

Unemployment duration and personality

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ARTICLE INFO

Article history:

Received 3 March 2010

Received in revised form 7 March 2011

Accepted 8 March 2011

Available online 17 March 2011

JEL classification:

J64

C41

PsycINFO classification:

3100

3600

Keywords:

Unemployment duration

Personality traits

Big Five

Duration analysis

ABSTRACT

This paper focuses on the role personality traits play in determining individual unemployment duration. We argue that a worker's job search intensity is decisively driven by her personality traits, reflected in her propensity to motivate and control herself while searching for a job. Moreover, personality traits, in as far as they can be signaled to a potential employer, may also enhance the probability of receiving and accepting a job offer.

For our econometric duration analysis, we use the well-accepted taxonomy "Big Five" to classify personality traits. Based on individual unemployment data taken from the German Socio-Economic Panel (SOEP) our empirical findings reveal that the personality traits *Conscientiousness* and *Neuroticism* have a strong impact on the instantaneous probability of finding a job, where the former has a positive effect and the latter has a negative effect. The direction of the effect on the subsequent employment duration is the opposite. We do not find any significant effects of the personality traits *Extraversion* and *Agreeableness* on the duration of unemployment. The personality trait *Openness* eases finding a job only for female unemployed workers and workers with migration background.

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1. Introduction

The role played by personality traits in an individual's success on the labor market has drawn considerable attention in labor economics. Recent empirical findings show significant effects of personality on various economic outcomes, such as earnings, labor force participation and employment probability. Comparatively little is known, however, about how personality traits affect the transition period from unemployment to the employment. We contribute to the discussion on the relation between personality and economic outcomes by looking at how the unemployment duration differs for people with different personality traits.

Traditionally, labor economists focus on incentive schemes, the role of labor market institutions and educational attainment in their analysis of the transition out of unemployment. Apart from the usual socio-economic control variables, individual heterogeneity is regarded as being important, particularly from an econometric point of view, but is usually considered to be unobservable. Ignoring individual differences such as personality traits, however, leads to the well-known spurious duration dependence of unemployment and possibly to misleading evaluations concerning public measures to increase the employability of the unemployed. Besides the role of the economic incentive scheme, which is central to all job search models, it is obvious that a number of additional, usually unobservable factors determine the success of finding

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a job. For instance, a worker's job search intensity is not solely driven by economic incentives but also by the propensity to motivate and discipline herself while searching for a job. Moreover, personality traits, in as far as they can be signaled to a potential employer, may also enhance the probability of receiving and accepting a job offer. Therefore based on a conventional job search model with endogenous job search effort, we argue that the channels through which personality traits may effect a person's transition from unemployment to employment are manifold and may not only be linked to preferences (e.g. risk attitude, self-regulation), search costs (disutility of search) or the job offer arrival rate.¹ The individuals with certain traits might face lower search costs, which in turn may increase the optimum search intensity and the reservation wage. More intense search will increase the number of offers received, however the net effect on the unemployment duration is ambiguous due to the increased reservation wage. Workers with different personality traits may even face different wage offer distributions. For instance, the wage offer distribution for workers with a high degree of *Openness* may have fatter tails than the one for workers with a low degree of *Openness*. Therefore from a theoretical point of view the sign of effect of certain personality traits is ex-ante undetermined and remains to be tackled empirically.

In the following we use a reduced form approach to assess how different personality traits affect an unemployed individual's instantaneous probability of finding a job. In particular, we try to work out the extent to which different dimensions of personality traits have an effect on transitions out of unemployment and on the duration of this subsequent employment. As mentioned in Bowles et al. (2001), traits might have different effects for women and men, or different ethnic or language groups. Therefore, we check the robustness of our findings by considering different subpopulations of the labor market (male and female workers, immigrants and natives). Furthermore, following the results by Barrick and Mount (1991), different occupations require different types of personality traits, we also explore the importance of personality traits on unemployment and employment duration for various occupational groups and sectors. By estimating employment durations for the formerly unemployed workers in our sample, we provide empirical evidence to what extent the same personality traits are beneficial in keeping the job.

The outline of the paper is as follows. Section 2 briefly reviews previous research on the relationship between personality traits and individual labor market outcomes. Section 3 focuses on the sample and some descriptive evidence. Section 4 briefly describes the econometric method used and elaborates on the empirical results. Finally, Section 5 summarizes the main results and concludes the paper.

2. Personality traits and previous findings

Our empirical analysis is based on the well-accepted taxonomy known as the “*Big Five*” of Norman (1963) for classifying personality traits (see John et al., 1999, and the references given therein for the evaluation of the *Big Five* personality traits). “*Big Five*” model of personality is a hierarchical organization of personality traits in terms of five basic dimensions: “*Extraversion, Agreeableness, Conscientiousness, Neuroticism, and Openness to Experience*”. After more than four decades, the “*Big Five*” taxonomy is still the most accepted one, not only in personality and social psychology, but also in other fields such as industrial- and organizational psychology and personal economics.

A considerable number of studies analyze the relationship between personality and various economic outcomes in social science fields such as economics, sociology, social psychology and personnel psychology (for a review of the psychology and sociology literature on this topic see Ozer and Benet-Martinez, 2006; Farkas, 2003). Heckman et al. (2006) find significant effects of personality traits, such as self-control and self-esteem, on wages. They show that both traits are valued for both men and women by the labor market, but find some gender differences over different sectors. Mueller and Plug (2006) estimate the effect of personality on male and female earnings using a US data set. In their study lower scores in *Agreeableness* and *Neuroticism* and higher scores in *Openness* are associated with higher earnings for males, whereas higher scores in *Conscientiousness* and *Openness* have a positive effect on the earnings of females. In strong contrast to their results is the Swedish study by Zetterberg (2005), which does not find any difference in returns to personality traits (self-esteem) across genders. He, however, points out that the returns to personality traits vary over the earning distribution. This result is consistent with the view that the returns to personality traits vary over different occupational positions and sectors. Nyhus and Pons (2005) find that *Neuroticism* is negatively associated with the wage of both women and men, while *Agreeableness* is negatively associated with lower wages only for women for the Netherlands. Using a US data set, Mohanty (2009) shows that positive attitude positively affects the earnings directly as well as indirectly through schooling. Using the same information on the Big Five as in our study, Heineck and Anger (2010) find significant effects of personality traits on wages for Germany.

Labor market participation and employment probabilities are major economic outcome variables which have been investigated in their relationship to personality traits. The study by Wichert and Pohlmeier (2010) focuses on the effect of the Big Five on female labor force participation. They show, that with the exception of *Agreeableness*, all other Big Five personality traits have statistically significant effects on the participation probability. *Conscientiousness* and *Extraversion* affect the participation probability positively, whereas *Openness* and *Neuroticism* decrease the participation probability. They also show that the interindividual traits *Extraversion* and *Agreeableness* have strong effect on wages of women where the former effect is positive while the latter is negative. Mohanty (2010) investigates the effect of positive attitude on the participation

¹ For a search theoretical discussion see for example Mortensen and Pissarides (1999), Pissarides (2000) among others.

decision and employment probability. His results indicate that these probabilities are determined partly by positive attitude of the worker. He, however, also emphasizes the gender differences of the effects.

Further studies, especially in the psychology literature, concentrate on the link between personality traits and other economically relevant outcome variables like job performance, job search behavior, job change frequency, absenteeism etc. (see Tokar et al., 1998, and their references for a review). These studies show that such outcomes are also related to personality. Although, these studies are difficult to generalize due to the restricted samples they use, they signal the importance of personality traits in determining various economic outcomes.

In light of previous empirical findings on the effects of personality on individual labor market performance, we expect that individual unemployment duration is affected by personality through various channels. The channels can be worked out in a basic search theoretical model with the following elements: search cost and the job arrival rate as functions of search intensity, and the reservation wage. In such a framework, these factors determine the hazard rate of an individual job searcher. Intuitively, but also based on previous empirical findings, it is very likely that these factors are determined directly and/or indirectly by personality. The cost of the search depends on how efficient one can search for a job. Schmit et al. (1993) show that *Conscientiousness* and *Openness* are positively correlated with an efficient job search behavior, whereas *Neuroticism* has a negative correlation. However, the costs of the search also influences the reservation wage which, in turn, decreases the job acceptance probability. Personality traits signaled to a potential employer, on the other hand, will have different effects on the wage offers depending on how valuable these traits are for the job under consideration. Moreover, individuals with certain traits will have different bargaining power and this will also affect the transition from unemployment to employment. Since personality traits influence the interaction between job searcher and employer and are likely to affect the employer's hiring policy, linked employer–employee data would be desirable to disentangle the complex interaction in the hiring process which would still require strong identifying assumptions (restrictive functional form assumptions, exclusion restrictions etc.). Given our data limitations, we propose the estimation of a reduced form to investigate the overall relationship between individual unemployment duration and personality traits. Similar to many related studies using self-reported personality trait measures, potential endogeneity problems should not be ignored. As mentioned by Carneiro and Heckman (2004), self-reported ex-post assessments are likely to be both causes and consequences of economic outcomes. Although there are several studies in the psychology literature which argue that the personality traits are stable over the life cycle and are not seriously affected by life outcomes (see Costa and McCrae, 1988; McCrae and Costa, 1994, and the references given therein), some empirical studies provide evidence supporting the view that personality traits change over the life cycle (Srivastava et al., 2003; Borghans et al., 2008). Despite the yet inconclusive discussion on the stability of personality traits, inclusion of the measures of personality traits in economic analysis is very important in different respects. First, personality measures are useful to control for unobserved individual heterogeneity (Boyce, 2010; Anand et al., 1991). Second, as emphasized by Carneiro and Heckman (2004) and given that this literature is relatively new, these studies are essential to shedding light on the importance of personality in determining economic outcomes.

3. Data

Our empirical study is based on data from the German Socio-Economic Panel (SOEP). The SOEP is a wide-ranging representative longitudinal study of private households. The Panel was started in 1984 with randomly selected adult respondents from West Germany. A random sample from East Germany is included after German reunification in 1990. Every year, there were nearly 11,000 households, and more than 20,000 persons sampled from residential population in Germany. Some of the many topics covered in SOEP include household composition, occupational biographies, employment and earnings. Aside from these topics, the 2005 wave of the SOEP includes a 15-item short version of the Big Five Inventory. The Revised NEO Personality Inventory (NEO PI-R), the most widely used psychological personality inventory, with 240 items is not tractable as a part of the very comprehensive SOEP survey due to the time constraints. Therefore, the 15-item short version is prepared according to the results of a pretest, which was conducted in 2004 on a number of different short item scales to test the Big Five approach. Gerlitz and Schupp (2005) explain in detail the pretest procedure and the results of the reliability and validity analysis. The Cronbach's alpha reliabilities (Cronbach, 1951) reported in Gerlitz and Schupp (2005) are: *Openness* 0.74, *Conscientiousness* 0.72, *Agreeableness* 0.53, *Extraversion* 0.62 and *Neuroticism* 0.57. Although the reliability coefficients found in the literature are on average 0.80 (John et al., 1999), these values of the coefficients do not necessarily indicate unreliability of the short inventory. As Mueller and Plug (2006) and Heineck and Anger (2010) mention the alpha reliability coefficients increase with the number of items. Given that there are three items per personality trait in the SOEP, the ratios found are satisfactory (Dehne and Schupp, 2007).

Each wave of the panel contains retrospective monthly information about the individual employment history of the previous calendar year. Although the SOEP distinguishes between several categories of employment status, we aggregate this information into three distinct categories: unemployed, employed and out of labor force.² A person is defined to be unemployed (a job searcher) if she is currently not employed and has indicated that she is looking for a job.

Employment status refers to any kind of working activity: full time, part time or short working hours. Out of labor force, on the other hand, includes retirement, parental leave, school, vocational training and military service. Our sample only

² Employment status used in this paper is self-reported.

Table 1
The self-assessment questions in the SOEP 2005 wave.

"I see myself as someone who ...	
Extraversion:	... is communicative, talkative ⊕ ... is outgoing, sociable ⊕ ... is reserved ⊖
Agreeableness:	... has a forgiving nature ⊕ ... is considerate and kind to others ⊕ ... is sometimes somewhat rude to others ⊖
Conscientiousness:	... does a thorough job ⊕ ... does things effectively and efficiently ⊕ ... tends to be lazy ⊖
Neuroticism:	... is relaxed, handles stress well ⊖ ... gets nervous easily ⊕ ... worries a lot ⊕
Openness:	... is original, comes up with new ideas ⊕ ... has an active imagination ⊕ ... values artistic experiences ⊕

Note: ⊕: positively related with the trait; ⊖: negatively related with the trait.

consists of individuals who experience unemployment spells with a subsequent employment spells.³ We use SOEP data 1984–2007, such that we have information on the individuals entering unemployment between 1983 and 2006. We exclude individuals younger than 20 and older than 55 at the time of their entry into unemployment. This is done to avoid issues such as school and/or university enrollment as well as early retirement. We also exclude individuals from the sample for whom we did not have information concerning their *Big Five* personality traits or one of the other characteristics we use for our analysis. This leaves us with a sample of 4466 individual unemployment spells of 2735 individuals and 4191 employment spells of 2605 individuals. The difference in the number of individuals occurs due to the missing explanatory variables used in the analysis for the employment duration. Due to recurring unemployment, 35% of the observed unemployment and employment spells are multiple spells, which we treat for the sake of simplicity as independent observations.⁴

In order to measure personality traits, self-assessment questions on the *Big Five* are used from the 2005 wave of SOEP. The respondents are asked to assess fifteen statements which are related to the *Big Five* personality traits (see Table 1). The ordering of the statements during the interview was not clustered. The respondent has to indicate the degree of agreement with each statement on a 7-tier Likert-Scale from "strongly disagree" to "strongly agree". For each trait, there are three statements. Strong agreement with a statement is interpreted as meaning that the respondent possesses the corresponding trait heavily (⊕) or does not possess this trait (⊖) depending on the statement. We construct single indexes for each personality trait by adding up the numeric values of the answers of the three questions for each trait. "Strongly disagree" is worth one point and "I strongly agree" seven points for a question which has a positive association with the corresponding trait. If the question is negatively associated with the personality trait, we give one point for "I strongly agree" and seven for "I strongly disagree". Thus, the indexes of each trait range between three and twenty-one. All further variables used in this study are listed in Table A.1 in Appendix A.

3.1. Unemployment spells

Table A.2 of Appendix A contains the summary statistics of unemployment duration and personality traits for the overall sample and the subsamples we use in our analysis.⁵ Individual unemployment duration is longer for foreign workers than for Germans. There is also a significant difference in unemployment duration between male and female workers. Almost 40% of the unemployment spells end within 3 months. 80% of the unemployment spells are shorter than one year and only 3% of the unemployment spells last longer than 3 years. The self-assessment of male and female workers with respect to all *Big Five* dimensions differs significantly. Similarly, we find significant differences between German and foreign unemployed workers for *Extraversion*, *Agreeableness* and *Openness*. There are significant differences between blue-collar and white-collar workers for all the traits except for *Conscientiousness*. Traits associated with better job performance are more pronounced for white-collar workers, while *Neuroticism* is more pronounced for blue-collar workers. Similarly, there are also differences in personality traits across sectors showing that job choice is also determined by personality. As expected, unemployed individuals who formerly worked in the service sector reveal more *Extraversion*, *Neuroticism*, *Openness* and *Agreeableness* compared to workers from the construction or the manufacturing sector. This exploratory finding makes it clear that individual differences in unemployment duration due to differences in personality traits may be "direct" through differences in individual search intensities but also "indirect" through sectoral choice which in turn reflects personality traits.

³ We have information on the starting and ending dates of all the spells. For some individuals there is a gap between the end of the unemployment spell and the beginning of the employment spell. If this gap is not longer than 2 months, we count the unemployment spell as ending with an employment spell.

⁴ Deleting multiple spells from the sample did not change our empirical findings qualitatively.

⁵ The detailed descriptive statistics of all variables used in our analysis are available as Web Appendix, Uysal and Pohlmeier (2010).

3.2. Employment spells

In a second step of our empirical study, we also analyze the effect of personality traits on employment duration of the formerly unemployed in order to explore to what extent the same personality traits contribute to employment stability. The sample of employment spells consists of 4191 observations from which 31% percent are right censored. The summary statistics of the employment durations and personality traits of this sample are given in Table A.3. About 50% of the employment spells lasts at least 1 year. Table A.3 provides information on the distribution of the covariates by occupational status and sectors in the current job. In fact, the comparison of averages of the covariates for the employed sample gives similar figures to that for the unemployed sample. This result is not really surprising given that individuals' occupational position and the sector in which they are working do not often change.

4. Empirical results

For the empirical study, we use the approach proposed by Han and Hausman (1990) for the analysis of grouped durations. This model is based on a semiparametric proportional hazard rate of the form

$$\lambda_i(\tau) = \lim_{\Delta \rightarrow 0^+} \frac{\Pr[\tau < t_i < \tau + \Delta | t_i > \tau]}{\Delta} = \lambda_0(\tau) \exp(-X_i' \beta), \quad (4.1)$$

where t_i is the unemployment duration (failure time), $\lambda_0(\cdot)$ the base line hazard and X_i a vector of covariates. Integration and taking logs on both sides gives the log integrated baseline hazard:

$$\Lambda_0(t) = \ln \int_0^t \lambda_0(\tau) d\tau = X_i' \beta + \varepsilon_i, \quad (4.2)$$

where $\varepsilon_i = \ln \int_0^t \lambda_i(\tau) d\tau$ is extreme value distributed. Durations are grouped into T subperiods. The subperiod t refers to the time interval between consecutive time points $t - 1$ and t . Thus, the probability of worker i leaving the unemployment pool in this subperiod is:

$$\Pr[\text{leaving unemployment in subperiod } t | X_i] = \int_{\Lambda_0(t-1) - X_i' \beta}^{\Lambda_0(t) - X_i' \beta} f(\varepsilon) d\varepsilon = F_\varepsilon(\Lambda_0(t) - X_i' \beta) - F_\varepsilon(\Lambda_0(t-1) - X_i' \beta), \quad (4.3)$$

where $F_\varepsilon(\cdot)$ denotes the cdf of the extreme value distribution. Let the indicator variable Y_{it} be

$$Y_{it} = \begin{cases} 1, & \text{if } i \text{ exits unemployment in subperiod } t, \\ 0, & \text{otherwise.} \end{cases}$$

With the use of this indicator variable we can write the likelihood function of N observations:

$$L(\beta, \Lambda_0(1), \dots, \Lambda_0(T)) = \prod_{i=1}^N \prod_{t=1}^T \{F_\varepsilon(\Lambda_0(t) - X_i' \beta) - F_\varepsilon(\Lambda_0(t-1) - X_i' \beta)\}^{D_i Y_{it}} \{1 - F_\varepsilon(\Lambda_0(t) - X_i' \beta)\}^{1-D_i}, \quad (4.4)$$

where D_i is the censoring indicator taking on the value 1, if duration t_i has elapsed and 0 if there is right censoring. The likelihood takes on the form of an ordered response model with censoring. We follow the arguments of Han and Hausman (1990) and use the logit distribution to approximate the outcome probabilities of the extreme value distribution. The threshold parameters $\Lambda_0(1), \dots, \Lambda_0(T)$, which are jointly estimated with the coefficients on the explanatory variables, serve as grid point estimates for the (continuous) log integrated hazard rate.

For our application, the Han–Hausman approach has several advantages. First, it is a well-suited model for monthly measured unemployment duration. Since we cannot assume that monthly measured unemployment duration is a continuous variable, we use a model for grouped duration. Second, this method has more flexibility than standard parametric proportional hazard specifications. In particular, its flexibility arises from the fact that we do not need to specify any functional form for the baseline hazard function. As Meyer (1990) argues, the semiparametric hazard estimation hinders inconsistent estimation of covariates due to a misspecified baseline hazard function.

The estimates for the determinants of unemployment duration based on the Han–Hausman estimator are given in Table A.4 in Appendix A. As defined by Eq. (4.1), a positive coefficient indicates a negative effect of the corresponding covariate on the hazard rate and thus a positive effect on unemployment duration. We analyze these effects first for the overall sample. Then, considering the gender differences and possible differences for natives and immigrants, we estimate the model for these subsamples. Lastly, since the effects of the personality traits are context-related, we analyze the effect of the *Big Five* separately by occupational status and sectors in the previous job. For this purpose, we create corresponding subsamples for blue-collar and white-collar workers, as well as for the largest sectors: manufacturing, construction and service. Regression results are given for the overall sample and also for the subsamples separated by gender, nationality, occupational status and sectors. For the regressions, we use the standardized indices for the *Big Five* traits. Thus, one unit change in one of the *Big Five* variables in the regression represents a change of one standard deviation of the same variable in levels. The observed unemployment spells are grouped in 3 monthly unemployment durations of 18 months and the last threshold is set in the 24th

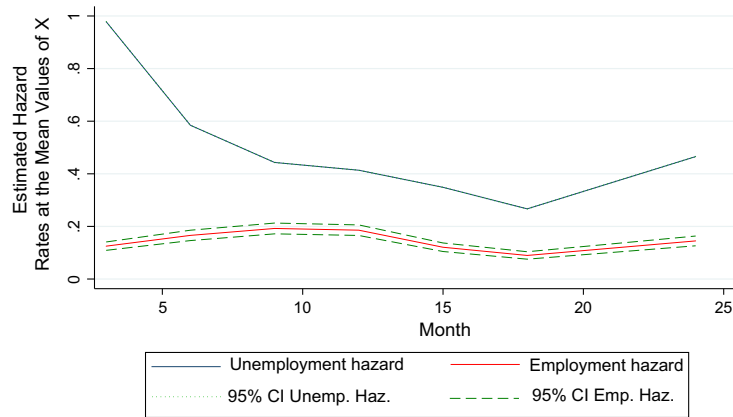


Fig. 1. Hazard rate with 95% confidence band. Estimates are based on more general specification of unemployment and employment hazards.

month, so that we obtain seven estimation points (thresholds) for the log integrated rate.⁶ Longer durations are captured in a remaining group. The corresponding plot of hazard rates at the mean of the explanatory variables for the first regression is given in Fig. 1. The hazard rate reveals a plausible shape by falling in the first 6 months dramatically and falling further until the unemployment benefit scheme forces the unemployed to increase search intensity.

We summarize the results related to the personality traits in Table 2. We only report the percentage change in the hazard rates with respect to one standard deviation increase in the measure of the personality trait, if the coefficient estimate of the corresponding personality trait is significant. We do not find any significant impact of *Extraversion* and *Agreeableness* on unemployment duration for the overall sample as well as for the subsamples. Note, however, that our estimates are conditional on the previous sector and occupation. Since sectoral and occupational choice is also determined by personality traits (e.g., more agreeable workers find themselves in the service sector) our results simply indicate that no additional effect can be identified from the data. In terms of a structural model, there could be two compensating effects of *Agreeableness* on the unemployment duration. There is a well documented empirical result on the negative correlation between *Agreeableness* and wages, which could indicate lower reservation wage, but also lower wage offers in average. Since these two effects could balance each other, we do not see any significant effect on the duration of unemployment.

The signs of the effects of the three other personality traits, intraindividual traits, are consistent across subsamples provided they are significant. The three traits *Conscientiousness*, *Openness* and *Neuroticism* are significant for the estimates based on the overall sample. More conscientious and more open workers are more likely to find a new job faster, while *Neuroticism* is a trait that is likely to hinder job opportunities. Conscientious people are more likely to have lower search costs because they are more organized and more efficient searchers by definition. Therefore, they will receive more job offers on average than others. Moreover, they are also expected to give better signals to the potential employers which would mean higher wage offer and higher probability of accepting the offer. The net effect on the hazard rate will, therefore, be positive. Open people are expected to be less choosy in their job search and more likely to apply to a variety of jobs. This will increase the job arrival rate and the wage offers will also be distributed over a larger interval. It is also intuitive to think that the reservation wage of an open individual is lower because she values the experiences more. Thus, the positive net effect of this personality trait on the hazard rate coincides with our expectations. *Neuroticism*, on the other hand, may increase the search costs, as the neurotic people do not handle problematic situations well. This would lead to inefficient job search and negative signals to the potential employees. Hence, we observe that the hazard rate decreases with higher scores in *Neuroticism*.

The effect of *Openness* on unemployment duration is particularly pronounced for foreign workers. An increase of the *Openness* score by one standard deviation leads to an increase of the hazard rate by almost 35%. For labor markets with rather restrictive career patterns like the German one, where changes in the profession are comparatively rare and difficult due to legislative restrictions, worker's ability to cope with new situations is very important. We believe that *Openness* reflects this ability in such context. In this sense, this trait is particularly valuable for foreign workers who, by definition, have to cope with the problems arising because of the specific labor market structure in Germany. A similar reasoning holds for female workers. For the German labor market, Franz et al. (2000, chap. 10) find that women, who have changed the job they have been trained for and who also changed employer, face significant earnings reductions. In such situations, where there is high probability of a necessary adjustment to a new working environment, the trait *Openness* pays off most.

The finding that personality traits measured by the *Big Five* are more pronounced for blue-collar workers compared to white-collar workers is rather plausible because, for white-collar workers, cognitive skills are more relevant than personality traits. Here, *Conscientiousness* and *Openness* positively affect the success of finding a job and *Neuroticism* negatively affects it. For white collar workers, only *Neuroticism* turns out to be a handicap for a successful job search. Our sector specific analysis

⁶ We repeated the regression analysis with various numbers of threshold parameters. The results of interest are not sensitive to the choice of the number of thresholds.

Table 2
Summary of results for different subsamples of unemployed.

	CONSC	EXT	AGR	OPE	NEU
Entire sample	8.23***	–	–	6.29**	– 7.85***
Female	–	–	–	13.51***	–
Male	14.25***	–	–	–	–10.78***
German	8.30**	–	–	–	–7.23***
Foreign	–	–	–	34.88***	–
Blue-collar	12.63***	–	–	8.80**	– 9.32***
White-collar	–	–	–	–	–11.01**
Manufacturing	13.66**	–	–	16.85**	–
Construction	24.94***	–	–	–	–
Service	–	–	–	13.75**	–13.77***

Note: The numbers indicate the percentage change in the hazard rates with respect to one standard deviation increase in the measure of personality trait. *: % 10 significance, **: % 5 significance, ***: % 1 significance.

Table 3
Summary of results for different subsamples of employed.

	CONSC	EXT	AGR	OPE	NEU
Entire sample	–10.01***	–	–	–	9.26***
Female	–9.23*	–	–	9.33*	–
Male	–9.90**	–	–	–	10.74**
German	–7.42**	–	–	6.95**	11.35***
Foreign	–25.53***	–	24.58**	–	–
Blue-collar	–12.51***	–	–	–	–
White-collar	–	–	–	–	9.34*
Manufacturing	–	–	29.41***	–14.34**	–
Construction	–14.31**	–	–	–	–
Service	–	–	–	–	15.73***

Note: The numbers indicate the percentage change in the hazard rates with respect to one standard deviation increase in the measure of personality trait. *: % 10 significance, **: % 5 significance, ***: % 1 significance.

clearly confirms that the relevance of certain personality traits is sector specific. *Openness* turns out to be a useful trait for those unemployed who had their previous job in the manufacturing or in the service sector. *Neuroticism* is a handicap for former employees of the service sector. For the construction sector and the service sector, we find a significant negative effect of *Conscientiousness* on the duration of unemployment.

The effects of the other explanatory variables, which are not related to personality traits, reveal the expected sign. Increase in educational attainment decreases the unemployment duration. Married people have shorter unemployment spells. Unemployment benefits increases the unemployment duration by reducing the search intensity. Having children creates a negative incentive effect for women while the effect is positive for males.

Our estimates reflect the conditional effects of personality traits on individual unemployment duration given the individual's educational choice. Personality traits may also have an effect on educational choices and educational success. Therefore, we also performed the same regression omitting the schooling variables. The results (see Web Appendix), however, did not change substantially so that we conclude that the indirect effects of personality traits through education are of minor importance.

Our findings that the effect of the personality traits are strongly context-related are confirmed when looking at the employment spells of the formerly unemployed. The employment spells are also grouped in three monthly employment durations lasting 18 months. The corresponding plot of hazard rates at the mean of the explanatory variables for the employment duration regression is given in Fig. 1.⁷ Here, the hazard rate of employment is low but increases over time, indicating a positive duration dependence going along with the increase of on-the-job experience. Contrary to the hazard rate for the unemployed, the employment hazard does not change dramatically over time which simply reflects the fact that, in employment, the incentive scheme to exit does not change substantially.

The estimation results for the employment durations are shown in Table A.5 in Appendix A and Table 3 summarizes the significant estimates of personality trait measures for all subsamples of employed. Looking at the overall sample first, we see that the signs of the coefficients are different. This holds in particular for *Neuroticism* for which we also find significant coefficients in most of the subsamples. For foreign workers, the relative importance of the traits switches. While *Openness* seems to be a decisive trait in finding a job, *Conscientiousness* is the one that guarantees job stability. At the same time, *Agreeableness* has a negative effect on the employment duration.

All in all, the power of the *Big Five* traits to explain employment duration is not as large as it is for unemployment durations. The results are confirmed when looking at the employment durations by job status or sectors separately. The effect of

⁷ In order to make the unemployment and employment hazard rates comparable the same thresholds are used.

Table 4
Descriptive statistics of the Big Five traits by employment status in 2005.

	Employed		Unemployed		t-Test p-Value	Kolmogorov–Smirnov p-Value
	Mean	Std. dev.	Mean	Std. dev.		
Conscientiousness	18.09	2.52	17.99	2.53	0.55	0.97
Extraversion	14.58	3.41	14.73	3.33	0.53	0.50
Agreeableness	16.22	2.88	16.27	2.87	0.82	0.79
Openness	13.45	3.51	13.35	3.43	0.66	0.76
Neuroticism	11.67	3.57	12.17	3.51	0.04	0.21
No. of obs.	1001		270			

Conscientiousness on employment duration is positive for blue-collar workers. Neuroticism is the only significant personality trait for white-collar workers. One standard deviation increase in Neuroticism results in an approximately 9% increase in unemployment hazard of white-collar workers. In the manufacturing sector, Agreeableness has a negative effect on employment duration, whereas Openness has a positive effect. For those who are employed in the construction sector, the only personality trait which plays a role is Conscientiousness. Neuroticism is the only significant personality trait for employment in the service sector.

For the interpretation of our results we implicitly assume that personality traits are stable in adulthood. This assumption cannot be tested given our data limitations and would only be testable if personality traits are measured at different point over the life cycle. Our identifying assumption finds support by previous findings in the psychology literature. Although the stability of personality is still an open question for psychologists, there is significant literature supporting the stability of personality in the adulthood, especially if it is measured by underlying traits (see, for example, [Heatherton and Weinberger, 1994](#), for a review). More recent papers, such as [Costa et al. \(2000\)](#), [Costa and McCrae \(2006\)](#) provide additional evidence regarding the stability of personality during the adulthood. Moreover, [Costa et al. \(2000\)](#) show that life events have very little effect on personality traits.

Using the same Big Five questions of the SOEP, [Wichert and Pohlmeier \(2010\)](#) show that for the case of female labor force participation personality traits measured in a cross-section have stable explanatory power. In addition, they regress the Big Five responses on indicators of the labor force participation in the past and find no evidence that the responses are effected by the work history. If an individual's personality traits change endogenously due to the employment (e.g. ceteris paribus a person without unemployment history is more open than somebody who was unemployed in previous years) we would find significant differences in the response behavior except in 2005 with respect to their previous employment history. Evidence against a reverse causality in the sense that the self-assessments are driven by the employment status is provided in [Table 4](#) above. Here, we test the mean differences of the scores by employment status at the survey time in this particular year. Only

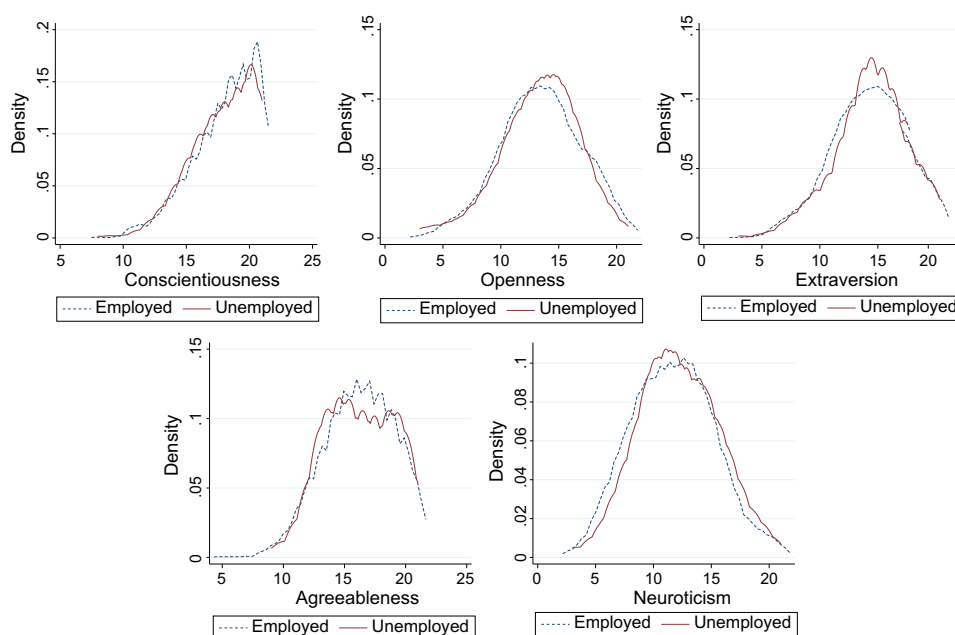


Fig. 2. Distribution of the Big Five personality traits in the sample (SOEP, 2005) using a Gaussian Kernel with a bandwidth chosen by Silverman's rule of thumb.

for the trait *Neuroticism* do we find differences in response behavior according to employment status. For all other traits, there is clear evidence that employment and response behavior are uncorrelated. Additionally, we use the Kolmogorov–Smirnov test to test for equality of distribution functions. The large p -values indicate a clear non-rejection of the null that the distributions of the *Big Five* personality traits for individuals employed and unemployed in the survey year do not differ. Fig. 2 illustrates the kernel density estimates of the traits by participation status at the time of interview. We see that the distribution of the personality traits are close to the normal distribution except for the personality trait *Conscientiousness*, which is left skewed. The reason could be that the individuals tend to give more socially desirable answers to the questions related to the *Conscientiousness*. However, this is true for both employed and unemployed samples. Given these results, we can at least argue that the response behavior is not affected by employment status.

5. Conclusion

Our goal in this paper has been to examine the role of personality traits in determining the success of unemployed workers seeking a job and their success in keeping the subsequent job. This is done by estimating a reduced form unemployment duration model with the semiparametric proportional hazard rate method by Han and Hausman (1990). We can show that personality traits are major determinants of job search behavior. Not all five dimensions of the *Big Five* contribute, however, to explaining observed individual unemployment durations in the same way. In fact, the traits *Extraversion* and *Agreeableness* reveal no explanatory power while the relevance of the other three traits vary across subgroups.

We find strong evidence that the role of the *Big Five* traits is context-related. The traits do seem to matter more if a person is unemployed. It appears that low scores for *Neuroticism* and high scores for *Conscientiousness* are important determinants for being offered and holding down a job. The relevance of personality traits in explaining individual job search behavior is also confirmed by focusing on the effects across different occupations and sectors. In this sense our study complements previous studies on the effects of personality on educational attainment and earnings by showing that personality traits are also quantitatively important factors for reducing individual unemployment duration and increasing job stability.

Our results contribute to the discussion on individual heterogeneity in duration models by showing that observable differences in personalities are able to explain parts of individual differences in job search behavior. This indicates that appropriate screening of the unemployed by assessing their personalities and eventually offering appropriate interventions (e.g. training of self-regulatory skills) may improve their success in the labor market.

Future research should focus on the channels through which personality traits affect the chances of finding a job. A structural approach able to identify to what extent personality traits serve as signals for a potential employer and to what extent they simply increase the job search effort would be desirable. Empirical estimates of such a structural approach would help to evaluate the role of specific training programs (e.g. application training) for the unemployed.

Acknowledgements

Financial support by the German Research Foundation (DFG), the Center for Psychoeconomics and the Center of Quantitative Methods and Survey Research (CMS) at the University of Konstanz is gratefully acknowledged.

Appendix A

Tables A.1, A.2, A.3, A.4, A.5.

Table A.1

Definition of variables. Source: SOEP, own definitions

Variable	Definition
DUR_UNEMP	Unemployment duration in months
DUR_EMP	Employment duration in months
LOW_EDU	Dummy, 1 if no degree or less than or equal to 10 years of schooling
MID_EDU	Dummy, 1 if high school degree (12 or 13 years of schooling) or professional degree
HIGH_VOC	Dummy, 1 if high school degree and vocational training
HIGH_EDU	Dummy, 1 if highest degree is university degree
FEMALE	Dummy, 1 if female
GERMAN	Dummy, 1 if German
EAST	Dummy, 1 if living in East Germany
AGE	Age in years at the beginning of the unemployment spell
MARR	Dummy, 1 if married at the beginning of the unemployment spell
NOKID	Dummy, 1 if individual does not have children
ONEKID	Dummy, 1 if women has one child
TWOKID	Dummy, 1 if women has two children
THREEKID	Dummy, 1 if women has three or more children

Table A.1 (continued)

Variable	Definition
ANYHELP	Dummy, 1 if worker received unemployment benefit or relief during unemployment spell
LNWAGE	Log of average hourly wages during employment spell
<i>Industry Dummy Variables</i>	
AGRI	= 1 if in mining or agriculture
MANU	= 1 if in manufacturing
TRANS	= 1 if in transportation or public utilities
CONSTRUC	= 1 if in construction sector
TRADE	= 1 if in retail trade or wholesale
SERVICE	= 1 if in services
<i>Occupation Dummy Variables</i>	
APPREN	=1 if apprentice, trainee or intern
SELF_EMP	=1 if self employed
WORKER	=1 if worker
EMPLOYEE	=1 if employee
CIVIL	=1 if civil servant
AGRI_WORKER	=1 if agricultural worker
<i>Personality traits</i>	
EXT	Score for <i>Extraversion</i> (from 3 to 21 (very pronounced))
AGR	Score for <i>Agreeableness</i> (from 3 to 21 (very pronounced))
CONSC	Score for <i>Conscientiousness</i> (from 3 to 21 (very pronounced))
NEU	Score for <i>Neuroticism</i> (from 3 to 21 (very pronounced))
OPE	Score for <i>Openness to Experience</i> (from 3 to 21 (very pronounced))

Table A.2

Summary statistics of unemployment duration and personality measures for the unemployed sample.

	Entire sample	By gender		By nationality		By occupation		By sector		
		Female	Male	German	Foreign	Blue-col.	White-col.	Manufact.	Construct.	Service
DUR_UNEMP	7.81 (9.36)	8.30 (9.23)	7.45 (9.44)	7.52 (8.95)	9.66 (11.43)	8.24 (10.17)	7.36 (8.53)	8.64 (10.56)	6.72 (8.78)	7.92 (8.92)
CONS	18.00 (2.65)	18.20 (2.52)	17.86 (2.74)	18.00 (2.63)	17.99 (2.78)	18.11 (2.71)	18.00 (2.49)	18.10 (2.76)	17.94 (2.76)	17.91 (2.58)
EXT	14.58 (3.37)	15.07 (3.32)	14.22 (3.36)	14.65 (3.34)	14.13 (3.52)	14.24 (3.39)	15.00 (3.22)	14.33 (3.44)	14.21 (3.19)	14.80 (3.46)
AGR	16.16 (2.92)	16.74 (2.82)	15.73 (2.92)	16.12 (2.92)	16.37 (2.96)	15.94 (3.02)	16.41 (2.80)	16.34 (2.93)	15.45 (3.00)	16.38 (2.88)
OPE	13.41 (3.54)	13.87 (3.48)	13.07 (3.55)	13.56 (3.49)	12.43 (3.68)	12.76 (3.55)	14.14 (3.36)	12.88 (3.60)	13.06 (3.56)	13.96 (3.54)
NEU	12.21 (3.57)	12.70 (3.59)	11.85 (3.52)	12.19 (3.56)	12.35 (3.62)	12.37 (3.53)	12.04 (3.63)	12.12 (3.47)	12.10 (3.36)	12.37 (3.69)
# of obs.	4466	1886	2580	3853	613	2323	1549	1065	820	1536

Note: Standard errors are given in parentheses.

Table A.3

Summary statistics of employment duration and personality measures for the employed sample.

	Entire sample	By gender		By nationality		By occupation		By sector		
		Female	Male	German	Foreign	Blue-col.	White-col.	Manufact.	Construct.	Service
DUR_EMP	33.36 (44.43)	29.77 (39.12)	36.04 (47.85)	32.57 (43.34)	38.41 (50.62)	30.60 (42.69)	37.89 (46.29)	42.22 (52.50)	25.04 (34.68)	31.56 (42.35)
CONSC	18.00 (2.65)	18.22 (2.50)	17.84 (2.75)	18.00 (2.63)	18.01 (2.79)	18.08 (2.73)	18.00 (2.50)	18.06 (2.74)	17.94 (2.79)	17.93 (2.59)
EXT	14.60 (3.39)	15.10 (3.33)	14.23 (3.38)	14.68 (3.36)	14.10 (3.54)	14.24 (3.38)	14.92 (3.30)	14.35 (3.50)	14.17 (3.09)	14.88 (3.44)
AGR	16.17 (2.92)	16.77 (2.80)	15.72 (2.93)	16.14 (2.91)	16.35 (2.99)	15.91 (3.03)	16.52 (2.77)	16.23 (2.96)	15.38 (3.00)	16.47 (2.86)
OPE	13.43 (3.54)	13.93 (3.48)	13.06 (3.53)	13.60 (3.48)	12.39 (3.71)	12.75 (3.48)	14.04 (3.37)	12.97 (3.55)	13.02 (3.55)	13.96 (3.49)
NEU	12.18 (3.58)	12.68 (3.62)	11.79 (3.50)	12.16 (3.57)	12.30 (3.65)	12.40 (3.49)	12.02 (3.67)	12.04 (3.54)	12.10 (3.31)	12.20 (3.62)
# of obs.	4191	1793	2398	3628	563	2179	1547	956	715	1543

Note: Standard errors are given in parentheses.

Table A.4

Regression results for unemployment durations.

	Entire sample	By gender		By nationality		By occupation		By sector		
		Female	Male	German	Foreign	Blue-col.	White-col.	Manufact.	Construct.	Service
<i>Personality traits</i>										
CONSCST	-0.079 (0.01)	-0.002 (0.96)	-0.133 (0.00)	-0.080 (0.02)	-0.068 (0.44)	-0.119 (0.01)	-0.020 (0.70)	-0.128 (0.05)	-0.223 (0.01)	-0.043 (0.43)
EXTST	0.015 (0.64)	0.003 (0.96)	0.020 (0.63)	0.004 (0.90)	0.106 (0.19)	0.045 (0.29)	-0.008 (0.88)	-0.012 (0.85)	-0.015 (0.84)	0.060 (0.27)
AGRST	0.017 (0.59)	-0.011 (0.81)	0.028 (0.50)	0.002 (0.96)	0.085 (0.34)	0.059 (0.17)	-0.007 (0.90)	0.065 (0.32)	0.052 (0.50)	0.014 (0.79)
OPEST	-0.061 (0.05)	-0.127 (0.01)	-0.020 (0.63)	-0.028 (0.41)	-0.299 (0.00)	-0.084 (0.05)	-0.011 (0.84)	-0.156 (0.02)	0.038 (0.61)	-0.129 (0.02)
NEUST	0.082 (0.00)	0.058 (0.18)	0.114 (0.00)	0.075 (0.02)	0.084 (0.28)	0.098 (0.01)	0.117 (0.02)	0.061 (0.31)	0.056 (0.43)	0.148 (0.00)
<i>Other characteristics</i>										
AGE	0.026 (0.00)	0.031 (0.00)	0.020 (0.00)	0.032 (0.00)	-0.003 (0.74)	0.015 (0.00)	0.041 (0.00)	0.031 (0.00)	0.011 (0.16)	0.032 (0.00)
GENDER	0.291 (0.00)			0.302 (0.00)	0.443 (0.02)	0.411 (0.00)	0.193 (0.08)	0.305 (0.02)	1.144 (0.00)	0.039 (0.72)
GERMAN	-0.312 (0.00)	-0.459 (0.00)	-0.244 (0.04)			-0.221 (0.05)	-0.583 (0.00)	-0.148 (0.34)	-0.359 (0.14)	-0.441 (0.01)
EAST	0.155 (0.02)	0.208 (0.00)	0.101 (0.25)	0.175 (0.01)	-0.072 (0.86)	0.213 (0.02)	0.188 (0.07)	-0.001 (0.99)	0.309 (0.05)	0.251 (0.02)
MID_EDU	-0.461 (0.00)	-0.343 (0.30)	-0.500 (0.00)	-0.467 (0.00)	-0.443 (0.01)	-0.517 (0.00)	0.137 (0.61)	-0.643 (0.00)	-0.171 (0.47)	-0.433 (0.01)
HIGH_VOC	-0.628 (0.00)	-0.487 (0.76)	-0.721 (0.00)	-0.688 (0.00)	0.119 (0.80)	-0.440 (0.14)	0.035 (0.91)	-0.911 (0.02)	0.358 (0.59)	-0.756 (0.00)
HIGH_EDU	-0.640 (0.00)	-0.356 (0.23)	-0.852 (0.00)	-0.689 (0.00)	-0.332 (0.31)	-0.799 (0.00)	0.016 (0.95)	-0.757 (0.00)	-0.115 (0.75)	-0.737 (0.00)
MARR	-0.138 (0.05)	-0.044 (0.99)	-0.149 (0.14)	-0.173 (0.02)	-0.037 (0.86)	-0.100 (0.32)	-0.151 (0.20)	-0.130 (0.39)	-0.198 (0.30)	-0.029 (0.80)
ONEKID	-0.045 (0.58)	0.272 (0.01)	-0.296 (0.01)	-0.078 (0.36)	0.137 (0.59)	-0.069 (0.53)	-0.095 (0.50)	-0.350 (0.03)	-0.023 (0.91)	0.078 (0.57)
TWOKID	-0.021 (0.80)	0.126 (0.17)	-0.201 (0.08)	-0.089 (0.34)	0.295 (0.20)	-0.083 (0.48)	0.008 (0.95)	-0.320 (0.06)	-0.043 (0.84)	0.051 (0.73)
THREEKID	0.229 (0.04)	0.158 (0.30)	0.242 (0.12)	0.240 (0.06)	0.187 (0.45)	0.199 (0.17)	0.137 (0.49)	-0.110 (0.64)	0.740 (0.01)	0.249 (0.18)
ANYHELP	0.861 (0.00)	1.091 (0.00)	0.663 (0.00)	0.863 (0.00)	0.937 (0.00)	0.707 (0.00)	0.991 (0.00)	0.908 (0.00)	0.525 (0.04)	0.762 (0.00)
AGRI	-0.412 (0.01)	-0.128 (0.97)	-0.637 (0.00)	-0.480 (0.00)	0.203 (0.70)	-0.587 (0.00)	-0.057 (0.89)			
MANU	0.016 (0.84)	0.016 (0.56)	-0.070 (0.54)	0.070 (0.43)	-0.205 (0.33)	-0.102 (0.39)	0.022 (0.87)			
TRANS	-0.219 (0.12)	-0.259 (0.22)	-0.333 (0.06)	-0.175 (0.26)	-0.583 (0.09)	-0.244 (0.20)	-0.185 (0.49)			
CONSTRUC	-0.406 (0.00)	0.453 (0.04)	-0.539 (0.00)	-0.391 (0.00)	-0.593 (0.03)	-0.575 (0.00)	0.201 (0.33)			
TRADE	0.026 (0.77)	0.085 (0.48)	-0.099 (0.48)	0.047 (0.61)	-0.212 (0.48)	-0.124 (0.41)	0.065 (0.60)			
APPREN	0.315 (0.00)	0.540 (0.00)	0.060 (0.72)	0.351 (0.00)	0.129 (0.76)					
SELF_EMP	0.382 (0.01)	0.112 (0.90)	0.418 (0.04)	0.365 (0.03)	0.593 (0.24)					
BLUE	0.105 (0.16)	0.342 (0.00)	-0.031 (0.79)	0.120 (0.13)	0.021 (0.93)					
CIVIL	-0.601 (0.09)	-0.873 (0.05)	-0.594 (0.20)	-0.627 (0.09)	0.339 (0.82)					
AGRI_WORKER	0.939 (0.06)	1.765 (0.05)	-0.100 (0.89)	0.939 (0.07)	1.577 (0.32)					
Other Controls*	+	+	+	+	+	+	+	+	+	+
Unemp. rate	+	+	+	+	+	+	+	+	+	+
# of obs.	4466	1886	2580	3853	613	2323	1549	1065	820	1536
Log-likelihood	-7354.20	-3186.00	-4105.70	-6251.68	-1077.43	-3853.41	-2495.68	-1801.47	-1227.07	-2556.85

Note: *p*-values are in parenthesis. The suffix "st" represents the standardized values of the variable. * Year dummies for the unemployment entrance year and national unemployment rate at the year of entrance in to the unemployment.

Table A.5
Regression results for employment durations.

	Entire sample	By gender		By nationality		By occupation		By Sector		
		Female	Male	German	Foreign	Blue-col.	White-col.	Manufact.	Construct.	Service
<i>Personality traits</i>										
CONSCST	0.106 (0.00)	0.097 (0.06)	0.104 (0.02)	0.077 (0.04)	0.295 (0.00)	0.134 (0.00)	0.077 (0.17)	0.048 (0.53)	0.154 (0.07)	0.064 (0.25)
EXTST	-0.020 (0.56)	0.041 (0.43)	-0.048 (0.29)	-0.001 (0.98)	-0.078 (0.41)	0.008 (0.85)	-0.056 (0.33)	-0.049 (0.51)	-0.038 (0.62)	-0.038 (0.50)
AGRST	-0.011 (0.74)	-0.070 (0.17)	0.025 (0.58)	0.013 (0.71)	-0.220 (0.03)	-0.018 (0.70)	0.018 (0.75)	-0.258 (0.00)	0.063 (0.45)	0.077 (0.16)
OPEST	-0.048 (0.16)	-0.089 (0.09)	-0.020 (0.67)	-0.067 (0.07)	0.106 (0.27)	-0.028 (0.55)	-0.084 (0.13)	0.155 (0.04)	-0.054 (0.50)	-0.092 (0.11)
NEUST	-0.089 (0.00)	-0.046 (0.33)	-0.102 (0.02)	-0.108 (0.00)	0.028 (0.75)	-0.065 (0.12)	-0.089 (0.10)	-0.045 (0.50)	-0.075 (0.34)	-0.146 (0.01)
<i>Other characteristics</i>										
AGE	0.000 (0.97)	0.009 (0.14)	-0.009 (0.08)	0.002 (0.65)	-0.008 (0.43)	-0.001 (0.81)	-0.003 (0.70)	0.006 (0.46)	-0.011 (0.20)	0.003 (0.63)
GENDER	-0.141 (0.07)			-0.160 (0.06)	-0.018 (0.94)	-0.194 (0.10)	-0.171 (0.17)	-0.066 (0.67)	0.716 (0.02)	-0.032 (0.78)
GERMAN	0.011 (0.91)	-0.171 (0.33)	0.097 (0.45)			-0.064 (0.61)	0.223 (0.28)	0.180 (0.34)	-0.001 (0.99)	0.027 (0.89)
EAST	-0.175 (0.01)	-0.247 (0.02)	-0.118 (0.22)	-0.136 (0.06)	-1.107 (0.01)	-0.239 (0.02)	-0.291 (0.01)	-0.303 (0.06)	0.031 (0.85)	-0.316 (0.01)
MID_EDU	0.196 (0.05)	0.320 (0.05)	0.108 (0.42)	0.184 (0.14)	0.399 (0.04)	0.311 (0.01)	0.244 (0.33)	0.414 (0.03)	0.305 (0.19)	0.286 (0.13)
HIGH_VOC	0.267 (0.12)	0.630 (0.01)	0.001 (0.99)	0.240 (0.21)	0.610 (0.29)	0.681 (0.03)	0.148 (0.62)	0.156 (0.69)	1.684 (0.04)	0.409 (0.11)
HIGH_EDU	0.295 (0.03)	0.251 (0.22)	0.462 (0.02)	0.255 (0.11)	0.770 (0.04)	-0.038 (0.89)	0.522 (0.05)	0.336 (0.24)	0.716 (0.10)	0.598 (0.01)
FULL	0.791 (0.00)	0.526 (0.00)	1.641 (0.00)	0.748 (0.00)	0.778 (0.00)	0.764 (0.00)	0.619 (0.00)	0.680 (0.00)	1.272 (0.00)	0.879 (0.00)
MARR	0.048 (0.54)	-0.150 (0.18)	0.251 (0.03)	0.026 (0.75)	0.299 (0.21)	0.068 (0.53)	-0.056 (0.66)	-0.032 (0.86)	0.533 (0.01)	0.097 (0.43)
ONEKID	0.126 (0.15)	0.167 (0.24)	0.014 (0.91)	0.117 (0.21)	-0.013 (0.96)	0.110 (0.36)	0.202 (0.18)	0.099 (0.61)	0.093 (0.65)	0.187 (0.20)
TWOKID	0.111 (0.23)	0.243 (0.11)	-0.084 (0.51)	0.094 (0.35)	0.253 (0.34)	0.022 (0.86)	0.244 (0.13)	0.158 (0.45)	-0.358 (0.09)	0.166 (0.28)
THREEKID	-0.025 (0.84)	-0.001 (0.99)	-0.176 (0.32)	-0.013 (0.93)	-0.141 (0.61)	-0.082 (0.60)	0.086 (0.71)	-0.054 (0.85)	0.145 (0.66)	0.026 (0.90)
LNWAGE	0.131 (0.06)	0.099 (0.31)	0.167 (0.10)	0.168 (0.02)	-0.146 (0.49)	0.028 (0.78)	0.115 (0.33)	0.291 (0.06)	0.293 (0.66)	0.360 (0.00)
AGRI	-0.251 (0.11)	-0.368 (0.22)	-0.264 (0.17)	-0.249 (0.13)	-0.168 (0.76)	-0.303 (0.10)	-0.007 (0.99)			
MANU	0.245 (0.01)	0.181 (0.18)	0.255 (0.05)	0.301 (0.00)	-0.101 (0.69)	0.249 (0.05)	0.155 (0.34)			
TRANS	0.144 (0.34)	-0.046 (0.86)	0.231 (0.24)	0.060 (0.72)	0.223 (0.57)	0.166 (0.42)	0.255 (0.34)			
CONSTRUC	-0.307 (0.00)	-0.001 (0.99)	-0.372 (0.00)	-0.254 (0.02)	-0.745 (0.01)	-0.420 (0.00)	-0.040 (0.87)			
TRADE	0.127 (0.18)	0.081 (0.51)	0.116 (0.46)	0.122 (0.23)	0.188 (0.54)	0.244 (0.12)	0.106 (0.44)			
APPREN	-2.285 (0.00)	-2.059 (0.00)	-2.473 (0.00)	-2.234 (0.00)	-3.513 (0.00)					
SELF_EMP	0.294 (0.04)	0.025 (0.90)	0.572 (0.00)	0.267 (0.07)	0.352 (0.49)					
BLUE	-0.502 (0.00)	-0.525 (0.00)	-0.438 (0.00)	-0.550 (0.00)	-0.132 (0.63)					
CIVIL	0.086 (0.79)	0.639 (0.20)	-0.313 (0.50)	0.030 (0.93)	-					
Other Controls*	+	+	+	+	+	+	+	+	+	+
# of obs.	4191	1793	2398	3628	563	2179	1547	956	715	1543
Log-Likelihood	-5850.67	-2592.44	-3211.06	-5047.67	-775.35	-3250.71	-2055.23	-1228.63	-1069.05	-2181.97

Note: *p*-values are in parenthesis. The suffix "st" represents the standardized values of the variable. * Year dummies for the employment entrance year.

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