

Bauer, Thomas K.; Bachmann, Ronald; David, Peggy

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Labor Market Entry Conditions, Wages and Job Mobility ^{*†}

Ronald Bachmann Thomas K. Bauer Peggy David

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Abstract

Economic conditions at the time of labour market entry can induce wage differentials between workers entering the labour market at different points in time. While there exists much empirical evidence on the existence and persistence of the effects of labour market entry conditions, little is known about their interaction with employees' mobility behaviour. Using German administrative data, this paper analyzes the determinants of job mobility, emphasizing the role of initial wage gaps. The analysis suggests that the effects of entry conditions play an important role in explaining job transitions. Labour market entrants earning less than the average starting wage are more likely to change jobs, directly as well as indirectly. Moreover, labour market transitions tend to reduce the effects of entry conditions, implying that job mobility operates as an adjustment mechanism that reduces the initial wage differences between workers.

JEL codes: *E24, J31, J62, J64*

Keywords: *mobility, job-to-job, wages, labour market entry, initial conditions.*

*Ronald Bachmann, Rheinisch-Westfälisches Institut für Wirtschaftsforschung (RWI), bachmann@rwi-essen.de; Thomas K. Bauer, RWI, Ruhr-Universität Bochum and IZA Bonn, bauer@rwi-essen.de; Peggy David, Ruhr Graduate School in Economics and RWI, david@rwi-essen.de.

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1 Introduction

A number of empirical studies suggests that economic conditions prevailing at the time workers enter the labour market significantly affect their earnings (e.g. Bloom and Freeman, 1986, and Shin, 1994). Whether these wage effects are long-run in nature has been a widely studied question, yielding ambiguous results (e.g. Baker, Gibbs, and Holmstrom, 1994, Oreopoulos, von Wachter, and Heisz, 2008, Harris and Holmstrom, 1982, Welch, 1979). The standard competitive model implies that the labour market operates as a spot market, where wages are solely determined by labour demand and labour supply and thus are equal to the individual's marginal productivity. In such a model, labour market shocks at the beginning of a worker's career are temporary and do not lead to long-lasting wage effects. Alternative economic theories suggest that differences in initial labour market conditions - arising, for example, from variations in the cohort size or business cycle fluctuations - can induce persistent wage differentials between entry cohorts (e.g. Harris and Holmstrom, 1982).

While there exists a large body of literature that theoretically and empirically shows the existence as well as the persistence of the effects of initial conditions on wages, research on how conditions at the time of labour market entry are related to workers' job mobility remains scarce. Looking at a sample of Canadian college graduates, Oreopoulos, von Wachter, and Heisz (2008) provide one of the few studies analyzing the impact of job-starting conditions on worker's early career. They document that the unemployment rate at job entry, diminishing the worker's starting wage, significantly raises the probability of job separation. Furthermore, they provide descriptive evidence that this increased job mobility in turn positively affects wages, and therefore is able to partly reverse the earnings losses experienced through less favourable career starting conditions.

In a related vein, we study the relationship between economic starting conditions and early job mobility addressing two questions: (i) Do wage differentials induced by initial conditions significantly affect an individual's mobility decision?, and (ii) can job mobility act in such a way as to reduce these initial wage gaps? In order to answer these questions, we use a large administrative data set representing 2% of German employees. Our analysis proceeds in three steps. First, we quantify the impact of economic conditions on the wages of labour market entrants. Second, we examine the determinants of individual job mobility, emphasizing the effect of entry conditions in this context. Finally, using an instrumental variable approach

we analyse to what extent worker mobility contributes to a reduction of the initial wage gaps between different entry cohorts. In contrast to previous studies which analyze the different potential causes of initial conditions, we rather use a more general approach and focus on pure year effects acting as a proxy for the effects of entry conditions.

We contribute to the existing literature in several ways: First, we use a large, and representative, sample of labour market entrants in West Germany. Second, we are able to distinguish between various destination states and between voluntary and involuntary job mobility. Finally, we identify the causal effect of job mobility on wage growth.

Our results suggest that wage differentials induced by labour market entry conditions play an important role in explaining job transitions. Workers entering the labour market under unfavourable conditions and earning less than the average starting wage show an increased mobility compared to workers entering during more favourable times and earning average or higher-than-average starting wages. Moreover, the wage discrepancies that occur between workers entering the labour market at different points in time decrease with experience. Direct and indirect labour market transitions further reduce initial wage gaps, implying that job mobility operates as an adjustment process that reduces the initial wage differences between worker groups.

The remainder of this paper is organized as follows. The next section contains a review of the literature on initial conditions, cohort effects, and early job mobility. Section 3 presents a description of the data set, particularly addressing the identification of job transitions. In Section 4 the methodology used in this paper is discussed. Descriptive statistics and estimation results are presented in Section 5. Section 6 contains a number of sensitivity analyses. Section 7 summarizes and concludes.

2 Initial Conditions, Cohort Effects and Job Mobility

The analysis conducted in this paper builds on two strands of the literature: (i) studies on the impact of initial labour market conditions on earnings, and (ii) the job mobility literature, analyzing the determinants and wage effects of individual job transitions. In this section, we provide a brief survey of the existing theoretical and empirical studies for both strands. Although the subsequent empirical analysis does not differentiate between the different potential sources of entry wage differentials, for the sake of completeness our overview also covers studies providing various explana-

tions for differences in wages between entry cohorts.

2.1 Initial Labour Market Conditions and Wages

The economic literature points to several theories that explain why initial labour market conditions might lead to wage differentials between entry cohorts. Studies examining the impact of the demographic cycle on earnings find a considerable increase in labour supply - emanating, for example, from the entry of baby boomers into the job market - adversely affects entry wages (Freeman, 1979, and Welch, 1979). The analysis whether these wage disadvantages remain throughout workers' careers has created contention among researchers (Berger, 1989, Bloom, Freeman, and Korenman, 1987, and Murphy, Plant, and Welch, 1988). In particular, Bloom, Freeman, and Korenman (1987) track the progress of different U.S. cohorts from 1969 to 1984. Their results suggest that large cohorts are able to at least partly catch up in earnings within a decade after labour market entry. Welch (1979) finds similar results for the period from 1967 to 1975 and confirms that wage disadvantages do not persist as the cohort ages. However, Berger (1989) using almost identical data but less restrictive assumptions does not find any convergence in wages across cohorts.

Wage differentials between entry cohorts may also be the result of labour demand shocks, such as technological progress or business cycle fluctuations. For example, there is evidence that individuals hired during economic recessions experience lower entry wages than individuals hired in economic upturns (e.g. Bils, 1985, and Solon, Barsky, and Parker, 1994), with several studies finding that this cohort effect is persistent (e.g. Oreopoulos, von Wachter, and Heisz, 2008, Oyer, 2006, and von Wachter and Bender, 2008). Several theories can be put forward to explain this long-term impact of poor initial economic conditions. Models of implicit contracts, developed for example by Azariadis (1975) as well as Harris and Holmstrom (1982) and empirically tested by Beaudry and DiNardo (1991), and Baker, Gibbs, and Holmstrom (1994), suggest that business cycle conditions at the time of labour market entry may affect individuals' long-term wages, because of missing or insufficient wage adjustments. Another type of model focuses on cyclical variations in hiring and promotion standards, which might lead to differences in workers' productivity and hence to differences in current and future earnings (Okun, 1973, and Reder, 1955). A prevalent explanation for persistent cohort effects is based on the human capital model, stating that the initial economic situation affects workers' opportunity to accumu-

late skills and thus has a sustained impact on individual labour market performance (Gibbons and Waldman, 2004).

2.2 Early Job Mobility

Workers' careers - and in particular young workers' careers - can be characterized by a collective search process: Workers search for firms that value their skills most highly, while firms search for the most productive workers (cf. Jovanovic, 1979). But given their characteristics, labour market entrants may not be able to immediately find an employer that offers them the most productive jobs, which implies that job transitions are an integral part of early working lives (Topel and Ward, 1992). Thus early job mobility plays an important role in improving the quality of job matches and hence for the evolution of workers' wages. This especially holds true in times of unfavourable economic conditions, when suitable jobs are particularly hard to find. Note, however, that job transitions as a mechanism to adjust workers' early wages to average market wages are not taken into account by the theories of cohort wage effects mentioned above.

Empirical studies examining the determinants of job transitions early in the career suggest that the wage level is crucial for individual mobility. Topel and Ward (1992), for example, analyze the mobility patterns of young men and find a lower job stability for lower-paid jobs. This corresponds to results reported by Oreopoulos, von Wachter, and Heisz (2008), who show that economic downturns, diminishing workers starting wage, significantly raise the rate of job change. Common explanations for these findings are based on job search (Burdett, 1979) and job matching approaches (Jovanovic, 1979), which predict a long-lasting catch-up process if wages have temporarily declined. Thus, workers in employment relationships where they do not experience sustained productivity increases tend to search for better jobs that offer higher wages as well as higher match qualities. This implies that employer-to-employer transitions that occur for voluntary reasons are able to increase young workers' wages. There exists empirical evidence that confirms the beneficial wage effects of voluntary job mobility which takes place during the early stages of peoples' working lives. Antel (1986), and Bartel and Borjas (1978), for example, find mobility-induced wage premiums that range between 8% and 20%. Similarly, the analysis by Oreopoulos, von Wachter, and Heisz (2008) indicates that wage disadvantages, experienced by workers graduating in a recession, are partly reversed through job changes. This implies that individuals affected by poor initial

labour market conditions might use the opportunity to advance in their careers through job changes, avoiding persistent earnings disadvantages and yielding a convergence between cohort and average market wages.

Likewise, firms may eventually lay off workers who experience relatively high wages because of favourable starting conditions. This kind of separation might lead to a loss of initial wage advantages and therefore contribute to a reduction of cohort effects. A prevalent explanation for wage losses of displaced workers is based on the human capital theory (Becker, 1975). It suggests that investments in job specific skills create a higher earnings potential, making job mobility less profitable. In line with the model of imperfect information, Gibbons and Katz (1991) argue that at the time of hiring, employers are insufficiently informed about workers' productivity. Since firms have an incentive to lay off less able workers, displacements may serve as a negative signal to other employers. This adverse selection of job movers implies that involuntary employer-to-employer transitions may entail negative wage effects, which has been confirmed by several empirical studies. Kletzer and Fairlie (2003) and von Wachter and Bender (2006), for example, point to the fact that job displacements in workers' early careers lead to sizeable and persistent wage losses. Similarly, von Wachter and Bender (2008) show that initial wage advantages, obtained from favourable labour market conditions, are reduced when workers lose their job.

With the exception of, for example Antel (1986) and Perez and Sanz (2005), only a few empirical papers analyze voluntary and involuntary job changes simultaneously and thus allow for both beneficial as well as adverse mobility.

3 Data

In the following analysis we employ the IAB Employment Sample (IAB), a data set provided by the Institute for Employment Research (IAB). The IABS is a 2% representative sample of the *Employment Statistics Register*, an administrative panel data set of the employment history of all individuals in Germany who worked in an employment relationship covered by social security between 1975 and 2004, supplemented with information on all unemployment spells of the workers covered. For 1995, the Employment Statistics Register contains the labour market history of 79.4% of all employed persons in Western Germany, and 86.2% of all employed persons in

Eastern Germany.¹

The data set provides information on gross daily wages subject to social security contributions, which we deflate using consumer prices (base year 2000). Further worker characteristics included are the employees' year of birth, sex, nationality, and education. To meet the problem of inconsistent and missing information on the individual's education, we use an education variable corrected following an imputation procedure provided by Fitzenberger, Osikumino, and Völter (2006).²

We restrict our sample to West-German individuals who started their career between 1980 and 1999, because the record on unemployment benefit recipients are unreliably measured before 1980. We analyze the career paths of these individuals in their first five years on the labour market. For a better comparison of wages, we exclude part-time workers, homeworkers, trainees, and individuals with parallel employment spells. For each entry cohort we trim wages at the 1st and 99th percentiles and leave unconsidered the starting wages close to the contribution ceiling.³ Finally, we drop individuals with missing values for the variables used in the empirical analysis. Using these selection criteria, our final sample comprises 195,384 labour market entrants with a total of about 1.3 million spells.

The IABS is representative regarding employment covered by the social security system but not regarding unemployment, because only those unemployed who are entitled to transfer payments are covered.⁴ We can

¹The employee history is based on the integrated notification procedure for health insurance, the statutory pension scheme, and unemployment insurance. At the beginning and at the end of any employment spell, employers have to notify the social security agencies. This information is exact to the day. For spells spanning more than one calendar year, an annual report for each employee registered within the social insurance system is compulsory, and provides an update on, for example, the qualification and the current occupation of the employee. A detailed description of the Employment Statistics Register and the notification procedure is given by Bender, Haas, and Klose (2000). Note that civil servants and self-employed workers are not included in the data.

²Particularly, we use the imputation procedure 2B by Fitzenberger, Osikumino, and Völter (2006), where education reports are extrapolated if a person's education sequence is consistent.

³Other studies based on administrative individual data are usually subject to the problem that the wage information in the IABS is censored at the social contribution ceiling. Because we only consider individuals entering the labour market for the first time, these data problems barely affect our analysis: Less than 0.4% of the workers' starting wages are top coded. Within the first five years of labour market experience about 10% of the workers reach wages affected by the contribution ceiling.

⁴For example, workers who fail to report to the unemployment office are not counted as unemployed even if they have been laid off and are looking for a job. The same is true for workers who, during the two years prior to unemployment, have worked for less than 12 months in a job covered by social security legislation. Also, workers can be temporarily denied unemployment

derive three labour market states at each moment in time: employment (E) covered by social security, unemployment (U), if the worker is receiving transfer payments, and non-participation (N). Since the latter state cannot be directly observed, we define non-participants as individuals leaving the sample. Therefore, transitions to non-participation include also transitions to the civil service, to self-employment, retirement or marginal employment, because these destinations are not covered by social security legislation and are therefore not covered by the Employment Statistics Register.

Since the IABS data set contains daily information on the employment and unemployment history of every individual in the sample, it is possible to calculate separation flows taking into account every change of the labour market state that occurs within a certain time period. Using the establishment identification number provided in the data set, we are able to identify three different separation flows: transitions (i) from employment to non-participation (EN), (ii) from employment to unemployment (EU) and (iii) from employment to another employment relationship (EE). As firms and workers may fail to correctly report the beginning and the end of a job or of a period of unemployment, we disregard small gaps in the records. In particular, we define a direct transition between two labour market states if the time lag between two spells (employment or unemployment) is smaller than 30 days. It should also be noted that our definition of a job is based on the establishment level and not on the firm level. A transition from one establishment to another one within the same firm will therefore be treated as an employer-to-employer flow.

Concerning EE flows, recent research has pointed out that a distinction between voluntary and involuntary job changes proves to be important (Antel, 1986). Since the IABS data do not designate any reason for a job separation, we are not able to directly differentiate between voluntary and involuntary moves. As an alternative, we follow previous studies (e.g. Perez and Sanz, 2005) and compare direct employer-to-employer transitions and those with an intervening unemployment spell of less than 1 month (EE_d) to employer-to-employer transitions with an intervening unemployment spell that is larger than 1 month (EE_{id}).⁵ Corresponding to the notion in the job

benefits for different reasons (e.g. unjustified job quits, failure to take up an acceptable job), and are not recorded as unemployed for periods of non-receipt of benefits.

⁵Our data set only records unemployment spells if the worker receives unemployment benefits. We are thus not able to identify the true length of unemployment. Following Fitzenberger and Wilke (2006), we therefore use the nonemployment period as a proxy for the true unemployment period, which is defined as all nonemployment spells after an employment spell

mobility literature, the first type of separation is most likely initiated by the worker and is interpreted as a voluntary move. The latter one, however, results most likely from a lay-off and is considered to be an involuntary move.⁶ Transition rates are calculated by using aggregate employment as denominator.

4 Econometric Framework

In the first part of the empirical analysis, we estimate the probability of experiencing a certain job separation S_{iet} by using a standard probit model:

$$Pr(S_{iet} = 1|X, Z) = \Phi(\beta_1 X_{it} + \beta_2 Z_{et} + \beta_3 T_t + \gamma C_i), \quad (1)$$

where $\Phi(\cdot)$ is the standard normal cumulative distribution function. In order to get a general idea of young workers' mobility behaviour, we first use the probit framework to analyze transitions from one employer to another (EE), from employment to unemployment (EU), and from employment to non-participation (EN). In a second step, we focus on employer-to-employer transitions and estimate the transition probabilities of changing employers directly (EE^D flows: EE flows with an intervening nonemployment spell < 1 month) and changing employers indirectly (EE^{ID} flows: EE flows with an intervening nonemployment spell ≥ 1 month). X_{it} is a vector of individual characteristics, including gender, skill level, and employment duration and Z_{et} a vector of establishment characteristics, including establishment size and industry dummies. In order to account for differences in economic conditions at the time of separation, we include yearly dummies (T_t).

The explanatory variable of main interest is the wage effect of the labour market conditions at the beginning of the worker's career (C_i). In order to calculate these initial wage differentials we first estimate the following wage regression using a simple OLS approach:

$$\ln w_{i0} = \alpha_0 + \alpha_1 X_{i0} + \alpha_2 Z_{e0} + \sum_{j=2}^J \delta_j C_j + \epsilon_{i0}, \quad (2)$$

where $\ln w_{i0}$ refers to the real daily log wage of individual i at the time of entering the labour market ($t=0$), X_{i0} is a vector of individual characteristics, Z_{e0} is a vector of establishment characteristics, and the vectors α_0 , α_1 ,

including at least one period with receipt of transfer benefits.

⁶Using this definition, job separations induced by the employer might be considered as voluntary moves. This is possible, for example, if the employer notifies the worker in advance that he will be laid off, giving him the opportunity to search on-the-job. We therefore view our measure of voluntary transitions as an upper bound.

α_2 , and δ_j are coefficients to be estimated. C_j denotes a set of $j - 1$ dummy variables indicating the year an individual enters the labour market. These variables constitute a summary measure of the conditions prevailing at the time of labour market entry which include, for example, business conditions and the size of the cohort entering the labour market in a given year. In a second step, the coefficients δ_j obtained from estimating equation (2) by using an arbitrarily chosen reference year, are transformed into deviations from the grand mean of starting wages following Jann (2005). These starting wage deviations enter equation (1) with one variable comprising values smaller than zero and a second one comprising values larger than zero, allowing positive and negative deviations to have different effects on the transition probabilities.⁷ Table A.1 provides definitions as well as summary statistics of all the worker and establishment characteristics used in the empirical analysis.

In the second part of the empirical analysis, we aim at investigating whether job mobility contributes to a decrease in the initial wage differential between labour market entrants across years within the first five years of their labour market career. In this part of the analysis we concentrate on individuals who stayed in their first job, individuals who directly transit from one employer to another, and individuals who indirectly change employers. We then compare how the wage gap between workers that enter the labour market in different years changes for these three groups. This is done by estimating the following model:

$$\begin{aligned} \ln w_{i5} = & \gamma_1 + \gamma_2 X_{i5} + \gamma_3 Z_{e5} + \gamma_4 EE_{i5}^D + \gamma_5 EE_{i5}^{ID} + \sum_{j=2}^J \delta_j C_j \\ & + \sum_{j=2}^J \theta_{1j} C_j EE_{i5}^D + \sum_{j=2}^J \theta_{2j} C_j EE_{i5}^{ID} + \epsilon_{i5}. \end{aligned} \quad (3)$$

Different to model (2), we now examine the workers' wages five years after their labour market entry ($t=5$). Moreover, equation (3) extends the previous one as it additionally includes two dummy variables EE_{i5}^D and EE_{i5}^{ID} , indicating whether only direct or only indirect employer changes take place. In order to gauge the wage effect of mobility for workers entering the labour market in different years, we interact these two indicator variables with the year dummies C_j .

Previous studies point out that the failure to control for the simultane-

⁷Since predicted variables are included as regressors, standard errors are corrected following Murphy and Topel (1985).

ous determination of wages and mobility may result in biased and inconsistent estimators (Abowd, Kramarz, and Roux, 2006, Altonji and Shakotko, 1987, and von Wachter and Bender, 2006). We address the possible endogeneity of changing employers by using an instrumental variable approach. There we employ the argument that due to improved outside job opportunities workers are pulled into new jobs, while they are pushed out of their current job because of worsened working conditions (McLaughlin, 1991). Thus, we instrument for the probability of voluntary mobility with the annual industry employment growth rate, arguing that due to industry-specific human capital workers are likely to change jobs within the same industry. This implies that in growing industries more job openings are available which positively affects the likelihood of a voluntary job change. Following Goeggel and Zwick (2009), who analyze the job and wage mobility behaviour of German apprentices, we use a mass layoff indicator as an instrument for the probability of involuntary job mobility. Mass layoffs are defined as a 30 percent reduction of the employment in an establishment from one year to another. It is assumed that workers are more likely to leave the job involuntarily if an establishment's labour force was reduced significantly in the year of separation.

The industry employment growth rate as well as the mass-layoff indicators are highly correlated with the workers' likelihood to change employers directly and indirectly, respectively, making them strong instruments. Moreover, it seems plausible to argue that both instruments are uncorrelated to unobservable individual characteristics affecting wages.

5 Descriptive Evidence and Estimation Results

Before we turn to the impact of initial labour market conditions on workers' mobility behaviour and the role of job mobility in adjusting wage differentials, we show the pattern of initial wage gaps as well as the evolution of wages over time for workers entering the labour market in different years. Figure 1 plots the development of average log real daily wages for workers starting their career between 1980 and 1999, in addition to average wages at the time of labour market entry as well as five years later. The average starting wage varies significantly over time and the resulting wage differentials between workers entering the labour market in different years decrease slowly over time.⁸

⁸It can be shown that wages at the time of labour market entry follow the GDP growth rate.

The observed variations in starting wages may not solely be driven by differences in labour market entry conditions, but also by variations in the composition of the worker groups entering the labour market in different years. The corresponding summary statistics, which are reported in Table A.2, show that workers entering in different years only differ slightly in observable characteristics (share of females, share of skill groups and cohort size). This issue is examined explicitly in Table 1, which presents the entry year effects obtained by estimating several specifications of equation (2). With the exception of workers entering the labour market in 1990, worker groups entering in all years earn starting wages that significantly differ from the average. For example, workers starting their working career in 1980 earn 21.4% less than the average, while entrants in 1999 have starting wages 21.3% above the average.⁹ Taking into account observable person (skill level, gender) and establishment characteristics (industry, region, establishment size) reduces the estimated year effects to some part. The wage differentials between entry cohorts are further reduced when we control for a linear time trend in addition to composition effects.

5.1 The Impact of the Initial Wage Gap on Job Mobility

Table 2 displays several separation transitions by labour market experience and deviation from the mean starting wage, to illustrate the job mobility behaviour of individuals affected by diverse starting conditions. It becomes apparent that all transition rates are decreasing with the individual's labour market experience. Furthermore workers of the lower quintiles tend to be more mobile at the beginning of their career. For example, two years after labour market entry, workers with starting wages below the average show employer-to-employer transition rates ranging from 20.6% to 18.8%, while the second year EE transition rates of workers whose entry wage lies above the sample mean only reach about 15% to 16%. The transitions from employment to non-participation (EN) show a very similar pattern. For employment-to-unemployment transitions (EU), however, slightly different properties can be observed. Workers with starting wages near the average and those with positive deviations seem to have the lowest transition rates, varying from 9.4% to 9.7% two years after labour market entry. On the other hand, workers with negative deviations from the mean starting wage show increased inflows to unemployment.

⁹The probability to enter the labour market follows a strongly procyclical pattern. Therefore we argue that the estimated wage losses constitute a lower bound of costs due to unfavourable starting conditions, as the costs of an increased unemployment probability would add.

Table 2 additionally displays the transition rates for direct (EE^D) and indirect employment changes (EE^{ID}). Here, we can again observe that direct EE flows are higher for workers from the lower quintiles. Moreover, EE flows with an intervening nonemployment spell increase with negative wage deviations and are least likely to occur for workers with starting wages near or above the sample mean. Overall, Table 2 shows that individuals with negative initial wage deviations, however, tend to be more mobile.

Table 3 displays the marginal effects of the three separation flows EE, EN, and EU, obtained from estimating two specifications of a probit model: (i) a basic specification described in equation (1) (see columns (1), (3) and (5)), and (ii) an extended specification, which includes also interaction variables of entry year effects with worker's employment duration to examine whether the impact of initial wage differentials varies with employment duration (columns (2), (4) and (6)). The results are generally in line with the literature on job mobility. The marginal effects of all three transitions indicate that job separations are negatively correlated with the skill level, suggesting that transitions are a more common phenomenon among less educated individuals. The estimation results also show that employment duration negatively affects the likelihood of separating. This negative duration dependence may be attributed to the accumulation of firm-specific human capital, which makes it less profitable to dissolve the worker-firm match. The result that women face a significantly lower risk of job separation than men, irrespective of the destination state, is, however, not in line with other studies on labour market flows, which usually find women to be more mobile than men, and to be more likely to transit from employment to unemployment or nonparticipation, usually because of maternity and child care. For our sample, consisting of job starters, these factors do not play an important role, which may explain the discrepancy between our results and those usually found in the literature.

Concerning the impact of the initial wage gap on transition probabilities, the estimation results largely confirm the results from the descriptive analysis. The probabilities that an EE or EN flow occur are increasing with negative entry year effects, and decreasing with positive entry year effects. A different pattern occurs for the outflows to unemployment. Here the estimation results indicate that positive entry year effects do not have a statistically significant impact on the transition probability. Negative entry year effects, however, significantly increase the probability of moving. Our overall finding is that workers entering the labour market during poor economic conditions tend to be more mobile, which is in line with the

evidence presented by Oreopoulos, von Wachter, and Heisz (2008).

The coefficients obtained from estimating the probability of changing jobs directly and indirectly are also shown in Table 3 (columns (7), (8), (9) and (10)). For both types of transitions, we find very similar features with respect to workers' skill level and gender, as well as job duration. The same is true for the entry year effects. Positive entry year effects significantly reduce the likelihood of direct employer-to-employer transitions: A one percent increase of the positive entry year effect lowers the transition probability by 0.11%. Arguably, labour market entrants affected by advantageous economic conditions earn wages above the average and do not have an incentive to search for better paid jobs. The probability of changing employers through a nonemployment spell, however, is not significantly affected by positive entry year effects.

Negative entry year effects, on the other hand, are positively correlated with employer-to-employer transitions, irrespective of whether they occur directly or indirectly. If the negative wage differential is raised by one percentage point, the likelihood for direct and indirect transitions increases by 0.33% or 0.16%, respectively. The marginal effects of the interaction terms in the second specification indicate that this effect is even larger at the beginning of a worker's career and then gradually declines with employment duration (see columns (2) and (4)). This increased probability of direct employer-to-employer transitions could be the result of on-the-job search. Workers entering the labour market during unfavourable starting conditions, and earning less than the average cohort wage, might feel underpaid. While they are employed, these workers search for better jobs, and are likely to switch jobs without an intervening nonemployment spell. With respect to the increased likelihood of indirect employer changes, one could argue that negative year effects may lower the individual's motivation and thus increase shirking. Since these workers face a higher risk to be laid off, employer-to-employer transitions are likely to occur through a period of nonemployment.

5.2 Adjustment of Entry Year Effects

To examine the role of job mobility in the reduction of entry year effects over time, we compare wages and wage growth between stayers and movers five years after labour market entry. Stayers are defined as workers who stay in their first job. Movers are classified into three groups: workers who change

jobs within the first five years of their labour market career (i) directly, (ii) indirectly, or (iii) directly as well as indirectly.¹⁰ The distribution of the individuals in our sample over these categories is shown in Table A.3.

Table 4 presents the wage growth for the five quintiles of the entry wage distribution by deviation from the mean starting wage. In general, wage growth appears to be much higher for workers whose entry wages show negative deviations, irrespective of whether they stay at their first employer, move directly or indirectly. For example, the wages of stayers in the first quintile grow by more than 165%, while the wages of those in the 5th quintile only grow by 21.5%. For all workers but those in the highest quintile, wage growth is steeper when workers change employers directly. For workers in the lower quintiles, even indirect job changes lead to higher wage growth than staying with the same employer.¹¹ These results suggest that unfavourable labour market conditions at the time of labour market entry result in inappropriate job matches, such that any kind of job change seems to be beneficial to workers. In contrast to this, wages grow less when workers in the upper quintiles switch employers, i.e. direct employer-to-employer transitions result in a 15.6% wage growth, while indirect transitions increase wages by only 11.5%.

These patterns of wage growth indicate that workers with wage disadvantages due to unfavourable economic conditions at the beginning of their career are able to at least partly close the initial wage gaps. Table 4 reveals that at the time of entering the labour market, log real daily wages range from 3.065 in the first quintile to 4.197 in the fifth quintile. After gaining five years of labour market experience, these wage differentials have decreased, for all groups of workers considered. Since workers of the lower quintiles experience a higher wage growth than those of the upper quintiles, convergence between wages occurs even for stayers. However, wage convergence is even more pronounced when workers are mobile, indicating that job mobility leads to a stronger reduction of initial wage differentials than staying with the same employer.

To empirically test this statement, we estimate equation (3) as described in the previous section.¹² The estimation results obtained from a simple

¹⁰By this definition, workers are allowed to switch employers several times within the first five years. Restricting the sample to workers who only once changed jobs leads to very similar, but slightly reduced effects.

¹¹The lower wage growth of indirect moves outweighs the higher wage growth of direct moves. Due to this, workers who change jobs directly and indirectly within their first five career years show an intermediate wage growth rate.

¹²Here we only consider workers who change jobs only directly or indirectly within the first

OLS model are shown in Table 5. The coefficients in the first row of this table show the average effect of staying with the initial firm, changing jobs directly as well as changing jobs indirectly. The interaction terms indicate how these main effects are modified when we distinguish between workers entering the labour market in different years. Overall, wages of stayers are 3.8% below the average. This negative effect is even higher for workers who started their career before 1988, but lower for those who entered the labour market afterwards. The older cohorts, suffering from initial wage disadvantages, can benefit from changing employers without an intervening nonemployment spell. While the main effect of direct job mobility lies at about 3.4%, it is even higher for these earlier years. Workers entering the labour market in earlier years also benefit strongly from changing employers indirectly. One can observe opposite results for workers who start their career later and initially earn wages above the average: Compared to the main effect, direct and indirect job changes cause a lower wage. Figure 2 shows the estimated entry year effects five years after labour market entry for stayers and movers compared to the initial entry year effects at the time of labour market entry. After five years of labour market experience, the wage differentials across workers with different entry years have decreased for both, movers and stayers. This reduction is much stronger when workers change their employers, suggesting that job mobility is an important mechanism for wage convergence across entry cohorts. For example, the 11.1% wage disadvantage of workers who started their career in 1984 and stay in their first job is reduced to 7.9%, while direct and indirect movers experience a reduction of negative wage differentials to 3.6% and 0.08%, respectively.

As discussed in Section 4 the OLS results may be biased, due to the endogeneity of the mobility decision. Therefore, Table 6 additionally presents the estimation results from an IV approach, where the industry employment growth rate and a mass-layoff indicator are used as instruments for voluntary and involuntary job mobility. Both instruments appear to be strong predictors of the workers' probability to change jobs. Most importantly a F-test of joint significance of the instruments suggests that our results do not suffer from a problem of weak instruments. Table 6 shows that the IV results differ from the respective OLS results. In particular, indirect mobility now has a significantly negative effect on wages five years after labour market entry, staying has positive effect, and direct job-to-job mobility has a positive effect. Those who show both types of job mobility (about 18.000 workers) are not included.

bility is most beneficial for wages. This results can be explained by the fact that the IV approach yields a local average treatment effect on the treated. Therefore, the IV coefficients only apply for those affected by the instrument. This means that the instruments seem to identify voluntarily and involuntarily mobile workers more precisely than it is the case for the OLS estimation - the effect of indirect/involuntary mobility is therefore more negative in the IV estimation than in the OLS estimation, and the opposite is true for direct mobility.

5.3 Sensitivity Analysis

In order to test the robustness of our results, we first address the endogenous nature of the labour market entry decision.¹³ It might be the case that in times of unfavourable economic conditions, individuals decide not to enter the labour market and postpone their career start by lengthening their educational training. We therefore analyze workers who start working after finishing their apprenticeship separately, arguing that these workers are not easily able to respond to fluctuations in economic conditions and are thus unlikely to defer the starting point of their labour market career. The regression results for these workers show that workers who start their career after an apprenticeship and who are affected by positive wage deviations experience almost the same transition probabilities as the entire sample. With respect to negative initial wage differentials, however, apprentices are more likely to separate from their employer. Being less able to postpone their labour market entry and to avoid poor match qualities, unfavourable economic conditions have a stronger effect on their transition probabilities. Estimating the impact of the time of labour market entry on apprentices' wages leads to very similar results as for the whole sample.

In a second robustness test, we conduct our analysis using the predicted instead of the actual year of entry. Again, this leads to qualitatively very similar results as for the whole sample. Quantitatively, year of entry effects on wages are found to be somewhat smaller. This can be explained by the fact that workers who do not postpone their labour market entry generally find jobs with characteristics which are relatively independent of economic conditions. To take an example, workers who do not postpone their labour market entry in a recession are likely to have found a relatively good job, i.e. they do not contribute to negative year of entry effects.

¹³The results from the robustness tests are not displayed in this paper, but are available from the authors upon request.

Finally, we carry out both parts of the empirical analysis for different sub-populations. Distinguishing between gender and skill groups leads to very similar estimation results as for the whole sample.

6 Conclusion

This paper investigates the relationship between entry year effects in wages and workers' mobility behaviour early in their career. Throughout the analysis, we use a large German administrative panel data set covering the time period from 1975 to 2004. In a first step, we model the probability of experiencing job transitions, where we focus on direct and indirect employer-to-employer transitions. One of the explanatory variables, which is included in the regressions and is of particular interest, is the wage differential caused by variations in economic conditions at the time of labour market entry. These wage differentials varying significantly across entry cohorts are found to be an important determinant of job mobility. For all types of transitions we can show that workers affected by poor economic starting conditions are more likely to separate from their job. For example, workers who earn wages 20% below the mean starting wage face a 5.8% higher risk to directly switch employers than workers with average starting wages.

In a second step, we investigate the change in the entry year effect that can be attributed to job mobility. To tackle the endogeneity problem which emerges from the possibility that mobility is likely to be correlated with unobserved individual and job characteristics affecting earnings, we apply an instrumental-variable approach. As an instrument for the probability of direct job mobility, we use the industry employment growth rate. The probability of indirect job mobility, in return, is instrumented by a mass lay-off indicator. We find that wage differentials across entry cohorts decrease with labour market experience. Moreover, the estimation results show that cohorts with wage advantages can benefit from direct job changes, but are adversely affected by employer transitions with an intervening unemployment spell. For workers with initial wage disadvantages, however, job mobility in general increases wages. Overall, our empirical results show that job mobility indeed operates as an adjustment mechanism that leads to a reduction of wage differentials between workers entering the labour market at different points in time.

References

- ABOWD, J. M., F. KRAMARZ, AND S. ROUX (2006): “Wages, mobility and firm performance: Advantages and insights from using matched worker-firm data,” *The Economic Journal*, 116, F245–F285.
- ALTONJI, J. G., AND R. A. SHAKOTKO (1987): “Do Wages Rise with Job Seniority,” *Review of Economics and Statistics*, 54(3), 437–460.
- ANTEL, J. J. (1986): “Human Capital Investment Specialization and the Wage Effects of Voluntary Labor Mobility,” *Review of Economics and Statistics*, 68(3), 477–483.
- AZARIADIS, C. (1975): “Implicit Contracts and Underemployment Equilibria,” *The Journal of Political Economy*, 83(6), 1183–1202.
- BAKER, G., M. GIBBS, AND B. HOLMSTROM (1994): “The Wage Policy of a Firm,” *Quarterly Journal of Economics*, 109, 881–919.
- BARTEL, A. P., AND G. J. BORJAS (1978): “Wage Growth and Job Turnover: An Empirical Analysis,” NBER Working paper 285, National Bureau of Economic Research.
- BEAUDRY, P., AND J. DINARDO (1991): “The Effect of Implicit Contracts and the Movement of Wages over the Business Cycle,” *Journal of Political Economy*, 99(4), 665–688.
- BECKER, G. (1975): “Human Capital,” 2nd ed. university of chicago press for the nber, Chicago, IL.
- BENDER, S., A. HAAS, AND C. KLOSE (2000): “IAB employment subsample 1975-1995. Opportunities for analysis provided by the anonymised subsample,” IZA Discussion Paper 117, Institute for the Study of Labor (IZA).
- BERGER, M. C. (1989): “Demographic cycles, cohort size, and earnings,” *Demography*, 26(2), 311–321.
- BILS, M. J. (1985): “Real Wages over the Business Cycle: Evidence from Panel Data,” *Journal of Political Economy*, 93(4), 666–689.
- BLOOM, D. E., AND R. B. FREEMAN (1986): “The Youth Problem: Age or Generational Crowding,” NBER Working Paper 1829, National Bureau of Economic Research.

- BLOOM, D. E., R. B. FREEMAN, AND S. KORENMAN (1987): "The Labour Market Consequences of Generational Crowding," *European Journal of Population*, 3, 131–176.
- BURDETT, K. (1979): "A Theory of Employee Job Search and Quit Rates," *American Economic Review*, 68(1), 212–220.
- FITZENBERGER, B., A. OSIKUMINO, AND R. VÖLTER (2006): "Imputation Rules to Improve the Education Variable in the IAB Employment Subsample," *Schmollers Jahrbuch / Journal of Applied Social Science Studies*, 126(3), 405–436.
- FITZENBERGER, B., AND R. A. WILKE (2006): "Unemployment Durations in West -Germany Before and After the Reform of the Unemployment Compensation System during the 1980ties," Discussion paper, Goethe University Frankfurt.
- FREEMAN, R. B. (1979): "The Effect of Demographic Factors on Age-Earnings Profiles," *The Journal of Human Resources*, 14, 289–318.
- GIBBONS, R., AND L. KATZ (1991): "Layoffs and Lemons," *Journal of Labor Economics*, 9(4), 351–380.
- GIBBONS, R., AND M. WALDMAN (2004): "Task-Specific Human Capital," *AEA Papers and Proceedings*, 94, 203–207.
- GOEGGEL, K., AND T. ZWICK (2009): "Good Occupation - Bad Occupation? The Quality of Apprenticeship Training," Discussion Paper 09-024, ZEW.
- HARRIS, M., AND B. HOLMSTROM (1982): "A Theory of Wage Dynamics," *Review of Economic Studies*, 49, 315–333.
- JANN, B. (2005): "DEVCON: Stata module to apply the deviation contrast transform to estimation results," Statistical Software Components, Boston College Department of Economics.
- JOVANOVIĆ, B. (1979): "Job Matching and the Theory of Labor Turnover," *Journal of Political Economy*, 87, 972–990.
- KLETZER, L. G., AND R. W. FAIRLIE (2003): "The Long-Term Costs of Job Displacement Among Young Workers," *Industrial Labor Relations Review*, 56(4), 682–698.

- McLAUGHLIN, K. J. (1991): “A Theory of Quits and Layoffs with Efficient Turnover,” *Journal of Political Economy*, 99(1), 1–29.
- MURPHY, K. M., M. PLANT, AND F. WELCH (1988): “Cohort Size and Earnings in the United States,” in *Economics of Changing Age Distributions in Developing Countries*, ed. by R. D. Lee, W. B. Arthur, and G. Rodgers, pp. 39–58. Oxford University Press, Oxford.
- MURPHY, K. M., AND R. H. TOPEL (1985): “Estimation and Inference in Two-Step Econometric Models,” *Journal of Business and Economic Statistics*, 3(4), 370–379.
- OKUN, A. M. (1973): “Upward Mobility in a High-Pressure Economy,” *Brookings Papers of Economic Activity*, 1, 207–252.
- OREOPOULOS, P., T. VON WACHTER, AND A. HEISZ (2008): “The Short- and Long-Term Career Effects of Graduating in a Recession: Hysteresis and Heterogeneity in the Market for College Graduates,” IZA Discussion Paper 3578, Institute for the Study of Labor (IZA).
- OYER, P. (2006): “The Macro-Foundations of Microeconomics: Initial Labor Market Conditions and Long-Term Outcomes for Economists,” NBER Working Papers 12157, National Bureau of Economic Research.
- PEREZ, J. I. G., AND Y. R. SANZ (2005): “Wage Changes Through Job Mobility in Europe: A Multinomial Endogenous Switching Approach,” *Labour Economics*, 12, 531–555.
- REDER, M. (1955): “The Theory of Occupational Wage Differentials,” *American Economic Review*, 45, 833–852.
- SHIN, D. (1994): “Cyclicalities of Real Wages among Young Men,” *Economics Letters*, 46(2), 137–142.
- SOLON, G., R. BARSKY, AND J. A. PARKER (1994): “Measuring the Cyclicalities of Real Wages: How Important is Composition Bias?,” *Quarterly Journal of Economics*, 109(1), 1–25.
- TOPEL, R. H., AND M. P. WARD (1992): “Job Mobility and the Careers of Young Men,” *Quarterly Journal of Economics*, 107(2), 439–479.
- VON WACHTER, T., AND S. BENDER (2006): “In the Right Place at the Wrong Time: The Role of Firms and Luck in Young Workers Careers,” *American Economic Review*, 96(5), 1679–1705.

- (2008): “Do Initial Conditions Persist Between Firms? An Analysis of Firm-Entry Cohort Effects and Job Losers using Matched Employer-Employee Data,” in *The Analysis of Firms and Employees: Quantitative and Qualitative Approaches*, ed. by S. Bender, J. Lane, K. L. Shaw, F. Andersson, and T. von Wachter. University Chicago Press.
- WELCH, F. (1979): “The Effect of Cohort Size on Earnings: The Baby Boom Babies’ Financial Bust,” *Journal of Political Economy*, 87(5), 65–97.

Tables and Figures

Table 1: Year effects in starting wages

Year of entry	(1)		(2)		(3)	
	Coeff.	(S. D.)	Coeff.	(S. D.)	Coeff.	(S. D.)
1980	-0.214***	(0.004)	-0.152***	(0.004)	-0.020***	(0.004)
1981	-0.217***	(0.004)	-0.156***	(0.004)	-0.037***	(0.006)
1982	-0.242***	(0.005)	-0.186***	(0.004)	-0.081***	(0.006)
1983	-0.230***	(0.005)	-0.184***	(0.004)	-0.093***	(0.005)
1984	-0.225***	(0.005)	-0.187***	(0.004)	-0.111***	(0.005)
1985	-0.197***	(0.005)	-0.169***	(0.004)	-0.106***	(0.005)
1986	-0.145***	(0.005)	-0.122***	(0.004)	-0.074***	(0.004)
1987	-0.113***	(0.005)	-0.096***	(0.004)	-0.061***	(0.004)
1988	-0.083***	(0.005)	-0.082***	(0.004)	-0.061***	(0.004)
1989	-0.052***	(0.004)	-0.057***	(0.004)	-0.050***	(0.004)
1990	0.001	(0.005)	-0.013***	(0.004)	-0.020***	(0.004)
1991	0.057***	(0.005)	0.038***	(0.004)	0.017***	(0.004)
1992	0.212***	(0.005)	0.180***	(0.004)	0.145***	(0.004)
1993	0.214***	(0.005)	0.191***	(0.004)	0.142***	(0.005)
1994	0.210***	(0.005)	0.178***	(0.005)	0.115***	(0.005)
1995	0.234***	(0.005)	0.186***	(0.005)	0.110***	(0.006)
1996	0.211***	(0.006)	0.177***	(0.005)	0.087***	(0.006)
1997	0.179***	(0.006)	0.146***	(0.005)	0.042***	(0.006)
1998	0.188***	(0.006)	0.138***	(0.005)	0.020***	(0.007)
1999	0.213***	(0.006)	0.169***	(0.005)	0.036***	(0.007)
Age			0.043***	(0.001)	0.043***	(0.001)
Female			-0.114***	(0.002)	-0.114***	(0.002)
Med.-skill			0.104***	(0.003)	0.104***	(0.003)
High-skill			0.247***	(0.006)	0.247***	(0.006)
Firm controls			X		X	
Time Trend					X	

Source: Authors' calculations, based on IABS 1975-2004.

Note: Dependent variable is the log real daily wage. Year effects are calculated as deviations from the grand mean starting wage. Firm controls include dummy variables for establishment size, industry, and region. The three specifications differ by the inclusion of observable controls only.

Table 2: Mobility statistics by deviation from mean entry wage

Deviation from entry wage	Experience year	Worker flow rates				
		EE	EN	EU	EE ^D	EE ^{ID}
1st quintile	1st year	0.210	0.242	0.169	0.235	0.133
	3rd year	0.206	0.162	0.147	0.224	0.108
	5th year	0.183	0.132	0.116	0.196	0.077
2nd quintile	1st year	0.183	0.221	0.102	0.196	0.085
	3rd year	0.188	0.142	0.103	0.200	0.079
	5th year	0.162	0.120	0.092	0.171	0.064
3rd quintile	1st year	0.208	0.243	0.111	0.222	0.091
	3rd year	0.182	0.129	0.098	0.193	0.074
	5th year	0.159	0.122	0.087	0.168	0.061
4th quintile	1st year	0.193	0.241	0.107	0.204	0.093
	3rd year	0.166	0.118	0.094	0.177	0.075
	5th year	0.145	0.122	0.083	0.152	0.062
5th quintile	1st year	0.168	0.220	0.097	0.176	0.082
	3rd year	0.149	0.108	0.097	0.156	0.078
	5th year	0.137	0.111	0.078	0.143	0.057

Source: Authors' calculations, based on IABS 1975-2004.

Note: The flow definitions are in Table A.1. The 1st quintile represents the bottom 20% of the wage distribution, the 5th quintile represents the top 20%.

Table 3: Probit Estimation results

	EE		EU		EN		EE ^D		EE ^{TD}	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Female	-0.0183*** (0.0024)	-0.0182*** (0.0024)	-0.0395*** (0.0015)	-0.0395*** (0.0015)	-0.0162*** (0.0003)	-0.0162*** (0.0003)	-0.0240*** (0.0026)	-0.0238*** (0.0026)	-0.0119*** (0.0008)	-0.0118*** (0.0008)
Mediumskill	-0.0193*** (0.0038)	-0.0192*** (0.0038)	-0.0794*** (0.0025)	-0.0793*** (0.0025)	-0.0154*** (0.0004)	-0.0153*** (0.0004)	-0.0429*** (0.0041)	-0.0426*** (0.0041)	-0.0391*** (0.0014)	-0.0388*** (0.0014)
Highskill	-0.0449*** (0.0058)	-0.0449*** (0.0058)	-0.0888*** (0.0019)	-0.0887*** (0.0019)	-0.0099*** (0.0005)	-0.0095*** (0.0005)	-0.0780*** (0.0059)	-0.0779*** (0.0059)	-0.0316*** (0.0009)	-0.0313*** (0.0009)
7-12 months	-0.0436*** (0.0030)	-0.0419*** (0.0030)	-0.0544*** (0.0013)	-0.0536*** (0.0014)	-0.0095*** (0.0003)	-0.0115*** (0.0003)	-0.0918*** (0.0030)	-0.0891*** (0.0030)	-0.0393*** (0.0006)	-0.0383*** (0.0006)
13-18 months	-0.0526*** (0.0033)	-0.0493*** (0.0034)	-0.0895*** (0.0013)	-0.0885*** (0.0013)	-0.0094*** (0.0004)	-0.0133*** (0.0003)	-0.1277*** (0.0031)	-0.1230*** (0.0033)	-0.0455*** (0.0006)	-0.0441*** (0.0006)
19-24 months	-0.1194*** (0.0032)	-0.1153*** (0.0035)	-0.1066*** (0.0012)	-0.1054*** (0.0013)	-0.0129*** (0.0004)	-0.0182*** (0.0003)	-0.1912*** (0.0030)	-0.1855*** (0.0033)	-0.0479*** (0.0006)	-0.0464*** (0.0006)
25-36 months	-0.1360*** (0.0028)	-0.1301*** (0.0034)	-0.1274*** (0.0011)	-0.1256*** (0.0013)	-0.0106*** (0.0003)	-0.0190*** (0.0003)	-0.2140*** (0.0027)	-0.2059*** (0.0032)	-0.0559*** (0.0006)	-0.0536*** (0.0007)
37-60 months	-0.2083*** (0.0025)	-0.1998*** (0.0037)	-0.1521*** (0.0011)	-0.1490*** (0.0016)	0.0381*** (0.0005)	0.0129*** (0.0005)	-0.2936*** (0.0024)	-0.2824*** (0.0036)	-0.0697*** (0.0007)	-0.0656*** (0.0009)
pos. wage gap	-0.0008*** (0.0002)	-0.0007*** (0.0003)	-0.0013 (0.0007)	-0.0012 (0.0008)	-0.0015*** (0.0001)	-0.0077*** (0.0001)	-0.0011*** (0.0033)	-0.0011*** (0.0032)	-0.0005 (0.0009)	-0.0010 (0.0009)
neg. wage gap	0.0013*** (0.0002)	0.0025*** (0.0004)	0.0028*** (0.0002)	0.0030*** (0.0004)	0.0046*** (0.0003)	0.0056*** (0.0004)	0.0033*** (0.0002)	0.0055*** (0.0004)	0.0016*** (0.0002)	0.0028*** (0.0004)
pos. wage gap *empl. dur.		-0.0002 (0.0002)		-0.0003* (0.0002)		0.0008*** (0.0000)		-0.0001 (0.0002)		-0.0005 (0.0003)
neg. wage gap *empl. dur.		-0.0002*** (0.0000)		0.0002 (0.0002)		-0.0001*** (0.0000)		-0.0004*** (0.0001)		-0.0001*** (0.0000)
No. of observations	2,634,945		2,634,945		2,634,945		2,832,804		2,832,804	

Source: Authors' calculations, based on IABS 1975-2004.

Note: Standard errors in parentheses. Significant levels: *: 10%, **: 5%, ***: 1%. Each regression includes region, establishment size, year, and quarterly dummies.

EE: employer-to-employer flows, EU: employment-to-unemployment flows, EN: employment-to-nonparticipation flows (see Table A.1).

Table 4: Wage and wage growth by quintile

Deviation from entry wage	Wage growth, reference group: 3rd quintile				
	At entry	Stay	EE^D	EE^{ID}	$EE^D + EE^{ID}$
1st quintile		1.100 (0.007)	1.819 (0.021)	1.531 (0.005)	1.861 (0.019)
2nd quintile		0.307 (0.007)	0.460 (0.020)	0.397 (0.005)	0.418 (0.018)
4th quintile		-0.205 (0.007)	-0.276 (0.019)	-0.220 (0.005)	-0.237 (0.018)
5th quintile		-0.339 (0.007)	-0.705 (0.019)	-0.561 (0.005)	-0.649 (0.017)
const.		0.554 (0.005)	0.861 (0.015)	0.676 (0.006)	0.791 (0.012)

Deviation from entry wage	Wage, reference group: 3rd quintile				
	At entry	Stay	EE^D	EE^{ID}	$EE^D + EE^{ID}$
1st quintile	-0.710 (0.002)	-0.202 (0.005)	-0.065 (0.015)	-0.099 (0.005)	-0.067 (0.010)
2nd quintile	-0.248 (0.002)	-0.066 (0.004)	-0.031 (0.013)	-0.051 (0.005)	-0.056 (0.009)
4th quintile	0.195 (0.002)	0.065 (0.004)	0.041 (0.013)	0.051 (0.005)	0.043 (0.009)
5th quintile	0.442 (0.002)	0.197 (0.004)	0.123 (0.013)	0.103 (0.005)	0.115 (0.009)
const.	3.775 (0.001)	4.205 (0.003)	4.262 (0.009)	4.246 (0.003)	4.258 (0.007)

Source: Authors' calculations, based on IABS 1975-2004.

Note: See notes to Table 2. Coefficients are estimated by regressing wage or wage growth on the 1st, 2nd, 4th and 5th quintile.

Table 5: OLS-Estimation of entry year effects five years after labour market entry

	Coeff.	(S. D.)		Coeff.	(S. D.)		Coeff.	(S. D.)
Stay	-0.038***	(0.002)	EE ^D	0.034***	(0.002)	EE ^{ID}	0.003	(0.003)
1980	-0.091***	(0.002)	1980*EE ^D	0.038***	(0.003)	1980*EE ^{ID}	0.055***	(0.004)
1981	-0.084***	(0.002)	1981*EE ^D	0.025***	(0.003)	1981*EE ^{ID}	0.044***	(0.004)
1982	-0.101***	(0.002)	1982*EE ^D	0.042***	(0.003)	1982*EE ^{ID}	0.060***	(0.004)
1983	-0.099***	(0.002)	1983*EE ^D	0.061***	(0.003)	1983*EE ^{ID}	0.074***	(0.004)
1984	-0.079***	(0.002)	1984*EE ^D	0.043***	(0.003)	1984*EE ^{ID}	0.071***	(0.005)
1985	-0.058***	(0.002)	1985*EE ^D	0.035***	(0.003)	1985*EE ^{ID}	0.048***	(0.005)
1986	-0.027***	(0.002)	1986*EE ^D	0.030***	(0.003)	1986*EE ^{ID}	0.034***	(0.005)
1987	-0.014***	(0.002)	1987*EE ^D	0.032***	(0.003)	1987*EE ^{ID}	0.028***	(0.005)
1988	-0.002	(0.002)	1988*EE ^D	0.028***	(0.003)	1988*EE ^{ID}	0.029***	(0.006)
1989	0.023***	(0.002)	1989*EE ^D	0.025***	(0.003)	1989*EE ^{ID}	0.001	(0.006)
1990	0.047***	(0.001)	1990*EE ^D	0.005	(0.003)	1990*EE ^{ID}	-0.035***	(0.004)
1991	0.052***	(0.002)	1991*EE ^D	-0.011***	(0.003)	1991*EE ^{ID}	-0.013**	(0.006)
1992	0.086***	(0.002)	1992*EE ^D	-0.043***	(0.003)	1992*EE ^{ID}	-0.059***	(0.005)
1993	0.073***	(0.002)	1993*EE ^D	-0.055***	(0.004)	1993*EE ^{ID}	-0.043***	(0.006)
1994	0.062***	(0.002)	1994*EE ^D	-0.043***	(0.004)	1994*EE ^{ID}	-0.059***	(0.006)
1995	0.059***	(0.002)	1995*EE ^D	-0.054***	(0.004)	1995*EE ^{ID}	-0.068***	(0.006)
1996	0.047***	(0.001)	1996*EE ^D	-0.045***	(0.004)	1996*EE ^{ID}	-0.060***	(0.006)
1997	0.037***	(0.003)	1997*EE ^D	-0.033***	(0.004)	1997*EE ^{ID}	-0.038***	(0.006)
1998	0.050***	(0.003)	1998*EE ^D	-0.046***	(0.004)	1998*EE ^{ID}	-0.054***	(0.006)
1999	0.018***	(0.003)	1999*EE ^D	-0.033**	(0.004)	1999*EE ^{ID}	-0.014**	(0.006)

Source: Authors' calculations, based on IABS 1975-2004.

Note: Dependent variable is the log real daily wage. Regression also includes gender, skill level, establishment size, industry and region. Entry year effects are calculated as deviations from the grand mean wage.

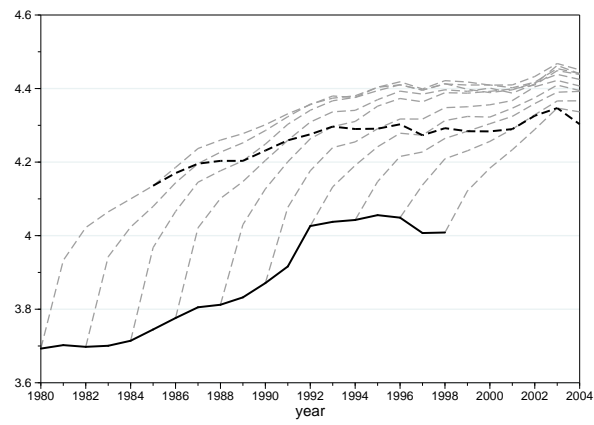
Table 6: IV-Estimation of entry year effects five years after labour market entry

	Coeff.	(S. E.)		Coeff.	(S. E.)		Coeff.	(S. E.)
Stay	0.089***	(0.011)	EE ^D	0.100***	(0.019)	EE ^{ID}	-0.189***	(0.018)
1980	-0.076***	(0.003)	1980*EE ^D	0.078***	(0.008)	1980*EE ^{ID}	0.064***	(0.010)
1981	-0.095***	(0.004)	1981*EE ^D	0.084***	(0.008)	1981*EE ^{ID}	0.062***	(0.010)
1982	-0.102***	(0.004)	1982*EE ^D	0.088***	(0.009)	1982*EE ^{ID}	0.059***	(0.011)
1983	-0.083***	(0.004)	1983*EE ^D	0.060***	(0.009)	1983*EE ^{ID}	0.045***	(0.011)
1984	-0.058***	(0.003)	1984*EE ^D	0.044***	(0.008)	1984*EE ^{ID}	0.040***	(0.011)
1985	-0.056***	(0.003)	1985*EE ^D	0.010	(0.009)	1985*EE ^{ID}	0.028***	(0.011)
1986	-0.036***	(0.003)	1986*EE ^D	-0.016**	(0.008)	1986*EE ^{ID}	0.040***	(0.011)
1987	-0.011***	(0.003)	1987*EE ^D	-0.015**	(0.008)	1987*EE ^{ID}	0.031***	(0.012)
1988	-0.010***	(0.003)	1988*EE ^D	0.000	(0.009)	1988EE ^{ID}	0.026*	(0.012)
1989	0.003	(0.002)	1989*EE ^D	0.004	(0.008)	1989EE ^{ID}	0.019*	(0.011)
1990	0.018***	(0.003)	1990*EE ^D	-0.007	(0.009)	1990EE ^{ID}	0.011	(0.012)
1991	0.025***	(0.003)	1991*EE ^D	-0.015*	(0.009)	1991EE ^{ID}	0.008	(0.012)
1992	0.036***	(0.003)	1992*EE ^D	-0.025***	(0.010)	1992EE ^{ID}	-0.013	(0.012)
1993	0.059***	(0.003)	1993*EE ^D	-0.019*	(0.011)	1993EE ^{ID}	-0.047***	(0.013)
1994	0.070***	(0.004)	1994*EE ^D	-0.026***	(0.011)	1994EE ^{ID}	-0.049***	(0.014)
1995	0.082***	(0.004)	1995*EE ^D	-0.035***	(0.011)	1995EE ^{ID}	-0.067**	(0.014)
1996	0.084***	(0.004)	1996*EE ^D	-0.048***	(0.011)	1996EE ^{ID}	-0.086***	(0.015)
1997	0.067***	(0.003)	1997*EE ^D	-0.051***	(0.012)	1997EE ^{ID}	-0.078***	(0.014)
1998	0.043***	(0.003)	1998*EE ^D	-0.050***	(0.011)	1998EE ^{ID}	-0.075***	(0.014)
1999	0.040***	(0.003)	1999*EE ^D	-0.063***	(0.011)	1999EE ^{ID}	-0.017	(0.014)

Source: Authors' calculations, based on IABS 1975-2004.

Note: See notes to Table 5.

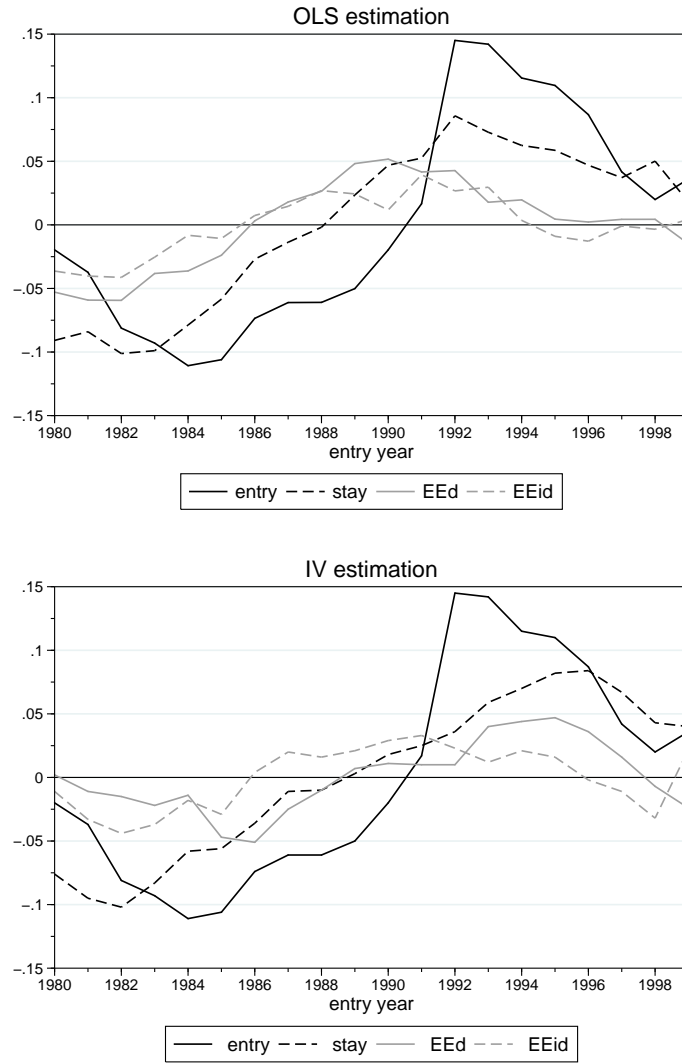
Figure 1: Wages by year of labour market entry



Source: Authors' calculations, based on IABS 1975-2004.

Note: The grey broken lines show the evolution of wages for cohorts entering the labour market between 1980 and 1999. The black solid and the black broken lines show cohort wages at labour market entry and five years after labour market entry, respectively.

Figure 2: Estimated entry year effects five years after labour market entry



Source: Authors' calculations, based on IABS 1975-2004.

Note: See notes to Table 5.

Appendix

Table A.1: Definition of characteristics

Variable	Mean	Std. Dev.	Definition
EE flows	0.1089	0.3121	Transitions from one employer to another one.
EU flows	0.0645	0.2456	Transitions from employment to unemployment.
EN flows	0.1208	0.3252	Transitions from employment to nonparticipation.
EE ^D flows	0.1158	0.3201	Direct EE flows and EE flows with an intervening nonemployment spell < 1 month.
EE ^{ID} flows	0.0467	0.2107	EE flows with an intervening nonemployment spell ≥ 1 month.
Age	22.413	3.0156	Age of individual.
Low-skilled	0.1767	0.3785	Dummy=1 if individual holds a lower secondary school diploma without a professional degree.
Medium-skilled	0.7601	0.4260	Dummy=1 if individual has a lower secondary school diploma and professional degree; or a high school diploma and without a professional degree; or a school diploma as well as a professional degree.
High-skilled	0.0632	0.2364	Dummy=1 if individual holds a university degree or university of applied sciences degree.
Industry dummies	0.0225	0.1451	Agriculture, Mining and Energy
	0.2986	0.4434	Production
	0.0918	0.2875	Construction
	0.2624	0.4571	Trade, Transport
	0.2875	0.4563	Services
	0.0372	0.1901	State.
Establishment size dummies	0.3101	0.4580	1-19 employees
	0.2539	0.4387	20-99 employees
	0.2785	0.4399	100-999 employees
	0.1575	0.3931	more than 1000 employees
Entry Wage	39.725	16.368	Real daily wage at the time of labour market entry.
Wage	55.481	24.176	Real daily wage.
Positive wage gap	24.396	12.429	Positive deviation from grand mean starting wage in %.
Negative wage gap	28.014	7.5647	Negative deviation from grand mean starting wage in %.

Source: Authors' calculations, based on IABS 1975-2004.

Table A.2: Cohort characteristics at labour market entry

Year of entry	Characteristics					Cohort size
	Age	Female	Low-skill	Med.-skill	High-skill	
1980	19.76 (2.64)	0.46 (0.50)	0.28 (0.45)	0.68 (0.47)	0.04 (0.20)	13314 (0)
1981	19.72 (2.40)	0.45 (0.50)	0.25 (0.43)	0.71 (0.45)	0.04 (0.19)	12310 (0)
1982	19.92 (2.40)	0.45 (0.50)	0.21 (0.41)	0.75 (0.44)	0.04 (0.19)	10962 (0)
1983	20.06 (2.45)	0.46 (0.50)	0.20 (0.40)	0.75 (0.43)	0.04 (0.21)	10416 (0)
1984	20.14 (2.40)	0.45 (0.50)	0.20 (0.40)	0.75 (0.43)	0.04 (0.20)	10470 (0)
1985	20.40 (2.53)	0.46 (0.50)	0.19 (0.40)	0.75 (0.43)	0.05 (0.22)	10592 (0)
1986	20.56 (2.49)	0.46 (0.50)	0.17 (0.38)	0.78 (0.42)	0.05 (0.21)	11647 (0)
1987	20.75 (2.54)	0.47 (0.50)	0.17 (0.37)	0.78 (0.41)	0.05 (0.22)	11702 (0)
1988	20.91 (2.60)	0.46 (0.50)	0.17 (0.37)	0.78 (0.42)	0.05 (0.22)	11362 (0)
1989	21.02 (2.64)	0.46 (0.50)	0.17 (0.37)	0.77 (0.42)	0.06 (0.24)	12060 (0)
1990	21.14 (2.67)	0.47 (0.50)	0.16 (0.37)	0.77 (0.42)	0.06 (0.24)	11739 (0)
1991	21.39 (2.80)	0.48 (0.50)	0.16 (0.37)	0.77 (0.42)	0.07 (0.25)	10689 (0)
1992	21.67 (2.86)	0.49 (0.50)	0.15 (0.35)	0.78 (0.41)	0.07 (0.26)	10376 (0)
1993	21.63 (2.82)	0.48 (0.50)	0.13 (0.33)	0.80 (0.40)	0.07 (0.26)	8602 (0)
1994	21.65 (2.88)	0.47 (0.50)	0.14 (0.34)	0.78 (0.41)	0.08 (0.27)	7822 (0)
1995	21.72 (2.94)	0.44 (0.50)	0.15 (0.36)	0.76 (0.42)	0.08 (0.28)	7596 (0)
1996	21.69 (2.92)	0.47 (0.50)	0.14 (0.34)	0.78 (0.42)	0.08 (0.27)	6716 (0)
1997	21.78 (2.93)	0.46 (0.50)	0.15 (0.35)	0.77 (0.42)	0.08 (0.27)	6873 (0)
1998	21.87 (3.04)	0.47 (0.50)	0.16 (0.37)	0.74 (0.44)	0.09 (0.29)	7016 (0)
1999	21.68 (2.86)	0.45 (0.50)	0.17 (0.38)	0.75 (0.44)	0.08 (0.26)	6800 (0)

Source: Authors' calculations, based on IABS 1975-2004.

Table A.3: Distribution of stayers and movers

	Stay	$EE^D (>1)$	$EE^D (=1)$	$EE^{ID} (>1)$	$EE^{ID}(=1)$	EE^D+EE^{ID}
1980	0.367	0.152	0.200	0.035	0.095	0.151
1981	0.373	0.150	0.184	0.041	0.100	0.153
1982	0.385	0.145	0.187	0.040	0.098	0.145
1983	0.398	0.136	0.187	0.039	0.095	0.145
1984	0.401	0.141	0.203	0.030	0.083	0.142
1985	0.410	0.139	0.214	0.024	0.077	0.137
1986	0.423	0.134	0.218	0.022	0.065	0.139
1987	0.430	0.135	0.220	0.017	0.069	0.129
1988	0.446	0.131	0.225	0.016	0.061	0.122
1989	0.448	0.124	0.232	0.017	0.055	0.124
1990	0.429	0.141	0.233	0.018	0.053	0.126
1991	0.439	0.135	0.218	0.025	0.067	0.116
1992	0.437	0.131	0.218	0.024	0.070	0.119
1993	0.425	0.130	0.215	0.027	0.074	0.130
1994	0.428	0.129	0.218	0.029	0.068	0.129
1995	0.436	0.115	0.218	0.026	0.076	0.129
1996	0.440	0.112	0.218	0.029	0.069	0.133
1997	0.431	0.112	0.236	0.023	0.072	0.127
1998	0.457	0.103	0.222	0.023	0.073	0.123
1999	0.429	0.117	0.245	0.020	0.072	0.117

Source: Authors' calculations, based on IABS 1975-2004.

Note: The flow definitions are in Table A.1.