Peak	8.0391	6.9696	16.9281	7.4889	-258.7778
Pseudo R-squared	0.2084	0.2158	0.252	0.1544	0.1844
Number of observations	30.733	93.840	59.973	173.184	336.491

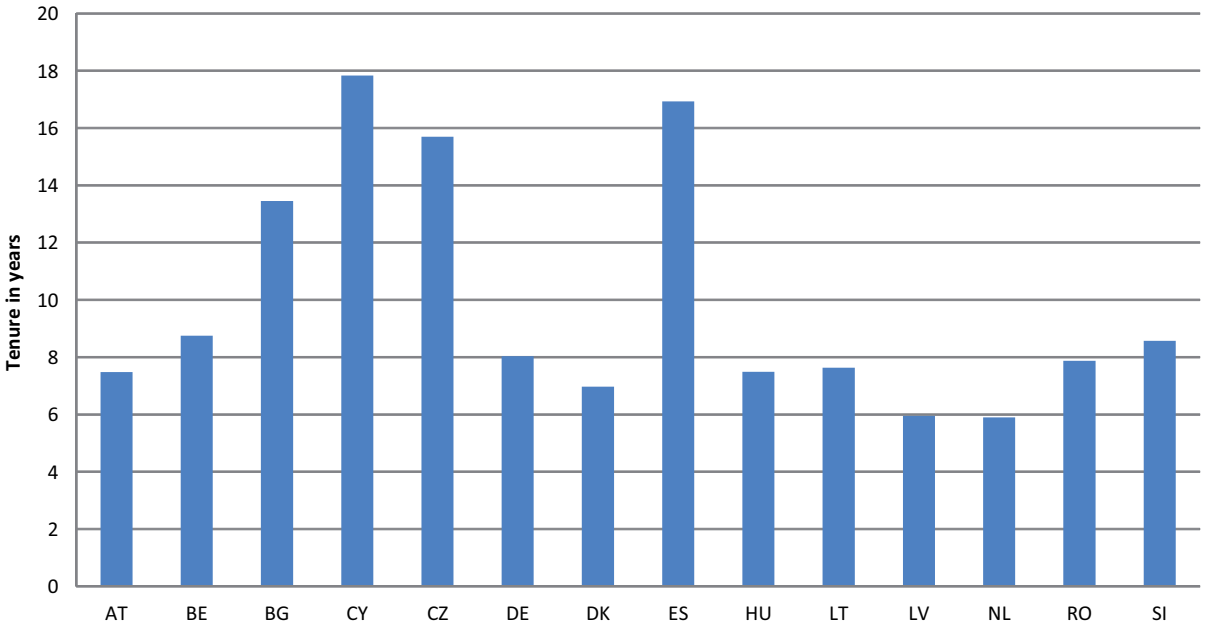
	LT	LV	NL	RO	SI
Tenure in years	1.1394*** (-22.92)	1.1666*** (-8.49)	1.3134*** (-6.15)	1.1233*** (-26.37)	1.1188* (-2.33)
Tenure in years (quadratic)	0.9915*** (-8.65)	0.9871*** (-6.02)	0.9772*** (-5.05)	0.9926*** (-7.94)	0.9935 (-1.27)
Peak	7.6324	5.9508	5.8996	7.8761	8.5719
Pseudo R-squared	0.1296	0.1105	0.256	0.0797	0.1733
Number of observations	37.137	23.580	67.258	127.030	47.342

Notes: Ordered logit estimation based on EU-LFS.
Control variables included, but not shown: indicator variables for skill level and gender, marital status, part-time and temporary job indicators, company size, nationality, country, economic sector and occupation.
Cubic and quartic terms are also included but not displayed.
t-statistics in parentheses. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.
Source: *EU-LFS, authors' calculations*

A different pattern is seen for countries such as Belgium and Bulgaria. The first year of tenure increases the chances of moving up the earnings distribution by about 5% compared with remaining in the initial earnings decile (Figure 39). In these countries, returns to tenure appear lower at the beginning of a job, but last longer since they decrease much more slowly over time (the odds ratio of the quadratic term is closer to 1 than for the other countries).

Italy stands out since it is the only country that has an odds ratio very close to 1 for the quadratic term (Table 18). As both the linear and the quadratic term are close to 1, this means that tenure in Italy has very little influence on earnings position.

Figure 40: Turning point in tenure–earnings decile relationship, by country



Note: Italy is not included because both the linear term and the quadratic term are positive and thus there is no turning point.
Source: *EU-LFS, authors' calculations*

What drives these different returns to tenure across countries? As mentioned at the beginning of this chapter, labour market institutions may provide some clues to answering this question. Which labour market institutions display a systematic link with the earnings–tenure relationship was investigated by correlating the linear coefficient and the turning point from the country regressions (which corresponds to the slope of the earnings–tenure relationship at very low tenure) with the extent of job-to-job transitions (which indicates voluntary job mobility) and labour market institutions.

The country-specific job-to-job[13] transition rates were calculated in a model that distinguishes between three different possible transitions between one year and the other:

- remaining in employment in the same job;
- changing jobs;
- becoming unemployed or inactive.

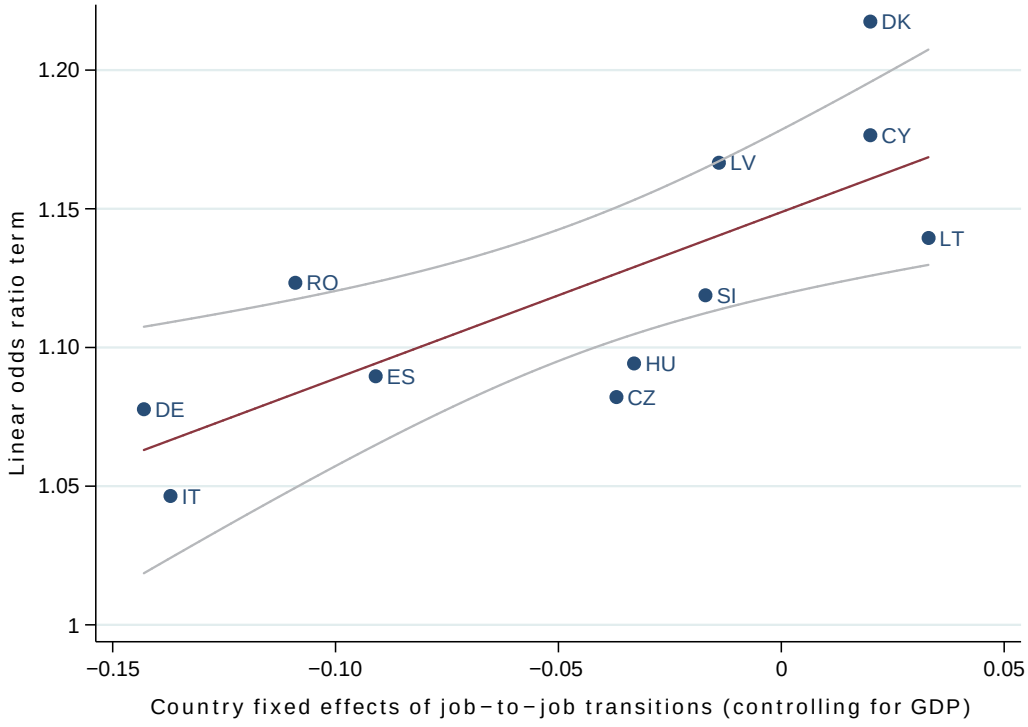
The age, skill and gender composition of the labour force are controlled for in these regressions, as well as for the depth of the crisis by including GDP, which varied between the countries in the sample.

Looking at worker mobility, Deelen (2012) found, using administrative data from the Netherlands, that pay and tenure were positively correlated; this correlation was particularly strong in industries where job mobility is low. From this, the author concluded that low job mobility is a factor that facilitates steep earnings–tenure profiles. The question of whether the intensity of the earnings–tenure relationship varies systematically with the country-specific level of job-to-job transitions was therefore investigated in this study.

A positive association was found (Figure 41), which means that in countries with more job mobility, the returns to tenure are higher. This result is in contrast with the findings of Deelen (2012) and is most likely driven by selection. This selection comes about because individuals who have high earnings or expect an increase in earnings in their current job are more likely to stay with their employer, thereby contributing to the positive association between earnings and tenure. However, individuals who are not satisfied with their earnings from their current job are more likely to change employers, thereby contributing to the measurement of an overall high level of job-to-job transitions (Burdett and Mortensen, 1998). This means that high levels of job-to-job transitions are observed at the same time as a positive association between earnings and tenure, but these two factors may not have a causal relationship since they are brought about by distinct groups in the economy.

[13] A job-to-job change was identified if the individual indicated they had been employed in the last year and in the interview month, but recorded a job tenure of less than 12 months.

Figure 41: Correlation between the linear coefficient and country fixed effects of job-to-job transitions



Source: *EU-LFS, authors' calculations*

To analyse whether the earnings–tenure relationship displays a systematic link with country-specific labour market institutions, the linear term of the ordered regression model was correlated with institutional factors such as trade union density, employment protection, unemployment benefits, minimum wages and bargaining level. None of these correlations reached conventional statistical significance levels. This does not mean that labour market institutions are unimportant, but rather that the effects being measured are imprecise. There are several potential reasons for this.

First, the measurement of the association between tenure and earnings position in this study is relatively crude. In particular, the EU-LFS data do not allow workers to be followed over time or many company characteristics to be taken into account. This means it is not possible to adequately control for selection, and selection may be important. As explained above, high earners with long tenure and low earners with short tenure are observed, but the underlying reason for the higher earnings of long-tenured workers may not be tenure per se, but rather factors such as individual ability or job and match quality, which are not available in the EU-LFS data. Hence, the measure of the tenure-relative earnings association estimation used in this study may have an upward bias and this bias is likely to differ between countries. Therefore, correlations with measures of specific institutions do not yield significant results.

Second, there are many interactions between labour market institutions (Boeri and van Ours, 2008). This means that in countries with the same union density but otherwise different institutional settings, unions may influence the earnings–tenure relationship differently. The Danish example illustrates very well that it may be the combination of institutional factors that counts. When applying the conclusions of Williams (2009) from a UK study on the importance of union membership to the earnings–tenure profile to Denmark, which has a high union density, one might expect a strong association between earnings and tenure. However, Buhai et al (2014), relying on longitudinal linked employer–employee data, found a relatively low association between earnings and tenure. The authors argue that 'flexicurity' governs the Danish labour market, indicating that there are some labour market institutions that are quite rigid but others that are more flexible. In such a context, unions may have very different effects on earnings.

Investigating how combinations of institutional factors can explain the association between tenure and earnings is a promising research endeavour that is beyond the scope of this report.

Summary

The analysis of the relationship between tenure and the relative earnings position of individual workers in Europe yielded some interesting insights.

First, the results suggest that in the first decade of a job there is a positive relationship between tenure and the probability of improving the relative position in the earnings distribution. Afterwards, the chances to advance in the earnings distribution due to higher tenure decline. These results suggest that longer tenure is relevant for earnings growth, especially in the early phase of a career. Yet, due to data limitations, it has not been possible to identify a causal effect of tenure on earnings. In addition, the analysis may be capturing an association that is closely linked to the economic crisis since it investigated the years 2010 to 2011.

Second, the odds of moving to a higher earnings decile with increasing tenure were found to be higher for men, for high-skilled workers and for workers belonging to the 35–54 years age group.

Finally, the analysis showed that returns to tenure differ across the European countries in the sample used. This finding concerns:

- the rate at which the relative earnings position improves as workers accumulate more tenure;
- the point from which onwards increases in tenure do not improve the chances of moving to a higher earnings decile any more.

For instance, countries with high returns to tenure in the first years of a job include Austria, Cyprus and Denmark. Belgium and Bulgaria make up the other end of the spectrum, with low but lasting returns to tenure. Specific labour market institutions such as employment protection or union density do not adequately explain differences across countries. Instead, it is likelier that different combinations of labour market institutions influence the relationship between tenure and the relative earnings position and can offer explanations for cross-country differences.

Conclusions

This report investigates the evolution of job tenure for the period 2002 to 2012 using micro data from the EU Labour Force Survey (EU-LFS), looking particularly at long-term trends and the changes that took place during the Great Recession. To explain the evolution of average job tenure, the entire tenure distribution is analysed, with a focus on short and long tenure. This makes it possible to investigate whether there are specific developments at the tails of the job tenure distribution that may not be visible when examining only average tenure. In a last step, an investigation of the link between job tenure and earnings provides important insights into the aggregate costs of job loss during the Great Recession. In all stages of the analysis, particular attention is paid to how job tenure differs between worker groups, job types and countries, and how job tenure was affected by the financial and economic downturn.

Average job tenure at the EU aggregate level increased slightly from 116.5 months in 2002 to 123 months in 2012. Similarly, there was a small increase in average job tenure during the crisis, which occurred together with a decrease in the share of short-tenured workers in the early years of the crisis. This can be explained by two factors:

- short-tenured jobs were disproportionately destroyed during the crisis;
- there was less job creation during the crisis, leading to a lower number of newly created jobs (Bachmann et al, 2014).

Consequently, average tenure was influenced by a strong cyclical component that has to be separated from long-term trends.

An analysis of the tenure distribution for the individual Member States of the EU reveals strong cross-country differences in the pre-crisis period. For example, mean tenure was lowest in Latvia at 86 months (7 years) and highest in Slovenia at 137 months (11.5 years). The continental European countries (Austria, Belgium, Denmark, Luxembourg and the Netherlands) and the Mediterranean countries showed comparably high average tenure, while the central and eastern European (CEE) countries as well as Ireland and the UK were characterised by low average tenure. Slovenia and Spain were notable exceptions to these patterns: Slovenia exhibited an extremely high average tenure compared with the other CEE countries, while Spain had a lower average tenure than the other Mediterranean countries.

These differences in mean tenure across Europe are related to four distinctive tenure distributions. The continental and Mediterranean countries (except for Spain) are mostly characterised by a low share of short-tenured and a high share of long-tenured jobs. The opposite is true for the Baltic states, Denmark, Ireland, Spain and the UK, which are characterised by the lowest average tenure levels due to a higher share of short-tenured and lower share of long-tenured workers. Finland and Sweden show relatively polarised tenure distributions, with a high share of short-tenured and long-tenured workers alike. In contrast, the CEE countries have few workers at both ends of the tenure distribution. These patterns are not only true when defining short- and long-tenured jobs as workers with tenure below the 10th and above the 90th percentiles, but also more generally when analysing the share of workers below the 25th and above the 75th percentiles.

Possible reasons for diverging pre-crisis levels of mean tenure, as well as diverging tenure distributions, include compositional effects in terms of the workforce or industry structure, different labour market institutions or country-specific preferences of workers in terms of the ‘lifetime employment relationship’. In terms of labour market institutions, employment protection legislation, the prevalence of temporary contracts and, more generally, labour market flexibility appear to be particularly important. Furthermore, differences in mean tenure are closely related to the share of long-tenured jobs.

During the crisis period, mean tenure increased for the majority of countries. Concentrating on mean tenure and ignoring changes less than 1 month (found in 7 countries), 7 countries experienced a decrease in mean tenure, while 12 countries experienced an increase. The countries that were hit especially hard by the crisis (Estonia, Greece, Ireland, Italy, Latvia, Portugal and Spain) all showed considerable increases in mean tenure. This increase in mean tenure can be explained by

a shift towards relatively more long-tenured jobs. The shift was mainly caused by a decrease in the share of short-tenured workers and could be observed clearly in Bulgaria, Greece, Ireland and Spain.

Thus, the observed changes in mean tenure can mainly be explained by business cycle effects. In other words, abstracting from the cyclical effects for the development of mean tenure, but not taking into account compositional effects, there appears to be no evidence that mean tenure decreased in Europe between 2002 and 2012. Nevertheless, compositional effects in terms of the workforce or industry structure may hide underlying trends.

The next step in the analysis was to examine the evolution of job tenure for different worker groups. For the EU as a whole, mean tenure was higher for men than for women, but this gap narrowed over the observation period. This most likely reflects the changing career patterns of women in Europe. Again, this overall picture hides important cross-country heterogeneity. In the pre-crisis period, mean tenure was much higher for men than for women in countries such as Austria, Cyprus, Germany, Greece, Ireland, Luxembourg, the Netherlands, Spain and the UK. In contrast, for a few countries (the Baltic states, Hungary, Poland and Sweden), mean tenure was higher among women. During the crisis, the most remarkable increase was seen in Spain, where mean tenure increased from 92 to 106 months for women and from 112 to 125 months for men. In contrast, pronounced decreases of mean tenure during the crisis were found for men in Luxembourg (147 to 133 months) and for women in Lithuania (111 to 97 months).

Mean tenure is systematically higher for older age groups compared with younger age groups, because one more year of tenure is by definition one more year of age (although not vice versa). Controlling for this fact, a shift–share analysis showed that large parts of the increase in tenure (aggregated across EU countries, but also for many individual countries), especially in the pre-crisis period, were due to changes in the age composition of the workforce. In other words, the growing share of older workers explains why, apart from during the crisis, an increasing overall tenure is observed. Thus, the results suggest that job destruction due to the crisis as well as an ageing workforce may be responsible for a considerable upward shift in tenure. At the same time, there seems to be a long-term trend towards shorter job tenure. Together, these factors lead to the result that average tenure remains stable apart from cyclical effects. However, the underlying, negative trend in average job tenure only becomes apparent when explicitly controlling for demographic developments. In particular, during 2002–2012, the shift–share analysis shows that tenure would have decreased by 2.58 months if the demographic structure of the workforce had remained constant.

The analysis then turned to whether the evolution of job tenure had differed strongly between skill groups. For the EU as a whole, skill level seems not to have played an important role for the development of mean tenure between 2002 and 2012. However, some country differences emerge for the crisis period, when mean tenure on average decreased in 18 countries for low-skilled workers but only in 9 countries for medium-skilled workers. For low-skilled individuals, mean tenure on average increased by a remarkable 9% in Spain and 16% in Ireland.

Tenure also varied strongly by job characteristics during the observation period of 2002 to 2012. Among all permanently employed workers, the share of long-tenured workers was twice as high as the share of short-tenured workers in the pre-crisis period. This tendency towards long-tenured jobs covered by a permanent contract was reinforced by a persistent destruction of short-tenured jobs during the crisis. In contrast, temporary workers were much more often short-tenured than long-tenured. Short-tenured jobs among temporary workers are equally lost during an economic downturn, but recovery takes place more quickly compared to long-tenured jobs.

Interestingly, the job tenure of temporary workers adjusted very differently in the individual countries during the crisis. For example, it increased strongly during the crisis in Spain, but not in Denmark. These cross-country differences in the impact of the crisis on temporary employment suggest that the role of temporary employment in national labour markets differs considerably across EU countries.

Occupations display strong differences with respect to average tenure. For example, pre-crisis mean tenure varies from about 86 months for service and sales workers to 136 months for managers and legislators and professionals. Furthermore, a shift–share analysis revealed that compositional effects (that is, aggregate tenure changing because certain occupations were particularly strongly hit by the crisis) did not play an important role during the crisis.

Similar results hold for economic sectors. For example, for the time period 2002 to 2007, extremely large differences in tenure can be seen between sectors, ranging from a mean tenure of 61 months for hotels and restaurants to 174 months for energy and water supply. Looking at two specific sectors (financial intermediation and manufacturing) for individual countries, tenure in financial intermediation increased in many countries during the crisis, probably due to destruction of short-tenured jobs in this sector. However, this happened to a relatively small extent, which is surprising given that the recession started as a financial crisis. Mean tenure in manufacturing developed analogously to the entire economy.

Some important insights were obtained by performing a multivariate regression analysis for selected countries for which data were available to investigate the importance of job and worker characteristics for job tenure, taking into account all factors simultaneously. For example, the gender gap in mean tenure was around 10 months in the descriptive statistics. In the regression analysis, which controlled for other factors such as the skill level and occupation, the difference in mean tenure between women and men was reduced to 3 months. This implies that a large part of the gender gap in mean tenure observed in the descriptive statistics can be 'explained' by other factors, such as women working in occupations where mean tenure is lower (for example, the hotels and restaurants industry).

Another interesting result is that the pre-crisis level of mean tenure fell with the skill level, that is, it was longest for low-skilled workers and shortest for high-skilled workers. One explanation is that high-skilled workers more often search for a new job and are thus more likely to have voluntary job-to-job transitions, which reduce mean tenure. This is less likely for medium- and low-skilled workers. During the crisis period, the differences in mean tenure declined slightly, possibly due to the overall decline in voluntary job-to-job transitions during the crisis.

The regression results also show that age effects seem to be a driving force for an increasing mean tenure, even during the crisis. This finding, obtained within a multivariate framework, supports the results from the shift–share analysis on the importance of demographic change for the development of tenure.

The results from the earnings–tenure analysis suggest that in the first decade of a job, there is a positive relationship between tenure and the probability of improving one's relative position in the earnings distribution. After the first decade, the chances to advance in the earnings distribution due to higher tenure decline. In particular, the odds of moving up in the earnings distribution, compared with staying in the original earnings decile, increase by 8% per year at the beginning of a job. This increase, however, comes to a halt after nine years in the same job. This result implies that the costs of job destruction are actually lower for short-tenured than for long-tenured workers. Furthermore, the odds of moving to a higher earnings decile were found to be higher for men, high-skilled workers and workers belonging to the 35–54 years age group. In addition, returns to tenure were found to differ across the European countries in the sample. This finding concerned both the rate at which the relative earnings position improves as workers accumulate more tenure, as well as the point from which onwards increases in tenure do not improve the chances of moving to a higher earnings decile any more. However, no clear cross-country pattern emerged in this context.

In summary, mean tenure varies quite strongly between the EU Member States. Differences in mean tenure can be directly linked to the shape of the tenure distribution, which takes four distinctive forms according to the prevalence of short- and long-tenured workers. Apart from cyclical effects, there is hardly any sign that countries are becoming more similar to each other in terms of their tenure distributions. However, it is paramount to control for demographic developments when comparing the evolution of mean tenure across countries. When controlling for an ageing workforce,

the previously stable trend in mean tenure actually turns negative for many countries, that is, when looking at tenure for specific age groups over time, a downward trend is observed. Therefore, at least in some countries, there was a trend towards declining mean tenure between 2002 and 2012 once the age composition of the workforce was controlled for. Whether this implies a decline in worker welfare and life satisfaction in a country, however, can only be determined when taking into account further country-specific labour market characteristics, such as the earnings–tenure relationship, the importance of voluntary job-to-job transitions, as well as the development of labour market participation, for example, of women.

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Annex: Computing tenure from EU-LFS data

In the EU-LFS dataset, the variable 'startime' (that is, the time since the person began working) can be used to compute tenure. However, some patterns within this variable are problematic. For some tenures in the range 25–36 months in the original variable 'startime', there is a clear – and quite surprising – drop in the number of observations; in the range 37–43 months, the number of observations drops to 0 followed by subsequent spikes at 44 and 47 months.

The drop in observations in the range 25–36 months may be due to the design of the survey questionnaire, leading to a systematic measurement error. The key issue here is that the respondent is only asked the starting month of a spell of work if tenure is less than or equal to 2 years. By subtracting calendar years, the relevant cut-off between 2 and 3 years may be subject to a filtering process. Some individuals may report a difference between the start year and the interview year of 3 years despite the fact that their true tenure is between 25 and 36 months (that is, longer than 2 years).

The reason for 0 observations in the range 37–43 months is unclear.

Given that the survey design as described above does not lead to a smooth distribution and the particularly implausible values of 0 for specific tenure classes between 37 and 43 months, tenure was recalculated to avoid these problems. The calculation follows that described in the EU-LFS user guide (Eurostat, 2011, p. 54).

The new variable leads to a more plausible distribution of tenure; in particular, the values of 0 are eliminated. Even using this procedure, however, a decline in observed tenures remains between 25–36 months (see Figures 4 and 5). As explained above, this is likely to be a consequence of the survey design.

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This report describes the findings of a study of change in job tenure between 2002 and 2012 in the EU. The study examined change in mean tenure as well as the distribution of short and long tenure in the EU and in individual Member States. It also looked at differences in tenure according to different sociodemographic and job characteristics (gender, age, skill level, permanent and temporary employment, occupation and economic sector), examining in particular how tenure evolved before and during the economic and financial crisis. The link between job tenure and earnings was also investigated. Although the descriptive evidence did not reveal a decline in mean tenure or a decline in the relative importance of long-term employment relationships, analyses controlling for certain sociodemographic and job characteristics provided some evidence of an underlying trend of declining average tenure in EU Member States.

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