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How individual characteristics and attitudes shape the job search process of graduates.

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Abstract:

Economic factors and individual attitudes have an impact on the mobility of university graduates. At this point of the life, mobility is highest, but still little is known about the process leading to actually starting a job at a certain place. The paper at hand investigates the job search process by means of a graduate survey of three German universities located in a non-metropolitan area at two points in time: prior to graduation and one year later. We asked for individual characteristics and attitudes during the job search, ex ante preferred places, and actual locations of the first job. The data reveal that a focus on job-related issues helps to find a job, to find it faster, and to find the job at a familiar place. Having a familiar place among the preferred places as well as being spatially open has no influence on the success and the duration of the job search.

Keywords: graduate mobility, regional labour mobility, universities, Germany

JEL Classifications: J61, I23

1. Introduction

Each graduate has his or her own strategy to find a job. The paper at hand will investigate what impact some individual characteristics and attitudes have on employment success and location of the first job. This topic contributes to the research on graduate mobility. Most studies in this field analyse performed moves and investigate the impact of various external factors and personal characteristics on the decision to move. The most important factors influencing migration are income and employment opportunities in regions (see e.g. Falk and Kratz 2009; Greenwood 1973), proximity to family and friends (see e.g. Buenstorf et al. 2016; Dahl and Sorenson 2010) as well as natural amenities (see e.g. Partridge 2010; Rappaport 2007). When concentrating on university graduates, winners of the inter-regional competition for graduates are central, prospering regions while peripheral areas usually lose graduates (Flöther and Kooij 2012; Haapanen and Tervo 2012; Venhorst 2013). However, even non-metropolitan university regions sometimes attract more students than they are losing after graduation - at the expense of non-university regions (see Flöther and Kooij 2012 for Germany and Winters 2011 for the US). These ex-post studies do not take into account the spatial preferences of graduates for certain places which probably guides their job search process, as do further individual characteristics and attitudes. The impact of individual attitudes and characteristics on the job search process are, however, of great interest for firms and regional policy makers. Since young and highly educated individuals are a gain for a region (see Florida 2002; Sterlacchini 2008), regions make some efforts to retain graduates in a region or attract them to certain regions. However, regional managers and Human Resources staff of firms usually do not know much about the preferred search channels used for the job search and whether graduates focus more on soft factors like infrastructure (traffic, child care) and cultural offers or on “hard” factors like the characteristics of the job.

Von Proff et al. (2016) made a first step to take individual attitudes of the prospective graduates into account and investigated how these characteristics influence the geographic scope of the job search. However, the paper of von Proff et al. (2016) evaluates the preferences of the graduates at the beginning of their job search. This neglects the actual decision for a job and the place of the job. The paper at hand fills this research gap. It takes the whole job search process into account by investigating data from two surveys of the same graduates: prior to graduation and one year later. Thus, the contribution of the paper to the literature is that we include attitudes and preferences of the graduates (as indicated by the individuals themselves) and analyse how the attitudes prior to graduation influenced the success of the job search as well as the place of the first job. In particular, our research questions are: (1) who has found a job? (2) who needed longer for the job search? And (3) who has found a job at a familiar place?

The data come from a survey among graduates from three universities in Middle Hesse, which was conducted twice: For the first survey, every student in his/her second last term (or higher) was contacted (April 2012). The follow-up survey was conducted one year later (May 2013), when many (but not all) had graduated and started job search. Since characteristics of the university region have an impact on mobility decisions (Falk and Kratz 2009), we have homogenous data in this respect.

The remainder of the paper is structured as follows. Section two contains findings from earlier studies on graduate mobility and the job search process. Hypotheses are derived from these findings and from own considerations on the influence of job search process characteristics. In the third section the dataset is described and some statistics are provided. Results for each of the three research questions are presented and discussed in section four. Section five concludes.

2. Literature review and theory

The literatures on characteristics that increase the probability for graduates to find a job is extensive. Since the focus of the paper at hand lies on attitudes during the job search, only the most important insights for the objective characteristics are presented shortly. Of course, there is a wide literature on labour mobility in general. However, since the focus of the paper at hand is on graduate mobility, some of this general literature will not be reviewed. Section 2.3 then focuses on the attitudes and preferences.

2.1 Studies on factors influencing employability

Krabel and Flöther (2014) distinguished between four types of arguments related to the job search process: the human capital endowment, social capital endowments, and demographic characteristics of job seekers, as well as regional economic conditions.

Human capital theory focuses on the optimisation of income and job satisfaction (Sjaastad 1962). A better education is related to career advances (Baruch and Leeming 2001). University graduates are all highly educated, nevertheless, there are differences in the certificates (Bachelor, Master etc.) and the grades (as a measure of the studies' success) vary. The best students, i.e. those with the best grades can be assumed to find a job especially quickly after or even before graduation. However, they have the possibility to be selective in order to find the optimal job. Hence, in the study of Krabel and Flöther (2014), the grade has no significant impact on the probability to be employed one year after graduation.

Regarding the social capital one can assume that having a large network helps to find a job. Krabel and Flöther (2014) do not find a positive impact of the help of relatives or friends during the job search on the likelihood of being employed. However, in a direct comparison of job applications via contacts with other forms of applications, Obukhova and Lan (2013) find a much higher success probability of applications via contacts. Furthermore, business internships help to find a job, because internships are a form of work experience. Internships lead to a certain probability to be employed later by the respective firm, because the firm as good information how well the graduate matches for a job (Krabel and Flöther 2014; Obukhova and Lan 2013).

Demographic factors influencing employability are age, gender, family obligations, and more. Employability often decreases with age, but when focusing on graduates, the effect should hardly be observable, since most university graduates are of similar age somewhere in the twenties. The findings for gender reveal that women are disadvantaged on the labour market and it is more difficult for them to find a job (Krabel and Flöther 2014). They find in addition, that having children has a negative impact on finding a job only for female graduates.

Regarding the regional economic environment, graduates in more peripheral regions could be disadvantaged because there are fewer jobs in the university region. If, however, they are mobile within the country or even abroad, this should not be a problem for finding a job. Indeed, Krabel and Flöther (2014) found that graduates in more peripheral German regions do not have a disadvantage for finding a job, even though they have to be more mobile.

2.2 Studies on factors influencing mobility

Labour mobility is a human capital investment decision and, hence, higher education graduates are more mobile than other groups of the population (Miller 1977). However, the majority of them do not move from their region of studies (Gottlieb and Joseph 2006; Venhorst et a. 2011), and if they move, they often move to neighboured regions (Hansen et al. 2003). There are strong pull factors keeping them at familiar places (see also the next subsection below). Nevertheless, there are some factors having a positive influence on mobility which will be discussed in the following. For example, prior moves have a large impact on the propensity to move again (Haapanen and Tervo 2012; von Proff et al. 2016).

Sophisticated jobs for highly educated persons are not evenly distributed in space (it is more a national than a local job market) and tertiary educated people move disproportionally often to innovative and growing cities and leave rural regions (Faggian et al. 2013; Krabel and Flöther 2014; Lemistre and Magrini 2011; Tano 2014). The best students have more choices for the first job, whether these are located at a familiar place or somewhere else is not determined from the outset. Empirically, Krabel and Flöther (2014) found the students with higher grades to be significantly less mobile, while Faggian et al. (2007a) found better Scottish graduates to move over larger distances than those with lower grades. Demographic factors influencing mobility are largely the same as for employability. Mobility is highest for individuals at the age of labour force entrance and lower for younger and older ones. The older individuals are, the larger are their location-specific assets and the higher the costs of relocating (DaVanzo 1983). Hence, relocations pay off less often for older individuals. For graduates, these costs are lower, since they still have to find their first job and they are less often married and usually do not have children. Venhorst et al. (2011) do not find an influence of age on within-country mobility for college graduates but an inverted-u relationship for university graduates, Faggian et al. (2007a) do not find a significant relationship for Scottish and Welsh graduates. The findings for gender are inconclusive. While the respective dummies are insignificant in some studies (e.g. Belfield and Morris 1999), Faggian et al. (2007b) found some evidence for larger mobility of British female graduates, Venhorst et al. (2011) the same for Dutch female graduates. In contrast, Abreu et al. (2015) find larger mobility of British male graduates. More clearly is the influence of marriage and own children on mobility: family obligations decrease the propensity to move (Busch and Weigert 2010; Haapanen and Tervo 2012; Krabel and Flöther 2014).

The regional environment has an impact on mobility decisions as well. For example, university regions in the Netherlands with higher regional GDP growth rate retain more local graduates than those regions which are doing economically worse (Venhorst et al. 2011). Similarly, regions with a higher share of highly qualified employees can retain more graduates while graduates from less attractive regions have to be more mobile (Krabel and Flöther 2014). Economic cycles have a rather

small impact on mobility in the study of Venhorst et al. (2011): economically favourably situations increase mobility modestly. Since in the paper at hand, data from one region and one graduation cohort are used, the regional and economic circumstances are the same for all survey respondents. Which findings are specific to Middle Hesse will be discussed.

To the author's knowledge, next to the studies on applications via social contacts, there are no studies investigating individual preferences during the job search and their influence on the job search outcome. The next subsection presents our own considerations into this topic.

2.3 Theory on individual attitudes and preferred places

Use of different channels for job vacancies

Several channels are available for searching information about firms and job vacancies. Graduates relying on social networks during the job search are more likely to find a job (Obukhova and Lan 2013). Focusing on print media could result in a disadvantage (compared to searching in the internet, which is kind of the "standard channel"), because some firms abstain from announcing job vacancies in print media due to low coverage compared to ads in the internet.

H1a: Graduates searching a job predominantly with the help of contacts will find a job more easily and within shorter time, while the opposite is true for graduates using predominantly print media.

Furthermore, social networks tend to coincide with familiar places, i.e. social ties are centered at familiar places (Breschi and Lissoni 2009). Hence, graduates who rely on friends and acquaintances during the job search will most likely find jobs at familiar places.

H1b: Graduates searching a job predominantly with the help of contacts will find a job disproportionally often at familiar places.

Focus on job-related issues, proximity to family and friends, or amenities

Flöther/Kooij (2012) used data from graduates from 54 German universities and found that 63% of the graduates stayed in the federal state of the university. A NUTS1 retention of around 60% was measured for the Netherlands as well and seems to be no German specificity (Venhorst 2013; UK: 64% in Belfield and Morris 1999). Furthermore, mobile people (not only graduates) often like to return to regions where they have lived before because they have maintained social links to these regions (DaVanzo 1983; Schneider et al. 2015; Venhorst 2013). Nevertheless, many graduates are spatially open during the job search process, i.e. they do not have preferred places but focus on job-related issues (von Proff et al. 2016). Those having preferred places may prefer them because they are proximate to family or friends, because they offer good job opportunities or amenities like possibilities for leisure activities and good infrastructure, or because of low costs of living. According to the human capital theory, those focusing on job-related factors and those who are spatially open during the job search process can be expected to find a job more easily and within shorter time. All graduates with stronger focus on proximity to family and friends or amenities may constrain the search and thus have it more difficult to find a job. Hence we state:

H2a: Graduates focusing on job-related issues and those spatially open will find a job more easily and within shorter time.

There has been a long discussion about the strength of the influence of job opportunities and amenities. Gottlieb/Joseph (2006) find that amenities play a role for the decision to move to a place, but only for people with a PhD this effect is stronger than the pull-effect of economic factors. In a study of Dahl/Sorenson (2010), Danish technical workers placed very high weights on social factors when considering where to work. Hence, we expect graduates who focus on job-related issues to go to an unfamiliar place more likely than those focusing on proximity to family and friends. Regarding the focus on amenities, these are perceived very differently by each individual and hence, we cannot state a hypothesis on the resulting influence on mobility.

H2b: Graduates focusing on job-related issues and those spatially open will more likely move to an unfamiliar work place.

Preference for familiar places

As explained in section 2.2, the majority of the graduates stay in the university region or return to the home region. Nevertheless, there are graduates who explicitly want to leave the university region and indicate preferred places at a distance to any familiar place and who do not include the university region into the job search (von Proff et al. 2016). These graduates should be disadvantaged for finding a job, because they both restrict their search to certain places and forego the chance to search at well-known places. Of course, the spatially open graduates have a completely unrestricted job search (see H1a), but if restricted to certain places, the preference for familiar places should be an advantage. Hence, we expect:

H3a: Graduates with preferred places coinciding with the home or university region have a higher probability to find a job and a shorter duration of the job search.

Regarding mobility, it is intuitive to expect that graduates searching in the university region or preferring other familiar places are more likely to stay in a familiar region. Nevertheless, for the sake of completeness of the hypotheses we add the last hypothesis:

H3b: graduates with preferred places coinciding with the home or university region will more likely find a job at a familiar place.

3. Data and Method

3.1 The survey

The data was collected by a survey among all graduates of three German universities located in Middle Hesse (Justus-Liebig-Universität Giessen - JLU, Philipps-Universität Marburg - PUM, Technische Hochschule Mittelhessen - THM) in 2012 and 2013. The first online survey was conducted in the year prior to graduation. In particular, we sent e-mails to every student who should be in his/her last year of study, i.e. based on the regular study time, every student in his second last term (or higher) was contacted. Around 8,500 students graduate at the three universities in total every year and we received 1396 completed surveys, of which 1022 indicated that they approved to be contacted for the follow-up survey. The second survey one year later resulted in 371 answers, of which 178 complete observations can be used for the analysis below. The rather low number can be

explained with the fact that the majority of graduates (the majority of the respondents of the first survey were Bachelor students) did not search a job after graduation but continued studying a Master's or PhD degree (68%) or made some kind of sabbatical (14%).

The survey asked the prospective graduates about up to five places where they search for the first job after graduation and the reasons why these places are attractive for them, the reason for their spatial limitation or openness, their home domicile (where they grew up), whether they have made internships, whether they wrote/are writing the thesis in collaboration with a company, which media they used for searching job vacancies, and person-related information. The follow-up survey asked for the grade of the exam, whether they found a job (no internship etc.), how long they searched for this job (including "zero" months for graduates who found a job without sending an application), and where it is located.

The question for preferred places was formulated very openly, i.e. respondents could type anything into the field for preferred places. The international cases were excluded, since in many cases the graduates wanted to work there only temporarily (e.g. "work and travel") which makes the job search not comparable to a search for traditional jobs in Germany. The preferred places were assigned to the official administrative spatial units, with a focus on the counties (405 *Landkreise* and *kreisfreie Städte*) and the states (16 federal states). If the indicated region was larger than a county, only the state could be assigned. In Hamburg and Berlin state and county are identical.

The region under observation is "average" and can be viewed as representative for Germany. There are only mid-sized cities (80,000 inhabitants), but these host three universities. It lies centrally in Germany and is economically average. This can be seen by a comparison of the regional job market index in comparison to the national one (Figure 1). Both indices proceed similarly. Of course, the results of the study may differ from those for metropolitan areas, but since the majority of German students graduates in medium-sized cities, we assume that the results are largely representative for universities in this type of region. Furthermore, the economic situation was only slightly worsening during the period of observation and overall good.

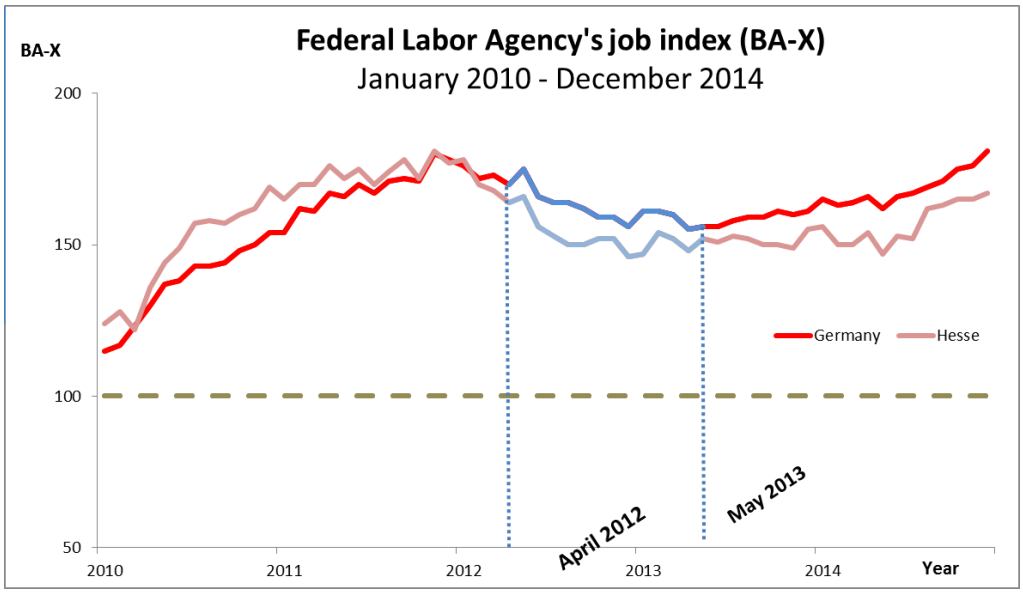

Figure 1: Job market index in Hesse and Germany.

3.2 Variables and descriptive statistics

Of the 135 survey respondents who found a job and gave information on domicile and job location, 15 (11%) found a job in their home county/city and 73 (54%) in the home state. This shows that there is a strong trend to go back home. Regarding the university region, 32 of 137 (23%) stayed in the counties of Marburg or Gießen, 87 of 137 (63.5%) stayed in Hesse. There are six persons (4%) whose home domicile, university, and job location is Marburg/Giessen (26 additional individuals did not grow up there but stayed for the first job). Sixty-three persons (47%) who grew up, studied, and now work in Hesse (the average for all German states is 53% according to Fabian and Minks, 2008). Additional 23 respondents (17%) did not grew up in Hesse, but stayed there for the first job. Added up, this value is comparable to the results of other European studies as mentioned above in section 2. Hence, overall mobility is on the level of the German average.

From all ticks the respondents made regarding reasons for preferred places or spatial openness we calculated the share of ticks related to job characteristics, those related to family and friends' location, and other reasons. This results in an indicator for the job-focus versus the family/friends-focus and the amenity focus of the individuals during the job search. Similarly, indicators were calculated for the preferred media during the job search measuring how strong the respondents relied on the web, print media, personal contacts, intermediaries like professional associations and alumni networks, or tried to contact certain firms directly (application independently of job vacancies). Since we asked very detailed on the ways of the job search, we added the individual answers up to these five categories and calculated the shares. Tables 1 to 3 give an overview over the variables.

Variable	**Explanation**	**Descriptive statistics -** for dummy variables the absolute frequencies of zeros and ones are reported
female (reference)	dummy for female persons and unspecified gender (3 cases)	0: 49 / 1: 129
male	dummy for male persons	0: 129 / 1: 49
married	dummy for married respondents	0: 166 / 1: 12
partner	dummy for respondents living in a partnership but not married	0: 60 / 1: 118
kids	dummy for persons having child(ren)	0: 170 / 1: 8
age24 (reference)	dummy for respondents aged 24 or younger (at the time of the first survey)	0: 127 / 1: 51
age25-27	dummy for respondents aged 25-27	0: 92 / 1: 86
age28-30	dummy for respondents aged 28-30	0: 152/ 1: 26
age31	dummy for respondents aged 31 and older	0: 163 / 1: 15
Bachelor (reference)	dummy for respondents with Bachelor degree	0: 144 / 1: 34
Master	dummy for respondents with Master degree	0:109 / 1: 69
Diploma	dummy for respondents with diploma degree	0: 140 / 1: 38
oth_exam	dummy for respondents with state exam or other types of degrees	0: 141 / 1: 37
internship	number of internships made during studies (up to "5 or more")	min: 1 / max: 5 / mean: 2.47

thesis	dummy for having cooperated with a firm while writing the thesis	0: 147 / 1: 31
grade	numeric variable measuring the grade from 1.0 (best) to 4.0 (passed)	min: 1.0 / max: 3.5 / mean: 1.84
JLU (reference)	dummy for graduates from JLU	0: 80 / 1: 98
PUM	dummy for graduates from PUM	0: 116 / 1: 62
THM	dummy for graduates from THM	0: 160 / 1: 18
intensity	count variable for the number of applications (each five applications count for one point)	min: 1 / max: 8 / mean: 3.47 / sd: 2.29
vintage	number of months between graduation and second survey	min: 2 / max: 14 / mean: 8.75 / sd: 3.34

Table 1: Descriptive statistics for the control variables.

Age was measured by dummies in order to include the few older survey respondents sensibly and to allow a non-linear impact. Males are underrepresented (27.5% in the survey compared to almost 50% of the students at the three universities) and the allocation of fields of study are not completely representative (agricultural sciences: 15 / economics, sociology, law: 32 / engineers (THM): 8 / humanities: 62 / medical sciences: 14 / natural sciences: 29 / other subjects at THM: 10 / other subjects at PUM and JLU: 7). According to statistics from PUM, the medical students are underrepresented and students of economics/sociology/law are overrepresented, while the other subjects are similar to the shares of overall graduates. Unfortunately, there are no detailed statistics for the graduates available that distinguish between all subjects, age, gender, and degree. Graduates with Master degrees are overrepresented, since overall there are more than twice as many Bachelor graduates than Master graduates in Germany. Nevertheless, the variables will be included as controls. The search for a job via the web and contacts prevails, as could be expected. About two thirds of the respondents had preferred places at the time of the first survey. Forty-one of them had to broaden the geographical scope during the job search. Also roughly two thirds included Middle Hesse into the spatial scope of the job search, which means that one third really wants to leave the university region, especially often graduates from Marburg. Around 80% of the students have familiar places among the preferred places (note that those respondents who are spatially open have by definition NO preferred place and hence these variables are zero for them).

Variable	**Explanation**	**Descriptive statistics -** for dummy variables the absolute frequencies of zeros and ones are reported
contacts (reference)	share of search mechanisms related to personal contacts (at the time of the first survey)	min: 0 / max: 1 / mean: 0.23
web	share of web sources as search mechanisms	min: 0 / max: 1 / mean: 0.34
intermediaries	share of search mechanisms related to professional associations, alumni clubs etc.	min: 0 / max: 0.6 / mean: 0.09
direct	share of direct search mechanisms (application independently of job vacancies)	min: 0 / max: 1 / mean: 0.12
print media	share of print media as search mechanisms	min: 0 / max: 0.5 / mean: 0.10
other_focus (reference)	share of reasons for preferred places/spatial openness **not** related to job or family and friends, e.g. leisure time possibilities or costs of living (at the time of the first survey)	min: 0 / max: 1 / mean: 0.44 / sd: 0.29
job_focus	share of reasons for preferred places/spatial openness related to job characteristics	min: 0 / max: 1 / mean: 0.28 / sd: 0.28

ff_focus	share of reasons for preferred places related to family and friends	min: 0 / max: 1 / mean: 0.28 / sd: 0.31
open	dummy for being spatially open during the job search (asked at the time of the first survey)	0: 119 / 1: 59
geo_scope+	dummy for having broadened the geographical scope during the job search process	0: 137 / 1: 41
univ_region	dummy indicating that a person takes the university region (i.e. Middle Hesse) into account during job search (this question was asked independently of the questions for preferred places in order to investigate whether there is potential to retain graduates in the university region)	0: 69 / 1: 109
ppu-county	dummy indicating whether any of the preferred places is identical to the university region, measured on the level of the county	0: 150 / 1: 28
ppu-state	same like ppu-county, but measured on the level of the state	0: 95 / 1: 83
pph-county	dummy indicating whether any of the preferred places is identical to the home region (= where the person grew up), measured on the level of the county	0: 142 / 1: 36
pph-state	same like pph-county, but measured on the level of the state	0: 84 / 1: 94

Table 2: Descriptive statistics for job search related variables.

Variable	**Explanation**	**Descriptive statistics -** for dummy variables the absolute frequencies of zeros and ones are reported
jobfound	dummy indicating whether a job was found	0: 41 / 1: 137
duration	duration of the job search in months	n = 178 / min: 0 / max: 19 / mean: 1.98 / sd: 2.65
jobfamplace_county	dummy indicating whether a job was found at a familiar place (measured on the level of the county)	n = 137 / 0: 94 / 1: 41 / NA: 2
jobfamplace_state	dummy indicating whether a job was found at a familiar place (measured on the level of the state)	n = 137 / 0: 39 / 1: 96 / NA: 2

Table 3: Descriptive statistics for the dependent variables

The majority of the respondents who filled out the survey completely have found a job. The duration of the job search of those who had found a job by the time of the second survey is rather short with on average 3 months (not reported in Table 3). This is in line with the respective data from another German graduate survey (Wolf 2012).

3.3 Models

The estimation technique used for investigating the first research question is a logit model, since the dependent variable (jobfound) is dichotomous. Regarding the other two research questions, only such graduates can be included who have found a job. Hence, there may be a sample selection problem. However, a Heckman two step regression reveals that having a job and the duration and place familiarity respectively are independent, i.e. the inverse Mill's ratio is insignificant in both cases (results available from the author on request). Therefore, it is possible to estimate the models for the second and the third research question with the subset of graduates having found a job. For the duration of job search a Poisson model could be used since we have count data there. However, the

data can be viewed as survival data with having found a job as the "hazard event". We estimate a Cox proportional hazards model for the hazard at time t of an individual with covariates (independent variables) X.

$$jobfound(t|X) = jobfound_0(t)\exp(X\beta')$$

$jobfound_0(t)$ is then the baseline hazard function.

The variable for having found a job at a familiar place is dichotomous and will be investigated by a logit model. Since the reasons for having found a job at the university region may differ from those for a job at the home domicile region, three version of the model were estimated: (1) found a job at a familiar place (2) found a job at the university place (3) found a job at the home domicile. Note, that $job\ found\ at\ familiar\ place = job\ at\ university\ place \cup job\ at\ home\ domicile$. The instances of jobs found in a familiar county are very few and the analysis was not performed on the county level.

There were only 8 instances of children and, in addition, this variable is highly correlated with being married. Hence, it had to be excluded.

For the first and second model, all 178 observations can be used. For the third model, only the graduates were included who had found a job at the time of the second survey (137 observations). Since the variable for graduates from THM is identical with the sum of the dummies for the field of studies "engineers (THM)" and "other subjects at THM", it cannot be included in the regressions. The variance inflation factors were calculated in each regression and revealed that the remaining variables are not highly correlated.

4. Results and discussion

The following subsections contain the results for each research question, i.e. who found a job, who needed longer for the job search, and who found a job at a familiar place.

4.1 Who found a job?

In our first model, a dummy for having found a job at the time of the second survey is the dependent variable and the model is a logit model. Since age and the type of degrees are correlated, we report three specifications of the model: (1) with age and degree dummies, (2) only with degree dummies, (3) only with age dummies. Even though a test on variance inflation shows that in the first results the correlations have an impact, the first specification is almost as good as the third one, while the specification without age dummies gives worse results, according to the AIC. Hence, the discussion of the results focuses on (1) and (3) which yield similar findings. The results show that job search success is less likely if the graduate relies predominantly on print media, while there is not difference between the other media and the reference category "contacts". In the third specification of the model, focusing on the internet seems to be an even better strategy than using contacts. In the other specifications, the coefficient is of similar size but to noisy to be significant. Similarly, the coefficient for intermediaries like professional associations is positive and large, but not significant. This suggests that being a member of a professional association may be an advantage during job search.

Overall, Hypothesis 1a is partly supported (see Table 4). A stronger focus on job characteristics makes it more likely to have found a job compared to focusing on amenities (reference category), while a stronger focus on friends and family does not matter. This finding supports Hypothesis 2a: the more important non-job-related issues are for the graduates, the more difficult is it to find a job. The spatial preferences do not show an influence on the likelihood to find a job except when the graduate increased the geographical scope during the search process, which has a negative impact. Most likely, the scope was broadened due to the unsuccessful job search and this larger scope did not lead to success until the time of the survey. Hence, we do not find support for Hypothesis 3a.

There are several control variables significant: graduates aged 25 and above have less often found a job compared to the ones younger than 25 years. Graduates with Master degree have a 7.7 times (odds ratio) higher chance to have found a job. This reflects the still existing reluctance of German firms to employ Bachelor degrees, which did not exist in Germany until around 2000. Up to then, the "normal" degree was the diploma, which is comparable to a Master degree. By now, only students who needed especially long for their studies graduate with a diploma degree. Hence, there employability is not higher than that of Bachelors and is insignificant in the model. Since males are underrepresented in the data we will not try to explain the significantly higher success of them in finding a job.

As expected, a significant – at 5% level of significance – positive influence on the likelihood to have a job is given by having done more internships (odds ratio of 2.3 in specification 3 and 2.8 in specification 1), and by having written the thesis with a firm partner (significant only in specification 3 with an odds ratio of 8.8). Both findings are in line with our expectations. The control variable "vintage" is highly significant: of course, those who have finished earlier are more likely to have succeeded in finding a job. The variable intensity has a negative impact. Most likely, the graduates who have sent many applications are those who have difficulties on the job market and hence, they had not yet found a job at the time of the second survey.

Graduates from PUM had less often found a job at the time of the second survey compared to their colleagues from JLU (odd ratios 0.06 and 0.1 for model specifications 1 and 3 respectively). Note, that there is no THM dummy, since the graduates of the THM are included via two fields of study dummies of which "engineers" is reducing the likelihood to have found a job (significant at 10%) in comparison to "natural sciences" (reference). The greater propensity of PUM graduates to move may make the job search for these individuals more longsome. Since the time between the two surveys was limited, these persons had not yet found a job at the time of the second survey.

As a robustness check, we estimated the same model with the ppu-state/pph-state variables instead of ppu-county/pph-county, i.e. we measured the concurrence of familiar regions and preferred places on the level of the federal state (see Model 1a in Table 8 in the appendix). There are no changes in the significances. Hence, the model is confirmed by the second estimation.

Model 1	(1)		(2)		(3)	
	coeff.	std. err.	coeff.	std. err.	coeff.	std. err.
intercept	-1.861	2.626	0.321	2.121	0.669	2.214
male	3.297 ***	1.125	1.321 *	0.732	2.703 ***	1.006
married	-0.040	1.397	-1.032	1.219	-0.102	1.362
partner	-0.197	0.875	-0.158	0.731	-0.207	0.814
age25-27	-2.305 **	1.106			-1.979 **	0.946
age28-30	-5.711 ***	1.649			-4.616 ***	1.381
age31	-3.648 **	1.748			-3.084 *	1.601
Master	2.046 *	1.210	0.358	0.986		
Diploma	1.563	1.181	-0.190	0.976		
oth_exam	-0.124	1.402	-1.220	1.257		
internship	1.039 ***	0.396	0.556 **	0.273	0.844 **	0.328
thesis	2.319	1.527	1.526	1.000	2.178 *	1.304
grade	-0.376	0.741	-0.562	0.626	-1.024	0.628
PUM	-2.865 ***	0.935	-1.585 **	0.691	-2.319 ***	0.829
intensity	-0.468 **	0.190	-0.371 **	0.147	-0.391 **	0.167
vintage	0.503 ***	0.130	0.325 ***	0.095	0.440 ***	0.115
web	3.598	2.371	1.445	1.572	3.973 *	2.201
intermediary	2.197	2.892	1.175	2.432	3.346	2.780
direct	0.475	1.951	-0.332	1.596	0.373	1.910
printmedia	-5.877 **	2.976	-2.881	2.379	-5.428 *	2.883
jobfocus	4.162 **	1.943	1.693	1.366	3.405 **	1.705
ff_focus	2.178	1.573	-0.156	1.220	2.113	1.513
open	-0.351	0.957	-0.685	0.806	-0.457	0.934
geo_scope+	-1.899 **	0.784	-1.240 *	0.642	-1.597 **	0.703
univ_region	0.132	0.783	0.629	0.654	0.118	0.742
ppu_county	0.214	1.155	-0.704	0.933	-0.338	1.036
pph_county	-0.260	0.882	0.283	0.824	-0.262	0.871
	AIC: 153.47	n = 178	AIC: 167.1	n = 178	AIC: 152.09	n = 178
	fields of study included; significance at */**/***: 10%/5%/1%					

Table 4: Results of model 1 (logit, dependent variable: dummy for "job found"). Reference categories: female/sex unspecified, single, age24, Bachelor, JLU, contacts, oth_focus.

4.2 Who needed longer for the job search?

Table 5 shows the results of the hazard model with duration as dependent variable and "job found" as hazard event. Using the internet helps to find a job faster in comparison with the reference category "contacts". This is not in line with Hypothesis 1a, where we assumed that contacts are especially useful. It seems that application processes via the internet are just faster. The other search media do not differ from "contacts". Regarding Hypothesis 2a, we find evidence for a positive impact of a focus on job related issues (compared to a focus on amenities) but no impact of spatial openness. Furthermore, increasing the spatial scope of the job search, including the university region in the job search or preferring a familiar place does not have an impact on the duration of the job search. Hence, we have to reject Hypothesis 3a.

Some of the personal characteristics variables are significant. Males do find a job faster. While being married has no significant influence, having a partner increases the duration of the job search. The "higher" degrees (Master and Diploma) help to find a job faster compared to Bachelor degrees. Since German firms have more experience with traditional Diploma degrees and the new equivalent Master degree this is not surprising. Students from Marburg do not only find less often a job (see the discussion in the last section) but also need longer to find one. Those with more applications need longer for the job search. The underlying third variable influencing both duration and the number of applications is certainly the matching on the job market: graduates with qualifications low in demand on the market will need longer and have to send more applications.

Model 2 applies concurrence of familiar places and preferred places at the level of the counties or (larger) cities. As a robustness check, the concurrence on the level of the federal states was used in a further model (see Table 9 in the appendix). Some variables lose their significance. Robust are the findings for males, married graduates, PUM students, and the focus on job-related issues during the job search.

Model 2	(1)			(2)		
	β	exp(β)	se(β)	β	exp(β)	se(β)
male	0.870 ***	2.386	0.306	0.711 **	2.036	0.285
married	0.307	1.359	0.582	0.236	1.266	0.586
partner	-0.570 **	0.565	0.291	-0.493 *	0.611	0.274
age25-27	-0.320	0.726	0.278	-0.063	0.939	0.243
age28-30	-0.113	0.893	0.394	0.214	1.239	0.364
age31	-0.556	0.574	0.556	-0.381	0.683	0.540
Master	0.735 *	2.086	0.379			
Diploma	0.759 *	2.136	0.456			
oth_exam	0.415	1.515	0.456			
internship	0.114	1.120	0.088	0.116	1.123	0.080
thesis	0.136	1.146	0.291	0.250	1.284	0.290
grade	-0.027	0.974	0.267	-0.237	0.789	0.242
PUM	-0.469 *	0.626	0.256	-0.412 *	0.662	0.249
intensity	-0.486 ***	0.615	0.085	-0.482 ***	0.617	0.083
vintage	-0.011	0.989	0.036	-0.014	0.986	0.034
web	0.775 *	2.170	0.420	0.718 *	2.050	0.404
intermediary	-1.441	0.237	0.896	-1.333	0.264	0.871
direct	0.509	1.664	0.557	0.510	1.666	0.527
printmedia	-1.100	0.333	0.907	-1.106	0.331	0.872
jobfocus	1.622 ***	5.061	0.572	1.447 **	4.249	0.575
ff_focus	0.572	1.772	0.458	0.505	1.658	0.440
open	-0.278	0.757	0.370	-0.301	0.740	0.369
geo_scope+	0.145	1.156	0.300	0.190	1.209	0.293
univ_region	-0.014	0.986	0.260	0.008	1.008	0.258
ppu_county	0.341	1.406	0.419	0.133	1.142	0.407
pph_county	0.247	1.280	0.362	0.286	1.332	0.359
	R2 = 0.456 n=178, events=137			R2 = 0.443 n=178, events=137		
	Likelihood ratio test = 108.3, p=0.000			Likelihood ratio test = 104.1, p=0.000		
	Wald test = 86.31, p=0.000			Wald test = 82.06, p=0.000		
	Score (logrank) test = 97.56, p=0.000			Score (logrank) test = 92.61, p=0.000		
	fields of study included; significance at */**/***: 10%/5%/1%					

Table 5: Results of Model 2 (Cox proportional hazards model, dependent variable duration of job search, events: job found). Reference categories: female/sex unspecified, single, age24, Bachelor, JLU, contacts, oth_focus. Next to the coefficients, the values of exp(β) and the standard error of the coefficient are displayed.

4.3 Who found a job at a familiar place?

The third research question investigates whether the job is at a familiar place or not, i.e. the dependent variable is a dummy indicating the coincidence of job place and either home or university region, measured on the level of the federal state. Table 6 shows that university region and home region coincide in many cases. Hence, the effects for the home and the university region cannot completely be distinguished. Table 7 reports results for the university federal state (Hesse) and for any familiar federal state, i.e. a dummy variable indicating whether the job is at the home OR the university region.

	job at university region	job not at university region
job at home domicile region	63	10
job not at home domicile region	23	39

Table 6: coincidence of home and university region

Many of the personal characteristics do not have an influence on the chance to find a job at a familiar place. As expected, those including the university region (Middle Hesse) into their job search find a job in Hesse more often. This variable is highly significant in all specifications and leads to odds ratios of seven to nine, i.e. it becomes up to nine times as likely to find a job in Hesse when including Middle Hesse into the job search. In specifications (3) and (4), we can clearly see that preferring the university region (not only Middle Hesse but whole Hesse) leads to a higher probability to find a job there. Remember that these two findings are related on two different questions: "did you include Middle Hesse into your job search?" and "which are your preferred locations?". Hypothesis 3b is supported, even though putting both familiar regions together (left panel) leads to insignificant results. Graduates who broadened the geographical scope during the search have more often found a job in Hesse. Probably, they initially wanted to leave the university region but then found a job there.

In the specifications without the type of degree we find that using the help of intermediaries increases the chance to find a job at an unfamiliar place (compared with the reference category "contacts"). The reason is probably that many professional associations act nationally rather than locally. Regarding the reliance on print media we do not find a difference to "contacts". Hypothesis 1b is not supported.

Regarding hypothesis 2b, we find that graduates focusing on job related issues are more likely to work in Hesse in three of the four model specifications. At a first glance this contradicts Hypothesis 2b. But a possible explanation is the knowledge about jobs in the region which was acquired during the studies, e.g. by internships, firm presentations, excursions, or part-time jobs next to the studies. Spatial openness during the job search seems to have no effect.

A robustness check with the independent variable measured on the county level, i.e. the coincidence of the county where the job is located and a familiar county, does not give significant results. It is very unlikely that students from rural regions find a job in exact the same county, even though they might find a job in the next larger city. Hence, we have too few positive incidences of jobs at familiar places for a valid regression.

Model 3: job at fam. state	(1) coeff.	std. err.	(2) coeff.	std. err.	Model 3: job at univ_reg.	(3) coeff.	std. err.	(4) coeff.	std. err.
intercept	-2.007	2.935	0.611	2.438	intercept	-4.417	2.821	-2.584	2.297
male	1.131	1.068	0.573	1.005	male	0.167	0.990	-0.023	0.906
married	1.195	1.563	1.638	1.567	married	1.046	1.592	1.492	1.617
partner	0.723	0.767	0.746	0.751	partner	0.994	0.768	0.992	0.747
age25-27	0.720	1.011	0.283	0.858	age25-27	1.261	0.944	0.503	0.776
age28-30	0.350	1.389	0.337	1.209	age28-30	1.655	1.315	1.094	1.171
age31	-1.560	1.628	-1.947	1.491	age31	0.930	1.563	-0.004	1.397
Master	1.461	1.211			Master	0.125	1.166		
Diploma	-0.091	1.190			Diploma	-1.105	1.187		
oth_exam	-0.668	1.272			oth_exam	-1.927	1.356		
internship	0.064	0.269	0.002	0.240	internship	0.060	0.270	-0.063	0.250
thesis	0.489	1.103	0.749	1.064	thesis	0.548	0.946	0.514	0.921
grade	0.969	0.816	0.318	0.674	grade	1.177	0.726	0.910	0.612
PUM	-2.116 **	0.919	-1.912 **	0.878	PUM	-1.938 **	0.796	-1.874 **	0.800
intensity	-0.926 ***	0.291	-0.776 ***	0.258	intensity	-1.114 ***	0.303	-0.940 ***	0.260
vintage	0.209 *	0.125	0.119	0.108	vintage	0.323 **	0.135	0.220 *	0.114
web	-1.106	1.240	-1.576	1.173	web	-0.378	1.223	-0.877	1.177
intermediary	-5.324	3.264	-5.911 *	3.079	intermediary	-5.039	3.227	-5.240 *	2.919
direct	0.661	1.916	0.362	1.633	direct	2.035	1.785	1.405	1.605
printmedia	0.124	2.640	1.377	2.533	printmedia	0.580	3.044	1.440	2.861
jobfocus	2.904 *	1.665	2.568	1.577	jobfocus	3.987 **	1.757	3.829 **	1.663
ff_focus	0.621	1.481	0.511	1.409	ff_focus	-0.142	1.561	-0.216	1.455
open	-0.452	1.246	-0.209	1.195	open	-1.140	1.277	-1.086	1.191
geo_scope+	0.995	0.958	1.156	0.957	geo_scope+	1.900 **	0.917	1.801 **	0.876
univ_region	2.544 ***	0.841	2.218 ***	0.780	univ_region	2.340 ***	0.876	2.003 ***	0.777
ppu_state	1.443	0.958	1.225	0.886	ppu_state	3.172 ***	1.067	2.935 ***	1.011
pph_state	0.920	1.183	1.371	1.085	pph_state	-0.224	1.056	0.038	1.028
	AIC=154.46 n = 135		AIC=151.7 n = 135			AIC=156.67 n = 135		AIC=154.21 n = 135	
	fields of study included					fields of study included			
	significance at */**/***: 10%/5%/1%					significance at */**/***: 10%/5%/1%			

Table 7: Results of model 3 (logit; dependent variables: location of the job concurs with a familiar federal state or the state of the university, respectively)

5. Conclusion

The paper at hand contributes to the literature on graduate mobility by investigating the influence of individual preferences and attitudes during the job search on the job search outcome. The reliance on print media is a disadvantage for finding a job and the preference for the internet helps to find a job faster. Using the help of intermediaries like professional associations leads to a job rather out of the home or university region. Firms can use this as an advantage to attract graduates from other regions by distributing job vacancies via these associations.

When comparing the attitudes towards job-related issues in contrast to amenities or the proximity to family and friends, in all three models a job focus is an advantage: the respective graduates find more often a job, get the job faster and more often at a familiar region. The non-result for amenities, may, however, be related to the region under observation. For many people, Hesse is not the federal

state of their dreams and inhabitants of Hesse are often less proud of their state than inhabitants of Bavaria or Saxony are. Hence, graduates who want to live in a vivid, creative environment, may prefer the three largest cities of Germany: Berlin, Hamburg, and Munich. These three cities were named disproportionally often among the preferred places. It would be an own study on more universities to investigate the influence of amenities during the job search of graduates in more detail. For graduates themselves the message is easy: focusing on job characteristics make it easier to find a job than focusing on soft factors around the job.

Having a familiar place among the preferred places as well as being spatially open has no influence on the success and the duration of the job search. These initially attitudes are of low importance. However, those who would like to stay in the university region or who would like to go back home do so more often. The strongest retention effect can be seen from the attitude “I include the Middle Hesse into my job search”. Regional politicians in the university regions can try to make the university region interesting for subsequent labour market entry. As soon as graduates do not exclude the university region from their search, the probability of staying in Hesse becomes up to nine times as high. Those in other regions may try to stay in contact with high-school graduates who study elsewhere in order to keep them informed about working possibilities when they want to come back after university graduation. Together with findings from other studies that social ties are rather local and help to make the job search particularly successful, we see that there is good potential to retain graduates in the university region.

Of course, the paper at hand is not without limitations. Since the data comes from three German universities and contains only 178 graduates, the robustness of the findings have to be checked in further studies. In addition, the measures for the intensity of the use of the different channels could be improved, which will maybe lead to more precise findings regarding the channels.

Appendix

Model 1a		(1)			(2)			(3)	
	coeff.		std. err.	coeff.		std. err.	coeff.		std. err.
intercept	-2.052		2.514	0.196		2.068	0.317		2.228
male	3.914	***	1.286	1.439	*	0.747	3.040	***	1.097
married	-0.160		1.417	-1.045		1.191	-0.089		1.393
partner	-0.453		0.896	-0.339		0.738	-0.249		0.805
age25-27	-2.558	**	1.139				-1.958	**	0.940
age28-30	-6.374	***	1.832				-4.897	***	1.468
age31	-3.707	**	1.795				-2.946	*	1.602
Master	2.055	*	1.196	0.387		0.990			
Diploma	1.713		1.189	-0.068		0.977			
oth_exam	-0.713		1.436	-1.371		1.275			
internship	1.272	***	0.465	0.641	**	0.287	0.939	***	0.353
thesis	2.357		1.599	1.420		0.958	2.155		1.316
grade	-0.415		0.746	-0.607		0.627	-1.043	*	0.623
PUM	-3.253	***	1.032	-1.693	**	0.706	-2.465	***	0.859
intensity	-0.556	***	0.209	-0.409	***	0.155	-0.415	**	0.173
vintage	0.563	***	0.152	0.343	***	0.098	0.461	***	0.123
web	4.370		2.700	1.851		1.655	4.594	*	2.431
intermediary	1.323		3.166	0.797		2.515	2.791		2.894
direct	1.022		2.001	0.202		1.661	1.019		2.092
printmedia	-5.861	**	2.920	-2.804		2.403	-5.260	*	2.782
jobfocus	4.658	**	2.115	1.956		1.388	3.734	**	1.840
ff_focus	2.576		1.839	-0.540		1.306	2.159		1.687
open	-0.391		1.096	-0.565		0.910	-0.513		1.057
geo_scope+	-2.003	**	0.803	-1.275	**	0.642	-1.638	**	0.711
univ_region	-0.177		0.822	0.220		0.644	-0.161		0.755
ppu_state	1.731		1.158	1.010		0.982	1.003		1.028
pph_state	-1.505		1.191	-0.465		0.966	-1.025		1.071
	AIC: 150.91		n = 178	AIC: 166.6		n = 178	AIC: 151.12		n = 178
	fields of study included; significance at */**/***: 10%/5%/1%								

Table 8: Robustness check for model 1 with concurrence of preferred places with university/home region on the level of the federal states instead of counties.

Model 2a	(1)			(2)		
	β	exp(β)	se(β)	β	exp(β)	se(β)
male	0.959 ***	2.609	0.307	0.807 ***	2.240	0.283
married	0.491	1.633	0.547	0.436	1.546	0.548
partner	-0.530 *	0.589	0.287	-0.465 *	0.628	0.273
age25-27	-0.284	0.753	0.277	-0.063	0.939	0.240
age28-30	0.023	1.024	0.399	0.295	1.343	0.367
age31	-0.697	0.498	0.543	-0.541	0.582	0.528
Master	0.582	1.789	0.365			
Diploma	0.592	1.807	0.436			
oth_exam	0.322	1.379	0.439			
internship	0.123	1.131	0.087	0.117	1.125	0.080
thesis	0.196	1.217	0.293	0.285	1.329	0.292
grade	-0.062	0.940	0.253	-0.228	0.796	0.233
PUM	-0.453 *	0.636	0.256	-0.390	0.677	0.247
intensity	-0.513 ***	0.599	0.084	-0.508 ***	0.602	0.083
vintage	-0.013	0.987	0.034	-0.011	0.989	0.033
web	0.715 *	2.043	0.422	0.657	1.929	0.408
intermediary	-1.355	0.258	0.882	-1.353	0.258	0.871
direct	0.390	1.476	0.567	0.403	1.497	0.544
printmedia	-0.898	0.407	0.902	-0.890	0.410	0.872
jobfocus	1.479 ***	4.389	0.559	1.362 **	3.904	0.564
ff_focus	0.449	1.567	0.480	0.375	1.455	0.461
open	-0.331	0.718	0.392	-0.334	0.716	0.394
geo_scope+	0.190	1.209	0.305	0.221	1.247	0.301
univ_region	0.147	1.159	0.245	0.120	1.127	0.243
ppu_state	-0.322	0.725	0.323	-0.372	0.689	0.321
pph_state	0.404	1.499	0.338	0.464	1.590	0.335
	R2 = 0.454 n=178, events=137			R2= 0.446 n=178, events=137		
	Likelihood ratio test = 107.8, p=0.000			Likelihood ratio test = 105, p=0.000		
	Wald test = 84.04, p=0.000			Wald test = 80.68, p=0.000		
	Score (logrank) test = 93.77, p=0.000			Score (logrank) test = 90.28, p=0.000		
	fields of study included; significance at */**/***: 10%/5%/1%					

Table 9: Robustness check for model 2 with concurrence of preferred places with university/home region on the level of the federal states instead of counties.

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