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

Dimitris Pavlopoulos* Didier Fouarge†

Abstract

Purpose – We investigate the extent and the human-capital determinants of low-wage mobility for labour market entrants, in the UK and Germany.

Design/methodology/approach – Using panel data for the UK (BHPS) and Germany (GSOEP), we apply a competing-risks duration model that allows us to study transitions from low pay to competing destination states: higher pay, self-employment, unemployment and inactivity. Unobserved heterogeneity is tackled by a non-parametric mass-point approach.

Findings – We find that low pay is only a temporary state for most young job starters. However, there is a small group of job starters that is caught in a trap of low pay, unemployment or inactivity. In the UK, job starters escape from low pay mainly by developing firm-specific skills. In Germany, involvement in formal vocational training and the attainment of apprenticeship qualifications account for low pay exits.

Originality/value – Over the past decades, unemployment and low-wage employment have emerged as major challenges facing young labour market entrants. While most empirical studies focus exclusively on the transition from low pay to high pay, we show that a significant percentage of young entrants are caught in a low-pay - non-employment trap. Moreover, we show that, depending on the institutional context, different types of human capital investments can account for a successful low-pay exit.

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

Paper type Research paper

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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 (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 get-

ting 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 (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 (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 particular, 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. As 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. Conse-

quently, 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]

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.

The two countries' different patterns of youth labour market entry are projected 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 and Jenkins, 2004; Stewart, 2007). In Germany, the 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

Extending the standard approach that focuses on mobility from low pay to high pay, we apply a discrete-time duration model for young low-paid labour market entrants 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 could 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 which is identified under weaker assumptions (van den Berg, 2001).^[7] 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:

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

where L_{ki} is the likelihood contribution of individual i in spell k as defined in equation 2.

Correcting for unobserved heterogeneity is essential in multiple-spells models in order to control for the correlation between spells within the same individual. Moreover, 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 this approach, the transitions to different states vary between a finite number of mass-points or groups of people. 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.^[8] 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 with $P_m(\mathbf{X}_{it}, t)$ replaced by $P_m(\mathbf{X}_{it}, t_k, j)$.

Endogeneity of initial conditions will 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 may 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. However, if this endogeneity is not fully controlled for resulting estimates may well contain some bias.

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.^[9]

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 (Dex et al., 1998). Moreover, this decision has been shown to crucially depend on the country's institutional support for mothers (Uunk et al., 2005), and to be jointly dependent on the labour supply of the male partner (Powell, 2002). In addition, while male workers tend to work full-time, the females' supply decision generally has implications for the number of hours worked (Paull, 2008). Controlling

for the factors affecting these different career paths, the joint supply decision or the decision to work part-time is beyond the scope of this study.

In Germany, many young people enter the labour market through an apprenticeship, 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 for all the waves 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. The minimum wage line only appears in the UK because 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 (lower than secondary school, secondary school or tertiary education). Second, apprenticeship (dummy variable) is also a measure of general human capital in Germany.

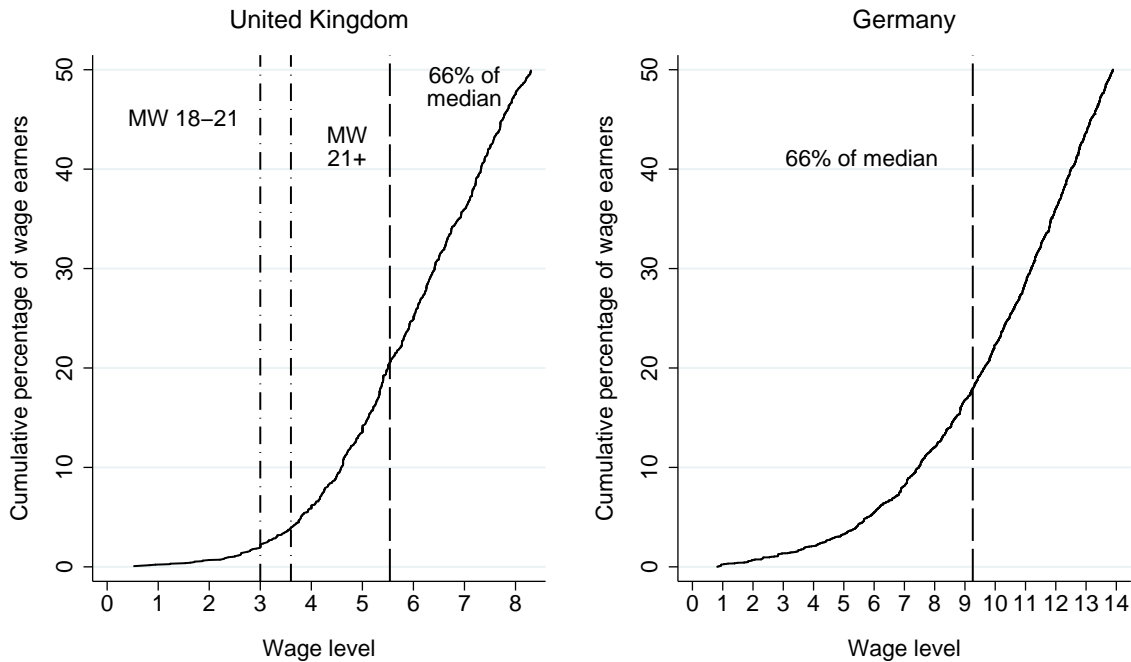


Figure 1: Distribution of gross hourly wages, males aged 16-55, year 2000. The minimum wage ‘MW 21+’ applies to workers above the age of 21, while the minimum wage ‘MW 18-21’ applies to workers aged 18 to 21.

Finally, firm-specific human capital is measured by the occurrence of formal training (dummy variable for participation in formal training scheme in year prior to the survey) and tenure (in months) in the current job. The models we estimated include controls for age, marital status (dummy when legally married), firm size^[10], sector of industry (commercial services, industry, primary sector, non-commercial services and public sector), part-time work (fewer than 35 hours per week), temporary contract, white color workers, calendar time ^[11] and unemployment spells prior to the first labour market entry.

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.

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.^[12]

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 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

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. The year-to-year transition rates are reported in Table 3. As the table shows, 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.

Although we expected transitions to self-employment to take place more often in

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

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 are more common in Germany.

Figure 2 plots the cumulative probability of staying in a low paid job after t years for three educational levels. For all educational levels, the exit rate out of low pay is larger in Germany than in the UK. 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.

Results from the competing-risks model

The competing-risks analysis was performed separately for the UK and Germany. The model that best accounts for unobserved heterogeneity is the two-mass-points model.^[13] 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

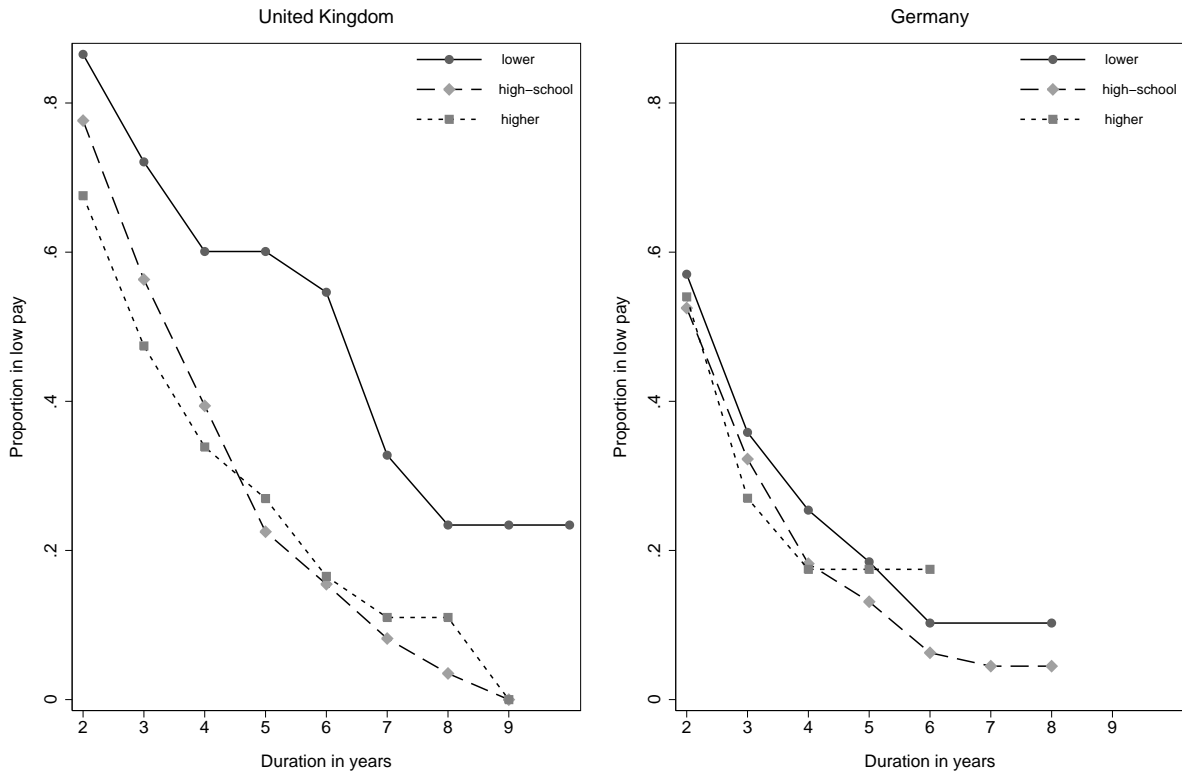


Figure 2: Cumulative probability of staying in low pay by education level

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 in 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

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

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’. However, German low-paid workers in this group have high transition probabilities to unemployment (.15) and inactivity (.16).

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, it 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. 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 our descriptive findings, 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.^[14]

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. Only the model estimates for duration dependence, the spell number and the human capital variables are reported.^[15] We tested several specifications of duration dependence (linear, nominal, quadratic), with the logarithmic specification performing best.

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 transitions to inactivity we find 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 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.

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 are partly in line with this expectation, the picture that emerges is more complex. In the countries under 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:

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

(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	0.395 (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. Control variables: age, marital status, firm size, sector of industry, part-time work, temporary contract, white color worker, calendar time and unemployment spells prior to the first labour market entry. Standard errors between brackets.

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

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 transi-

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

(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	-0.132 (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. Control variables: age, marital status, firm size, sector of industry, part-time work, temporary contract, white color worker, calendar time and unemployment spells prior to the first labour market entry. Standard errors between brackets.

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

tion to unemployment. Therefore, for the group of movers, firm-specific skills (as measured by long tenure) 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.

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. We 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. 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.

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, however, 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.

Surprisingly, the educational level appears to have little effect on the low-pay mobility of German 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 industry). 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.

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, their partner's labour supply and the country's institutional context.

^[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 assume 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]A multiple-spell multiple-state approach in the framework of Gagliarducci (2005) would be appropriate for our research question as this would allow us to investigate further processes such as the low pay - unemployment cycle. However, in our sample there are very few sequences of the type low pay - non employment - low pay which makes the implementation of the multiple-state model infeasible.

^[8]All estimations were carried out in Latent Gold (Vermunt and Magidson, 2008).

^[9]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.

^[10]We use dummies for small, medium and 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.

^[11]Calendar time is useful to estimate a possible effect of the introduction of the minimum wage in the UK, in 1999 as well as the sub-minimum wage for 16 and 17-year-old workers in 2004. Our results indicate that none of the two calendar-time dummies suggest the existence of such an effect. 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.

^[12]In both countries, the probability of re-entering low pay is approximately 10% for labour market entrants.

^[13]This choice was based on the log-likelihood, the AIC and the BIC fit measures. These measures are not reported but are available from the authors on request.

^[14]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.

^[15]The parameter estimates for the control variables are not reported. They are available from the authors on request.

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