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E-mail address: Helmut.Mahringer@wifo.ac.at
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Low-wage jobs: a means for employment integration of the unemployed?

Evidence from administrative data in Germany and Austria[1]

Authors:

Carola Grün (University of Göttingen), Helmut Mahringer (WIFO – Austrian Institute for Economic Research, Vienna), Thomas Rhein (Institute for Employment Research, Nuremberg)

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Does the low wage sector serve as a stepping stone towards integration into better-paid jobs or at least towards integration of jobless people into employment? There is evidence for a "low-wage trap" and for a high risk of low-wage earners to get unemployed, but this may also be due to sorting effects and not to low-wage work itself. The present paper contributes to this debate analysing employment spells of male low-wage earners who had been unemployed before, with methods of continuous-time event history analysis. The present data have been retrieved from two large administrative micro-data sources: The IAB employment sample (IABS) for Germany, and a combination of social security data from the Austrian Social Insurance Institutions. Two possible exits of low-wage spells are focussed on: exits to higher-paid employment (upward mobility vs. persistence), and exits to unemployment ("no pay-low pay cycle"). The results show shorter spell durations in Austria, pointing to a considerably higher fluctuation and labour turnover in the Austrian labour market. The influence of individual and firm-related characteristics and of the individual unemployment history on exit probabilities and the role of duration dependence in both countries is investigated. With regard to upward mobility, no convincing evidence for "true" duration dependence is found, at least for Germany. As to the risk of falling back into unemployment, the results suggest that even low-wage workers can accumulate job-related human capital favouring employment integration over time.

JEL Classification: J64, J63, J31

Keywords: unemployment dynamics, low wage, duration analysis

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1. Introduction

With high and rising unemployment levels, European labour market institutions have often been blamed for being too rigid. High levels of employment protection and centralised wage bargaining are supposed to prevent more low-wage jobs that could bring unemployed people back into jobs – especially those who are low-skilled or have other competitive disadvantages.

On the other hand, a growing low-wage sector may also increase the share of the "working poor", which in Continental Europe is still small compared to the US. Moreover, previous evidence[2] has shown that low-wage jobs are often unstable and the low paid are exposed to the risk of becoming unemployed and/or fluctuating between low-paid jobs and unemployment. Furthermore, those who have been in employment for a longer time have only limited chances to get into better-paid jobs. So it is still unclear if, and to what extent, the low-pay sector serves as a stepping stone towards better-paid jobs or at least towards lasting integration of jobless people into employment.

The present paper is meant to contribute to the clarification of this issue, and take a closer look at the dynamics of low-wage employment in two European countries. More specifically, it is focussed on persons entering low-paid jobs out of unemployment and investigates if (and who for) these jobs serve as a stepping stone towards better-paid jobs or at least provide for stable integration into employment. Two alternative outcomes of low-wage spells are focussed on: 1. upward mobility to better-paid jobs and 2. return to unemployment. Results are compared against a third option, which is persistence in low-wage employment. The first two results can be labelled as positive, or negative,respectively, from the perspective of labour market policy, whereas this is less clear in the case of persistence: persisting in a low-wage job at least provides for employment integration and may be appropriate for persons with low skills and productivity potentials. However, this is less the case for high-skilled workers. Moreover, the income level remains low, in many cases not much above unemployment-related benefits received precedingly. In any case, both upward mobility and persistence in low-wage employment can be considered as employment integration.

Although the issues of low-wage persistence and of the so-called no pay-low pay cycle have already been investigated in previous studies, the present paper is, to the best of our knowledge, the first one to focus on low-wage spells started out of unemployment and that applies methods of competing risk analysis (duration analysis) to provide answers to the following questions:

1. How likely are exits to higher wage or to unemployment, and how fast do these transitions take place?

2. Which are the individual and firm-related characteristics in either case?

[2] See OECD (1996 and 2003), and Stewart (2007) for Britain; evidence for Germany is presented in Eichhorst et al. (2005) and Schank et al. (2009).

The present paper uses pooled data on low-wage spells started between 1998 and 2004. A low wage is defined as being below two thirds of the median wage – the most commonly used low wage threshold in the related literature. In order to reduce the heterogeneity of our data, the analysis is confined to males in the main working age (25-54 years). Also, the problem of unobserved heterogeneity is dealt with: beyond observable characteristics, individuals may also differ in unobservable characteristics such as ability or motivation. Not taking these factors into account may bias the results. Therefore, we make use of rich information on the labour market history of individuals preceding each relevant job spell, that are assumed to mirror ability and motivation. Details will be explained below.

Moreover, the present paper is a cross-country study including Germany and Austria, since institutional factors are expected to play a role for the outcomes. Although both countries are often labelled as highly regulated continental welfare states, the Austrian labour market is characterised by a higher degree of flexibility and deregulation, especially with regard to employment protection.

To start with, some theoretical considerations are given in section 2, an overview on previous evidence in section 3. Afterwards, some stylised facts about labour market institutions and developments in both countries are given in section 4. Data sets and data-selection are described and the estimation strategy employed is explained in sections 5 and 6. Descriptive evidence is presented in section 7, multivariate estimation results in section 8, and conclusions in section 9.

2. Theoretical considerations

Which arguments support the bridge function towards better-paid jobs, which arguments let expect the negative outcome of falling back into unemployment? In a first step, the possibility of upward mobility is considered. Why should low-wage jobs serve as a bridge towards better-paid jobs, either within the same firm, or when employees change jobs? One argument can be derived from contract theory[3]: Before the start of an employment relationship, there is asymmetric information on skills and abilities of employees. So firms may use lower-paid jobs to "screen" newly hired workers. Screening also refers to the ability to learn and acquire firm-specific human capital. Provided that newly hired workers prove successful, they are promoted to better-paid jobs. Unemployed persons with a higher skill level should be more likely to take up such jobs than the low-skilled, since higher formal skills should also facilitate the acquisition of firm-specific human capital, so more transitions to better-paid jobs for higher skilled persons may be expected. Moreover, such transitions should be more likely within larger firms, since they usually have big internal labour markets with promotion ladders and a higher complexity and variety of firm-specific tasks (Schank et al. 2009).

Beside promotion chances within the firm, low-wage jobs may also offer insight into job opportunities with other firms, and better chances to get such jobs than out of unemployment, which may be a bad signal for potential employers.

However there are also arguments against the "bridge" scenario. From previous research it is known that low-wage jobs are often also low-quality jobs. The distinction between low-paid and higher-paid jobs can be considered as one dimension of the "good" and "bad"

[3] For an overview of contract theory, see Cahuc / Zylberberg (2004), chapter 5.

jobs distinction (Stewart 2007; Acemoglu 2001). These low-quality jobs offer poor opportunities to acquire general or firm-specific human capital[4]. Besides, being in a "bad" job may be a frustrating and discouraging experience, with negative effects on work effort and promotion chances. So being in a "bad" job should limit or prevent upward wage mobility within the firm, and could also be interpreted as a bad sign by other potential employers, because "employers offering good jobs may well use a person's current position as a screening device. While unemployment is a bad signal, being in a low-quality job may well be a worse one" (Layard et al. 1991, p. 249).

Another point is the outcome of falling back into unemployment. In accordance with the segmentation theory (Piore / Doeringer 1971), low-wage jobs are mostly part of a secondary segment of unstable and insecure low-quality jobs. These jobs have low work requirements and offer few or no possibilities to acquire job-specific human capital. Firms use these jobs as a buffer to adapt to demand or supply shocks, or to seasonal fluctuations. So, such jobs should be found more frequently in sectors with high fluctuations, such as the primary sector, construction or tourism-related activities; and more often in smaller and younger firms, which are known to have higher rates of labour turnover than larger and older firms (Davis / Haltiwanger 1999). In addition, low-skilled workers should be overrepresented in these jobs.

Interestingly, low-paid jobs with low work requirements do not necessarily fulfil a buffer function. Especially within larger firms, they are also indispensable for the internal division of work. More generally, recent research on the development of the occupational structure has shown that technological change in the last decades has not diminished the need for jobs with "easy" tasks, although the content of these jobs tends to shift away from routine tasks towards non-routine tasks (see Autor et al. (2003) for the U.S.; Spitz-Oener (2006) for Germany). So, beyond the buffer function there is a constant and continued need for workers fulfilling such easy tasks.

The arguments presented above lend no clear support for or against the "bridge" scenario, nor do they unambiguously back the "no pay-low pay cycle" argument. So, a careful look at the empirical evidence seems advisable.

3. Previous evidence

In a comparative study, the OECD (2003) analysed the dynamics of low-wage dynamics in 11 European countries and the U.S. over the years 1994-1999 with data from the European Community Household Panel (ECHP), and the Panel Study of Income Dynamics (PSID). Individuals observed in low-wage jobs were selected, and their employment careers were followed over the next five years. The study found considerable evidence for low-pay traps and instability. "In both Europe and the United States, workers who were low paid in the first year stayed on average nearly four of the next five years in either non-employment or low-paid employment (with non-employment accounting for more than a year…)" (p. 95). It concludes that "relatively few workers are persistently trapped in low-paid jobs, but a substantially greater number cycle between low pay and non-employment…" (p. 95). However, the analysis is purely descriptive and does not control for the individual

[4] This is corroborated by the fact that low-wage workers get less training than the higher-paid.

employment biography preceding the start of the low wage job, nor does it provide comparative evidence for individuals observed in higher-paid jobs.

Two studies for Britain (Cappellari / Jenkins 2004, and Stewart 2007), and a study for Germany (Uhlendorff 2006) investigate the dynamics of low-wage employment in more detail. They present descriptive evidence on low-wage persistence and the risk of unemployment, and find a considerable degree of persistence as well as a much higher risk for low-paid persons to become unemployed than for higher-paid persons. But these studies go a step further and analyse whether unfavourable outcomes are due to state dependence or to endogenous self-selection of individuals into low-wage jobs. *State dependence* means that the mere fact of being low paid[5] affects future labour market prospects negatively. Cappellari and Jenkins (2004) use a multivariate probit model for transitions between low pay, higher pay, and unemployment, taking endogenous selection into account. They conclude that there is state dependence, and that low-wage earners have a higher probability to become unemployed than higher-wage earners. Stewart (2007) obtains similar results by using a range of dynamic random and fixed effects estimators, the results of which differ only slightly. He concludes that low-wage employment has almost as large an adverse effect as unemployment on future prospects, and the difference in their effects is insignificant, and that low-wage jobs act as the main conduit for repeat unemployment and considerably increases its probability. Uhlendorff (2006), using multinomial logit panel models with random effects, also finds evidence for state dependence and for a "low pay-no pay cycle" in Germany, but finds that being low paid improves future employment prospects, compared to being unemployed.

At this point, it is helpful to consider the kind of panel data used in the analysis of the dynamics of low-wage employment. Two types of samples are conceivable:

1. *Stock samples,* i.e. persons observed in low-paid jobs at a given point in time, and

2. *Inflow* (or *spell) samples,* i.e. persons *taking up* low-paid jobs during a given time span.

In both cases, subsequent employment careers are analysed (and can be compared to the careers of higher wage earners).

The above-mentioned studies all use *stock samples.* This is due to the fact that both the BHPS and the GSOEP are not large enough[6] to yield sufficient inflow numbers for spell samples. But when using stock samples, the problem of left censoring arises, which is closely related to the problem of "initial conditions" (Heckman 1981): The initial state of a person (in our case: being in low-wage employment) is not independent of his/her preceding employment history. This leads to a sample selection bias, and the subsequent employment career cannot only be explained by observable characteristics. The studies using BHPS and GSOEP data are well aware of this problem and use various econometric techniques to control for initial conditions.

[5] In labour economics, the term "state dependence" was first used (in the 1980s) to analyse the persistence of unemployment. For a review of this literature, see Arulampalam et al. (2000).

[6] For the years considered in our analysis, the average number of adult respondents per year was clearly below 20,000 per year in each data set.

For the analysis of employment dynamics, inflow samples into low-wage employment seem to be more appropriate. There is no left censoring in these samples, and the problem of initial conditions, though not completely discarded, is strongly reduced. This is why administrative data sets are used, which are large enough to allow for spell sampling. Also, two additional sources of endogenous selection in survey data sets[7] can be circumvented or at least greatly reduced, i.e. panel attrition (which is non-existent in administrative data, and item non-response. In survey panels, information on income and wages is sometimes not provided by respondents and is generally less precise and reliable than in administrative data. So ,the data presented offer considerable advantages and allow for the application of duration analysis of job spells.

Up until now, there are many cross-country studies based on micro data from standardized international household survey panels, such as the ECHP or the CNEF[8]; but international comparisons based on administrative data are extremely rare. This is partly due to administrative data being not available to researchers in many countries for reasons of data privacy, or because the data are inappropriate for empirical analysis, and not comparable across countries, since they were not gathered for research purposes. So, the cross-country analysis based on administrative data sources made should be of interest also from a methodological point of view.

4. Comparing Austria and Germany

With regard to labour market institutions, Austria and Germany display many common features. In Esping-Andersen's influential typology of welfare states (1990), both countries are classified as "continental" or "conservative" welfare states. It is true that, in recent years, Germany has implemented various reforms, especially the so-called Hartz laws, which constitute a departure from this welfare state model. But for the period under investigation, most relevant institutions were similar in both countries, such as wage setting procedures, tax and social security systems, replacement rates for the unemployed, and the dual system of vocational training. But there is one difference that might be relevant for the quantitative importance and the characteristics of low-wage employment: employment protection is more "liberal" in Austria than in Germany.[9] It is not easy to identify the impact of employment protection in the available data, since temporary contracts cannot be distinguished from "standard" permanent contracts. So, if a spell ends in unemployment, it cannot be interpreted as a layoff, or just the expiration of a temporary contract. However, the results should allow for at least tentative conclusions in this regard.

The general labour market situation in both countries should also be considered. During the 90s, after a short "post-unification boom", the economy in unified Germany suffered from the deep crisis in the New Länder. Real GDP growth was only modest up to 1997

[7] For an exhaustive discussion of sources of endogenous selection in survey panels, see Cappellari / Jenkins (2008).

[8] ECHP = European Household Community Panel, a household survey with longitudinal data for fourteen European Countries 1994-2001; CNEF = Cross National Equivalent File, with similar data for Germany, the UK, the US, Canada and Australia; the German data are from the GSOEP.

[9] Although many legal stipulations of dismissal law were (and still are) similar in Germany and Austria, dismissals are de facto easier to push through in Austria, since the employee has fewer chances to contest it with legal action. In Germany, dismissals are often contested, leading to court procedures and (in many cases) to dismissal payments, which makes dismissals more expensive for employers.

(1.4%), then started to rise in 1998 and peaked at 3.0% in 2000. After that year, the so-called "new-economy-crisis" caused growth rates to fall to 0.7% (yearly average for 2001-2004).

Unemployment rates rose sharply in the early 90s, were at 8.2% in 1995, and continued to rise to 9.9% (1997), then dropped to 7.8% (2001, all rates according to ILO standards). Total employment mirrored this trend, and started to rise after 1997, but declined after 2001. So, the years 1998-2001 were somewhat more favourable for job starters out of unemployment than the consecutive years.

Economic trends in Austria were similar, reflecting the close economic ties with Germany. The country had relatively high GDP growth rates of around 3% between 1998 and 2000 and suffered a downturn in 2001 with growth rates of around 1% between 2001 and 2003. But unemployment rates were much lower than in Germany, and declined from 4.5% (1997) to 3.6% (2000), and then increased again to 4.3% in 2003.

To sum up, economic trends in the two countries were similar. But the labour market situation, in terms of unemployment rates, was clearly better in Austria. However the present analysis refers only to West Germany, whereas the unemployment figures given above refer to unified Germany. Standardized unemployment rates are not published separately for West and East Germany. But when comparing "official" rates based on registered unemployment, West German rates were between 1 and 2 percentage points below the national average. From this it can be inferred that the labour market situation in Austria was far better than in unified Germany, but also clearly better than in West Germany.

5. Data and sample selection

For Germany, we use the so-called weakly anonymised version 1975-2004 of the IAB Employment Sample (IABS), containing information on the employment history (including wages) of employees liable to social security on a daily basis[10]. The IABS is a 2% sample drawn from the IAB employee history supplemented by information on unemployment benefit recipients, the IAB recipient history. The sample covers a continuous flow of data on employment subject to social security as well as on receipt of unemployment benefits, unemployment assistance and maintenance allowance; therefore, it is highly suitable for performing analyses on employee and benefit recipient history. It also contains a number of firm characteristics.

For Austria, a similar data set based on social insurance data is used, offering detailed longitudinal and cross-section information for dependent employment spells and unemployment spells. These data from the Austrian Social Security Database contain detailed (anonymised) information on individual employment, unemployment on a daily basis as well as earnings histories, public pension contributions and allowances since 1972, and also basic employer information.[11] These matched employer-employee data nearly universally cover the essentials of the Austrian labour market. This database is combined

[10] For more information on IABS, see http://fdz.iab.de/en/FDZ_Individual_Data.aspx.

[11] See also Hofer and Winter-Ebmer (2003) for a description.

with data on unemployment spells registered at the public employment service (since 1998).[12] Due to their administrative character both data sources are highly reliable.

However, some limitations of both data sets must be taken into account. First, the German data do not cover self-employed persons and civil servants, but only employees liable to social security contributions. Second, when people are out of employment, we can observe them only if they are in *registered* unemployment and receive unemployment benefits, or maintenance allowance (in Germany)[13]. Third, IABS data distinguish between full-time and part-time employment, but do not contain information on working hours. This is why part-time employees are not considered.

The Austrian data set completely lacks the information on whether a worker is employed full time or part time. This made it necessary to identify full-time workers with imputation procedures[14]. Wages as the basis of social security contributions are top-coded because of the social security contribution cap (about 10% of the cases).

Comparable data sets for both countries are established according to the following rules:

Data on wages for West German full-time workers aged between 18 and 60 years are used to calculate a low-wage threshold of two thirds of the median wage for each year between 1998 and 2004. Then a *sample of low-wage spells* is constructed starting out of unemployment during this period. For Austria, this is done for the period 1998-2003. In order to reduce the heterogeneity of the sample, the spell samples only include *males* aged between 25 and 54 years at the time of inflow, and, in the case of Germany, only *West German* men[15]. As further restrictions, only those low-wage spells are included that

1. have a minimum duration of 30 days, and

2. are preceded by a spell of unemployment of at least two weeks.

With these two restrictions short-lived spells should be excluded and corrected for "artificial" fluctuation, i.e. quick changes between different labour market states that do not reflect sustainable transitions between unemployment and employment. A low-wage spell is interpreted to continue if the employee changes the employer but still remains in low-pay brackets. In other words, a firm change terminates the spell only in the case the wage paid in the new firm is above the low-wage threshold.

By this selection, samples of 24,160 spells in Germany and 160,843 in the Austrian data set are left, started by 17,876 males in Germany, and 74,777 in Austria. The number of persons is lower than the number of spells, since one person may have more than one spell in the period under investigation. As to possible exits, the distinction is between 1. full-time higher-wage employment (above the low-wage threshold), 2. unemployment, and 3. "other",

[12] At the Austrian Institute of Economic Research these anonymised administrative data are processed, validated and systematised within the INDI-DV Group (see Schöberl, 2004).

[13] This allowance ("Unterhaltsgeld") is paid to unemployed persons participating in training measures, instead of unemployment benefits ("Arbeitslosengeld" or "Arbeitslosenhilfe").

[14] Since this analysis is limited to 25 to 54 years old men outside the public services, who show an extremely low part-time share, this problem is of minor relevance.

[15] Confining the analysis to males also reduces the influence of possible data errors on the part-time/full-time distinction (part-time jobs wrongly classified as full time), since part-time jobs play only a minor role for men in both countries.

including part-time employment as well as men dropping out of the sample for various reasons[16]. Since "other" is a very heterogeneous category, this exit is not looked into in detail, the analysis is confined to exits 1 and 2. A low-wage spell is considered terminated only if it is interrupted for more than two weeks. For Germany, if low-wage spells persist up to the end of the year 2004, they are followed up to the end of 2007. New inflows after 2004 are not included. In Austria, low-wage spells persisting up to the end of the year 2003 will be followed until 2006.

This sampling procedure is repeated for *higher-wage spells* (above the low wage threshold) starting out of unemployment during the same period, with 1. low-wage employment, 2. unemployment and 3. "other", as possible exits. This allows for further conclusions on the low pay-no pay cycle –a "higher pay-no pay cycle" is expected to be of minor importance. In Germany, there were 52,805 such higher-wage spells, making up 69% of all full-time spells started out of unemployment. For Austria 828,480 higher-wage spells are observed, making up 84% of all full-time spells of males aged 25-54.

6. Estimation strategy: Hazard rates, (un)observed heterogeneity and duration dependence

Independent competing-risk estimations of the low-wage spells for the exits "upward mobility", and "return to unemployment"[17] are carried out. Such competing risk models are typically used for the analysis of employment spells, e.g. in the case of temporary jobs (recent examples are D'Addio / Rosholm 2005 and Gash 2008)[18]. For each exit, the duration of spells is modelled by specifying the hazard rate, i.e. the conditional probability of leaving the spell. Hazard rates are estimated with a non-parametric proportional hazards model. Comparing hazard rates for the two exits, the data obtained show the prevalence of one of the exit models. However, high hazard rates for the exit unemployment do not necessarily imply any correlation with low wages, but frequent returns to unemployment may occur regardless of the wage level. Therefore we also analyse *higher*-wage spells started out of unemployment. For these spells, we should expect the hazard rates for the exit "Return to unemployment" to be lower than for low-wage spells. Only in this case can we speak of a distinct no pay-*low* pay cycle.

Furthermore, the influence of observed characteristics of individuals and firms is investigated that is likely to affect exit probabilities. The expected influence of skill level, firm size, and firm age on exit behaviour has already been discussed above. Furthermore, the worker's age at the beginning of a job spell as independent variable is included, since is is expected that age should especially influence the exit probabilities to higher-paid jobs. Upward mobility is expected to decrease with age, since age-earnings profiles are generally steeper in younger years (Schank et al. 2009). Also, nationality is considered,

[16] Exits into higher-wage jobs (1.) or unemployment (2.) are only counted as such if the spells have a minimum duration of two weeks and have started not later than two weeks after the end of the low-wage spell. Otherwise exits are counted as "other". This is done in order to reduce the "noise" in the data, caused by changes of employment status immediately after the end of a low-wage spell.

[17] Because we focus on these two outcomes, other exit possibilities, such as transitions to self-employment or to non-activity, are not explicitly taken into account. Moreover, the data do not provide sufficient information in these cases.

[18] Like low wage jobs, temporary jobs are also frequently analysed under the "bridge" aspect (transition to permanent jobs vs. return to unemployment).

because foreign workers, especially from non-EU-15-countries, are often employed in unstable jobs with poor promotion prospects, partly as a result of discrimination, partly due to insufficient language skills. Moreover, information on the sector is included, since previous research shows that upward mobility differs considerably between sectors (Eichhorst et al. 2005). This also applies to job and labour turnover rates (Davis / Haltiwanger 1999), which should affect the exit probabilities to unemployment.

Beyond observed characteristics, exit behaviour can also be influenced by unobserved heterogeneity, which may bias coefficients for worker and firm characteristics if it is not accounted for. It should be noted that heterogeneity in the present sample is already reduced by focussing on males in main working age, all entering low-wage jobs out of unemployment. To take the remaining unobserved heterogeneity into account, a strategy already adapted in other studies on job spells is followed (e.g. Boockmann / Steffes 2005; Jahn 2008) and data on individuals' employment history of the past five years preceding any relevant job spell in our multivariate analysis are used. This includes information on the frequency and length of employment and unemployment spells during these years. It is expected that employment history is highly correlated with unobserved characteristics such as abilities, motivation, and career orientation of individuals. Disregarding this information should lead to an overestimation of negative duration dependence, or an underestimation of positive duration dependence, respectively.

Furthermore, two duration models are used that allow us to estimate size and direction of duration dependence – a parametric Weibull model, and a piecewise constant proportional hazards model. Hazard rates are not constant over time, but vary with the duration of the spell, so there is *duration dependence*. The pattern of duration dependence for the two exits yields important information. From empirical studies of job spells it is well known that hazard rates, regardless of the specified exit, tend to fall over time, so there is negative duration dependence (Farber 1999), and this pattern also appears in our spell sample (see below). However, this is not necessarily "true" (or genuine) negative duration dependence[19], which would imply that exit probabilities of individuals decrease over time, but this may also be due to worker heterogeneity: individuals with high exit probabilities tend to leave the sample more quickly than those with low exit probabilities, thus the share of the latter increases over time. In the case of transitions to higher-wage jobs, well-motivated, highly skilled individuals are likely to make this transition earlier than individuals with "unfavourable" characteristics, so the latter make up a growing part of the sample over time (Stewart / Swaffield 1999). Regarding the exit to unemployment, persons with "unfavourable" characteristics tend to make this transition earlier, and the "better" individuals with low exit probabilities tend to remain longer in the sample. In both cases, the spell sample displays falling hazard rates, although *individual* exit probabilities need not necessarily decrease, which would be "true" duration dependence. In the present case, the identification of the extent of "true" dependence is

[19] The terms "state dependence" and "duration dependence" are sometimes used interchangeably (e.g. by Heckman 1991), although they are not completely synonymous. Duration dependence implies that the length of time spent in a particular state influences the exit probability, whereas state dependence means that being in a particular state influences the exit probability, regardless of the time spent in this state. See Cappellari et al. (2007). However it is reasonable to assume that negative duration dependence is associated with negative state dependence, and vice versa.

of interest, because it provides further information on the question whether low-wage jobs serve as a bridge or a trap.

Considering the pattern for exits to higher-wage jobs, it is shown that "true" negative duration dependence would contradict the "bridge" argument, because if upward mobility is mainly based on the acquisition or re-activation of human capital over time, its probability should *increase* with spell length. However, if discouragement and persistence effects prevail over time, negative duration dependence would be seen.

For exits to unemployment, positive duration dependence is to be expected at the beginning of spells; this however is a general feature of job spells, regardless of the wage level, and can be explained by the fact that match quality for a new job match is uncertain at the beginning. As job duration increases, both employers and workers obtain more information on match quality. So the exit probability rises in the first months as matches with low quality are terminated (Jovanovic 1979).

Furthermore, it is expected that for exits to unemployment duration patterns at the beginning should be different in Germany and Austria. In Germany, there is a legal probationary period at the beginning of a new employment relationship, which usually lasts six months. During this time both parties can terminate the contract at will. After that period, the legal dismissal protection applies, which makes layoffs more difficult and costly for the employer. Therefore, exits should be more frequent in the first half year, and decline thereafter. This pattern should be less pronounced in Austria, where the probationary period is shorter (usually one month), and employment protection is less strict afterwards. However, small firms in Germany with fewer than 5 or 10 employees, respectively, are (or were) exempt from legal dismissal protection laws[20], so duration patterns for small firms should be more similar between both countries.

It is again interesting to analyse whether in case of exiting into unemployment hump-shaped hazard rates really reflect true negative duration dependence. This would suggest that low wage jobs at least partly favour employment integration.

7. Descriptive evidence on low-wage employment dynamics

In a first step, the low-wage incidence of our target group is investigated in a cross-sectional perspective (see *Figures 1 and 2)*. The ratio of low-paid men, as a percentage of all West German men aged 25-54 and working full time, has risen continuously from 4.2%, in 1990, to 9% in 2004[21]. In Austria the ratio of low paid men rose from 4% in 1998 to 5% in 2006. But the underlying low-wage threshold in Austria is lower than in Germany: in Austria monthly earnings equivalent to the low-wage threshold amount to 1,380 € in 2001, compared with 1,710 € in Germany. In spite of a similar GDP per capita (25,700 € in Germany and 26,400 € in Austria in the year 2001[22]), median wages (and thus also the low wage threshold) show considerable differences.

[20] The threshold for the legal title to dismissal protection has been changed several times since the 90s: From 1996 to 1998, and again since 2004, firms with fewer than 11 employees were (or are) exempt. Between 1999 and 2003, the threshold was lowered to companies employing 6 employees (in full-time equivalents).

[21] Note that the low-wage threshold (two thirds of the median wage) is calculated on the basis of all dependent full-time workers (men and women) aged 18-60 in West Germany, and Austria, respectively.

[22] Values that control for purchasing power parities widen the gap between Austria and Germany slightly.

Tables 1 and 2 give a broad overview of the aggregate dynamics of low-paid employment in both countries. The tables show pooled year-to-year transition rates between low-paid and better-paid employment and unemployment. They include men aged 25-54 observed in two consecutive years, on November 1st, as either unemployed or full-time employed. In the latter case low-wage and higher-wage employment is shown separately.

The numbers illustrate a considerable degree of low wage persistence and similar findings for Austria and Germany: of those low-wage earners in year *t*, more than two thirds (69.8% in Austria, 67.4% in Germany) remain in low-wage employment one year later, whereas only 20.2% of them are found in higher-wage employment in Germany, and 19.6% in Austria. We also find evidence for a low wage-no wage cycle: of the low-wage earners in year *t*, 12.9% are unemployed in *(t+1)* in Germany and 12.0% in Austria, so they face a much higher (unconditional) risk of unemployment than those in higher-wage employment (Germany 2%, Austria 3.1%). However, low-wage earners in *t* have a clearly higher probability of being in employment in the consecutive year, compared to the unemployed. This holds for both countries.

When looking at the unemployed in year *t* in Germany, a higher probability to move to higher-wage jobs (12.9%) than to low-wage jobs (7.8%) is evident; but this does not contradict the existence of a low wage-no wage cycle, since almost 93% of full-time employed men during the period 1998-2004 were in better-paid jobs (see Figure 1). These results are even more pronounced in Austria: 26.9% of unemployed men had a higher-wage job the next year, whereas only 10.6% are found in a full-time low-wage job.

Despite many similarities, one important difference between Germany and Austria can be observed: In Germany, low-paid persons are more likely to have high-wage jobs in the consecutive year (20.2%) than unemployed persons(12.9%). This is *not* the case in Austria. So, for an unemployed Austrian it seems to be a good strategy to decline a low-wage job offer and wait for a better-paid job. However, this conclusion may be misleading, as all the transition probabilities displayed in Tables 1 and 2 are *unconditional* probabilities, not taking into account individual heterogeneity.

Another aspect to be turned to is the spell sample resulting from inflows into low-wage employment out of unemployment. As shown in *Table 3,* in Germany more than 76% of all males had only one spell in the period under investigation, whereas in Austria more than half of all males in the sample had two or more spells during that time. So a low pay-no pay cycle seems to play a greater role in Austria.

Table 4 provides some more information regarding the characteristics of people in low-wage jobs. Younger males aged 25-34 are found most frequently, making up between 40 and 50% of the spell sample. *Low-skilled* males make up 24% of all inflows in Germany, and even 34.8% in Austria, which means that they are clearly over-represented in the sample[23]. Medium-skilled persons constitute the bulk of all inflows in the sample, whereas high-skilled persons are only a small minority in the sample. With regard to skill level, "low" refers to at most a lower secondary degree. "Medium" corresponds to a completed vocational training, mostly in the dual apprenticeship system that is prevalent in both countries, whereas "high" corresponds to a university degree, also including "Fachhochschulen"

[23] Of all employed men aged 25-54, only 11% (Germany), and 13% (Austria) were low skilled, according to the Eurostat Labour Force Survey (figures for 2001).

(universities of applied sciences). Unfortunately, the German data contain a relatively high share of males with unknown formal education level[24]. However, this share could be reduced to 3.8% by applying an imputation procedure developed for the education variable in the IABS (Fitzenberger et al. 2005).

Not surprisingly, low-wage jobs are more likely in small and medium-sized firms, particularly in Austria. As to the sectoral distribution, the high share of hotels and restaurants (almost 22%) in Austria stands out, reflecting the great importance of tourism-related activities for this country. Even more salient is the fact that, in Germany, one quarter of all low-wage jobs were offered by temporary work agencies, while temp work played only a minor role for higher-wage spells in Germany (Table 5), as well as for both types of spells in Austria. This is probably due to stricter employment protection rules in Germany. In general, higher-wage jobs also correlated with higher skill levels and were more likely to be found in larger firms, as can be seen from a comparison between Tables 4 and 5.

Tables 6 and 7 provide information on the exits of low-wage spells in absolute numbers as well as in percentages that can be interpreted as exit probabilities. The first two rows contain aggregate numbers. Of the 52,805 spells for West Germany, 43.54% ended in unemployed again, compared to only 18.8% who finally crossed the low-wage threshold. In Austria, even 55.5% were registered as unemployed afterwards, and only 17.9% took up a full-time job with higher wages. This again seems to confirm the very existence of a low wage-no wage cycle. 29.6% of all exits in Germany are classified as "other" (see above), which figure is higher than in Austria (23.7%). Only a small minority of the low-wage spells persisted up to the end of the sample period (8.2% in Germany, 2.9% in Austria).

Tables 6 and 7 also present a breakdown of the spells according to skill level and age. Taking the human capital theory, we expect that higher-skilled persons have better chances to end up in higher-wage employment. This expectation is confirmed in both countries (see column 2), whereas such persons' risk to return to unemployment is lower (see first column).

When looking at different age groups, exit probabilities to higher-paid jobs decrease with age. This is in line with the well-known fact that age-earnings profiles are clearly steeper for the younger. Exit rates to unemployment tend to rise slightly with age, which is surprising, since previous studies on job durations (e.g. Wolff 2004) have shown that job spells of young workers end up in unemployment more often. This indicates that dynamics among low-wage earners are different.

In Tables 8 and 9 we present additional information on the mean duration (measured in weeks) of low-wage spells ending in unemployment, and in higher-paid employment, respectively. In Germany, the mean duration of spells ending in unemployment was 38.3 weeks, considerably shorter than for spells ending in better-paid employment (49.4).[25] For both groups, mean durations in Austria were shorter, reflecting higher labour turnover in Austria. When looking at the breakdown according to levels of education, there are only small differences in durations with regard to spells ending in unemployment, but spells

[24] This is due to the fact that the IABS data are not provided by the employees themselves but by the employers, who do not always possess reliable information on the formal educational levels of each of their employees, especially in the case of non-German workers.

[25] For those who managed to cross the low-wage threshold, the durations of these subsequent better-paid employment spells were analysed. The mean durations of these spells are fairly long (110 weeks). This suggests that upward wage mobility leads to a higher employment stability.

ending in higher-wage employment are considerably shorter for the higher skilled in both countries, as one would expect. With regard to age, no major differences in mean durations can be found between the three age groups.

As mentioned above, the descriptive results seem to confirm the relevance of a low wage-no wage cycle. The share of workers returning to unemployment is much higher than the share of those finding higher wage employment and the share of those persisting in low-wage jobs (right censored spells).

The results for higher-wage spells, presented in *Tables 10 and 11*, are not immediately comparable to those for low-wage spells described before, because the exit destinations are defined differently: while a considerable share of low-wage spells ends in higher-wage employment, transitions from higher wage employment into low-wage (full-time) employment are marginal. Low-wage spells may end in higher-wage employment when wages rise sufficiently, whereas higher-wage spells merely continue. Therefore, high-wage spells are observed, on average, for a longer time-period, and thus the probability of observing unemployment as a destination of an ending spell should be higher for higher-wage spells than for low-wage spells.

Nevertheless, it comes as a surprise that, compared to low-wage spells, even more high-wage spells end in unemployment again (50.2% in West Germany, 72.1% in Austria). Again, the data for Austria show a higher fluctuation: this general observation is confirmed not only by the higher transition rates to unemployment, but also the lower share of right-censored spells. Additionally, longer mean durations of higher-wage spells returning to unemployment in Germany than in Austria are observed.

To get more insight into the transitions, a look at the baseline hazard rates is useful. Figures 3 and 4 plot baseline hazard rates for transitions from low-wage into higher-wage employment. The shape of the functions graph is similar in both countries: they decline over time, so the conditional probability of obtaining a better-paid job decreases over time. As to transitions from low-wage jobs to unemployment (Figures 5 and 6), hazard rates first increase, possibly resulting from separations because job matches turned out to be poor. Then, still before the end of the first year (= 52 weeks), hazard rates start to decline. Although the shape of the functions is similar in both countries, hazard rates are higher in Austria, especially in the first year and a half, reflecting higher low pay-no pay mobility. Figures 7 and 8 display hazard rates from higher- wage employment to unemployment. The hazards resemble those in Figures 5 and 6, but at a lower level, meaning that conditional probabilities of falling back into unemployment are lower for better-paid persons than for low-paid persons. But again the level of the hazard rates in Austria is higher.

8. Econometric method and results

In this section low-wage spells started out of unemployment are analysed in more depth with the duration analysis in a multivariate setting. Since the measurement unit in both data sets is days, we can apply duration models that allow for continuous time. Models with the exits "unemployment" and "higher wage" as independent competing risks are used. For this purpose a single-spell sample has been created: if a male had more than one low-wage spell between 1998 and 2003(2004), one spell was selected at random. The competing risk model implies that all other exits, such as part-time work or inactivity, are

considered as censored. Three different models were estimated: first, a semi-parametric proportional hazard model to estimate the influence of various co-variates on exit behaviour; second, a parametric Weibull model, and third, a piecewise constant exponential model. The latter two models have the advantage that they allow to directly estimate the extent of duration dependence. However, the Weibull model is based on relatively strong assumptions concerning the shape of the duration function that are not easily justified in our context. The piecewise constant model is more flexible in this regard, since it allows for the hazard rate to vary between specified time periods, but assumes that hazards are constant within each period[26]. The hazard rate is specified as follows:

$$r_{jk}(t) = exp\left\{\bar{\alpha}_l^{(jk)} + A^{(jk)}\alpha^{(jk)}\right\} \quad \text{if } t \in I_l$$

$\bar{\alpha}_l^{(jk)}$is a constant for each transition from status *j* to status *k*, associated with the time period l. $A^{(jk)}$is a row vector of co-variates, and $\alpha^{(jk)}$ is an associated vector of coefficients assumed not to vary between periods[27]. For the present analysis six months were chosen as time interval for each period. This is justified by the fact that many contracts end (or are renewed) after six, twelve, or eighteen months, given legal periods of notice and/or usual time periods for fixed-term contracts.

It should be mentioned that the results were similar between the three models as regards the sign and size of coefficients for the co-variates. Therefore, only the estimation results for the piecewise constant model (see Tables 12 and 13) are given.

Transition to higher wage jobs

The estimation results for transitions into higher-paid jobs can be found in column (1) of Tables 12 (Germany) and 13 (Austria). The coefficients for personal characteristics are displayed first. Contrary to expectations, being foreign does not affect upward mobility negatively; just on the contrary, coefficients are even significantly positive for EU-15-foreigners in Germany, and Non-EU-15-foreigners in Austria, although the effect is modest. In both countries, the younger age groups and the better skilled realise faster transitions to higher-paid jobs. This is in line with expectations and confirms the results of the descriptive analysis.

The coefficients for sectors are listed next. Compared to the manufacturing sector, which serves as a reference category, upward mobility is significantly lower in hotels and restaurants. This can be explained by the fact that the average duration of employment spells is relatively short in this sector, due to high seasonal variations. Therefore, the chance for a transition into higher wage is small, compared to other industries. The same applies to the primary sector.

Compared to manufacturing, upward mobility is higher in the construction sector and, most notably, for temp agency workers: it must be remembered that they make up a quarter of all low-wage spells in Germany. This may come as a surprise, as temp agency workers are mostly paid lower wages, and these wages are usually pre-defined and fixed for the time the respective employees work in a given employing firm. Nevertheless, they

[26] For the Weibull and the piecewise constant model graphs of pseudoresiduals were plotted, indicating that the piecewise constant model yields the better "fit". However, such plots should not be understood as goodness-of-fit tests in a strict sense, but only provide hints for model selection (Blossfeld / Rohwer 2002).

[27] This description of the model follows Blossfeld /Rohwer (2002), pp.120-121.

may be paid higher wages either by changing the employing firm or by receiving a contract from the actual employing firm. The sample investigated does not allow for a more detailed analysis of that issue, in any case however, this evidence deserves further attention. At this point, it should also be noted that the risk of falling back into unemployment is also higher for temp agency workers (column (2)).

With regard to firm size, the results show that smaller firms provide smaller chances to leave a low-wage job for a higher-wage job in both countries, as expected. By contrast, firm age only plays a minor role for upward mobility, and the effect is only significant in Austria[28]. So the expectation that young firms with high labour turnover offer fewer promotion chances is not confirmed.

Beside sector, firm size, and age, average earnings within the firm are of importance – there are typical "low-wage firms" with low average wages which offer fewer better-paid jobs. As expected, upward mobility is less pronounced when spells are started in such firms, and this effect is highly significant in both countries. Moreover, promotion chances may depend not only on average wages, but also on the wage dispersion within the firm. We cannot observe this dispersion directly in both data sets, so we use the share of low-skilled workers, who usually earn less, as a proxy. Conditional on average wages, we could expect that a higher share of low-skilled workers is associated with higher wage dispersion, and, as a consequence, better chances of transitions to higher pay, which indeed is the case in Germany, but not in Austria.

Furthermore, we have included the distance of the individual wage at the beginning of the spell from the low-wage threshold. It is obvious that crossing the threshold is easier and realised more quickly, if the wage is only slightly below that threshold. This is confirmed for both countries by the highly significant coefficient with the expected negative sign.

As mentioned earlier, information on the individual employment history prior to the job spell is also included. The results are also shown in Tables 12 and 13. To sum up, less attachment to employment in the three years preceding the low-wage job is associated with less pronounced upward mobility. One should, however, refrain from interpreting these coefficients as causal effects, since they are likely to be correlated with unobserved individual characteristics, but it is useful to include them in order to take unobserved heterogeneity into account. Nevertheless, the dummy variable for recalls deserves special attention. It must be remembered that 16% of all spells in Germany, and 33% in Austria, are recalls, i.e. low-wage earners are employed by the same firm repeatedly. In both countries the coefficient is clearly negative, meaning that recalled low-wage workers are less likely to get better-paid jobs. A plausible explanation for this is that they are hired, laid off, and hired again by firms with fluctuating labour demand, and each time they fulfil the same task within these firms. This constitutes a special variant of a low pay-no pay cycle, which is likely to be based on a mutual implicit agreement between employer and worker, so unemployment is endogenous in this case.

Transition to unemployment

The transition to unemployment is analysed not only for low-wage spells (column 2 of Tables 12 and 13), but also for the higher wage sample (column 3).

[28] Note that for Austria significance levels are often higher and standard errors are lower than for Germany, also because the Austrian sample is larger than the German one.

The results show that being foreign has only a weak influence on the risk of falling back into unemployment for both groups of workers in both countries. In Austria non-EU foreigners have a somewhat lower risk of falling back into unemployment. This result may reflect the importance of seasonal migration behaviour created by the demand for unskilled workers in tourism as well as the construction industry.[29] Interestingly, foreigners from EU-15 countries experience a higher transition rate into unemployment in Austria.

With regard to age, the descriptive evidence has shown that older low-wage workers run a higher risk of returning to unemployment. This result is not confirmed in the multivariate analysis, at least for Germany. In Austria the age-specific coefficients are significant, but the size of the effect is only minor. The age effect is more pronounced for higher-wage workers in both countries. The same applies to the skill level – the effect is a bit more pronounced in the case of better-paid workers.

As to sector-specific effects, we would expect a reversal of sign when comparing transitions to higher wage and to unemployment. This is indeed the case in many sectors, as for example in the primary sector, or in hotels and restaurants, where low-wage workers in both countries show a less pronounced upward mobility (column 1) and a higher risk of returning to unemployment, compared to the reference category (manufacturing). However, the construction sector and temp work agencies are exceptions to this rule: low-wage workers have higher transition rates to unemployment, but also to better-paid jobs. This indicates a marked dualism in both sectors: many workers either move up to better payment or get unemployed again, but relatively few persist in low-wage jobs.

The effect of firm size on transitions in both countries is as expected: the smaller the firm, the higher the exit risk to unemployment. This effect is even more pronounced for higher-wage workers. By contrast, firm age plays only a minor role.

As to the role of the previous employment history, again the influence of recalls is focussed on. Being a recalled worker increases the transition probability to unemployment by roughly one quarter. This seems to confirm the conclusion drawn above regarding this special kind of low pay-no pay cycle for recalled workers. However, the effect is even stronger in the case of better-paid workers, so this does not seem to be a specific characteristic of low-wage workers.

Taken the above-mentioned characteristics together, the coefficients for low-paid and for high-paid workers mostly have the same sign and are similar in magnitude, suggesting that the employment dynamics of the two groups are comparable.

The role of unobserved heterogeneity

As already mentioned, the data on the individual employment history are included in the empirical model thus taking unobserved heterogeneity into account. One may ask whether the data included are sufficient for unbiased results for the other variables and for the influence of duration dependence (see below).Any insufficiency may be difficult to rule out, yet at least can be verified by running a so-called frailty model, assuming a gamma-distributed unobserved heterogeneity (cf. Blossfeld / Rohwer 2002, chapter 10). This was done for the estimations presented in Table 12. The results were very similar to the

[29] In this respect, the higher risk to exit low-wage jobs into "other" positions (including leaving the Austrian labour market) has to be noted.

previous estimations, and the estimate for the variance of the mixing gamma distribution that should indicate the presence of unobserved heterogeneity was insignificant in all cases.

Duration dependence

As previously discussed, in particular for policy implications, it is important to estimate the effects of duration dependence. In the piecewise constant exponential model, this information is provided by the baseline hazards. If the coefficients decrease (increase) significantly with spell length, the duration dependence is negative (positive).

The coefficients for the baseline hazards are displayed at the bottom of Tables 12 and 13. As to transitions to higher wage (column 1), coefficients tend to decrease from the second period (6-12 months) to the last period displayed here (30-36 months); this points to negative duration dependence; however, in the German sample, standard errors are too high to reject the hypothesis that there is no true duration dependence, and that decreasing transition rates to higher wage employment are mainly due to sorting effects.

The comparison of the estimates obtained for transition probabilities into unemployment depending on the wage level (columns 2 and 3) also reveals interesting results. Here, there is evidence for negative duration dependence for low-wage as well as for higher-wage workers in both countries, indicating that the risk of failure decreases with time. This suggests that even low-wage workers can accumulate job-related human capital over time protecting them from being dismissed again. The effect is particularly strong after 12, and 24 months, suggesting that each additional year spent in employment reduces the risk of falling back into unemployment considerably.

9. Conclusions

Can low-wage jobs for the unemployed provide a bridge to better-paid jobs or at least stable employment integration? This question was investigated, using German and Austrian data sets that provide very accurate information on past labour market experiences as well as the duration of current low wage jobs.

On an aggregate level, low-wage persistence is shown to exist on a great scale. At the same time, low-wage earners face higher risks of being trapped in a low pay–no pay cycle, since the chances of being unemployed in the consecutive year are much higher for people in low-wage jobs. However, low-wage jobs still seem to offer better labour market prospects compared to being unemployed. These results are similar for both countries, and are in line with those for other European countries.

The descriptive evidence shows that a high share of low-wage spells started out of unemployment end in unemployment again. This share is considerably higher in Austria than in Germany, pointing at the high labour turnover in this country. This also applies to fluctuations between unemployment and higher-wage employment. The importance of industries with highly seasonal employment patterns as well as the frequent utilisation of temporary lay-offs that appear in the unemployment register may be factors explaining this difference. So the better overall labour market situation in Austria did not favour more durable employment spells, nor higher upward mobility.

The baseline hazard of returning into unemployment is higher for low-wage spells than for higher-wage spells in both countries. Nevertheless, in the medium term, even more higher-wage spells end in unemployment. These findings seem to be contradictory, but can be explained by longer durations of higher-wage spells. All in all, there is no convincing evidence for a distinct *low* pay-no pay cycle, since movements between higher pay and no pay also seem to be of great relevance.

As to the determinants of upward mobility for low-wage earners, the multivariate duration model confirms the positive influence of being younger and better skilled, as expected. Moreover, sector, firm size, and average wages within a firm allow identifying typical "low-wage" firms offering poor promotion prospects. In this context, the results for temp agency workers are particularly surprising, especially for West Germany, where these workers make up one quarter of all inflows into low-wage jobs.

The coefficients for individual employment history show that less attachment to employment in the past is associated with less pronounced upward mobility; however, this should not be interpreted as a causal effect. As concerns duration dependence, no convincing evidence for "true" duration dependence is found, at least for Germany, so decreasing transition rates are mainly due to sorting effects.

The analysis of the transitions of low-wage and higher-wage workers to unemployment shows that the influence of personal and firm-related characteristics is often similar for both groups. Age, skill level, and nationality matter only to a limited degree, whereas firm-related characteristics (sector, firm size) play a greater role. The highly significant coefficients for recalls reveal that there is a special segment of workers frequently changing between employment and unemployment not limited to low-wage workers, and this kind of "cycle" is presumably often based on an implicit agreement between firm and worker. This is particularly important in Austria, given the high share of recalls among low-wage and higher-wage workers in this country. As to the influence of duration dependence, there is evidence that decreasing hazard rates to unemployment persist in the multivariate duration model for both groups of workers. This suggests that even low-wage workers can accumulate job-related human capital that favours employment integration over time.

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Appendix: Tables and figures

Table 1: Year-to-year transitions of males aged 25-54 between unemployment and full-time employment, pooled data for 1998-2004 (West Germany)

	Status in year (t+1)			
	Higher wage	Low wage	Unemployment	Total
Status in year (t)				
Higher wage	96.6	1.2	2.3	100.0
Low wage	20.2	67.4	12.4	100.0
Unemployment	12.9	7.8	79.3	100.0
Total	84.9	5.7	9.4	100.0

Total number of observations: 1,023,569. Figures in each cell are percentage shares.
Source: Authors' calculations, based on IABS.

Table 2: Year-to-year transitions of males aged 25-54 between unemployment and full-time employment, pooled data for 1998-2003 (Austria)

	Status in (t+1)			
	Higher wage	Low wage	Unemployment	Total
Status in year (t)				
Higher wage	95.9	1.2	3.0	100.0
Low wage	19.6	69.8	10.6	100.0
Unemployment	26.9	10.6	62.5	100.0
Total	86.6	6.0	7.4	100.0

Total number of observations: 6,662,637. Figures in each cell are percentage shares.
Source: Authors' calculations, based on WIFO INDI-DV.

Table 3: Number of low wage spells per male, started out of unemployment between 1998-2004 (West Germany) and 1998-2003 (Austria)

	West Germany	**Austria**
1 spell	76.1	46.5
2 spells	16.9	23.5
3 spells	4.5	12.1
4 or more spells	2.5	17.9

Total number of spells: 24,160 (Germany); 160,483 (Austria);
Total number of males: 17,876 (Germany); 74,777 (Austria)

Table 4: Characteristics of low-wage spells

Numbers are percentage shares of total number of spells

	West Germany	Austria
Age		
25-34	47.5	41.7
35-44	33.9	35.9
45-54	18.6	22.5
Skill level		
low	24.0	34.8
medium	71.1	59.8
high	1.1	5.5
unknown	3.8	0.0
Nationality		
native	82.2	78.8
foreign EU-15	3.8	1.4
foreign non-EU-15	14.0	19.8
Size of firm (no. of employees) where spell started		
<6	19.7	34.5
6 - 10	10.8	14.8
11 – 25	15.2	16.7
26 – 100	27.9	18.7
101 – 250	13.7	7.7
> 250	8.0	6.6
unknowns	4.6	0.0
Sector where spell started		
Primary	5.0	5.4
Manufacturing	13.8	9.7
Mining, energy supply	0.2	0.2
Construction	10.5	11.3
Trade	12.2	15.4
Hotels and restaurants	8.1	21.9
Transport, storage and communication	9.6	12.2
Finance and insurance	0.3	1.0
Real estate, renting and business act.	10.8	9.2
personal services etc.	4.0	8.0
Temp work agencies	25.0	3.4
Other or unknown	0.5	2.5
Recall*		
Yes	15.9	33.1
No	84.1	66.9

Total number of spells: 24,160 (Germany); 160,483 (Austria)

* Recall = Person in low wage job had been employed by the same firm in the past.

Table 5: Characteristics of higher-wage spells

Numbers are percentage shares of total number of spells

	West Germany	Austria
Age		
25-34	40.6	40.2
35-44	37.0	37.0
45-54	22.4	22.8
Skill level		
Low	10.5	23.3
Medium	81.9	71.3
High	6.1	5.4
unknown	1.5	0.0
Nationality		
Native	90.6	83.3
foreign EU-15	2.4	1.0
foreign non-EU-15	7.1	15.8
Size of firm (no. of employees) where spell started		
<6	16.5	13.1
6 – 10	13.9	12.8
11 – 25	21.3	20.6
26 – 100	24.9	27.9
101 – 250	9.8	12.3
> 250	11.4	13.3
unknown	2.4	0.0
Sector where spell started		
Primary	3.5	1.8
Manufacturing	28.1	14.4
Mining, energy supply	0.6	1.1
Construction	31.9	43.4
Trade	11.7	9.7
Hotels and restaurants	1.9	9.0
Transport, storage and communication	8.1	7.4
Finance and insurance	0.9	0.5
Real estate, renting and business act.	8.4	4.7
personal services etc.	2.2	1.8
Temp work agencies	2.7	2.5
Other or unknown	0.3	4.1
Recall*		
Yes	20.7	57.0
No	79.3	43.0

Total number of spells: 52,805 (Germany); 828,480 (Austria)

* Recall = Person in higher wage job had been employed by the same firm in the past.

Table 6: Exits of low-wage spells (West Germany)

Numbers are percentage shares of total number of spells in each row

	Exits				
	Unemployment	**Higher Wage**	**Other**	**Right censored**	**Total**
All	43.5	18.8	29.6	8.2	100.0
Skill level					
Low	45.5	14.6	31.6	8.3	100.0
Medium	42.7	20.5	29.0	7.8	100.0
High	33.5	28.2	24.4	13.9	100.0
Age					
25-34	41.6	20.3	30.9	7.2	100.0
35-44	44.3	18.6	28.5	8.6	100.0
45-54	47.0	15.0	28.0	10.9	100.0

Source: Authors' calculations, based on IABS.

Table 7: Exits of low-wage spells (Austria)

Numbers are percentage shares of total number of spells in each row

	Exits				
	Unemployment	**Higher Wage**	**Other**	**Right censored**	**Total**
All	55.5	17.9	23.7	2.9	100.0
Skill level					
Low	54.2	16.7	26.2	2.9	100.0
Medium	56.9	18.2	22.1	2.8	100.0
High	48.3	23.0	25.0	3.7	100.0
Age					
25-34	51.4	20.8	25.6	2.3	100.0
35-44	56.7	17.0	23.2	3.1	100.0
45-54	61.3	14.2	20.8	3.7	100.0

Source: Authors' calculations, based on WIFO INDI-DV.

Table 8: Mean durations of low-wage spells (in weeks) (West Germany)

	Exits	
	Unemployment	**Higher Wage**
All	38.3	49.4
Skill Level		
Low	39.6	54.1
Medium	37.7	48.5
High	38.7	37.4
Age		
25-34	37.3	49.1
35-44	38.3	49.1
45-54	40.6	50.8

Source: Authors' calculations, based on IABS.

Table 9: Mean durations of low-wage spells (in weeks) (Austria)

	Exits	
	Unemployment	**Higher Wage**
All	32.7	39.9
Skill Level		
Low	33.2	37.6
Medium	32.3	40.3
High	34.0	47.4
Age		
25-34	32.1	39.6
35-44	32.8	39.6
45-54	33.6	41.4

Source: Authors' calculations, based on WIFO INDI-DV.

Table 10: Inflows into higher-wage jobs (above low-wage threshold) out of unemployment and destination state (West Germany)

	Exits				
	Unemployment	**Low Wage**	**Other**	**Right censored**	**Total**
All (as percentage of all spells)	50.2%	8.5%	21.9%	19.5%	100.0%
Median duration (in weeks)	57.2	85.1	-	-	-

Total number of spells: 52,805
Source: Authors' calculations, based on IABS. Mean durations are measured in weeks.

Table 11: Inflows into higher-wage jobs (above low-wage threshold) out of unemployment and destination state (Austria)

	Exits				
	Unemployment	**Low Wage**	**Other**	**Right censored**	**Total**
All (as percentage of all spells)	72.1%	2.8%	14.8%	10.3%	100.0%
Median duration (in weeks)	49.0	63.3	-	-	-

Total number of spells: 828,480
Source: Authors' calculations, based on IABS. Mean durations are measured in weeks.

Table 12: Piecewise constant exponential model, West Germany (continued on next page)

	Low wage spells		Higher-wage spells
	Exit: higher wage	**Exit: unemployment**	**Exit: unemployment**
Personal characteristics:	(1)	(2)	(3)
Foreign: EU 15	.189 (.095)*	-.105 (.073)	-.109 (.061) ‡
Foreign: Non-EU-15	-.021 (.056)	-.034 (040)	-.021 (.037)
Age 25-34	.366 (.051)**	.003 (.036)	-.202 (.025)**
Age 35-44	.243 (.054)**	.001 (.037)	-.084 (.024)**
Medium skill level	.253 (.047)**	-.041 (.032)	-.122 (.031)**
Higher skill level	.531 (.137)**	-.209 (.129)	-.278 (.054)**
Firm related characteristics:			
Primary sector	-.377 (.132)**	.378 (.065)**	.387 (.054)**
Mining, energy supply	-.364 (.580)	.733 (.253)**	.365 (.120)**
Construction	.167 (.076)*	.414 (.053)**	.484 (.026)**
Trade	-.034 (.062)	-.083 (.052)	-.091 (.033)**
Hotels and restaurants	-.348 (.110)**	.142 (.062)*	.365 (.069)**
Transport, storage and communication	-.039 (.067)	-.207 (.057)**	-.184 (.040)**
Finance and insurance	.229 (.293)	.310 (.239)	.008 (.104)
Real estate, renting and business activities	.054 (.068)	-.071 (.055)	-.003 (.039)
Personal and cultural services	-.133 (.107)	.054 (.072)	.146 (.064)*
Temporary work agencies	.516 (.060)**	.109 (.049)*	.144 (.061)*
Firm size: 1-5 employees	-.424 (.128)**	.319 (.121)**	.509 (.060)**
Firm size: 6-10 employees	-.346 (.130)**	.227 (.122) ‡	.463 (.060)**
Firm size: 11-25 employees	-.323 (.124)**	.247 (.120)*	.366 (.057)**
Firm size: 26-100 employees	-.180 (.118)	.177 (.117)	.203 (.056)**
Firm size: 101-250 employees	-.130 (.120)	.132 (.119)	.027 (.060)
Firm size: 251-1000 employees	-.214 (.128)	.180 (.125)	.005 (.062)
Firm age: < 1 year	.094 (.059)	.061 (.042)	-.061 (.038)
Firm age: 1-2 years	.088 (.064)	.068 (.047)	.014 (.042)

Table 12 (continued from previous page): Piecewise constant exponential model, West Germany

Average earnings per worker in firm	.017 (.001)**	.009 (.001)**	-.005 (.001)**
Share of low skilled employees in firm	.294 (.075)**	.117 (.054)**	.078 (.050)
Distance of individual wage from low wage threshold:	-.053 (.003)**	.013 (.002)**	.001 (.001)
Macro trend indicators:			
National unemployment rate in year of spell start	.145 (.025)**	-.081 (.020)**	-.208 (.013)**
National employment growth in year of spell start (as percentage change to previous year)	16.22 (1.32)**	-6.72 (1.00)**	-10.86 (.718)**
Controls for individual employment history before spell start:			
More than two unemployment spells within last three years (dummy)I	-.046 (.044)	.205 (.031)**	.463 (.024)**
No. of jobs within last 3 years: less than 2	-.150 (.061)*	-.160 (.046)**	-.264 (.033)**
No. of jobs within last 3 years: 2	-.138 (.059)*	-.161 (.045)**	-.176 (.032)**
No. of jobs within last 3 years: 3	-.084 (.063)	-.074 (.046)	-.039 (.031)
Cumulated duration of employment in year preceding spell start	-.019 (.007)**	-.001 (.006)	-.017 (.004)**
Cumulated duration of unemployment in year before last year preceding spell start	-.001 (.001)	.005 (.001)**	.008 (.001)**
No wage earnings in year preceding spell start (dummy)	.102 (.063)	-.062 (.045)	-.114 (.037)**
Total wage earnings in year preceding spell start	.000 (.000)**	-.000 (.000)	.000 (.000)
Recall (dummy)	-.406 (.067)**	.250 (.040)**	.281 (.024)**
Baseline hazards:			
0 - < 6 months	-7.660 (.297)**	-4.802 (.243)**	-3.276 (.152)**
6 - < 12 months	-7.330 (.297)**	-4.834 (.244)**	-2.744 (.153)**
12 - < 18 months	-7.845 (.300)**	-5.499 (.247)**	-3.880 (.155)**
18 - < 24 months	-7.758 (.301)**	-5.549 (.249)**	-3.556 (.155)**
24 - < 30 months	-8.038 (.306)**	-5.969 (.255)**	-4.333 (.160)**
30 - < 36 months	-8.096 (.310)**	-6.013 (.259)**	-4.104 (.159)**
No. of spells / No. of exits	15,374 / 3,347	15,374 / 5,923	30,282 / 11,945
Log likelihood	-9,277	-15,155	-31,525

Notes: Reference categories: German citizenship; age group 45-54; low skilled; manufacturing sector; firms with more than 1000 employees; firm age > 2 years; more than three jobs within last 3 years;. For further explanations, see main text. Significance levels: ‡: 10%, *: 5%, ** 1%. Standard errors in parentheses.

Table 13: Piecewise constant exponential model, Austria (continued on next page)

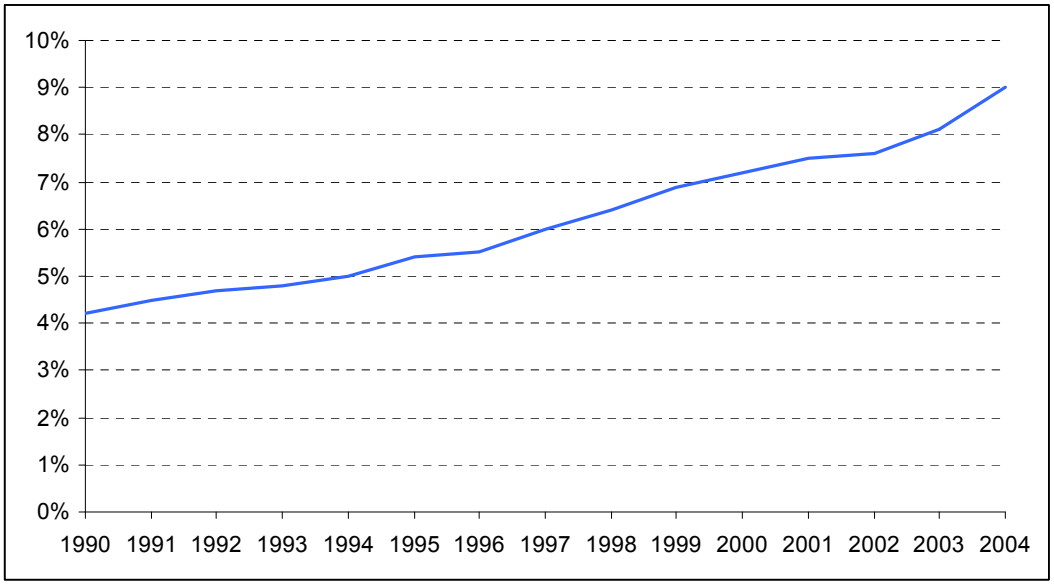
	Low wage spells		Higher-wage spells
	Exit: higher wage	**Exit: unemployment**	**Exit: unemployment**
Personal characteristics:	(1)	(2)	(3)
Foreign: EU 15	.082 (.068)	.158 (.045)**	.120 (.024)**
Foreign: Non-EU-15	.126 (.023)**	-.101 (.016)**	-.058 (.008)**
Age 25-34	.434 (.023)**	-.056 (.014)**	-.176 (.006)**
Age 35-44	.229 (.024)**	-.025 (.015) ‡	-.071 (.006)**
Medium skill level	.074 (.021)**	-.001 (.014)	.007 (.007)
Higher skill level	.192 (.033)**	-.123 (.026)**	-.211 (.012)**
Firm related characteristics:			
Primary sector	-.208 (.064)**	.436 (.030)**	.364 (.019)**
Mining, energy supply	.169 (.154)	.144 (.121)	.201 (.023)**
Construction	.213 (.034)**	.408 (.024)**	.540 (.007)**
Trade	-.014 (.027)	-.080 (.022)**	-.030 (.010)**
Hotels and restaurants	-.231 (.033)**	.216 (.022)**	.767 (.012)**
Transport, storage and communication	.189 (.031)**	.017 (.024)**	.059 (.011)**
Finance and insurance	.259 (.051)**	-.089 (.061)	-.325 (.036)**
Real estate, renting and business activities	.183 (.032)**	.102 (.025)**	.095 (.012)**
Personal and cultural services	-.058 (.038)	.316 (.025)**	.165 (.018)**
Temporary work agencies	.754 (.046)**	.717 (.036)**	.559 (.016)**
Firm size: 1-5 employees	-.257 (.032)**	.309 (.024)**	.524 (.010)**
Firm size: 6-10 employees	-.234 (.033)**	.214 (.025)**	.454 (.009)**
Firm size: 11-25 employees	-.141 (.030)**	.126 (.024)**	.377 (.008)**
Firm size: 26-100 employees	-.029 (.027)	.061 (.023)**	.267 (.008)**
Firm size: 101-250 employees	.051 (.031)	-.017 (.028)	.131 (.009)**
Firm age: < 1 year	.062 (.026)**	-.011 (.017)	.061 (.009)**
Firm age: 1-2 years	.082 (.031)**	.030 (.020)	.011 (.011)

Table 13 (continued from previous page): Piecewise constant exponential model, Austria

Median earnings per worker in firm	.015 (.001)**	.005 (.001)**	-.004 (.000)**
Share of low skilled employees in firm	-.065(.051)	.083 (.029)**	.393 (.018)**
Distance of individual wage from low wage threshold:	-.054 (.000)**	-.006 (.001)**	.000 (.000) ‡
Macro trend indicators:			
National unemployment rate in year of spell start	-.038 (.018)*	.161 (.012)**	.081 (.005)**
National employment growth in year of spell start (as percentage change to previous year)	.165 (.028)**	-.033 (.019)	-.012 (.008)
Controls for individual employment history before spell start:			
More than two unemployment spells within last three years (dummy)I	-.027 (.223)	.334 (.014)**	.371 (.006)**
No. of jobs within last 3 years: less than 2	-.175 (.043)**	-.246 (.029)**	-.321 (.021)**
No. of jobs within last 3 years: 2	-.197 (.021)**	-.333 (.016)**	-.442 (.007)**
No. of jobs within last 3 years: 3	-.060 (.021)**	-.199 (.015)**	-.241 (.007)**
Cumulated duration of employment in year preceding spell start	-.005 (.003)‡	-.007 (.002)**	-.012 (.001)**
Cumulated duration of unemployment in year before last year preceding spell start	-.004 (.001)**	.009 (.000)**	.012 (.000)**
No wage earnings in year preceding spell start (dummy)	.181 (.035)**	-.106 (.023)**	-.231 (.015)**
Total wage earnings in year preceding spell start	.000 (.000)**	-.000 (.000)**	-.000 (.000)**
Recall (dummy)	-.397 (.023)**	.269 (.014)**	.473 (.006)**
Baseline hazards:			
0 - < 6 months	-5.730 (.134)**	-5.956 (.095)**	-6.135 (.042)**
6 - < 12 months	-5.602 (.135)**	-5.533 (.095)**	-4.816 (.042)**
12 - < 18 months	-6.133 (.136)**	-6.586 (.097)**	-6.541 (.043)**
18 - < 24 months	-6.021 (.137)**	-6.720 (.099)**	-5.887 (.042)**
24 - < 30 months	-6.424 (.140)**	-7.055 (.102)**	-6.844 (.044)**
30 - < 36 months	-6.379 (.141)**	-7.087 (.103)**	-6.287 (.043)**
No. of spells / No. of exits	74,026 / 16,404	74,026 / 34017	331,318 / 187,882
Log likelihood	-46,537	-76,011	-364,023

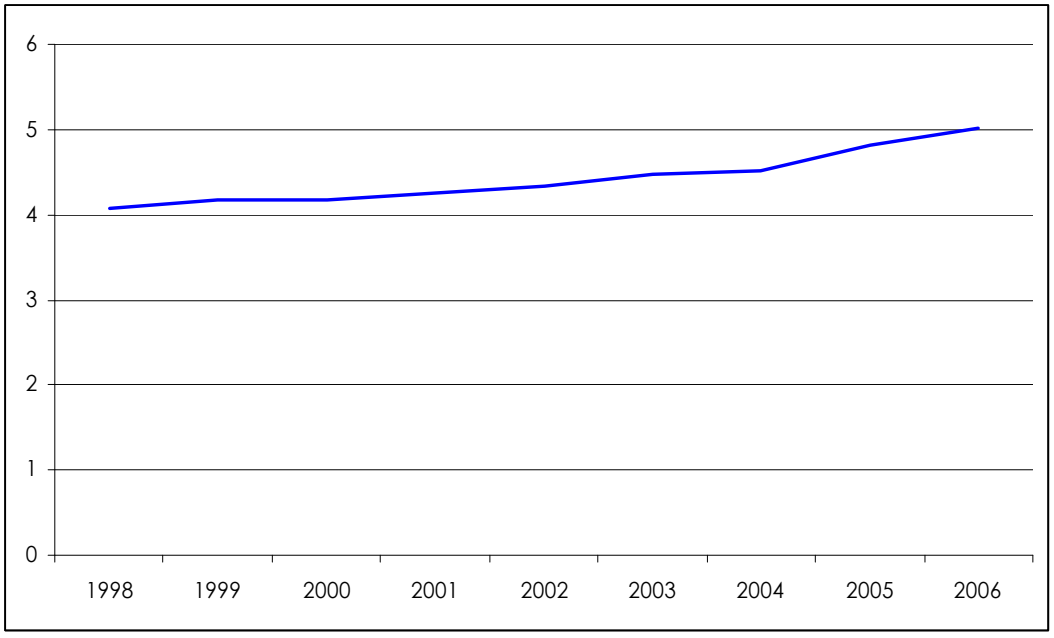
Notes: Reference categories: Austrian citizenship; age group 45-54; low skilled; manufacturing sector; firms with more than 250 employees; firm age > 2 years; more than three jobs within last 3 years;. For further explanations, see main text. Significance levels: ‡: 10%, *: 5%, ** 1%. Standard errors in parentheses.

Figure 1: Incidence of low-wage work for West German males aged 25-54 in full-time jobs liable to social security (apprentices excluded), 1990-2004



Source: Authors' calculations, based on IABS. The low-wage threshold is calculated as two thirds of the median wage of all full-time employees liable to social security (men and women) aged 18-60 and working in West Germany.

Figure 2: Incidence of low-wage work for Austrian males aged 25-54 in full-time jobs liable to social security, 1998-2006



Source: Authors' calculations, based on WIFO-INDI-DV. The low-wage threshold is calculated as two thirds of the median wage of all full-time employees liable to social security (men and women) aged 18-60 and working in Austria.

Figure 3: Baseline hazard function: transition rates from low wage into higher wage employment (West Germany, analysis time unit = weeks)

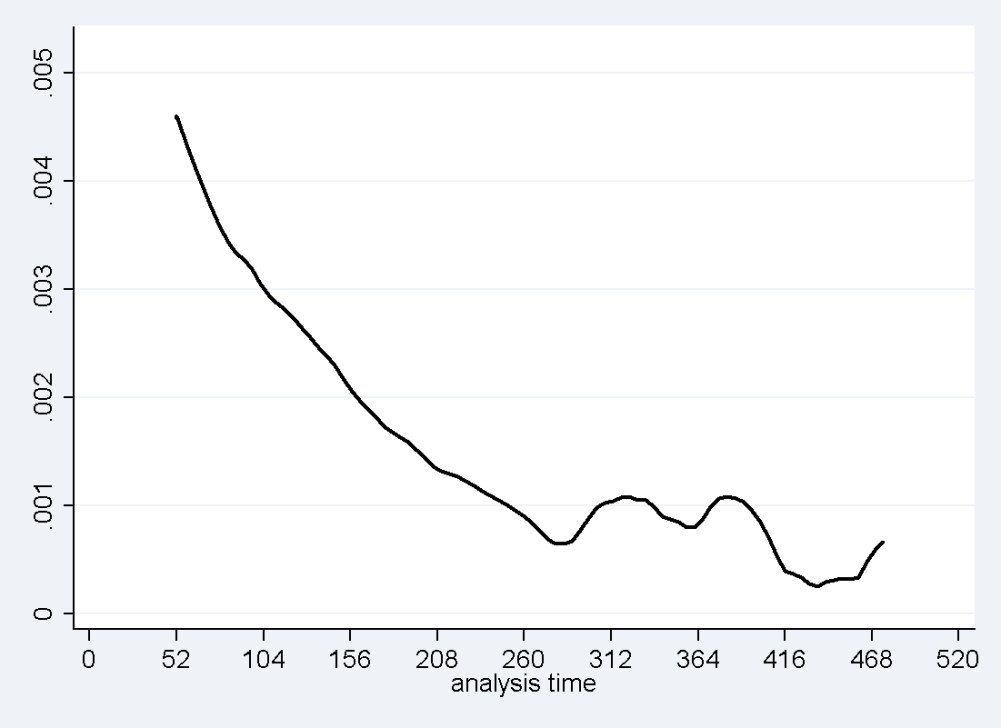


Figure 4: Baseline hazard function: transition rates from low wage into higher wage employment (Austria, analysis time unit = weeks)

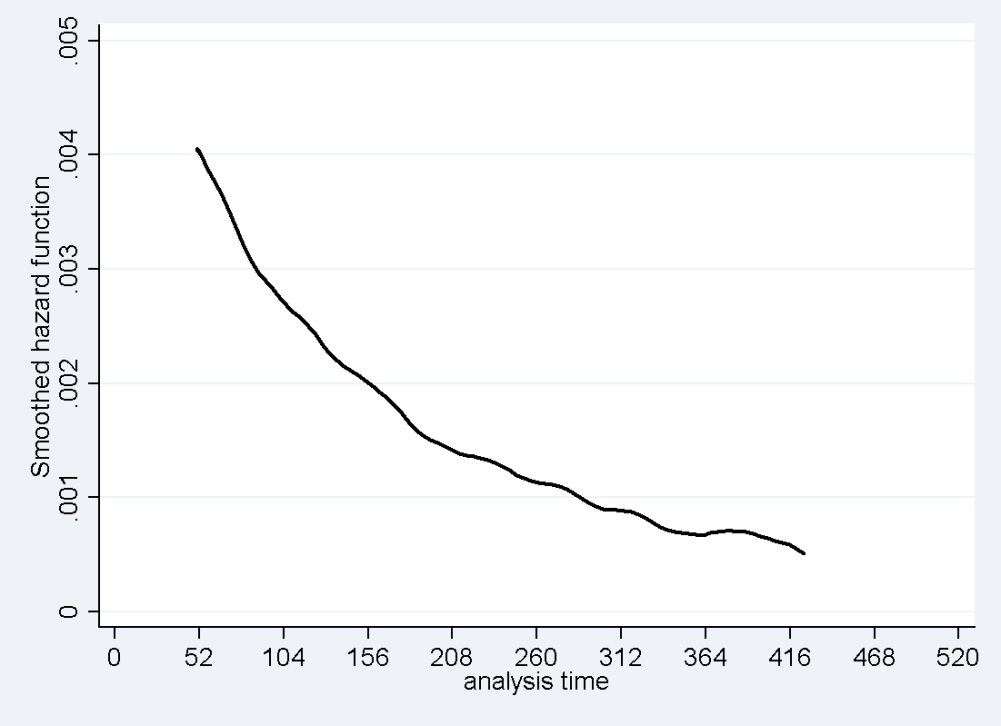


Figure 5: Baseline hazard function: transition rates from low wage employment into unemployment (West Germany, analysis time unit = weeks)

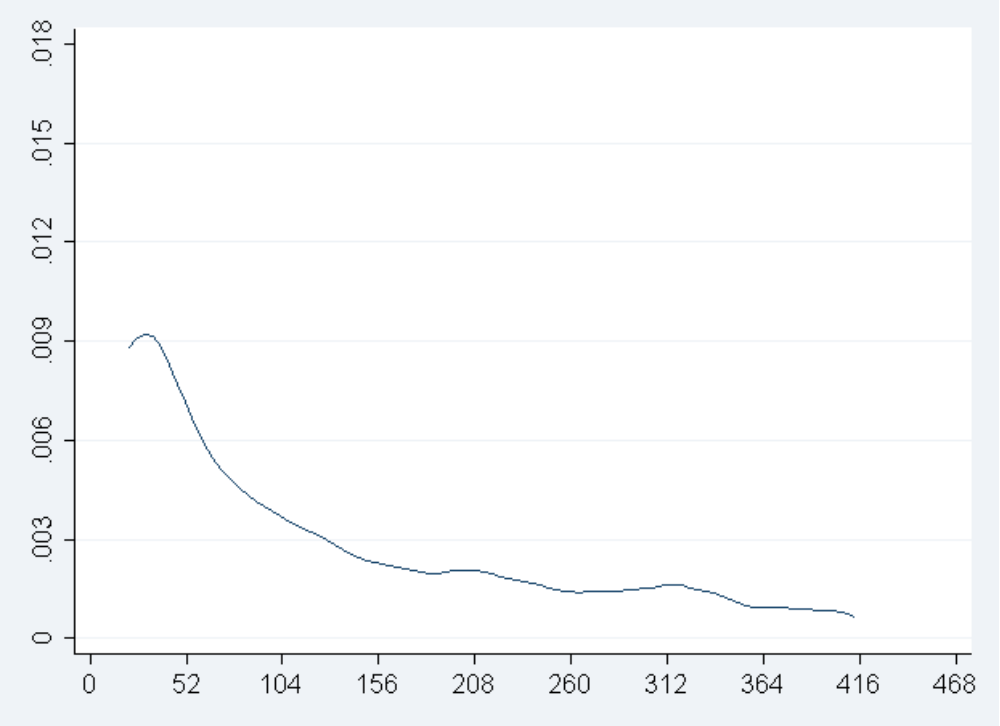


Figure 6: Baseline hazard function: transition rates from low wage employment into unemployment (Austria, analysis time unit = weeks)

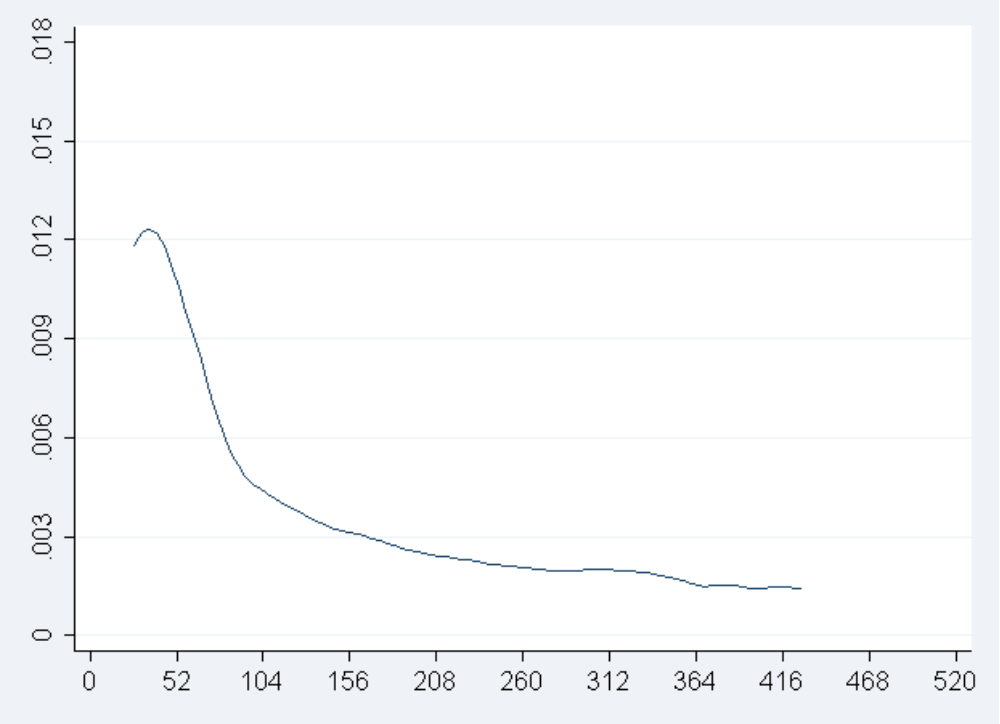


Figure 7: Baseline hazard function: transition rates from higher wage employment into unemployment (West Germany, analysis time unit = weeks)

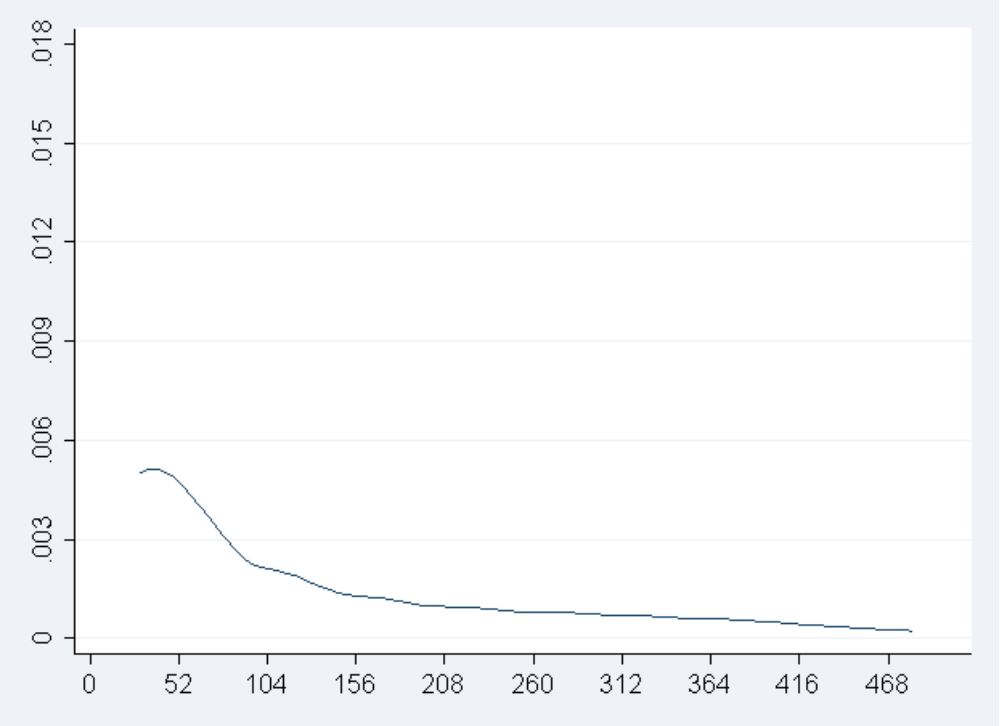


Figure 8: Baseline hazard function: transition rates from higher wage employment into unemployment (Austria, analysis time unit = week