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## Article

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# What drives the intention of Bavarian crafts apprentices to change employer or occupation? An empirical study in the crafts sector

Robert Wagner · Maximilian Wolf

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**Abstract** This paper combines several job related factors such as occupational enjoyment, job security, financial attractiveness, working conditions and social relations for the first time and estimates their impact on the intention of crafts apprentices to leave their training establishment or occupation. In contrast to previous analyses, we consider the dimension of the intended change by taking into account whether crafts apprentices intend to change establishment and/or occupation. We find that occupational enjoyment, regional proximity to the employer and job security are the most important drivers for the intention to stay with the training establishment. In contrast to other studies, monetary incentives do not drive the intention to leave the training establishment or occupation. Our results have far reaching implications for training establishments and institutions in the Bavarian crafts sector concerning incentive systems, initial screening of apprentices, further training as well as improvement of the image of the crafts sector to the public through crafts chambers.

**Keywords** Job related factors · Job change · crafts apprentices

**JEL Classification** J24 · J28 · J62

**Welche Faktoren beeinflussen die Absicht von bayerischen Handwerkslehrlingen die Firma oder den Beruf zu wechseln? Eine empirische Studie im Handwerkssektor**

**Zusammenfassung** In dieser Studie untersuchen wir, welche Faktoren im Kontext einer dualen Ausbildung im bayerischen Handwerk die Absicht von Auszubildenden beeinflussen, nach Abschluss der Ausbildung entweder das Ausbildungsunternehmen oder den Ausbildungsberuf zu wechseln. Exemplarische Faktoren sind Freude an der Arbeit, regionale Nähe zum Ausbildungsbetrieb, Arbeitsplatzsicherheit oder das Verhältnis zu Kollegen und Vorgesetzten. Anders als frühere Studien zu Job-Mobilität unterscheiden wir explizit zwischen den Möglichkeiten nur das Unternehmen zu wechseln, jedoch dem Ausbildungsberuf treu zu bleiben und der Alternative, sowohl das Unternehmen als auch den Beruf zu wechseln. Basierend auf einem multinomialen Logit Modell zeigen unsere Ergebnisse, dass Freude an der Arbeit, regionale Nähe zum Arbeitgeber und Arbeitsplatzsicherheit die wichtigsten Faktoren sind, um weiterhin beim Ausbildungsunternehmen tätig sein zu wollen. Unsere Ergebnisse haben praktische Relevanz für zahlreiche Institutionen im Handwerk.

## 1 Introduction

In spite of intensive efforts by employers to reduce labour turnover, employees frequently change employer or career

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(Neal 1999). Jovanovic (1979) argues that workers decide to change jobs in which their productivity is revealed to be low. Assuming establishments pay employees their marginal product, workers move out of jobs if their outside option is better (McLaughlin 1991) or the current wage is low relative to alternative wages (Parsons 1991). Therefore, wages are a key determinant in job changing decisions (e.g. Topel and Ward 1992; Fitzenberger and Spitz 2003). However, Freeman (1978) identifies job satisfaction as a driving force behind the decision on future job mobility. Job satisfaction in general and several job satisfaction dimensions significantly influence an employee's decision on job mobility (Clark 2001; Kristensen and Westergård-Nielsen 2004) as well as the intention for job mobility (Shields and Price 2002; Delfgaauw 2007; Böckerman and Ilmakunnas 2009). This means that, even if employers face a shortage of skilled labour, they cannot prevent labour turnover if employees are dissatisfied.

All studies analysing the effects of pecuniary as well as non-pecuniary job factors on job mobility focus on the labour market in general. As far as we know, the effect of job related factors on the intention of crafts apprentices in Germany to change employer or occupation after apprenticeship training has not yet been analysed. Low job satisfaction during apprenticeship training could be one reason for the low retention rate of around 30 % in the German crafts sector after apprenticeship graduation (Harhoff and Kane 1997; Büchel and Neubäumer 2001). On average, establishments from the crafts sector pursue a productivity orientated training strategy and invest less in training than establishments from other sectors (Mohrenweiser and Backes-Gellner 2008; Mohrenweiser and Zwick 2009). Low investment in training decreases training quality (Soskice 1994), reduces apprentices' job satisfaction and increases involuntary labour turnover. In the German crafts sector, involuntary labour turnover leads to a lack of skilled workers (Haverkamp et al. 2009).

In this paper, we analyse which job related factors affect the intention of crafts apprentices to change employer or occupation after finishing apprenticeship training. In contrast to previous studies, we do not just estimate the intention for worker-initiated job mobility—we simultaneously estimate whether apprenticeship graduates intend to change employer or occupation. Applying a multinomial logit model, we show that occupational enjoyment, job security and regional proximity to the current employer are the most important factors that affect the intention to change employer or occupation. We use a new data set containing unique information about future career plans and job related factors driving the intention of apprentices to change employer or occupation in the crafts sector. Our analysis contributes to the previous literature on job mobility by focusing on the specific group of German apprentices in the crafts sector. Furthermore, we test a broader set of job related factors that

affect the intention to change employer or occupation than previous studies.

Our results have practical implications for several institutions in the Bavarian crafts sector.<sup>1</sup> First of all, the analysis of job related factors for apprentices allows training establishments to develop systematic strategies to retain a higher proportion of apprenticeship graduates (e.g. initial screening of new apprentices). Second, organizations such as chambers (*Handwerkskammer*) that are responsible for the execution of apprenticeship training in the crafts sector can make use of the findings in order to adapt the dual apprenticeship systems to the needs of juveniles. Third, policy makers and the German Confederation of Skilled Crafts (*Zentralverband des Deutschen Handwerks*) can tackle the lack of skilled labour by enhancing the image of the crafts sector based on our results.

The remainder of this paper is structured as follows. Section 2 provides an overview of the most important literature on job satisfaction and job mobility. In Sect. 3, we provide an overview of the data set before analysing the connection between job related factors and job mobility in the next sections, using a multinomial logit model. After discussing the results, Sect. 6 summarizes the most important findings and provides a conclusion.

## 2 Background

One strand of previous literature examines the impact of wages on job mobility. Topel and Ward (1992) identify the wages of skilled workers as the key determinant in job changing decisions. Fitzenberger and Spitz (2003) show that low apprenticeship wages increase the probability of changing occupation after apprenticeship graduation.<sup>2</sup> However, Freeman (1978) identifies job satisfaction as an economic variable and shows that the effect of job satisfaction on quitting remains stable even after controlling for other economic variables such as wages or working hours. According to a model developed by Neal (1999), a worker derives utility from establishment and career matches. The first captures how well a worker interacts with his colleagues as well as how well the employee is suited to the environment created by the employer. The career match captures how well

<sup>1</sup>Because of the high specificity of our analysis, our results cannot be generalized or applied to other sectors.

<sup>2</sup>Other studies examine the effect of job and establishment changes of German apprenticeship graduates on wages in order to show the applicability of apprenticeship training contents to the labour market (Dustmann et al. 1997; Harhoff and Kane 1997; Werwatz 1997; Acemoglu and Pischke 1998; Clark and Fahr 2001; Fitzenberger and Spitz 2003; Bougheas and Georgellis 2004; Euwals and Winkelmann 2004; von Wachter and Bender 2006; Geel and Backes-Gellner 2009; Göggel and Zwick 2012).

the worker is suited to the type of work he or she is performing. If the worker has the chance to improve one of the matches, he or she will change establishment or career. The definitions of establishment and career match allow non-pecuniary job related factors to affect a worker's decision on job mobility.

The literature evaluating the effect of non-pecuniary job related factors on job mobility shows that job satisfaction affects job mobility. Clark (2001) uses promotion prospects, pay, hours worked, relations with supervisors, job security, ability to work on one's own initiative and the actual work itself as job satisfaction dimensions and argues that low job satisfaction is a good indicator for poor employer–employee match quality. He ranks the job satisfaction dimensions and shows that income and job security are the most important predictors of future quits.<sup>3</sup> A comparable study was conducted by Kristensen and Westergård-Nielsen (2004). They find comparable results; however, the ranking of the job satisfaction dimensions is different from the ranking suggested by Clark (2001).<sup>4</sup> In the paper by Kristensen and Westergård-Nielsen, the type of work is the most important indicator of future quits. Mendius (2002) analyses which job related factors are especially important in leading to a change in employer in the German crafts sector. Conducting expert interviews,<sup>5</sup> he shows that limited career and training prospects, physical stress, working hours and low job security compared with other sectors are important motives for skilled workers to leave. Interviews among German crafts workers reveal low salary and low job security as important driving factors for the decision to leave the crafts sector (Haverkamp et al. 2009).

In contrast to Clark (2001) as well as Kristensen and Westergård-Nielsen (2004), who estimate the effect of job satisfaction on future quits, other studies measure the impact of job satisfaction on the intention to quit and initiating a search for a new job. Delfgaauw (2007) estimates the likelihood of a worker searching for a new job outside the current organization as well as outside the current industry. He identifies different job satisfaction dimensions driving the intention to leave the establishment or the industry. At the establishment level, factors such as earnings, work pressure

and personnel management are important. At the industry level, financial prospects, working conditions and unpleasant work duties increase an employee's desire to change industry. Clark (2001) argues that the intention to quit might be just a different way of expressing dissatisfaction and critically asks whether we can learn something from estimating the effect of job satisfaction dimensions on the intention to quit. However, Böckerman and Ilmakunnas (2009) show that job search, as an extreme form of a quit intention, increases the probability of job mobility. Hence, job dissatisfaction leads to quit intentions, and these employees search for new matches more often.<sup>6</sup>

Some of the job related factors in previous studies overlap across studies, but the vast majority of job related factors differ.<sup>7</sup> This means that there is no consistency with regard to job satisfaction or job related factors. Previous studies use different items for and different aspects of job satisfaction. Yet, the results are comparable in terms of low job satisfaction increasing job mobility. We argue that job satisfaction can be seen as a job related factor affecting job mobility. Job satisfaction is a subjective variable (Freeman 1978) that captures what people think about their current employment match (Kristensen and Westergård-Nielsen 2004). However, this subjective evaluation of the current employment match contains several job related factors (Kristensen and Westergård-Nielsen 2004). Therefore, we define job satisfaction as all pecuniary as well as non-pecuniary job related factors capturing the employment match that can be evaluated by workers. This definition includes occupational enjoyment, wages, career and training prospects, social relations, working conditions, working environment and job security.

We focus on the effect of job related factors on the intention of crafts apprentices to change establishment or occupation. Therefore, we use job related factors that are specific for the crafts sector (e.g. Mendius 2002; Haverkamp et al. 2009) and important job related factors from studies outside the crafts sector (e.g. Clark 2001; Kristensen and Westergård-Nielsen 2004; Delfgaauw 2007). None of the studies presented above measures the effect of job related factors on the intention to change employer or occupation.

<sup>3</sup>This statement is only valid for the whole sample. Clark (2001) derives different results by dividing the sample according to gender, age and hours worked.

<sup>4</sup>Clark (2001) uses data from the UK; Kristensen and Westergård-Nielsen (2004) use data from Denmark. Kristensen and Westergård-Nielsen (2004) explain this difference by lower unemployment insurance benefits in the UK compared with Denmark.

<sup>5</sup>447 crafts establishments, research institutes, government agencies, federal employment agencies and crafts organizations (*Handwerksskammern*) participated in the expert interviews. They were asked to evaluate the future supply of skilled labour in crafts establishments using a questionnaire.

<sup>6</sup>Further literature examining the relationship between quit intentions and actual quits can be found in Delfgaauw (2007).

<sup>7</sup>Topel and Ward (1992) as well as Fitzenberger and Spitz (2003) estimate the effect of wages on changing occupation. Clark (2001) as well as Kristensen and Westergård-Nielsen (2004) operationalized job satisfaction by promotion prospects, hours worked, relations with supervisors, job security, ability to work on one's own initiative and the actual work itself. Delfgaauw (2007) identifies earnings, work pressure and personnel management as factors in changing employer and financial prospects, working conditions and unpleasant work duties as factors in changing industry. According to Mendius (2002), limited career and training prospects, physical stress, working hours and low job security are relevant job related factors in the crafts sector.

As far as we know, we are the first to differentiate between the intention of apprentices to change employer or occupation after apprenticeship graduation. We argue that a simultaneous consideration of changing employer or occupation in one estimation model is a more realistic approach to determine the specific job change intentions of crafts apprentices. Delfgaauw (2007) shows that the reasons for changing employer are different from the reasons for changing industry. The reasons for changing employer might also be different from those for changing occupation.

To sum up, workers optimize their employer or career match by changing employer or occupation (Neal 1999). Empirical evidence shows that job related factors capturing the current employment match are important determinants in the intention to leave an establishment or industry as well as for actual quits. Therefore, we deduce the hypothesis that job related factors affect a crafts apprentice's decision to leave the training firm or training occupation after finishing apprenticeship training. This means that the higher the satisfaction with a specific job related factor, the lower the probability of changing employer or occupation after apprenticeship graduation. However, the reasons might differ depending on whether apprentices intend to change employer and/or occupation.

The dual apprenticeship system in Germany<sup>8</sup> forms a good setting for our analysis. Crafts (*Handwerk*) establishments, like other small and medium sized enterprises (SME), depend on skilled apprentices in order to ensure their economic growth and handle the latest innovations (Kath 1996). The number of apprentices in crafts establishments traditionally exceeds its own demand for skilled human capital, so that other sectors of the economy benefit from this source of qualified labour (Smits and Zwick 2004). Cost and benefit analyses show that training above demand and, therefore, a high turnover was a profitable strategy for crafts establishments (Mohrenweiser and Zwick 2009; Wenzelmann et al. 2009). Yet, in recent years, the lack of workers at an intermediate skill level in German crafts occupations has increased. In 1999, 20 % of apprenticeship graduates aged 15–25 years left crafts establishments; in 2006, this proportion increased to 50 % (Haverkamp et al. 2009). Despite training above demand being a profitable strategy for crafts establishments, the increasing number of skilled workers leav-

ing the crafts sector leads to a shortage of skilled labour (Haverkamp et al. 2009). Therefore, we have variation in intended job mobility in the crafts sector as there are a lot of apprentices who stay with their training firm but also a lot of apprentices who leave their training firm.

Furthermore, training quality varies between training establishments and sectors. On the one hand, cost–benefit analysis of the Federal Institute for Vocational Education and Training (*Bundesinstitut für Berufsbildung*; BIBB) shows that establishments in the crafts sector invest less in training than other sectors (Wenzelmann et al. 2009). Second, a survey among around 6,000 apprentices in Germany illustrates that the perceived training quality differs between occupations and is low in crafts occupations. However, there are also quality differences between crafts occupations (Beicht et al. 2009). Consequently, we assume that job satisfaction among apprentices varies and affects their decision to change employer or occupation after apprenticeship training.

### 3 Data and sample characteristics

Our data were collected in 2009 via online and paper-based questionnaires among crafts apprentices in vocational schools. As the Bavarian ministry of education supported the data collection, we focused exclusively on apprentices in Bavaria. The crafts sector in Bavaria is quite strong compared with Germany as a whole (2009: 19.5 % of 975,316 crafts firms in Germany were located in Bavaria). Furthermore, apprenticeship training in the Bavarian crafts sector plays an important role in professional training (2009: 18.5 % of the 461,502 crafts apprentices in Germany were trained in Bavaria) (Deutscher Industrie- und Handelskammertag 2010; Zentralverband des Deutschen Handwerks 2010). The questionnaires were sent to Bavarian vocational schools, which distributed them randomly to crafts apprentices in specific occupations. In accordance with our research, the Bavarian vocational schools were asked to hand out the questionnaires only to apprentices who were just about to finish their apprenticeship training. In addition, vocational schools were asked to hand out the questionnaires only to apprentices from seven specific crafts sectors (automotive trade, crafts for commercial needs, finishing trade, food trade, health trade, main construction trade and personal services). The apprentices were asked about their future career plans, the reasons why they chose an apprenticeship in a crafts occupation and to what degree specific job related factors are fulfilled in the crafts sector. All items had to be answered on a five-point Likert scale, where 1 stands for 'does not apply at all' and 5 means 'applies to a very high degree'.

<sup>8</sup>The dual apprenticeship system is the main source of professional training in Germany: in 2008, around 50 % of men and women between 30 and 35 years of age had successfully completed apprenticeship training, whereas only around 20 % had a university degree; 18 % do not have a degree at all; 12 % had completed a professional school degree (Autorengruppe Bildungsberichterstattung 2010). Because of its efficiency in generating qualified personnel according to the needs of the economy, it has frequently been used as a role model in other countries (e.g. Bailey et al. 1992; Gitter and Scheuer 1997; Harhoff and Kane 1997; Gospel 1998; Steedman et al. 1998; Hamilton and Hamilton 1999; Lehmann 2000; Bosch 2010).



The questionnaire was designed based on the relevant literature and discussed with several experts (such as researchers in the handicraft sector as well as apprenticeship training supervisors). Two pre-tests among eight apprentices in the main construction trade guaranteed the comprehensibility and completeness of the questionnaire. Out of 2,560 apprentices, 1,792 participated in the online survey (non-response rate of 30.0 %), and out of 734 apprentices, 408 completed the paper based questionnaires (non-response rate of 44.4 %). After removing incomplete and inconsistent online as well as paper-based questionnaires and questionnaires from participants in the second year of training, we have a sample size of  $N = 1,088$ .

Descriptive statistics on individual, occupational and firm characteristics as well as the distribution of the factors in Germany can be found in Table 1.<sup>9</sup> Table 1 shows that the proportion of males in our sample is around 8 percentage points lower than the figure for Germany. Furthermore, the proportion of crafts apprentices who attended secondary grammar school is higher in our sample than in Germany as a whole. The distribution of occupational groups differs only slightly from the distribution in Germany. However, there is a large bias in establishment size. Large establishments are over-represented in our data, and only around 15 % of the apprentices work in very small establishments. However, the majority (around 55 %) of all crafts apprentices in Germany work in SMEs.

#### 4 Measurement of job mobility and job satisfaction

We use four items regarding further career plans to create a variable  $y$  indicating the worker-initiated intention to change employer or occupation.<sup>10</sup> All four items on further career plans had to be rated on a five-point Likert scale. One item indicates the intention to stay with the training firm, two items the intention to change employer but stay in the same occupation, and one item indicates the intention to change employer and occupation.<sup>11</sup> The job mobility variable  $y = 1$

<sup>9</sup>As not all the information about the apprentices is available for the Bavarian apprenticeship system, we alternatively present the descriptive statistics for Germany to show the appropriateness of our sample.

<sup>10</sup>The survey items underlying the job mobility variable can be found in Appendix A in English as well as German. The four items regarding future career plans do not directly ask for the intention of apprentices to change employer or occupation but for the attractiveness of several job alternatives (see Appendix A). We argue that apprentices do not try to realize unattractive alternatives. Therefore, the attractiveness items mirror a considerable part of the intention of the apprentices to change employer or occupation.

<sup>11</sup>Other questions on future career plans were either about further education (e.g. want to go to university) or too unspecific for our purposes (e.g. want to learn a new occupation or want to work in a new occupation does not necessarily imply that participants want to leave the training establishment).

**Table 1** Descriptive statistics on sample characteristics

Variable	Share (%)	Share in Germany (%)
Male	77.02	84.98 <sup>a</sup>
No schooling	2.20	2.85 <sup>b</sup>
Secondary general school	68.96	54.84
Intermediate school	24.80	36.74
Grammar school	4.04	5.56
Main construction trade	5.54	5.20
Finishing trade	10.11	17.00
Crafts for commercial needs	18.02	19.43
Automotive trade	35.11	30.80
Food trade	11.12	6.27
Health trade	2.85	3.23
Personal services	17.37	18.07
Establishment size 1–4	15.06	55.63
Establishment size 5–9	21.85	23.24
Establishment size 10–19	19.38	12.36
Establishment size 20–49	20.11	6.37
Establishment size 50–100	11.75	
Establishment size 101–499	8.36	2.40
Establishment size 500+	3.49	
Sample size = 1,088		

<sup>a</sup>Own calculations based on the number of apprentices in the respective crafts sectors ( $N = 192,241$ ) on 31 December 2010 in Germany (see [http://www.zdh-statistik.de/application/stat\\_det.php?LID=1&ID=MDE3OT%20E=&cID=](http://www.zdh-statistik.de/application/stat_det.php?LID=1&ID=MDE3OT%20E=&cID=), accessed 13 December)

<sup>b</sup>As there is no information about the educational background of recent apprentices in the relevant jobs, we present the number of new apprentices entering their training firm in 2010 ( $N = 52,440$ ) (see [http://www.zdh-statistik.de/application/stat\\_det.php?LID=1&ID=MDE4MzQ=&cID=00338](http://www.zdh-statistik.de/application/stat_det.php?LID=1&ID=MDE4MzQ=&cID=00338), accessed 13 December 2011)

if the rating to stay with the training firm is higher than the rating on the other three variables,  $y = 2$  if the rating of one of the two items on changing employer but staying in the same occupation is higher than the rating of the other two variables, and  $y = 3$  if the rating of the item on changing employer and occupation is higher than the rating on the other two items.<sup>12</sup> Some 31.25 % of our sample want to stay

<sup>12</sup>In case of ties (two alternatives were rated equally), we decided to put the apprentice into the higher job mobility category. This allows us to keep 294 observations which would be lost otherwise. To ensure that our findings are not driven by the definition of the variable, we repeated our analyses with all cases that can be uniquely defined. (We erased all 294 cases with ties). A multinomial logit estimation shows that the results from Table 5 only marginally change and that the significance levels are identical (the additional output can be provided on request). We applied the identical logic also in cases where all categories were rated with the values 1 or 2. However, only 13 respondents rated all

**Table 2** Cross tabulation of job mobility measures

	Employment offer by training establishment	Job offer from another firm	Communicated separation from the training establishment	No information about job offers or communicated separations	
Intention to stay with establishment and keep occupation	245 22.52 %	12 1.10 %	4 <sup>a</sup> 0.37 %	79 7.26 %	340 31.25 %
Intention to change establishment but keep occupation	144 13.24 %	31 2.85 %	14 1.29 %	190 17.46 %	379 34.83 %
Intention to change establishment and occupation (change career)	93 8.55 %	45 4.14 %	21 1.93 %	210 19.30 %	369 33.92 %
	482 44.30 %	88 8.09 %	39 3.58 %	479 44.03 %	1,088

<sup>a</sup>This figure is counterintuitive at first glance. One would expect that, if an apprentice has already told the training establishment that he or she wants to leave after apprenticeship training, the apprentice has no intention of staying with the training firm. However, these four cases can be explained by temporary separations from the training firm (e.g. military or social service). The apprentices leave for a couple of months but want to return afterwards. To check whether the four observations affect the results, we deleted these cases and repeated our analyses. All results remained constant

with their training establishment, 34.83 % intend to change establishment but stay in the same occupation, and 33.92 % want to change employer and occupation (Table 2).<sup>13</sup>

To verify whether the intended job mobility variable  $y$  is a valid criterion for the worker-initiated change of employer or occupation, we use information on employment offers of training as well as outside establishments and communicated separations from the apprentices.<sup>14</sup> Based on this information, we generate a dummy variable  $z$  indicating an impending separation and compare the variable  $z$  with the intended job mobility variable  $y$ . Table 2 shows that 44.30 % of our sample had already received an employment offer from the training firm, 8.09 % received an employment offer from an outside firm, and 3.58 % had already told the training establishment that they wanted to leave immediately after training. The variable for impending separation  $z = 0$  if the apprentice received an employment offer from the training establishment and  $z = 1$  if the apprentice either has a job offer from an outside firm or has told the training establishment that he or she intends to leave the training firm immedi-

ately after graduation.<sup>15</sup> We argue that the variable  $z$  mirrors the separation intention more precisely than the job mobility variable  $y$ . Our data allow us to specify the variable  $z$  for 566 respondents, because around 44 % of the apprentices in our sample had neither received an employment offer from the training firm or an outside firm nor said that they intended to leave the training establishment after graduation (Table 2). Some 15 % of the 566 respondents intended to leave the training establishment or had job offers from other establishments, and around 85 % received an employment offer from the training establishment (Table 3). Table 3 shows a cross tabulation for the variables of intended job mobility  $y$  and impending separation  $z$  with absolute and relative values. Some 43.29 % of the reduced sample had an employment offer from the training establishment and intended to stay with the current employer after apprenticeship graduation. On the other hand, 78 out of 84 apprentices who either received an employment offer from an outside firm or told the incumbent employer that they wished to leave after apprenticeship graduation want to change employer or occupation after apprenticeship graduation. Pearson's chi-square statistic reveals that the assumption of independency between the variables  $z$  and  $y$  cannot hold.<sup>16</sup> This means that the vari-

items with such low values. Additional analyses show that all findings remain robust after erasing these 13 cases. (Additional output can be provided on request).

<sup>13</sup>Our data do not provide information on changing occupation within the training establishment. Appendix D shows descriptive statistics for all four sub-groups of Table 2.

<sup>14</sup>Communicated separations from the training firm do not include dropping out of the apprenticeship training. The apprentices finish training but intend to leave immediately after graduation.

<sup>15</sup>We exclude apprentices who received an employment offer from the training establishment as well as from an outside firm as these cases cannot be uniquely assigned. However, if an apprentice received an employment offer from the training firm but also told the training firm that he or she leaves after graduation, the variable  $z = 1$ .

<sup>16</sup>Pearson  $\chi^2(2) = 70.79$ .

**Table 3** Cross tabulation of intended job mobility and impending separation

	Employment offer from training establishment ( $z = 0$ )	Communicated separation from the training establishment or job offer from another firm ( $z = 1$ )	
Intention to stay with establishment and keep occupation ( $y = 1$ )	245 43.29 %	6 1.06 %	$N = 251$ 44.35 %
Intention to change establishment but keep occupation ( $y = 2$ )	144 25.44 %	31 5.48 %	$N = 175$ 30.92 %
Intention to change establishment and occupation ( $y = 3$ )	93 16.43 %	47 8.30 %	$N = 140$ 24.73 %
	$N = 482$ 85.16 %	$N = 84$ 14.84 %	$N = 566$

ables of intended job mobility  $y$  and impending separation  $z$  measure comparable separation intentions.<sup>17</sup>

In contrast to previous studies which analyse the connection between job satisfaction and job mobility (e.g. Clark 2001; Kristensen and Westergård-Nielsen 2004; Delfgaauw 2007; Böckerman and Ilmakunnas 2009), our data provide no direct information about job satisfaction. This means that there are no questions such as ‘How satisfied are you with your job’. Instead, we use questions about the reasons for choosing apprenticeship training in a specific occupation as well as questions about how certain criteria are fulfilled in the crafts sector. The respondents had to rate 23 reasons for choosing a specific occupation on a five-point Likert scale. These 23 questions include statements such as ‘I chose this occupation to take over the family business’, which are irrelevant for our purposes. Other questions ask for comparable aspects (e.g. financial attractiveness or working hours) and are redundant as they are either part of the question block about the reasons for choosing a specific occupation or part of the 16 questions about how certain criteria are fulfilled in the crafts sector.

In a first step, we conducted an explorative factor analyses to reduce the number of dimensions. However, we did not find factors with an intuitive interpretation. Therefore, we selected five items from the question block about why a specific occupation was chosen (occupational enjoyment, image of the training establishment, job security, promotion prospects and financial attractiveness). Another eight items were chosen from the question block about how specific factors are fulfilled in the crafts sector (relation with supervisor, relation with colleagues, regional proximity of establishment, physically hard work, no routine in work, further training, fixed working hours and flexible working hours).

<sup>17</sup>Our data provide no information on realized job mobility. Therefore, we cannot say whether the participants were able to realize their intentions after apprenticeship graduation or not.

The original questions as well as the corresponding items can be found in Appendix B in English as well as German.<sup>18</sup>

We chose these 13 particular items for several reasons. First, we chose items that have been used in previous studies on job satisfaction and job mobility. Second, we argue that questions about why a specific occupation was chosen are more closely related to the current situation of an apprentice than questions about the crafts sector in general. Therefore, if questions in the two question blocks are redundant, we chose the question about the reason for choosing an occupation and not the items about how certain criteria are fulfilled in the crafts sector.<sup>19</sup> Fourth, all the apprentices in our sample are in their third or fourth year of training. We argue that ratings on all items are influenced by experience gained during the training period. Therefore, if apprentices are satisfied with the items mentioned above, they choose a high value on the Likert scale irrespective of whether the questions are retrospective or not. This means that, even if our questions do not specifically ask for job satisfaction, the ratings of the participants are closely related to job satisfaction. For the remainder of this paper, we call these items job related factors. A descriptive overview of the job related factors as well as the proportion of respondents who chose a 4 or 5 on the Likert scale can be found in Table 4.

The means of all job related factors are above the Likert scale middle value of 3, and we have variation in all items. In all but two criteria, more than 50 % of the respondents chose at least the value 4 on the five-point Likert scale. The figures in Table 4 suggest that, on average, crafts apprentices in Bavaria are satisfied with their current situation.

<sup>18</sup>Appendix C shows the correlations between the chosen items.

<sup>19</sup>To make sure our results are not caused by the items we chose, we ran our regressions with different items for identical factors. For instance, we used five different items that all capture financial attractiveness and repeated our regressions. We found no effect irrespective of which item we used. We used the same method for working hours, regional proximity to workplace and occupational enjoyment.



**Table 4** Descriptive statistics on job related factors

Variable	Mean	SD	Percentage choosing 4 or 5
Occupational enjoyment	4.238	0.897	85.48
Image of training establishment	3.798	1.039	69.67
Financial attractiveness (salary)	3.431	1.162	52.57
Promotion prospects in crafts	4.001	1.010	74.17
Job security in crafts	4.072	1.003	76.93
Relation with supervisor in establishment	3.388	0.988	47.34
Relation with colleagues in establishment	3.947	0.997	71.60
Regional proximity to establishment	3.608	0.987	55.88
Physically hard work in crafts	3.986	1.054	72.24
No routine in work in crafts	3.883	1.069	68.84
Further training possibilities	3.055	1.217	36.40
Fixed working hours	4.200	1.024	78.31
Flexible working hours	3.958	1.071	70.13
Sample size = 1,088			

The column 'Percentage choosing 4 or 5' shows the proportion of participants who chose the value 4 or 5 on the Likert scale. For the multivariate analyses, we transformed the Likert scaled variables into dummies. The dummies equal 1 if a participant chose the value 4 or 5 on the Likert scale and 0 otherwise. We argue that, if a participant chose at least the value 4, he or she is satisfied with the job related factor

## 5 Estimation model and findings

To estimate the effect of job related factors on the intention to change employer or occupation, we apply a multinomial logit model. The dependent variable  $y$  has  $m = 3$  mutually exclusive and non-ordered categories<sup>20</sup> (Winkelmann and Boes 2009). We choose  $y = 1$  ('intention to stay with training firm and keep occupation') as the reference category. Then, we calculate regressions for the remaining  $m - 1$  categories ( $y = 2$  'intention to change firm but keep occupation' and  $y = 3$  'intention to change firm and occupation') in reference to  $y = 1$ . The coefficients  $\beta_{mk}$  and  $\gamma_{ml}$  show changes in the log odds for the categories  $y = 2$  and  $y = 3$  relative to the base category  $y = 1$ .<sup>21</sup> The multinomial logit model allows for different alternative coefficients depending on which of the remaining  $m - 1$  categories is compared with the base category  $y = 1$ . This means,  $\beta_{2k}$  can differ from  $\beta_{3k}$ .

$$\ln\left(\frac{P(y_i = m)}{P(y_i = 1)}\right) = \alpha_m + \sum_{k=1}^K \beta_{mk} X_{ik} + \sum_{l=1}^L \gamma_{ml} W_{il}$$

$X$  represents a vector of all job related factors presented in Table 4 and  $W$  is a vector capturing all other factors that might influence the decision to change employer or occupation for each individual  $i$ . In this paper,  $W$  includes sex, educational background, firm size, occupation and a big-five in-

ventory.<sup>22</sup> Dohmen et al. (2005) show that attitudes towards taking risks in general as well as taking risks in one's career differ significantly by gender. Women have a higher risk aversion than men. A high risk aversion might negatively influence the decision to change firm or job. We try to take risk aversion into account by controlling for gender. Büchel and Neubäumer (2001) show that apprenticeship graduates with a low educational background have a lower probability of working in an occupation comparable to their trained occupation. This means that apprenticeship graduates with a low educational background have a higher probability of changing occupation than more highly educated apprenticeship graduates. Franz and Zimmermann (1999) find a positive correlation between establishment size and retention rate, and Harhoff and Kane (1997) show that the immediate departure rate of apprenticeship graduates differs by sector. This means that establishment size as well as the sector might influence the decision to change employer and/or occupation. As our analysis focuses on the crafts sector, we do not differentiate by sector but control for occupational groups within the crafts sector. The occupational groups can be found in Table 1.

All factors in vector  $W$  might also affect the job related factors in vector  $X$ . For instance, the image of the training firm might correlate with firm size. Thus, the estimates for the job related factors in vector  $X$  might be biased if we neglect the factors in vector  $W$ . We conducted several regres-

<sup>20</sup>As the dependent variable is characterized by non-ordered categories, we do not choose ordered response models such as the ordered probit model.

<sup>21</sup>Therefore, all raw estimates in Table 5 have to be interpreted relative to the base category  $y = 1$ .

<sup>22</sup>The questionnaire included a 10-item short version of the big-five inventory. It measures personality with 2 items per scale (extraversion, agreeableness, conscientiousness, neuroticism and openness) (Rammstedt and John 2007).

**Table 5** Raw estimates after multinomial logit

Variables	$\ln\left(\frac{P(y_i=2)}{P(y_i=1)}\right)$	$\ln\left(\frac{P(y_i=3)}{P(y_i=1)}\right)$
Occupational enjoyment	-0.288 (0.305)	-1.001*** (0.283)
Image of training firm	-0.572*** (0.197)	-0.536*** (0.207)
Relation with supervisor	-0.373** (0.180)	-0.567*** (0.193)
Relation with colleagues	0.0135 (0.227)	-0.201 (0.230)
Regional proximity to firm	-0.103 (0.177)	-0.679*** (0.185)
Physically hard work in crafts	0.0893 (0.198)	0.189 (0.211)
No routine in work in crafts	0.368 (0.204)	0.135 (0.210)
Further training possibilities	-0.164 (0.174)	-0.0450 (0.191)
Fixed working hours	-0.0451 (0.251)	-0.0628 (0.255)
Flexible working hours	-0.261 (0.225)	-0.344 (0.229)
Job security	-0.559** (0.242)	-1.026*** (0.240)
Promotion prospects	0.0355 (0.224)	-0.452** (0.220)
Financial attractiveness (salary)	0.154 (0.168)	0.0622 (0.183)
Sex	Yes	Yes
Schooling	Yes	Yes
Firm size	Yes	Yes
Occupation	Yes	Yes
Big-five inventory	Yes	Yes
Constant	0.781 (0.826)	1.496* (0.859)
LR $\chi^2$ (72)	280.25	
Pseudo $R^2$	0.1173	
Observations	1,088	

sions and added the control variables from vector  $W$  step-wise. The coefficients for the job related factors in vector  $X$  remain very stable after adding additional control variables from vector  $W$ , indicating a low correlation between the factors in  $X$  and  $W$ . Therefore, we only show the results for our full specification.<sup>23</sup> The raw estimates for the multinomial logit specification can be found in Table 5.

We find no gender effect but positive effects for educational background and a negative establishment size effect. A higher educational background has a positive effect

on the intention to change employer as well as occupation. However, apprentices who work in large companies are less likely to change firm and occupation. Furthermore, our results show that apprentices in food trade occupations are more likely to change occupation than apprentices from personal services and that a high degree of conscientiousness negatively affects the decision to change employer or occupation.<sup>24</sup>

Occupational enjoyment has a significant negative effect on the intention to change occupation but no effect on changing occupation. This finding is very intuitive. If an apprentice does not like his or her occupation, it would not make sense to change employer but stay in the same occupation. The image of the training firm as well as the relation with the supervisor have significant negative effects on the intention to change employer and occupation. Regional proximity to the incumbent employer has a negative, yet insignificant, effect on changing employer but a significant negative effect on the intention to change employer and occupation. Job security has a significant negative effect on changing employer and occupation. Promotion prospects have a negative effect on the intention to change occupation, but no significant effect on changing employer. This result might be caused by limited promotion prospects in certain occupations. Therefore, bad promotion prospects involve changing occupation as well as employer.

Surprisingly, financial attractiveness does not have a significant effect on the intention to change employer or occupation. Previous studies show that low wages are one of the most important drivers for job mobility after apprenticeship training (Fitzenberger and Spitz 2003). In contrast to other studies, we use an item asking for the perceived financial attractiveness of a particular crafts occupation instead of using real apprenticeship wages.<sup>25</sup> Therefore, measurement errors might be one explanation for our insignificant findings. However, it is more likely that our findings are driven by our homogeneous sample. We only look at one specific sector (crafts) and one specific group (apprentices in Bavaria). Fitzenberger and Spitz (2003) use a sample of West German males from different sectors and occupations. They show that apprenticeship graduates change occupation when average apprenticeship wages in the training occupation are low. More occupations and sectors imply more variation in apprenticeship wages because there are considerable wage differences between occupations and sectors (BIBB 2009). As we only focus on one sector and a couple of occupations, the variable measuring financial attractiveness is unlikely to have a comparable variation to the wage information in the analysis by Fitzenberger and Spitz (2003). Therefore, it is very likely that financial attractiveness would have

<sup>23</sup>The data do not provide information about whether apprentices are trained in the same training establishment or not. Therefore, we cannot control for specific firm dummies or cluster the standard errors at the training establishment level.

<sup>24</sup>Results are not shown in Table 5 but can be provided on request.

<sup>25</sup>Our data provide no information about apprenticeship wages.

**Table 6** Predicted probabilities for job related factors

	Intention to stay with training firm and keep occupation (%)	Intention to change firm but keep and occupation (%)	Intention to change firm occupation (%)
Sample average	29.12*** (0.016)	37.96*** (0.017)	32.92*** (0.016)
Occupational enjoyment = 0	18.77*** (0.310)	31.29*** (0.044)	49.94 *** (0.047)
Occupational enjoyment = 1	30.98*** (0.018)	38.73*** (0.018)	30.28*** (0.017)
Discrete change in the predicted probability for occupational enjoyment*	12.21	7.44	-19.66
Regional proximity = 0	24.80*** (0.023)	34.29*** (0.025)	40.97*** (0.026)
Regional proximity = 1	32.43*** (0.022)	40.40*** (0.023)	27.17*** (0.021)
Discrete change in the predicted probability for regional proximity*	7.63	6.11	-13.8
Job security = 0	18.21*** (0.029)	36.47*** (0.023)	45.32*** (0.038)
Job security = 1	32.92*** (0.019)	37.72*** (0.019)	29.36*** (0.018)
Discrete change in the predicted probability for job security*	14.71	1.25	-15.96

All calculations are based on estimates in Table 4 ( $N = 1,088$ )

All explanatory variables are fixed at their means

Standard errors (after delta-method) in parentheses: \*\*\*  $p < 0.01$ , \*\*  $p < 0.05$

\* Discrete change in the predicted probability levels shows the change in the predicted probability levels in percentage points if the corresponding dummy changes from 0 to 1

an effect on job mobility in an inter-sector analysis but in not in an intra-sector analysis.<sup>26</sup>

To get a feeling for the economic relevance of the job related factors occupational enjoyment, job security and regional proximity to the current employer, Table 6 illustrates how the probability values of the three categories of the job mobility variable  $y$  change if one or more of the dummy variables measuring the rating of job related factors changes from 0 to 1. The results in Table 6 allow us to draw important conclusions about the job mobility intentions of crafts apprentices. The first line in Table 6 shows the probability values for the sample average. The probability levels of all three categories of the job mobility variable  $y$  are around one-third. This means that the average apprentice in our sample intends to stay with the training establishment with a prob-

ability of around 29.12 %. This figure is consistent with an immediate average retention rate of roughly 30 % of apprentices in the crafts sector (Harhoff and Kane 1997; Büchel and Neubäumer 2001). However, if apprentices are dissatisfied with occupational enjoyment, the probability of staying with the training firm is just 18.77 %. However, if apprentices are happy with occupational enjoyment, the probability to stay with the training firms increases by 12.21 percentage points and the probability to change firm and occupation decreases by 19.66 percentage points. The smallest discrete changes for the predicted probabilities can be found for the intention to change firm but keep occupation, ranging from 1.25 to 7.44 percentage points. Especially the effect of job security on the intention to change firms but keep occupation (1.25 percentage points) is of hardly any economic relevance. However, the identified discrete changes for the remaining two categories range from 14.71 to -19.66 percentage points. Therefore, the identified effects for occupational enjoyment, job security and regional proximity have a high economic relevance for the intention to change employer or occupation.

<sup>26</sup> Another explanation could be that workers compare their wages with a reference group of co-workers. In most cases, there are no great differences in the wages of apprentices, but there are differences in the wages of skilled workers. Consequently, the wage argument may not be relevant at the end of the apprenticeship but at the beginning of the first job as skilled workers.

To check the robustness of our results, we ran additional probit regressions with different dependent variables. First, we use the impending separation information  $z$  as an alternative dependent variable and use the identical set of explanatory variables from Table 5. Because of the definition of variable  $z$ , the sample size is reduced to 566 observations for this robustness check. The three strongest coefficients of the multinomial logit model in Table 5 (occupational enjoyment, job security and regional proximity to firm) remain significant. All other job related factors have no significant effect on an impending separation. Model 1 in Appendix E shows the results for specification with the dependent variable  $z$ . When the item occupational enjoyment are rated with values 4 or 5 and all other factors remain constant, the probability of an impending separation decreases by 23 percentage points. However, if regional proximity or job security is rated with values 4 or 5, the risk of an impending separation decreases—*ceteris paribus*—by around 11 respectively 13 percentage points.

In a further robustness check, we transformed the job mobility variable  $y$  into a binary variable, where 1 indicates intended separation from the training establishment (values 2 and 3 of the job mobility variable  $y$ ) and 0 indicates the intention to stay with the training establishment (value 1 of the job mobility variable  $y$ ). This specification allows the running of a probit regression with the whole sample, because this information is available for all participants. Furthermore, it reduces the complexity of the interpretation of the coefficients, as the dependent variable only has two possible outcomes. In this specification, we only estimate whether an apprentice wants to leave the training establishment or not. Model 2 in Appendix E shows that all estimates from Table E except promotion prospects remain significant. If the items occupational enjoyment or job security are rated with values 4 or 5 and all other factors remain constant, the probability of intention to leave the training establishment decreases by 12 to 14 percentage points. When the items image of the training establishment, relation with supervisor or regional proximity to training firm are rated with the value 4 at least, the probability of an intended separation from the training firm decreases—*ceteris paribus*—by 7 to 10 percentage points.

The two robustness checks provided in Appendix E only provide information about how sensitive our findings are to changes in the specification. As our data provide no information about actual changes, we do not know whether the apprentices in our sample can realize their job mobility intentions or not. However, we argue that intentions about job mobility are important predictors for realized job mobility (Böckerman and Ilmakunnas 2009). Furthermore, the robustness checks show that the three most important and robust job related factors affecting an intention to seek job mobility are occupational enjoyment, job security and regional proximity to the current employer.

## 6 Conclusion and implications for crafts apprenticeships

The objective of our paper was to determine which job related factors drive the intention of Bavarian crafts apprentices to change employer or occupation. In contrast to previous studies, we estimated intended worker-initiated job mobility and differentiate between changing employer and changing employer plus occupation. We focused on specific job related factors for the crafts sector and integrated important aspects from previous studies. In contrast to other analyses, pecuniary factors cannot incentivize apprentices to stay with their training establishment or occupation. However, non-pecuniary job related factors such as occupational enjoyment, regional proximity and job security significantly affect the probability of leaving the training establishment and/or occupation.

Our results have several implications for establishments and institutions in the Bavarian crafts sector. First, in contrast to the traditional view, pecuniary factors do not have a significant effect on the intention of apprentices to change employer or occupation. We gave several explanations for these results in Chap. 5. For instance, we have less variation in our data than comparable studies concerning apprenticeship wages due to our homogeneous sample (we focus only on apprentices in Bavaria and seven occupations in the crafts sector). Regardless of the explanations, our results tip crafts establishments to focus on non-pecuniary incentives rather than to provide exaggerated salaries that might put them in economic difficulties to retain a lot of apprentices.

Second, initial screening of apprentices is of major importance for establishments in the crafts sector. Apprentices seem to search for jobs near their homes after finishing apprenticeship training. Consequently, establishments can mitigate the effects of losing skilled workers at the end of apprenticeship training by trying to provide training predominantly to apprentices wishing to reside near the establishment. Third, establishments should try to find new apprentices who enjoy working in the crafts sector: co-operation with schools and internships before the start of apprenticeship training can be useful ways of checking the personal preferences of apprentices for crafts work.

Our paper has some limitations. As we have no longitudinal data, we do not have any information about the connection between intended and actual changes of occupation or employer. Consequently, our results are limited to the intention to change employer or occupation. However, we argue that the intention to change occupation or employer is a strong predictor of realized job mobility. Second, our analysis is focused on the Bavarian crafts sector. Crafts establishments form a specific industrial sector. Hence, one can assume considerable differences from other industrial sectors concerning job related factors driving the intention to



change employer or occupation. Compared with other industries, the crafts sector is characterized by lower investment in training and less skilled apprentices. Additionally, Bavaria is a federal state with a strong infrastructure and an economically powerful crafts sector. Thus, the apprentices' opinions about job related factors might presumably depend on regional conditions. Because of the high specificity of our analysis, we cannot generalize our results to the German crafts sector.

In order to verify our results and their implications, further studies are necessary all over Germany in all industrial sectors. Future questionnaires should include specific questions regarding job satisfaction and wages. This would allow the analysis of the specific needs of apprentices in all economic sectors, comparison of results and learning from high quality training occupations.

### Executive summary

In this paper, we analyse which job related factors (e.g. occupational enjoyment, job security, financial attractiveness, working conditions and social relations) affect the intention of Bavarian crafts apprentices to change employer or occupation after finishing apprenticeship training. In contrast to previous studies, we do not just estimate the intention for worker-initiated job mobility—we simultaneously estimate whether apprenticeship graduates intend to change employer or occupation. Applying a multinomial logit model, we show that occupational enjoyment, job security and regional proximity to the current employer are the most important factors that affect the intention to change employer or occupation. In contrast to other studies on job satisfaction and job mobility, monetary incentives do not drive the intention to leave the training establishment or occupation. We use a new data set containing unique information about future career plans and ratings of job related factors driving the intention of apprentices to change employer or occupation in the crafts sector. The data were collected in 2009 via online and paper-based questionnaires among crafts apprentices from seven specific crafts sectors (automotive trade, crafts for commercial needs, finishing trade, food trade, health trade, main construction trade and personal services). Our analysis contributes to the previous literature on job mobility by focusing on the specific group of German apprentices in the crafts sector. Furthermore, we test a broader set of job related factors that affect the intention to change employer or occupation than previous studies. Our results have practical implications for several institutions in the Bavarian crafts sector. First of all, the analysis of job related factors for apprentices allows training establishments to develop systematic strategies to retain a higher proportion of apprenticeship graduates (e.g. initial screening of new apprentices). Second, organizations such as chambers (*Handwerkskammer*)

that are responsible for the execution of apprenticeship training in the crafts sector can make use of the findings in order to adapt the dual apprenticeship systems to the needs of juveniles. Third, policy makers and the German Confederation of Skilled Crafts (*Zentralverband des Deutschen Handwerks*) can tackle the lack of skilled labour by enhancing the image of the crafts sector based on our results.

### Kurzfassung

Im Rahmen dieser Studie untersuchen wir, welche Faktoren im Kontext einer dualen Ausbildung im bayerischen Handwerk die Absicht von Auszubildenden beeinflussen, nach Abschluss der Ausbildung entweder das Ausbildungsunternehmen oder den Ausbildungsberuf zu wechseln. Exemplarische Faktoren sind Freude an der Arbeit, regionale Nähe zum Ausbildungsbetrieb, Arbeitsplatzsicherheit oder das Verhältnis zu Kollegen und Vorgesetzten. Anders als frühere Studien zu Job-Mobilität unterscheiden wir explizit zwischen den Möglichkeiten nur das Unternehmen zu wechseln, jedoch dem Ausbildungsberuf treu zu bleiben und der Alternative, sowohl das Unternehmen als auch den Beruf zu wechseln. Basierend auf einem multinomialen Logit Modell zeigen unsere Ergebnisse, dass Freude an der Arbeit, regionale Nähe zum Arbeitgeber und Arbeitsplatzsicherheit die wichtigsten Faktoren sind, um weiterhin beim Ausbildungsunternehmen tätig sein zu wollen. Finanzielle Aspekte haben – anders als in bisherigen Studien – keinen signifikanten Effekt auf den Wunsch im Unternehmen zu verbleiben.

Unsere Daten wurden im Jahr 2009 mittels eines Fragebogens an bayerischen Berufsschulen erhoben. In Kooperation mit dem Bayerischen Kultusministerium und dem Ludwig-Fröhler-Institut wurden insgesamt 2.200 Lehrlinge befragt. Die Befragung deckte die Gewerke Bauhauptgewerbe, Ausbaugewerbe, Handwerk für den gewerblichen Bedarf, KFZ-Gewerbe, Lebensmittelgewerbe, Gesundheitsgewerbe und personenbezogene Dienstleistungen ab. Der Fragebogen enthielt neben sozio-demographischen Merkmalen wie Alter, Geschlecht, Nationalität und Schulbildung auch Informationen über den Ausbildungsbetrieb, Informationen über künftige Karrierepläne und Bewertungen von arbeitsrelevanten Faktoren. Im Vergleich zu bisherigen Studien berücksichtigen wir eine größere Anzahl von arbeitsspezifischen Faktoren, trennen zwischen Firmen- und Berufswechslern und fokussieren unsere Analyse auf Auszubildende im Handwerk.

Unsere Ergebnisse haben praktische Relevanz für zahlreiche Institutionen im Handwerk. Ausbildungsunternehmen können auf Basis unserer Ergebnisse Strategien zur Übernahme eines größeren Anteils von Ausbildungsabsolventen entwickeln, wie beispielsweise eine gezieltere Auswahl von Auszubildenden. Die für die Überwachung einer dualen



Ausbildung verantwortliche Handwerkskammer kann auf Basis unserer Ergebnisse Ausbildungsinhalte besser auf die Bedürfnisse von Jugendlichen abstimmen und der Zentralverband des Deutschen Handwerks kann gezielt das Image des Handwerkssektors verbessern.

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## Appendix A: Survey items underlying the dependent variable (change employer or occupation)

Variable change complexity	Survey item on plans for further career
Intention to stay with training establishment and keep occupation ( $y = 1$ )	<p>Please indicate your opinion about the attractiveness of the following job opportunities on the following Likert scale (1 = not attractive at all, 2 = not attractive, 3 = somehow attractive, 4 = attractive, 5 = very attractive, Anmerkung der Verfasser):</p> <p>Remain with the training firm for more than one year as a skilled worker</p> <p>Original question in German: Bitte bewerten Sie anhand der Skala (1 = Überhaupt nicht attraktiv, 2 = Nicht attraktiv, 3 = Teilweise attraktiv, 4 = Attraktiv 5 = Sehr attraktiv, Anmerkung der Verfasser) wie attraktiv Sie die beruflichen Alternativen nach der Ausbildung finden:</p> <p>Weiterhin langfristig (d. h. mehr als ein Jahr) in meinem Ausbildungsbetrieb als Geselle tätig sein</p>
Intention to change establishment but keep occupation ( $y = 2$ )	<p>Please indicate your opinion about the attractiveness of the following job opportunities on the following Likert scale (1 = not attractive at all, 2 = not attractive, 3 = somehow attractive, 4 = attractive, 5 = very attractive, author's note):</p> <p>Change firm in the crafts sector but keep working in my training occupation</p> <p>Change to another firm in industry but keep working in my training occupation</p> <p>Original question in German: Bitte bewerten Sie anhand der Skala (1 = Überhaupt nicht attraktiv, 2 = Nicht attraktiv, 3 = Teilweise attraktiv, 4 = Attraktiv 5 = Sehr attraktiv, Anmerkung der Verfasser) wie attraktiv Sie die beruflichen Alternativen nach der Ausbildung finden:</p> <p>Meinen Ausbildungsbetrieb verlassen, aber weiterhin in einem Handwerksbetrieb als Geselle im erlernten Beruf tätig sein</p> <p>Meinen Ausbildungsbetrieb verlassen und in die Industrie wechseln, in der ich meinen Beruf ausüben kann</p>
Intention to change establishment and occupation ( $y = 3$ )	<p>Please indicate your opinion about the attractiveness of the following job opportunities on the following Likert scale (1 = not attractive at all, 2 = not attractive, 3 = somehow attractive, 4 = attractive, 5 = very attractive, author's note):</p> <p>Change to another firm in industry even if can't keep my training occupation</p> <p>Work in another job</p> <p>Original question in German: Bitte bewerten Sie anhand der Skala (1 = Überhaupt nicht attraktiv, 2 = Nicht attraktiv, 3 = Teilweise attraktiv, 4 = Attraktiv 5 = Sehr attraktiv, Anmerkung der Verfasser) wie attraktiv Sie die beruflichen Alternativen nach der Ausbildung finden:</p> <p>Meinen Ausbildungsbetrieb verlassen und in die Industrie wechseln, auch wenn ich dort meinen erlernten Beruf nicht ausüben kann</p>

## Appendix B: Survey questions underlying the job related factors

Variable	Survey item
Occupational enjoyment	<p>Please indicate the reasons why you have decided to train in your job (on the following Likert scale, author's note) (1 = not important at all, 2 = not important, 3 = somehow important, 4 = important, 5 = very important, author's note):</p> <p>I enjoy doing crafts work</p> <p>Original item in German:</p> <p>Bitte bewerten Sie anhand der Skala, wieso Sie Ihren Ausbildungsberuf gewählt haben (1 = Überhaupt nicht wichtig, 2 = Nicht wichtig, 3 = Teilweise wichtig, 4 = Wichtig 5 = Sehr wichtig, Anmerkung der Verfasser):</p> <p>Die handwerkliche Tätigkeit bereitet mir Freude</p>

Variable	Survey item
Image of training establishment	<p>Please indicate the reasons why you have decided to train in your job (on the following Likert scale, author's note) (1 = not important at all, 2 = not important, 3 = somehow important, 4 = important, 5 = very important, author's note):</p> <p>The training establishment has a good reputation</p> <p>Original item in German: Bitte bewerten Sie anhand der Skala, wieso Sie Ihren Ausbildungsberuf gewählt haben (1 = Überhaupt nicht wichtig, 2 = Nicht wichtig, 3 = Teilweise wichtig, 4 = Wichtig 5 = Sehr wichtig, Anmerkung der Verfasser): Der Ausbildungsbetrieb hat ein gutes Image</p>
Financial attractiveness (salary)	<p>Please indicate the reasons why you have decided to train in your job (on the following Likert scale, author's note) (1 = not important at all, 2 = not important, 3 = somehow important, 4 = important, 5 = very important, author's note):</p> <p>This crafts occupation is financially attractive for me</p> <p>Original item in German: Bitte bewerten Sie anhand der Skala, wieso Sie Ihren Ausbildungsberuf gewählt haben (1 = Überhaupt nicht wichtig, 2 = Nicht wichtig, 3 = Teilweise wichtig, 4 = Wichtig 5 = Sehr wichtig, Anmerkung der Verfasser): Der Handwerksberuf ist finanziell attraktiv für mich</p>
Promotion prospects in crafts	<p>Please indicate the reasons why you have decided to train in your job (on the following Likert scale, author's note) (1 = not important at all, 2 = not important, 3 = somehow important, 4 = important, 5 = very important, author's note):</p> <p>This crafts occupation offers promotion prospects</p> <p>Original item in German: Bitte bewerten Sie anhand der Skala, wieso Sie Ihren Ausbildungsberuf gewählt haben (1 = Überhaupt nicht wichtig, 2 = Nicht wichtig, 3 = Teilweise wichtig, 4 = Wichtig 5 = Sehr wichtig, Anmerkung der Verfasser): Der Handwerksberuf bietet mir berufliche Perspektiven/Aufstiegchancen</p>
Job security in crafts	<p>Please indicate the reasons why you have decided to train in your job (on the following Likert scale, author's note) (1 = not important at all, 2 = not important, 3 = somehow important, 4 = important, 5 = very important, author's note):</p> <p>This crafts occupation offers job security.</p> <p>Original item in German: Bitte bewerten Sie anhand der Skala, wieso Sie Ihren Ausbildungsberuf gewählt haben (1 = Überhaupt nicht wichtig, 2 = Nicht wichtig, 3 = Teilweise wichtig, 4 = Wichtig 5 = Sehr wichtig, Anmerkung der Verfasser): Der Handwerksberuf bietet mir einen sicheren Arbeitsplatz</p> <p><b>What do you think – to what extent are the following factors fulfilled in the crafts sector?</b></p> <p>Original item in German: <b>Wie stark denken Sie, dass die folgenden Einflussfaktoren im Handwerk vorzufinden sind?</b></p>
Relation with supervisor in establishment	<p>Good relation with supervisor</p> <p>Original item in German: Gutes Verhältnis zum Vorgesetzten</p>
Relation with colleagues in establishment	<p>Good relation to colleagues</p> <p>Original item in German: Gutes Verhältnis zu den Kollegen</p>
Regional proximity to establishment	<p>Regional proximity of the workplace to your current residence</p> <p>Original item in German: Regionale Nähe des Arbeitsplatzes zum jetzigen Wohnort</p>
Physically hard work in crafts	<p>Physically hard work</p> <p>Original item in German: Körperlich anstrengende und belastende Arbeit.</p>
No routine in work in crafts	<p>No routine</p> <p>Original item in German: Vielseitige, abwechslungsreiche Arbeit (keine Routinearbeit)</p>
Further training possibilities	<p>Further training possibilities</p> <p>Original item in German: Weiterbildungschancen</p>
Fixed working hours	<p>Fixed working hours</p> <p>Original item in German: Geregelte Arbeitszeiten</p>

Variable	Survey item
Flexible working hours	Flexible working hours Original item in German: Flexible Arbeitszeiten

### Appendix C: Job satisfaction correlation matrix

Occupational enjoyment	<b>1</b>												
Image of training firm	0.18	<b>1</b>											
Relation with supervisor in firm	0.10	0.04	<b>1</b>										
Relation with colleagues in firm	0.18	0.11	0.27	<b>1</b>									
Regional proximity to firm	0.13	0.15	0.23	0.31	<b>1</b>								
Physically hard work in crafts	0.07	0.05	0.10	0.32	0.17	<b>1</b>							
No routine in work in crafts	0.08	0.10	0.25	0.36	0.21	0.28	<b>1</b>						
Further training possibilities	0.08	0.06	0.35	0.16	0.16	0.03	0.15	<b>1</b>					
Fixed working hours	0.13	0.11	0.28	0.44	0.25	0.27	0.35	0.16	<b>1</b>				
Flexible working hours	0.15	0.17	0.32	0.38	0.28	0.25	0.37	0.21	0.47	<b>1</b>			
Job security in crafts	0.23	0.27	0.12	0.20	0.16	0.09	0.09	0.06	0.11	0.15	<b>1</b>		
Promotion prospects in crafts	0.26	0.29	0.16	0.18	0.14	0.05	0.13	0.08	0.14	0.19	0.36	<b>1</b>	
Financial attractiveness (salary)	0.13	0.18	0.12	0.08	0.08	0.04	0.02	0.09	0.03	0.06	0.28	0.23	<b>1</b>

### Appendix D: Descriptive statistics for sub-groups

Variable	Job offer by training establishment (%)	Job offer from another firm (%)	Communicated separation from the training establishment (%)	No information about job offers or communicated separations (%)
Males	76.76	82.95	89.74	75.16
No schooling	2.08	1.14	2.56	2.51
Secondary general school	67.84	55.68	61.55	72.44
Intermediate school	26.97	32.96	25.64	21.09
Grammar school	3.11	6.82	10.25	3.96
Main construction trade	6.85	4.54	2.56	4.38
Finishing trade	11.62	15.91	20.52	6.68
Crafts for commercial needs	20.95	18.18	20.52	14.82
Automotive trade	29.67	42.05	33.33	39.46
Food trade	9.75	6.82	12.82	13.15
Health trade	3.11	0	2.56	3.14
Personal services	18.05	12.50	7.69	18.37
Establishment size 1–4	12.86	20.45	12.82	16.27
Establishment size 5–9	20.54	18.18	15.39	24.43
Establishment size 10–19	19.29	20.45	20.51	19.21
Establishment size 20–49	21.16	22.73	33.33	17.54
Establishment size 50–100	13.28	6.82	5.13	11.69
Establishment size 101–499	9.34	6.82	10.26	7.52
Establishment size 500+	3.53	4.55	2.56	3.34
Sample size ( <i>N</i> )	482	88	39	479

**Appendix E: Regression output on robustness checks**

Variables	(1)	MFE for Model (1)	(2)	MFE for Model (2)
Occupational enjoyment	−0.910*** (0.240)	−0.229*** (0.0771)	−0.413*** (0.149)	−0.127*** (0.0405)
Image of training establishment	−0.194 (0.170)	−0.0345 (0.0320)	−0.320*** (0.105)	−0.104*** (0.0324)
Relation with supervisor	−0.0922 (0.170)	−0.0155 (0.0287)	−0.276*** (0.0966)	−0.0936*** (0.0327)
Relation with colleagues	0.350 (0.224)	0.0518* (0.0290)	−0.0473 (0.119)	−0.0159 (0.0399)
Regional proximity to establishment	−0.614*** (0.163)	−0.113*** (0.0325)	−0.211** (0.0948)	−0.0707** (0.0315)
Physically hard work in crafts	−0.0623 (0.193)	−0.0107 (0.0336)	0.0932 (0.106)	0.0319 (0.0367)
No routine in work in crafts	0.139 (0.188)	0.0224 (0.0289)	0.148 (0.108)	0.0509 (0.0376)
Further training possibilities	−0.295 (0.186)	−0.0466* (0.0274)	−0.0571 (0.0945)	−0.0194 (0.0323)
Fixed working hours	−0.0753 (0.232)	−0.0130 (0.0414)	−0.0471 (0.134)	−0.0158 (0.0445)
Flexible working hours	0.240 (0.218)	0.0371 (0.0310)	−0.167 (0.119)	−0.0555 (0.0385)
Job security	−0.609*** (0.199)	−0.131** (0.0524)	−0.458*** (0.124)	−0.143*** (0.0349)
Promotion prospects	0.139 (0.193)	0.0222 (0.0291)	−0.115 (0.116)	−0.0384 (0.0380)
Financial attractiveness (salary)	−0.226 (0.160)	−0.0382 (0.0274)	0.0605 (0.0914)	0.0205 (0.0310)
Sex	Yes	Yes	Yes	Yes
Schooling	Yes	Yes	Yes	Yes
Establishment size	Yes	Yes	Yes	Yes
Occupation	Yes	Yes	Yes	Yes
Big-five inventory	Yes	Yes	Yes	Yes
Constant	0.245 (0.795)		1.199*** (0.437)	
LR $\chi^2$	101.29		160.67	
Pseudo $R^2$	0.2131		0.1189	
Observations	566		1,088	

For the multivariate analyses, we transformed the Likert scaled variables into dummies. The dummies equal 1 if a participant chose the value 4 or 5 on the Likert scale and 0 otherwise. We argue that, if a participant chose at least the value 4, he or she is satisfied with the job related factor

Model 1: Dependent variable impending separation (1 = communicated separation from the training establishment or job offer from another establishment; 0 = takeover offer by training establishment)

Model 2: Dependent variable intended separation (1 = intention to change occupation and/or establishment; 0 = intention to stay with training establishment)

MFE for Model (1) and MFE for Model (2) show marginal effects for a discrete change of dummy variables from 0 to 1

Standard errors in parentheses: \*\*\*  $p < 0.01$ , \*\*  $p < 0.05$

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