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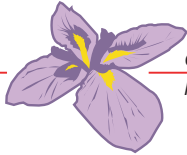
Escaping low pay: do male labour market entrants stand a chance?

by

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Dimitris Pavlopoulos* Didier Fouarge†

Abstract

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Keywords Low pay, labour market entry, duration model, human capital.

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1 Introduction

Over the past decades, the issue of the transition from education to work has gained increasing attention in the economic literature (Ryan, 2001). This is not without reason: in OECD countries, the youth unemployment rate increased from 12.3% to 13.4% between 1990 and 2004 (OECD, 2005), and the relative earnings of youths decreased by some 9 percentage points between the 1970s and the 1990s (OECD, 2006). Previous research on the school-to-work transition has scrutinized issues such as the labour force participation, the unemployment risk, the job and occupational mobility as well as the job quality of young job starters (Ryan, 2001; Hannan et al., 1997). Other studies have focused on the consequences of labour market entry in flexible jobs (Gangl, 2001; Scherer, 2004; de Grip and Wolbers, 2006). However, no research has been devoted to the wage and employment consequences of entering the labour market in a low-paid job. From an economic perspective this is an important issue: a short low-pay spell at the start of the career indicates temporary labour market adjustments, but long spells of low-pay employment reveal an imbalance between the supply and the demand of skills.

The aim of this paper is twofold: first, we investigate the low-wage mobility of male labour market entrants to higher pay, self-employment, unemployment and inactivity in a competing-risks setting.^[1] For this purpose, we apply a discrete-time duration model that accounts for unobserved heterogeneity (unobserved individual

differences in abilities). Low pay is defined as an hourly wage level below two-thirds of the median wage. Secondly, we assess the effect of two types of human capital – general and firm-specific human capital – on the low-wage mobility of labour market entrants. We investigate to what extent general skills acquired through education and formal vocational training, on the one hand, and skills acquired ‘on-the-job’, on the other hand, can account for low-pay mobility. The distinction between both types of skills is not trivial because economic theory suggests that a combination of a sorting explanation and a human capital explanation are relevant for the early careers of labour market entrants (Weiss, 1995). Employers have imperfect information on the productivity of labour market entrants. Therefore, as the sorting model would suggest, even highly-educated young workers may enter the labour market in a low-wage job. However, all workers can potentially acquire new skills. Thus, as the human capital model suggests, even the low-educated labour market entrants may invest in on-the-job training and earn a higher wage.

We use data from two countries with different institutional characteristics with respect to the school-to-work transition: the UK, which has a relatively weak link between education and the labour market, and Germany, which has a highly stratified educational and occupational system and a highly regulated labour market (de Grip and Wolbers, 2006). Our analysis is therefore illustrative of how various forms of human capital can account for low-pay mobility in different institutional settings.

The rest of the paper is organized as follows. Section 2 discusses the relationship between human capital and wage dynamics for labour market entrants. This section also discusses the role of institutional differences between the UK and Germany that could affect the school-to-work transition. In Section 3, the econometric model is described. The data used for the estimation is discussed in Section 4. Section 5 presents the results of the estimations. Conclusions are drawn in Section 6.

2 Human capital, sorting and labour market entry

Theoretical background

Information on the productivity of a worker is imperfect. Therefore, it is not possible for employers to accurately assess the productivity of newly hired employees. This is especially true in the case of school leavers, as they lack labour market experience. Although employers use educational attainment as a signal of their productivity (Spence, 1973), not all uncertainty can be immediately resolved. In such a case, the employer may offer an initial wage that is lower than the marginal productivity until additional information on abilities is revealed (Farber and Gibbons, 1996). This is usually linked to a probation period, which discourages workers with low unobserved abilities from applying for the job and can be used to ‘sort’ high-productivity

workers (Weiss, 1995; Wang and Weiss, 1998). Lange (2007) suggests that it takes an employer three years to resolve 50% of the initial uncertainty about the worker's productivity. During this period of uncertainty, a highly-skilled worker may be getting a low wage. After this period, the employer has gained more information on the worker's productivity, possibly leading to a wage increase for high-productivity workers. In fact, this wage increase may be quite large. Loh (1994) finds that wage growth in jobs with a probationary period is considerably higher than in jobs without probation. He suggests that on-the-job training is an important component of the probation period.^[2] In contrast, low-productivity labour market entrants will remain trapped in low pay or will be forced into unemployment or inactivity.

The aforementioned sorting explanation may seem plausible for a highly-educated worker who enters the labour market in a low-paid job. For low-skilled job starters, however, a human capital explanation seems more credible, as they may improve their general or firm-specific skills in the early stages of their careers, thus raising their wages.

Empirical studies, however, provide conflicting evidence as to the degree to which the sorting explanation and the human capital explanation can account for job mobility in different countries. Chevalier et al. (2004) suggest that there is little evidence in support of the sorting explanation in the UK, where job tenure is shown to be the main determinant of upward mobility (Gosling et al., 1997). In Germany,

apprenticeship plays a crucial role for the earnings progression of young workers (Harhoff and Kane, 1997; Ryan, 2001). These studies, however, are not specific to labour market entrants. While an assessment of the relevance of the sorting and the human capital model goes beyond the scope of this study^[3], we do combine and exploit the two models to identify the main predictors of low-pay mobility of school leavers, i.e. education as a measure of general human capital and training and tenure as measures of firm-specific human capital. In addition, as the sorting explanation points to the importance of unobserved (to the firm and to the researcher) ability and effort, these will also be accounted for in our panel data analysis.

The reward of human capital in the UK and Germany

The effect of human capital on low-pay mobility is investigated in two countries: the UK and Germany. These two countries were chosen as they differ considerably with respect to the institutions that regulate the school-to-work transition. The German labour market is strongly regulated by collective bargaining, which covers more than 80% of West German workers. Furthermore, the link between the education system and the labour market is strong (Gangl, 2001; Scherer, 2004; de Grip and Wolbers, 2006). The ‘key’ feature of this strong link is apprenticeship. More than 50% of young people go through a period of apprenticeship lasting up to three years (Ryan, 2001). Apprenticeship is a ‘dual system’, in the sense that apprentices

are employed by firms while attending courses at vocational schools. As employers are directly involved in the provision and delivery of apprenticeships, these provide direct information on the productivity of workers in a particular occupation. For this reason, apprenticeships develop skills that are transferable across jobs and employers (Hannan et al., 1997; Ryan, 2001), which differentiates them from typical on-the-job training. Empirical evidence on apprenticeships is in line with the considerations mentioned above. Approximately half of the apprenticeships lead to regular jobs (CPB, 1997). Especially apprentices trained in large firms are more likely to experience a smooth transition to regular employment (Winkelmann, 1996). Although most job matches between the ex-apprentices and their employer terminate within five years after completion of the apprenticeship period, these ex-apprentices enjoy a higher wage growth by changing jobs (Dustmann et al., 1997; Franz et al., 2000). Therefore, in our analysis for Germany, we consider apprenticeship as a form of general human capital rather than a form of firm-specific human capital.

In the UK, the education and vocational training system is less strongly geared towards the labour market than in Germany (Gangl, 2001; Hannan et al., 1997). Compared to the German system, the UK education system is more flexible and only weakly stratified. The apprenticeship system is less widespread in the UK, and it is associated with a lower status than in Germany (Brauns et al., 2000).^[4] There are also more opportunities to move across vocational training and university education than in Germany (Müller and Shavit, 1998). The British labour market

is dominated by market forces rather than by statutory regulations. In more detail, collective bargaining is less widespread and unionization rates are low, with only 22% of private sector workers covered by collective bargaining. In addition, minimum wage regulation was absent from 1993 until 1999, when a national minimum wage was introduced. From 1999, two minimum wage rates were set, a rate for workers older than 21 years and a lower rate for workers aged 18-21. In 2004, an even lower rate was introduced to cover workers aged 16-17. Job mobility rates are typically higher and entrepreneurship more common than in Germany. Consequently, the British employment system is more open than the German one and low pay is observed among all categories of employees rather than just among labour market entrants. Therefore, skills acquired on the job are a more important factor for earnings progression.^[5]

The two countries' different patterns of labour market entry are projected in the main indicators for youth employment in Table 1. This table illustrates that, in the UK, youth labour force participation is high and unemployment is decreasing. More importantly, long-term unemployment decreased sharply between 1995 and 2005, in contrast to the rising unemployment rates in other OECD countries. However, the British labour market does not perform well with respect to low-pay mobility. Low-pay persistence and increased mobility between low pay and unemployment is well-established in the UK (Stewart and Swaffield, 1999; Dickens, 2000; Cappellari

Table 1: Indicators of youth employment and unemployment
(in percentages)

		Germany		UK	
		1995	2005	1995	2005
Low-pay incidence	15-29		38.2		28.3
	Total (15-64)	14.3	15.7	20.9	19.4
Low-pay persistence ^a	15-29		12.7		9.2
Labour force participation rate	15-24	56.8	53.5	74.4	69.0
	25-34	90.2	90.6	94.1	92.0
	Total (15-64)	79.5	80.6	84.7	82.8
Unemployment rate	15-24	8.3	16.1	17.9	13.4
	25-34	7.0	12.0	10.1	4.7
	Total (15-64)	7.2	11.5	10.2	5.1
Share of long-term unemployment (> 1 year)	15-24	25.2	32.0	30.5	17.3
	Total (15-64)	45.9	53.8	49.6	26.2
Share of temporary employment	15-24	41.6	60.4	13.4	11.3
	Total (15-64)	9.9	14.0	6.2	5.2
Share of part-time employment	15-24	31.8	37.7	41.6	40.5
	Total (15-64)	12.6	17.5	17.7	22.1

Source: OECD (2008), OECD online statistical database, OECD (1996) and European Commission (2004).

^a This refers to the 5-year period 1997-2001 for Germany and 2000-2005 for the UK.

and Jenkins, 2004; Stewart, 2007). In Germany, on the other hand, youth labour market participation rate is lower than in the UK, and unemployment increased from 7.7% in 1992 to 11.7% in 2005, gradually becoming more persistent. Temporary contracts are more widespread than in the UK, as employers try to avoid the strict arrangements that regulate permanent contracts. In both countries, low pay is quite

common among workers below the age of 30, but it is more persistent in Germany.

3 A duration model for low-pay mobility

Our aim is to study transitions of young labour market entrants exiting low pay. Extending the standard approach that focuses on mobility from low pay to high pay, we apply a discrete-time duration model with four competing risks: moving to higher pay, to unemployment, to self-employment or to inactivity. Remaining in low pay is the reference state.^[6] We use a discrete-time model rather than a continuous-time model because our data were derived from yearly observations. Let $P_m(\mathbf{X}_{it}, t)$ be the probability that individual i escapes the low-pay status to a status m after t years. Let \mathbf{X}_{it} denote a matrix of covariates for individual i after being at risk for t years. The transition probability is specified by the following multinomial logit model:

$$P_m(\mathbf{X}_{it}, t) = \frac{\exp(\mathbf{b}'_0{}^m + \mathbf{b}'_1{}^m \ln t + \mathbf{b}'_2{}^m \mathbf{X}_{it})}{1 + \sum_{n=1}^4 \exp(\mathbf{b}'_0{}^n + \mathbf{b}'_1{}^n \ln t + \mathbf{b}'_2{}^n \mathbf{X}_{it})}, \quad (1)$$

for $1 \leq m \leq n$ and $P_0(\mathbf{X}_{it}, t) = 1 - \sum_{m=1}^4 P_m(\mathbf{X}_{it}, t)$. $\mathbf{b}_0^m, \mathbf{b}_1^m, \mathbf{b}_2^m$ are vectors of coefficients to be estimated. Therefore, when analyzing the first low-pay spell, the likelihood contribution of an individual for whom no event has taken place until

$T_i - 1$ is:

$$L_i = \left[\prod_{t=1}^{T_i-1} P_0(\mathbf{X}_{it}, t) \right] \left[P_0(\mathbf{X}_{iT_i}, T_i) \right]^{\left(1 - \sum_{m=1}^4 \delta_{tim}\right)} \prod_{m=1}^4 [P_m(\mathbf{X}_{iT_i}, T_i)]^{\delta_{tim}} , \quad (2)$$

$$\text{where } \delta_{tim} = \begin{cases} 1 & \text{if } d_{ti} = m \\ 0 & \text{if } d_{ti} = 0 \end{cases} ,$$

and d_{ti} is a censoring indicator.

However, none of the exit states can be considered as absorbing. Individuals who move out of low pay may re-enter low pay and consequently experience more than one low-pay spell. Therefore, we extend the first-spell model to a multiple-spells discrete-time duration model. Multiple-spells duration models have the advantage that they are identified under weaker assumptions than single-spell models. Most importantly, the identification of a multiple-spell duration model does not require the unobservables to be uncorrelated to the covariates (van den Berg, 2001). Let K_i denote the spell number in which an individual is last observed. The likelihood contribution of an individual for whom no event has taken place until $T_{ki} - 1$ in spell k is:

$$L'_i = \prod_{k=1}^{K_i} L_{ki} . \quad (3)$$

Correcting for unobserved heterogeneity is essential in multiple-spells models in order to control for the correlation between spells within the same individual. More-

over, duration models that fail to account for unobserved heterogeneity run the risk of overestimating negative duration dependence (or underestimating positive duration dependence) as well as underestimating the effect of time-varying covariates (Lancaster, 1990; Vermunt, 1997). Finally, accounting for unobservables also controls for possible dependence between the competing risks (Vermunt, 1997). We control for unobserved heterogeneity using the non-parametric mass-points approach introduced by Heckman and Singer (1984).

According to the mass-points approach, the transitions to different states vary between a finite number of mass points or groups of people in the sample. These J groups are not defined a priori, but they refer to groups of people who share similar levels of unobserved characteristics, reflecting different probabilities of exiting low pay, e.g. those with high levels of unobserved abilities and high exit probability to high pay, and those with low ability levels and low exit probability. This methodology allows both the intercept and the slopes (the coefficients) to vary across the J mass points. The slopes are allowed to vary across groups (mass points) as the returns to specific observed characteristics may be different across mass-points. Such a model is known as a random-slope model. Each group is indexed by j in the relevant parameters. The transition probability for individual i that belongs to group

j is given by:

$$P_m(\mathbf{X}_{it}, t_k, j) = \frac{\exp(\mathbf{b}'_{0j} + \mathbf{b}'_{1j} \ln t_k + \mathbf{b}'_{2j} \mathbf{X}_{it})}{1 + \sum_{n=1}^3 \exp(\mathbf{b}'_{0j} + \mathbf{b}'_{1j} \ln t_k + \mathbf{b}'_{2j} \mathbf{X}_{it})} \quad (4)$$

where t_k is the duration in spell k .

We base our choice for the number of groups on the Log Likelihood, the Akaike (AIC) and the Bayesian (BIC) Information criteria.^[7] The likelihood contribution of an individual belonging to group j is obtained as follows:

$$L''_i = \sum_{j=1}^J L'_{i|j} \pi_j, \quad (5)$$

where π_j is the probability of belonging to group j and the likelihood $L_{i|j}$ is defined as in equation (3), but now with $P_m(\mathbf{X}_{it}, t)$ replaced by $P_m(\mathbf{X}_{it}, t_k, j)$.

Endogeneity of initial conditions may be a potential source of bias for our analysis. However, as our sample includes only people who gain their first job within the reference period, the problem of initial conditions does not emerge from left-censoring: labour market entrants are observed as soon as they earn their first wage. Nevertheless, there may still be some endogeneity if the unobserved characteristics that determine the initial pay level are correlated with low-pay transitions. Moreover, the sample of individuals starting employment may be selective. Individuals who expect to find a low-paid job may postpone labour market entry by enrolling

in an educational or training program – thus increasing their human capital – or even by remaining jobless until labour market opportunities improve. Although it is fairly easy to account for this in a single risk model (Stewart and Swaffield, 1999), fully controlling for self-selection in a competing risks framework is a complex endeavour. In order to reduce bias from the possible endogeneity of initial conditions, we include a number of covariates that partly control for this problem: a dummy variable for calendar time that picks up the effect of the business cycle and its resulting effect on postponement of labour market entry as well as a dummy for a spell of non-employment prior to labour market entry that captures the effect of the initial match between the supply and the demand of skills.

4 Data and Main Concepts

For the UK, we use the 1991-2005 waves of the British Household Panel Survey (BHPS). For Germany, we make use of the German Socio-Economic Panel (GSOEP) for the years 1984-2005. We only use data for former West Germany, as the East German labour market presents considerable differences.^[8]

Sample selection

Since our focus is on labour market entrants, we selected males aged 16-30 who are entering the labour market for the first time in the period under scrutiny. Workers are considered as labour market entrants in year t if they report paid employment as their main activity for the first time in t , and education as their main activity in the years $t - 1$, $t - 2$ or $t - 3$. The majority of them are school leavers. Seasonal or part-time jobs combined with education were not taken into account. More specifically, we based the selection of our sample on the self-reported employment status. For every labour market entrant, we include information on all his observed low-wage spells. Our data is organized in a person-year file.

Female employees were excluded as they tend to have more heterogeneous career paths than males, especially because childbirth is a major event affecting their labour supply decision. Moreover, this decision has been shown to crucially depend on the country's institutional support for mothers and to be jointly dependent on the labour supply of the male partner. In addition, while male workers tend to work full-time, the females' supply decision generally has implications for the number of hours worked. Controlling for the factors affecting these different career paths, the joint supply decision or the decision to work part-time would be beyond the scope of this study.

In Germany, many young people enter the labour market through an appren-

ticeship, which is part of the education system. For this reason, we only consider them as labour market entrants after they have completed their apprenticeship. The possession of apprenticeship qualifications is controlled for in the model. Although apprenticeship qualifications also exist in the UK, no individuals in the British sample reported such a qualification. This is probably due to the fact that the British apprenticeship system was deregulated in the 1980s, and therefore the number of apprentices among young workers decreased considerably.

Low-pay

The main economic variable is the gross hourly wage. Since no information on the hourly wage was directly collected in the surveys, we derived it by dividing the salary in the month prior to the survey by the number of hours usually worked per week multiplied by 4.33. Following standard practice in the low-pay literature, the low-pay threshold is set to two-thirds of the median hourly wage (for a discussion about low-pay thresholds see OECD, 1996). We also performed a sensitivity analysis, using the first quartile of the wage distribution as the low-pay threshold. This did not affect the results in any significant way. Figure 1 plots the lower part of the cumulative distribution of hourly wages for male workers along with the low-pay threshold in the year 2000. For the UK, we also plot the two statutory hourly minimum wages: the rate for workers above the age of 21 as well as the rate for workers aged 18 to 21.

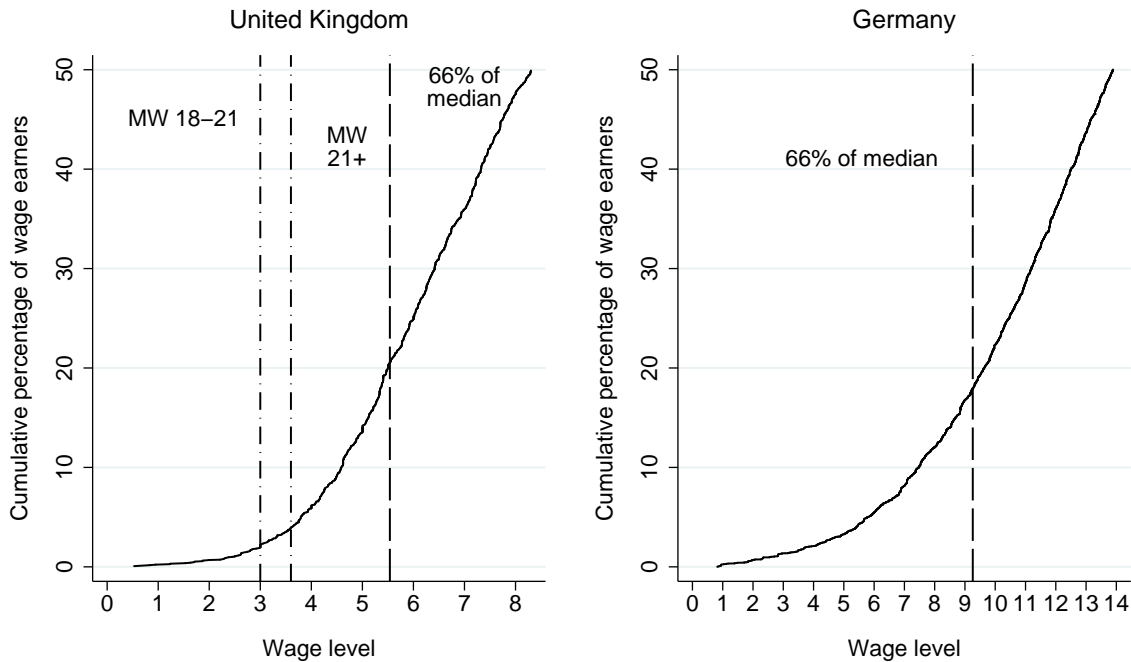


Figure 1: Distribution of gross hourly wages, males aged 16-55, year 2000. The minimum wage ‘MW 21+’ applies to workers above the age of 21, while the minimum wage ‘MW 18-21’ applies to workers aged 18 to 21.

The minimum wage line only appears in the UK as there is no national minimum wage in Germany. Our low-pay threshold ‘cuts’ the distribution at a higher wage level than the minimum wage. In the UK, about 21% of the workers are low-paid, while the relevant proportion in Germany is approximately 19%.

Three measures of human capital are included in the model. First, general human capital is captured by the highest education level attained by the individual. Second,

apprenticeship is also a measure of general human capital in Germany. Finally, firm-specific human capital is measured by the occurrence of formal training and tenure in the current job. All the covariates included in the analysis are described in the Appendix.

Low-paid entrants

Our sample consists of 658 individuals for the UK and 916 individuals for Germany. Descriptive statistics for our sample are given in Table 2 . This table indicates that the incidence of low pay among labour market entrants is higher in the UK than in Germany. The extended mean duration of low pay is longer in the UK (2.9 years) than in Germany (1.9 years). Although our data for Germany cover a considerably longer time period than our data for the UK, the average number of low-wage spells that an individual experiences is similar in both countries (1.3 and 1.4, respectively). The fact that the probability of experiencing more than one low-wage spell is not zero clearly indicates that low pay cannot be considered as an absorbing state for labour market entrants.^[9]

The composition of our sample shows that the low-paid job starter is usually single, younger than 25 years of age, with secondary school qualifications, working as a blue-collar worker on a temporary contract in the commercial services sector or

Table 2: Composition of the sample of low-paid labour market entrants, pooled years

		(in percentages)	
		UK	Germany
Incidence of low pay^a		55.6	48.4
Average nr of spells		1.4	1.3
Mean low-pay duration (in years)		2.9	1.9
Age	16-20	61.8	25.5
	21-25	27.6	53.9
	26-30	8.6	20.6
Married		5.0	12.9
Education	primary	23.2	28.6
	secondary	54.6	65.0
	tertiary	22.2	6.4
Training		32.1	44.7
Firm size	small	44.1	31.6
	medium	26.7	30.4
	large	29.2	38.0
Industrial sector	commercial ser- vices	40.6	22.4
	industry	23.5	46.9
	primary sector	26.4	2.2
	non-commercial services	4.9	13.3
	public sector	5.0	15.2
White collar		11.3	29.1
Part-time		10.0	12.0
Temporary contract		20.7	34.2
Non-employment spell		27.9	13.1
Apprenticeship (prior to labour market entry)		-	68.6
Cases		658	916

^a This is the incidence of low pay among all labour market entrants.

Note: The percentages for age, marital status, education, training, firm size, industrial sector, white collar, part-time employment and temporary contract refer to the first year of the first low-pay spell of individuals. The mean low-pay duration refers to all the spells.

in the industry sector. Some cross-country differences emerge. In the UK, more than a quarter of our sample experienced a period of non-employment after completing his education and before getting his first job. The relevant percentage is lower in Germany (13.1%). Low-paid labour market entrants are on average younger in the UK than in Germany. As expected, the distribution of the British sample is more uniform across education levels than in Germany. Compared to the UK, German low-paid entrants more often work in the industry sector.

5 Results

Exits from low pay

Table 3 presents the raw year-to-year transition rates in the two countries under scrutiny. For 658 workers in our British sample, we observe 1,528 transitions, while for the 916 workers in our German sample we observe 1,821 transitions. As shown in Table 3, low-pay persistence is higher in the UK than in Germany. The earnings of German low-paid labour market entrants cross more often the low-pay threshold than their British colleagues' earnings. This suggests that low-paid job starters in Germany experience more upward wage mobility. As expected, transitions from low pay to unemployment are more common in the UK than in Germany.

Table 3: Overall year-to-year transition rate, pooled years

(in percentages)

	UK	Germany
Remaining in low pay	58.7	42.6
Higher pay	28.0	39.7
Unemployment	9.2	6.9
Self-employment	2.5	2.5
Inactivity	1.6	8.3
Total	100	100
Individuals	658	916
Transitions	1,528	1,821

Transitions to self-employment are rather rare in our sample. Although we expected transitions to self-employment to take place more often in the liberal labour market of the UK than in the regulated German labour market, transition rates to self-employment do not differ between these two countries. An explanation for this is provided by Thurik (2003), who suggests that the favorable conditions for entrepreneurship in the UK mainly benefit large firms. Therefore, for individuals starting their employment career in a low-paid job there is no ‘easy way out’ to self-employment by starting a small business. Transitions to inactivity, on the other hand, are more common in Germany.

Figure 2 plots the cumulative probability of staying in a low paid job after t years for the UK and Germany and for three educational levels. As the graph shows, the exit rate out of low pay is larger in Germany than in the UK, for all educational levels. Contrary to our expectations, no obvious differences between

education groups emerge in Germany. However, in the UK, secondary and tertiary education graduates have a better chance of escaping from low pay than the low educated.

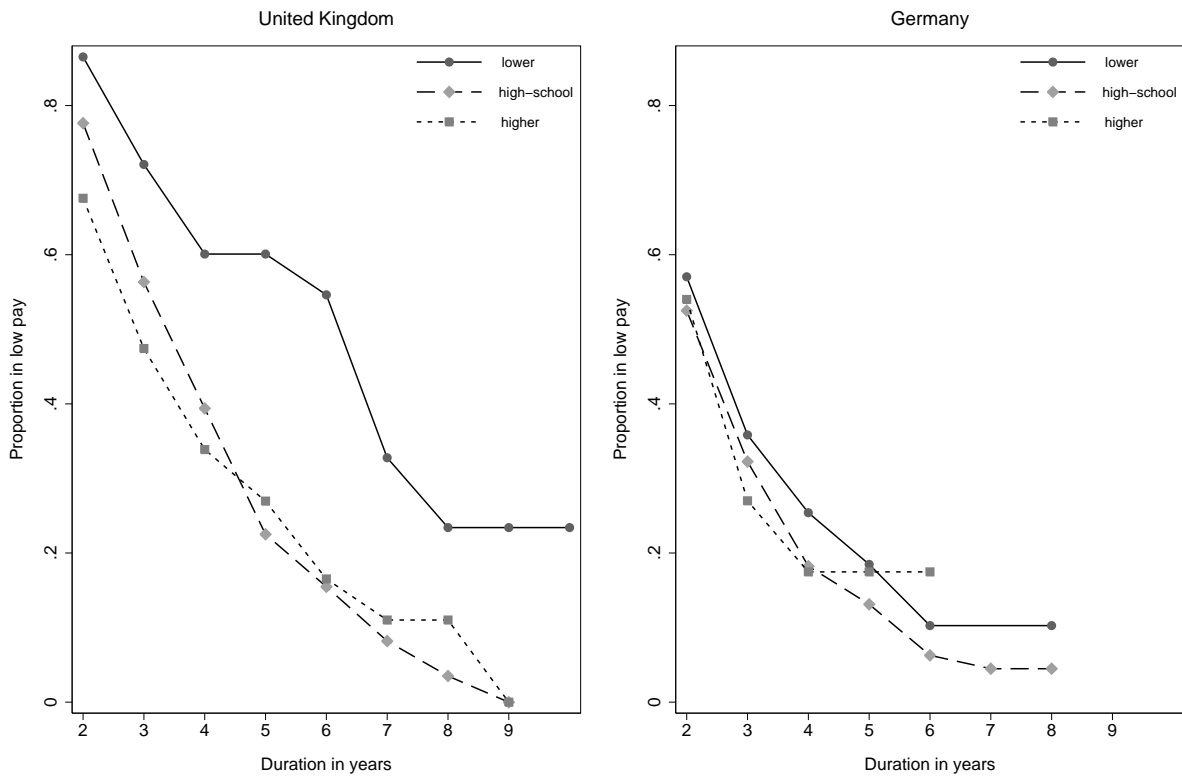


Figure 2: Cumulative probability of staying in low pay by education level

Results from the competing-risks model

The competing-risks analysis was performed separately for the UK and Germany. In both countries, the model that best accounts for unobserved heterogeneity is the two-

mass-points model.^[10] In both countries, we allowed the main variables of interest, namely duration dependence, number of spells, education, training, apprenticeship and tenure, to have a different effect across the two groups (mass points). Before interpreting the estimates for these variables, we discuss our findings with respect to unobserved heterogeneity. This feature of the approach developed by Heckman and Singer (1984) has rarely been exploited, although it provides very useful information. The two-mass-points model suggests the existence of two types of labour market entrants, each with common unobserved characteristics: one group with high unobserved ability and high exit probability to higher pay (‘movers’), and one group with low unobserved ability and low exit probability to higher pay (‘stayers’).

Both groups’ marginal probabilities of exiting low pay are presented in Table 4. These probabilities are derived from equation 4 by aggregating over the values of the covariates for our sample. In accordance with Table 3, the transition probability to higher pay is higher in Germany than in the UK; in Germany, the weighted average of the marginal transition probabilities is .39, while in the UK, it is .30. In the UK, the ‘stayers’ form the largest group (74% of the sample). For this group, the probability of remaining in low pay is .62. In contrast, in Germany, the group of stayers is smaller (31%). The staying probability of this group is also lower than in the UK (.40), and it does not differ much from the corresponding probability among ‘movers’. Unfortunately, German low-paid workers in this group are highly likely to exit to unemployment (.15) and to inactivity (.16).

Table 4: Group size and marginal transition probabilities in the two classes

	UK		Germany	
	Movers	Stayers	Movers	Stayers
Remaining in low pay	0.383 (0.036)	0.620 (0.016)	0.429 (0.018)	0.403 (0.035)
Higher pay	0.464 (0.033)	0.242 (0.015)	0.450 (0.018)	0.273 (0.048)
Unemployed	0.076 (0.023)	0.096 (0.010)	0.041 (0.008)	0.145 (0.026)
Self-employment	0.042 (0.007)	0.026 (0.005)	0.029 (0.008)	0.021 (0.009)
Inactivity	0.034 (0.015)	0.016 (0.004)	0.050 (0.012)	0.158 (0.028)
Total	1.0	1.0	1.0	1.0
Group Size	0.261	0.739	0.686	0.314

Similar cross-country differences also emerge for the group of movers. In the UK, this group (26% of the sample) is smaller than the group of stayers, but it is highly likely to move to higher pay (.46). For the group of movers, the marginal transition probability to self-employment (.04) is slightly higher than the corresponding observed probability of Table 3. However, this probability still indicates that self-employment is not a ‘way out’ of low pay for British labour market entrants. In Germany, the group of movers is the largest group (69% of the sample), but its staying probability is larger than the corresponding probability for the stayers (.42). What differentiates movers from stayers is their higher transitions probability to higher pay (.45) and their low transition probability to unemployment (.04) and

to inactivity (.05). In contrast to Germany, in the UK, marginal transition probabilities to unemployment do not differ considerably between the 2 groups. Based on the predicted probabilities of our model, we made an out-of-sample prediction concerning the expected duration of low pay. Specifically, we found that, in the UK, an individual with average characteristics entering the labour market in a low-paid job, has a probability of 79% to be still in low pay employment after a year, and 58% after two years. After three years, this probability drops to 40%. In accordance with the findings of our descriptive statistics, the relevant survival probabilities are lower for a German low-paid job starter with average characteristics. After one year in low pay, his survival probability is 59%, after two years it is 38%, while it drops to 26% after 3 years.^[11]

The estimates from the competing risks model are presented in Tables 5 and 6. Since remaining in low pay is treated as the reference category, the estimates in the tables concern the transitions to higher pay, unemployment, self-employment and inactivity. Tables 5 and 6 are split in two parts. Panel A contains the coefficients for duration dependence, the spell number and the human capital variables. As mentioned earlier, these coefficients are allowed to vary between the two groups (movers and stayers). Panel B contains the estimated coefficients for the control variables, which are common across groups. We tested several specifications of duration dependence (linear, nominal, quadratic), with the logarithmic specification performing best. In the discussion of the results, we mainly focus on the covariates

that are of interest in the light of our expectations: duration dependence, education level, training and job tenure.

Table 5: Parameters of the competing-risks model for exit from low pay - the UK

Panel A: Main Coefficients for the random slopes for movers and sayers

	‘Movers’				‘Stayers’			
	Higher pay	Unemployment	Self-employment	Inactivity	Higher pay	Unemployment	Self-employment	Inactivity
Log duration	0.395 (0.453)	-1.405 (1.059)	-2.203 (1.413)	1.121 (0.891)	-0.063 (0.158)	-0.451 (0.240)	-1.993*** (0.715)	-2.284*** (0.880)
Number of spell	0.989* (0.584)	-4.374 (8.359)	-17.774 (19.021)	1.398 (0.932)	-0.031 (0.150)	0.074 (0.235)	0.150 (0.426)	-7.266 (19.510)
Education (reference: low)								
High-School	-0.701 (0.889)	-2.398*** (0.959)	22.877 (14.211)	-1.765 (1.688)	0.770*** (0.270)	-0.209 (0.290)	-0.072 (0.467)	-0.018 (0.613)
Tertiary	0.532 (1.022)	-1.495 (1.205)	39.242** (20.201)	0.962 (1.485)	0.833*** (0.285)	-0.229 (0.341)	-0.465 (0.763)	-19.167 (36.931)
Training	-0.877 (0.567)	-0.431 (0.798)	-13.491** (6.708)	0.779 (0.788)	0.420** (0.206)	-0.826** (0.333)	-0.605 (0.501)	-2.736 (2.131)
Tenure	0.028** (0.014)	0.029 (0.022)	0.398** (0.166)	0.030 (0.021)	-0.010** (0.004)	-0.016** (0.007)	-0.010 (0.017)	0.022 (0.016)
Constant	-2.496*** (0.401)	4.729 (0.486)	-23.531 (0.752)	-6.238*** (19.513)	-2.659*** (0.401)	-0.800 (0.486)	-1.675** (0.752)	3.791 (19.513)

Remaining in low pay is the reference state. Coefficients for the control variables are presented in Panel B.

Standard errors between brackets.

* significant at 10%; ** significant at 5%; *** significant at 1%

The results indicate no significant effect of duration dependence for transitions to higher pay in either of the two countries. For self-employment, we only find negative duration dependence for the British stayers, while for inactivity we find

Table 5 (continued), Panel B: Other Coefficients

	Higher pay	Unemployment	Self-employment	Inactivity
Married	-0.518* (0.292)	-0.825* (0.453)	1.175* (0.713)	-0.237 (0.817)
Age (reference: 16-20 years)				
21-25 years	0.924*** (0.165)	0.300 (0.234)	0.102 (0.495)	0.411 (0.529)
26-30 years	0.880*** (0.239)	0.252 (0.348)	-1.379 (0.923)	0.907 (0.779)
Firm size (reference: small firm)				
Medium size firm	-0.042 (0.155)	0.041 (0.222)	-0.191 (0.446)	-0.032 (0.533)
Large firm	0.179 (0.156)	-0.171 (0.235)	-0.823 (0.547)	0.359 (0.516)
Part-time job	0.081 (0.290)	0.361 (0.353)	0.689 (0.590)	0.101 (0.734)
Temporary contract	-0.030 (0.209)	0.671*** (0.245)	0.490 (0.469)	1.636*** (0.499)
White collar job	0.238 (0.171)	-0.831*** (0.355)	-0.395 (0.650)	0.371 (0.583)
Industry (reference: commercial services)				
Industry	0.363** (0.176)	0.031 (0.233)	0.118 (0.476)	-0.204 (0.577)
Primary sector	0.075 (0.214)	0.137 (0.303)	-0.158 (0.660)	-0.572 (0.688)
Non-commercial services	0.312 (0.325)	-0.684 (0.546)	0.508 (0.721)	-2.132 (2.453)
Public sector	0.909*** (0.305)	-2.816* (1.544)	-0.507 (1.203)	0.100 (1.094)
Non-employment spell	-0.322** (0.163)	0.031 (0.218)	0.204 (0.434)	-0.417 (0.535)
Calendar time	yes	yes	yes	yes

Remaining in low pay is the reference state.

Standard errors between brackets.

* significant at 10%; ** significant at 5%; *** significant at 1%

negative duration dependence for both British stayers and German movers. We conclude that the longer the duration of the low-pay spell, the lower the likelihood will be that a British stayer becomes self-employed or inactive. For a German mover, we conclude that long low-pay spells decrease the likelihood of becoming inactive.

Table 6: Parameters of the competing-risks model for exit from low pay - Germany

Panel A: Main Coefficients for the random slopes for movers and stayers

	‘Movers’				‘Stayers’			
	Higher pay	Unemployment	Self-employment	Inactivity	Higher pay	Unemployment	Self-employment	Inactivity
Log duration	-0.132 (0.136)	-0.206 (0.299)	0.420 (0.383)	-1.104*** (0.349)	-0.151 (1.409)	1.404* (0.755)	-0.684 (1.678)	-0.152 (1.126)
Number of spell	-0.023 (0.145)	0.059 (0.298)	-1.321** (0.575)	0.218 (0.290)	-0.653 (0.853)	0.317 (0.546)	0.923 (1.480)	-1.439 (3.372)
Education (reference: low)								
High-School	-0.146 (0.151)	-0.738** (0.307)	0.989* (0.576)	-0.138 (0.273)	4.729*** (1.610)	1.171 (0.934)	4.381* (2.489)	8.187 (10.914)
Tertiary	-0.151 (0.285)	-1.533* (0.924)	0.639* (0.807)	-1.233 (0.823)	-0.451 (2.346)	1.685 (1.526)	4.134 (3.787)	11.109 (12.434)
Training	0.358** (0.161)	-0.569 (0.571)	-7.553 (15.436)	-0.309 (0.369)	-1.714 (1.766)	2.280** (1.052)	3.247 (3.036)	9.616 (7.247)
Apprenticeship	0.651*** (0.164)	-0.317 (0.341)	0.134 (0.487)	0.317 (0.294)	-7.424*** (2.278)	-5.040*** (1.780)	-4.080* (2.385)	-1.854 (7.705)
Tenure	0.004* (0.002)	-0.001 (0.006)	0.007 (0.007)	0.002 (0.005)	-0.099*** (0.046)	-0.067*** (0.021)	-0.071** (0.036)	-0.022 (0.029)
Constant	-0.942*** (0.336)	-1.482** (0.623)	-1.281 (1.096)	-1.562*** (0.572)	4.950*** (3.176)	3.150 (2.149)	-1.865 (5.244)	-11.351 (16.152)

Remaining in low pay is the reference state. Coefficients for the control variables are presented in Panel B.

Standard errors between brackets.

* significant at 10%; ** significant at 5%; *** significant at 1%

General and firm-specific human capital accounts for a large share of the individual differences in exit probabilities. From the discussion in Section 2, we expect the main determinant of low-pay exits to be general human capital in Germany and firm-specific human capital in the UK. Although our findings partly confirm this expectation, the picture that emerges is more complex. In the countries under

Table 5 (continued), Panel B: Other Coefficients

	Higher pay	Unemployment	Self-employment	Inactivity
Married	0.322* (0.177)	-0.283 (0.331)	0.422 (0.535)	-0.678 (0.490)
Age (reference: 16-20 years)				
21-25 years	0.305* (0.174)	-0.328 (0.327)	0.155 (0.698)	-1.105*** (0.296)
26-30	0.776*** (0.227)	-0.327 (0.424)	0.736 (0.751)	-1.322*** (0.408)
Firm size (reference: small firm)				
Medium size firm	0.243 (0.156)	-0.525* (0.292)	-1.218*** (0.447)	-0.167 (0.275)
Large firm	0.780*** (0.162)	-0.313 (0.308)	-1.702*** (0.653)	-0.326 (0.313)
Part-time job	-0.123 (0.233)	-0.285 (0.431)	1.381*** (0.449)	1.829*** (0.298)
Temporary contract	-0.223 (0.148)	0.779*** (0.270)	-0.154 (0.512)	0.493* (0.258)
White collar job	0.285* (0.150)	-0.228 (0.307)	0.959** (0.392)	0.527** (0.267)
Industry (reference: commercial services)				
Industry	0.648*** (0.168)	0.406 (0.324)	-0.057 (0.484)	0.452 (0.315)
Primary sector	-0.261 (0.382)	-1.039 (0.811)	-0.299 (1.093)	0.178 (0.676)
Non-commercial services	-0.226 (0.227)	0.040 (0.393)	-0.276 (0.569)	0.033 (0.371)
Public sector	-0.063 (0.234)	-0.534 (0.529)	-0.136 (0.825)	-0.317 (0.484)
Non-employment spell	-0.163 (0.226)	0.798** (0.335)	-0.561 (0.606)	-0.200 (0.431)
Calendar time	yes	yes	yes	yes

Remaining in low pay is the reference state.

Standard errors between brackets.

* significant at 10%; ** significant at 5%; *** significant at 1%

scrutiny, different types of human capital have a different effect on exit probabilities in the groups of movers and stayers. More specifically, in the UK and for the group of movers, only firm-specific skills affect the transition probability to higher pay: the longer the tenure, the higher the likelihood of moving to higher pay. Young

low-paid workers can increase their wage above the low-pay threshold by developing their skills in the internal labour market, a finding that is in line with Gosling et al. (1997). For the British movers, tenure increases also the likelihood of moving to self-employment. For the stayers, findings are in accordance with the vast literature on low-wage dynamics (see, for example, Stewart and Swaffield, 1999; Cappellari, 2000). Secondary or higher education and job-specific training significantly increase the likelihood of moving to higher pay, while tenure has a negative effect. Moreover, for the stayers, training and tenure decrease the likelihood of a transition to unemployment. Therefore, for the group of movers, firm-specific skills, as measured by long tenure, may stimulate exit to better earnings, while for the group of stayers, this may be achieved by having a secondary school diploma or a higher education degree or by job-specific training. For a highly-educated stayer, entering the labour market in a low-paid job seems to be a temporary event due to a short-run mismatch. This finding can be adequately explained by a sorting explanation, such as the existence of a probation period.

The picture is different in Germany. For the group of German movers, the education level does not have a significant effect on transitions to higher pay. Having a secondary school diploma or a higher education degree (the latter is significant only at the 10% level) decreases the likelihood of an exit to unemployment. In contrast, apprenticeship and job-related training are relevant, as they raise the likelihood of increasing the wage above the low-pay threshold. Employer tenure also has a small

positive effect (although only significant at the 10% level). The finding that education does not improve the wage prospects of German labour market entrants contradicts the findings of previous literature on low-wage dynamics (see, for example, Cappellari, 2000). Even the scarce literature specifically focusing on low-pay dynamics in Germany (Uhlendorff, 2006) suggests that higher education increases the likelihood for a transition above the low-pay threshold. However, these studies do not focus on labour market entrants. It seems that, for this group of workers, skills acquired by formal education are mainly rewarded upon entering the labour market.

As far as apprenticeship is concerned, the findings for the German movers suggest that general human capital that is directly job-related – in the sense that it is acquired during the dual training/work period and sometimes in the same firm where the worker gets his first job – is crucial for moving out of low pay at the beginning of the working career. For the German stayers, human capital does not seem to be very effective in explaining low pay transitions. Only secondary school education increases the likelihood of a transition out of low pay, while both apprenticeship and tenure decrease this likelihood. In fact, they decrease the likelihood of a transition to all competing states. At least for tenure, this indicates that the longer a German stayer remains in a low-wage job, the more likely he is to remain ‘locked’ below the low-pay threshold.

Further interesting findings from the model concern age, the industry sector, the type of employment contract, part-time employment and the occurrence of a non-employment spell between leaving full-time education and starting the first job.^[12] In both countries, given a stock of human capital, entering the labour market at an age older than 20 raises the likelihood to increase one's wage above the low-wage threshold. In Germany, workers in large firms are more likely to move to higher pay and less likely to become self-employed than their colleagues who are employed in small or medium-sized firms. In both countries, job starters on a temporary contract are more likely to become unemployed. In the UK, temporary workers are also more likely to become inactive than permanent workers. German part-time job starters are more likely to become self-employed or inactive than their full-time colleagues. In both countries, labour market entrants in the industry sector are more likely to increase their wage above the low-wage threshold compared to entrants in the commercial services sector. In the UK, entrants of the public sector share the same advantage. Finally, in both countries, a spell of non-employment before the first job has a 'scarring' effect on the early career of labour market entrants. In the UK, the occurrence of such a non-employment spell decreases the likelihood of moving to higher pay, while in Germany it increases the probability of becoming unemployed.

6 Concluding remarks

In this paper, we investigated the extent and the human capital determinants of low-wage mobility for labour market entrants in the UK and Germany. This subgroup of wage earners has received little attention in the economic literature. Our study investigated transitions from low pay to different destination states (higher pay, self-employment, unemployment and inactivity), while controlling for unobserved characteristics, such as ability. Combining the predictions of the human capital and the sorting model, we assessed the role of two types of human capital – general and firm-specific – on these transitions.

As far as unobserved abilities are concerned, our competing-risks duration model suggests the existence of two types of low-paid job starters: movers, with a high transition probability to higher pay, and stayers with a low transition probability to higher pay and/or with a high transition probability to unemployment. However, striking country differences emerge with respect to the size of these groups and their marginal transition probabilities. Although the marginal transition probability to higher pay in the group of movers is similar in both countries (.45 in Germany and .46 in the UK), the group of movers is larger in Germany than in the UK (69% and 26%, respectively). If we also consider the marginal transition probabilities to higher pay among the stayers, then we can conclude that more upward mobility opportunities exist for low-paid labour market entrants in Germany than in the UK.

Furthermore, in neither country does self-employment offer a ‘way out’ of low pay.

However, the results of the model indicate that low-wage job starters face a different challenges in the two countries under scrutiny. In the UK, in line with previous studies, strong low-wage persistence was found for the group of stayers, as the relevant staying probability is .62. In Germany, in contrast, the stayers are at greater risk of unemployment (transition probability .15) and inactivity (transition probability .16) than of low-pay persistence.

In view of the differences in school-to-work institutions between the two countries, we expected human capital characteristics to explain the low-pay mobility of labour market entrants. Formal education and apprenticeship were expected to be more decisive in the low-pay transitions in Germany, while training and tenure were expected to be more important in the UK. However, the picture emerging from our findings is more complex. In the UK, firm-specific skills, as measured by tenure, account for low-pay exits in the group of movers, while both general skills, as measured by education, and firm-specific skills, as measured by on-the-job training, account for low-pay exits in the group of stayers. Therefore, for the UK, a combination of a sorting explanation and a human capital explanation seems to offer the most accurate account of the low-wage mobility of labour market entrants. For some highly-educated job starters, a low-pay spell at the beginning of their working career is a temporary incident, possibly related to a probation period. Other labour

market entrants manage to escape low pay by investing in firm-specific skills, which points to a direct human capital explanation. Unfortunately, our data does not allow to investigate this effect in more detail.

In Germany, surprisingly, education appears to have little effect on the low-pay mobility of labour market entrants. Apprenticeship and training positively affect the low-wage mobility in the group of stayers. Therefore, a large part of German young workers can benefit considerably from the German apprenticeship system that provides skills transferable across employers (at least within the same industrial sector). It appears that upon entering the labour market, young German workers are sorted into low-wage and high-wage jobs according to their educational level. A learning effect, possibly related to a probation period, may be relevant to most workers with apprenticeship qualifications. Surprisingly, little effect of human capital factors is found for the group of German stayers. For this group of workers, having apprenticeship qualifications or long tenure in a low-wage job has a detrimental effect on labour market prospects. This is consistent with the segmentation in the German labour market.

Appendix: Description of the variables

Low-pay duration: This refers to the duration, measured in years, of the low-pay spell up to the time of the interview.

Age: The following age groups were defined: (0) 16-20 years, (1) 21-25 years and (2) 26-30 years.

Married: This is a dummy variable (0/1), indicating whether or not the individual is legally married.

Education: This refers to the education level attained by the individual with respect to secondary school. It, therefore, has three values: (0) lower than secondary school, (1) secondary school and (2) tertiary education.

Training: This is a dummy variable (0/1), indicating whether or not the individual participated in a formal training scheme in the year prior to the interview.

Apprenticeship: This is a dummy variable (0/1), indicating whether or not the individual has ever completed an apprenticeship. It is only defined for Germany.

Firm size: Three firm sizes are defined: (0) small, (1) medium and (2) large firm. In the UK these three values refer to firms with fewer than 25 employees, firms employing between 25 and 99 employees, and firms with more than 100 employees. In Germany, they refer to firms with fewer than 20 employees, firms with employing 20 and 199 employees and firms with 200 employees or more.

Industrial sector: We defined five industrial sectors: (0) commercial services, (1) industry, (2) primary sector, (3) non-commercial services and (4) public sector.

Part-time: This is a dummy variable (0/1), indicating whether or not the individual is working part-time. An individual is defined to be working part-time if he is employed for less than 35 hours per week.

White collar: This is a dummy variable (0/1), indicating whether or not the individual is performing supervisory work.

Temporary: This is a dummy variable (0/1), indicating whether or not the individual is employed under a temporary contract.

Tenure: This is the length of employment in the current job, measured in months.

Non-employment spell: This is a dummy variable (0/1), indicating whether or not the individual experienced a non-employment spell after finishing education and before starting his first job.

Notes

^[1]Our focus on male labour market entrants is motivated by the fact that female workers have very different career paths that are greatly influenced by major life events such as childbirth. Moreover, female labour supply decision depends on the country's institutional setting and on their partner's labour supply.

^[2]This is also true from a human capital perspective (Brown, 1989).

^[3]See (Weiss, 1995) and Chevalier et al. (2004) for an assessment of these two explanations.

^[4]This only applies after the deregulation of the UK labour market in the 1980s. The characteristics of the countries presented here are not static. Marsden (1990), for example, suggests that the UK labour market resembles the German one, as he uses data from the early 1980s.

^[5]Gosling et al. (1997) find that job tenure is the most important determinant of low-pay transitions in the UK, and Belfield and Wei (2004) suggest that wage growth is higher for workers in large firms (in which on the job learning is more common).

^[6]We consider workers to be constrained in their transitions. More specifically, we suggest that all low-paid workers would like to move to higher pay and that both staying in low pay and moving to unemployment or inactivity are involuntary actions. Therefore, we can estimate the model in a reduced form.

^[7]All estimations were carried out in Latent Gold (Vermunt and Magidson, 2008).

^[8]The BHPS data (Taylor et al., 2006) were made available by the Data Archive at Essex University. The GSOEP (Wagner et al., 1993) was provided by the German Institute for Economic Research.

^[9]In both countries, the probability of re-entering low pay is approximately 10% for labour market entrants.

^[10]The choice of the best-performing models was based on the log-likelihood, the AIC and the BIC fit measures. These measures are not reported but are available on request.

^[11]In a recent paper, Phimister et al. (2006) computed mean expected low pay durations for British low-wage workers in a competing risks framework on the basis of a methodology developed by Thomas (1996). While such computations are meaningful when the observed spells are sufficiently long, they are less meaningful in our case where the maximum duration of a low-pay spell is only 9 years in the UK and 13 years in Germany.

^[12]The estimates for the calendar time dummies have been omitted from Tables 5 and 6 for the sake of space. One important finding from these omitted estimates is that no effect of the introduction of the minimum wage in the UK in 1999 is detected. Moreover, the introduction of a minimum wage for 16 and 17-year-old workers in 2004 does not seem to have any effect on the transition probabilities. Although it is beyond the scope of this study to fully account for the effect of the different stages in which a minimum wage was introduced in the UK, a possible explanation for the lack of effect is that the minimum wage is set at a level significantly lower than the low-pay threshold.

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