Discussion Paper No. 05-34

The Geographical Mobility of Unemployed Workers

Evidence from West Germany

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Non–technical Summary

Interregional migration has often been considered an important means of equilibrating regional disparities in unemployment and wages. The underlying notion is that unemployed workers leave depressed regions in order to find employment in regions that offer better employment prospects. While this mechanism has been found to work efficiently in the US, European studies have often demonstrated that interregional mobility in Europe is an important means of equilibrating regional disparities only in the long run.

Given the high level of unemployment in Germany, the willingness and ability of unemployed workers to seek employment in more prosperous and to migrate out of depressed regions is of central concern if migration is supposed to be an effective means of equilibrating regional disparities. Recent empirical evidence on internal migration in West Germany is rather mixed. However, there is no study that explicitly focusses on the migratory behavior of unemployed jobseekers. This paper closes this gap by looking at the search strategies of unemployed job seekers across space. The main purpose of this paper is to investigate whether unemployed workers in Germany choose search strategies that favor migrating out of depressed regions with unfavorable re-employment opportunities. In addition, the paper investigates whether an extensive local accommodation of active labor market policies reduces interregional mobility among unemployed individuals. This has been suggested by some recent Scandinavian studies. The underlying notion of such a locking-in effect is that unemployed individuals may postpone or avoid moving by entering labor market programs.

The findings indicate that unemployed jobseekers choose search strategies that favor leaving local labor markets with an unfavorable labor demand situation compared to other regional labor markets. Moreover, this responsiveness to local labor market conditions is more pronounced for men as compared to women. There is also weak evidence that high-skilled jobseekers are more responsive to local labor demand conditions than low-skilled individuals. Given the high level of unemployment and generally low mobility levels among low-skilled individuals in Germany, this weak responsiveness may be of some concern. In contrast to the Scandinavian literature, the local accommodation of labor market programs does not exert any significant locking-in effect.

The geographical mobility of unemployed workers. Evidence from West Germany

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Abstract

Using a competing-risk framework of exiting unemployment to jobs in a local or a distant labor market area, this paper investigates whether unemployed individuals in West Germany choose search strategies that favor migrating out of declining regions. Moreover, the paper investigates how such search strategies are affected by the local accommodation of labor market programs. Such programs have been suggested to lead to a regional locking-in effect. Empirical results are obtained from a stratified Cox partial likelihood proportional hazards model that allows for location-specific fixed effects and are compared to estimates from a parametric log-logistic hazard model that takes account of unobserved individual heterogeneity. The findings indicate that unemployed in West Germany are responsive to local labor market conditions and are more likely to leave regions with unfavorable re-employment opportunities. No locking-in effect from labor market programs is found. The probability of migration is found to increase with search time.

Keywords: interregional mobility, unemployment duration, competing-risk, active labor market policy, unobserved location-specific heterogeneity

JEL classification: J62, J64, R23

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1 Introduction

It has often been argued that interregional mobility[1] plays a crucial role in equilibrating regional disparities in regional unemployment and wage levels. The underlying notion is that unemployed workers leave depressed regions in order to find employment in regions that offer better employment prospects. For the US, Blanchard and Katz (1992) find this adjustment mechanism to be quite effective. In European countries including Germany, however, interregional labor mobility lacks behind the mobility levels in the US, Canada, Japan and Australia (Eichengreen 1991, Braunerhjelm 2000). More importantly, even though unemployment and wage differences are important factors in determining migration in Europe, recent findings suggest that the elasticities of aggregate migration flows with respect to unemployment and wage differentials are lower than in the US (Puhani, 1999). Decressin and Fatas (1995) examine regional adjustment dynamics in Europe and find interregional mobility to play a major role in the adjustment processes after an adverse regional employment shock. However, compared to the findings by Blanchard and Katz, they find adjustment to take much longer so that regional disparities tend to be fairly persistent. For Germany, a study by Möller (1995) also suggests that interregional mobility is an important means of equilibrating regional disparities in the long run, but that it takes 2-3 years for interregional mobility to react to an adverse regional employment shock.

The effectiveness of migration as an equilibrating mechanism ultimately depends on migratory decisions at the individual level. In particular, given the high level of unemployment in Germany, the willingness and ability of unemployed workers to seek employment in more prosperous and to migrate out of depressed regions is of central concern if migration is supposed to be an effective means of equilibrating regional disparities. Recent empirical evidence on internal migration in West Germany is rather mixed. Decressin (1994) looks at migration flows between West German states and finds that these flows tend to go from high to low unemployment regions. Schlömer and Bucher (2001), on the other hand, do not find any relationship between unemployment and migration after excluding the East German states. A recent study by Windzio (2004) on the determinants of individual mobility between the southern and northern states in West Germany even suggests that individuals in high unemployment regions have lower migration probabilities. However, none of these studies explicitly focusses on the group of unemployed, but only looks at labor mobility in general. Yet, the migratory behavior of unemployed jobseekers, is likely to differ from employed individuals.

Therefore, this study examines the migratory behavior of unemployed jobseekers. In particular, the main purpose of this paper is to investigate whether unemployed workers in West Germany choose search strategies that favor migrating out of depressed regions with unfa-

[1] Throughout this paper, migration and interregional mobility are used synonymously.

vorable re-employment opportunities. In addition, the paper tests whether an extensive local accommodation of active labor market policies (ALMP)[2] reduces interregional mobility among unemployed individuals. This has been suggested by some recent Scandinavian studies (Westerlund 1997 and 1998, Fredriksson 1999). The underlying notion of such a locking-in effect is that unemployed individuals may postpone or avoid moving by entering labor market programs such as work creation schemes or training programs. In Germany, there has been an increasing interest in the evaluation of the job finding chances of participants in such programs (e.g. Bergemann and Schultz 2000, Bergemann et al. 2000, Caliendo et al. 2003) as well as in the macroeconometric evaluation of the effect of ALMP on the matching efficiency (e.g. Hagen and Steiner 2000, Hujer et al. 2002). This paper is the first study in the German context that looks at the effect of ALMP on interregional mobility.

This paper analyzes migratory behavior of unemployed jobseekers within a search-theoretic framework. The unemployed jobseeker chooses an optimal search strategy by allocating search effort across different regional labor markets and by choosing region-specific reservation wages such that the present value of accepting a job at this wage level just equals the present value of continuing the job search. This optimal search strategy may change over the duration of unemployment. According to Bailey (1991), migration probabilities are likely to increase with search time since jobseekers often consider migration only after local job opportunities have been exhausted. Due to this dynamic character of job search, Goss and Schoening (1984) argue that a binary choice model of migration that does not control for unemployment duration may be biased due to this unobserved heterogeneity. Since regional unemployment rates and regional average unemployment durations are related[3], this may explain why studies that do not take account of unemployment durations show mixed results with regard to the effect of regional unemployment rates on migration probabilities[4]. Therefore, recent research explicitly models migratory behavior of unemployed individuals within a hazard model specification of unemployment durations. By distinguishing between the competing-risks of exiting unemployment to different regional labor markets, this approach provides information on the actual search strategy of unemployed workers. So far, there have been only few studies that apply a competing-risk hazard model to the analysis of interregional mobility.

One example is the Finish study by Kettunen (2002). Using a Gompertz proportional hazard model with gamma distributed unobserved individual heterogeneity, the findings do not

[2]In Germany, ALMP have been an increasingly important policy instrument since the 1970s. During the late 1990s, the federal labor office spent around 30 % of total expenditures on ALMP (Caliendo et al. 2003).

[3]In steady state, unemployment rates and average unemployment durations are in fact directly proportional.

[4]Herzog and Schlottmann (1984) for the US and Tervo (2000) for Finland do find evidence that high regional unemployment encourages individuals to migrate out of the region. By contrast, UK studies by Pissarides and Wadsworth (1989) and Hughes and McCormick (1994) suggest that high regional unemployment levels even discourage mobility during the 1970s and 1980s.

indicate any significant effect of local labor demand on the migration hazard, i.e. the hazard of finding employment via residential mobility. Using a Cox proportional hazards model, the US study by Yankow (2002) finds higher employment and wage levels to significantly reduce the migration hazard, while the unemployment rate and regional employment growth do not exert any significant influence. In the German context, only Windzio (2004) uses a single-risk hazard model framework for the analysis of interregional mobility between north and south Germany. His findings suggest that higher local unemployment levels lower the migration hazard. However, as previously mentioned, his study sample is not restricted to unemployed individuals, but also includes employed individuals as well as individuals who are out of labor force.

In order to explicitly examine the determinants of interregional mobility of unemployed individuals in a framework that takes account of the possible duration dependence of the mobility decision, this study follows the recent research direction and applies a competing risk hazard model to the analysis of interregional mobility of unemployed individuals in West Germany. The analysis is based on the IAB employment subsample regional file. This register data set is well-suited for the proposed analysis because due to its sample size even relatively rare events of interregional mobility are observed in sufficient numbers to analyze migratory behavior of unemployed individuals. In particular, this data set allows for separate estimations for different sub-groups in order to test whether search strategies differ between men and women as well as between high-skilled and low-skilled individuals. I estimate a competing-risk proportional hazard model of unemployment durations using the Cox partial likelihood estimator (Cox, 1972). In order to take into account unobserved location-specific heterogeneity, the study uses a stratified partial likelihood estimator (Ridder and Tunali, 1999). For comparison, the paper also estimates a log-logistic accelerated failure time model that takes into account both location-specific fixed-effects and unobserved heterogeneity at the individual level.

The findings indicate that individuals choose search strategies that favor leaving local labor markets with an unfavorable labor demand situation compared to other regional labor markets. Moreover, this responsiveness to local labor market conditions is more pronounced for men as compared to women. There is also weak evidence that high-skilled jobseekers are more responsive to local labor demand conditions than low-skilled individuals. The local accommodation of labor market programs does not exert any significant locking-in effect in West Germany. Migration probabilities are generally found to increase with search time.

The outline of the paper is as follows. The next section introduces a model of job search across space. Data and some institutional background will be discussed in section 3. Section 4 presents the econometric approach. Estimation results are discussed in section 5. Section 6 concludes.

2 A search model with search across space

The theoretical framework is similar to Damm and Rosholm (2003) who develop a search-theoretic approach in which unemployed workers seek employment across two regional labor markets. The following framework is a simplified version of their approach because I do not consider the effect of place utilities of different residential locations in the decision process. Moreover, similar to the two-sector framework by Fallick (1992), I allow for layoffs because for unemployed individuals it seems implausible to assume that a job is held forever.

In this stationary framework, individuals are allowed to search simultaneously across two regional labor markets $k = l, d$ (local and distant)[5]. Jobseekers are risk-neutral and maximize the expected present value of job search V^u, discounted to the present over an infinite horizon at rate r. Wage offers from each labor market are drawn from known distributions $f_l(w)$ and $f_d(w)$ and arrive according to a Poisson process[6] with job offer rate $\alpha_k \sigma(e_k)$. This probability is the product of an exogenous probability of receiving a job offer from k, α_k and an increasing and concave function of the search effort devoted to labor market k, $\sigma(e_k)$ with $\sum_k e_k \leq 1$. A worker may loose a job according to the job destruction rate δ_k.

Searching the two labor markets comes with constant marginal cost c. Thus, searching the distant labor market is assumed to be no more costly than searching the local labor market[7]. The reservation wage and the allocation of search effort across k constitute the search strategy of the unemployed jobseeker. He chooses the search strategy that maximizes the expected present value of search V^u:

$$\begin{aligned} rV^u &= b - c(e_l + e_d) \\ &\quad + \alpha_l \sigma(e_l) \int_{w_l^r}^{w_{max}} (V_l^e(w) - V^u) dF_l(w) \\ &\quad + \alpha_d \sigma(e_d) \int_{w_d^r(t)}^{w_{max}} (V_d^e(w) - V^u) dF_d(w) \end{aligned} \tag{1}$$

This flow value of being unemployed is equal to the sum of four components: the value of unemployment b (e.g. transfer payments), the cost of searching the two labor markets, the expected surplus of a local job times the probability of receiving a job offer locally and the

[5]This is a generalization of the systematic search literature that considers the job searcher to sequentially sample regions, firms or sectors according to the expected returns from searching on these sub-markets (see Salop, 1973, McCall and McCall, 1987)

[6]Thus, the instantaneous probability of receiving more than one offer from both regional labor markets is zero.

[7]This assumption may be justified on two grounds. First of all, nowadays online job offers allow for searching for jobs anywhere in the economy at the same cost. Secondly, for unemployed job seekers, travel costs due to job interviews in distant regions are reimbursed by the employment office (see German social law (SGB) III: §45 and §46). Still, relaxing the assumption of constant marginal search costs points at some important future extension of the model.

expected surplus of a distant job that involves interregional residential mobility times the probability of receiving a job offer in this market. $V_k^e(w)$ refers to the value of employment at wage w. For the local market, $V_l^e(w)$ may be written as

$$rV_l^e(w) = w - \delta_l(V_l^e(w) - V^u)$$

with δ_l as the local job destruction rate. Thus, the value of being employed is equal to the wage rate w minus the probability of job loss times the expected value of job loss. At the reservation wage w_k^r, the value of being employed at this wage just equals the value of continuing search. Since $V_l^e(w) - V^u = \frac{w - rV^u}{r+\delta_l}$, the local reservation wage that equates $V_l^e(w_l^r)$ and V^u is:

$$\begin{aligned} w_l^r &= rV^u \\ &= b - c(e_l + e_d) \\ &\quad + \frac{\alpha_l \sigma(e_l)}{r+\delta_l} \int_{w_l^r}^{w_{max}} (w - w_l^r) dF_l(w) \\ &\quad + \frac{\alpha_d \sigma(e_d)}{r+\delta_d} \int_{w_d^r(t)}^{w_{max}} (w - w_d^r) dF_d(w) \end{aligned} \tag{2}$$

Since accepting a job offer from a distant labor market necessitates residential mobility and thus causes permanent mobility costs m[8], the value of a job in a distant labor market is:

$$rV_d^e(w) = w - m - \delta_l(V_d^e(w) - V^u)$$

With $V_d^e(w) - V^u = \frac{w - m - rV^u}{r+\delta_l}$, the reservation wage for the distant market may be written as:

$$\begin{aligned} w_d^r &= rV^u + m \\ &= b - c(e_l + e_d) \\ &\quad + \frac{\alpha_l \sigma(e_l)}{r+\delta_l} \int_{w_l^r}^{w_{max}} (w - w_l^r) dF_l(w) \\ &\quad + \frac{\alpha_d \sigma(e_d)}{r+\delta_d} \int_{w_d^r(t)}^{w_{max}} (w - w_d^r) dF_d(w) + m \end{aligned} \tag{3}$$

Thus, the reservation wage for a job that requires a residential move exceeds the local reservation wage in order to compensate the job mover for the moving costs. Since moving costs differ across individuals according to the distribution $f(m)$, individuals with high moving costs are less likely to accept a job offer from a labor market that involves mobility than others.

Comparative statics suggest that reservation wages for both local and distant jobs increase with improving job offer arrival rates, decreasing job destruction rates or improved wage offer

[8]This is a reasonable assumption if moving to a new residential location also involves psychological costs that are unlikely to be of the lump-sum type.

distributions anywhere in the economy. Also, reservation wages for both markets increase with unemployment benefits and decrease with increasing search costs. Increasing moving costs reduce the local reservation wage and have an ambivalent effect on the reservation wage for the distant labor market.

Besides determining the reservation wages for both markets, the job searcher endogenously allocates search effort across the two labor markets. For an interior solution, i.e. the maximum search effort is not being exhausted such that $\sum_k e_k < 1$[9], optimal search effort is given as:

$$\begin{aligned} R_k(e_k^*) &= c \\ \text{with } R_k(e_k^*) &= \frac{\alpha_k \sigma'(e_k^*)}{r+\delta_k} \int_{w_k^r}^{w_{max}} (w - w_k^r) dF_k w \end{aligned} \tag{4}$$

with R_k denoting the marginal benefit of search in region k. Thus, optimal search effort for any regional labor market equates the marginal benefit with the marginal cost of search. Thus, it is clear that even if the regions are identical in all conditions, search intensity in the local labor market exceeds the search intensity in the distant labor market because of the moving cost involved when accepting a job in the distant market. Moreover, deteriorating local labor market conditions relative to the distant labor market, do not only decrease search effort in the local market but also increases search effort in the distant labor market. This can be shown formally by differentiating equation (4) with respect to labor market related attributes. In particular, improving local labor market conditions in one market (i.e. a higher job-offer arrival rate, a lower job destruction rate or an improvement in the wage distribution) result in higher local search efforts in this market and lower search effort in the other market[10]. Thus, changing relative prospects for re-employment in the two regional labor markets affects the allocation of search effort[11].

The probability that an individual i with characteristics x who is unemployed at the beginning of period t makes a transition to employment in k during this period is now given by the probability of finding a vacancy in k, the probability of being offered the job and the probability of accepting it:

$$h_k(t, x_i) = \alpha_k(x_i)\sigma(e_k^*) * [1 - F_h(w_k^r(x_i))] \tag{5}$$

It follows from the above framework that the local job finding hazard $h_l(t, x_i)$ and the migration hazard $h_d(t, x_i)$ depend on the labor market conditions in all labor markets by affecting the

[9]The corner solution where the constraint is binding yields the same qualitative results.

[10]For a formal exposition in the context of a two-sector model without moving costs see Fallick (1988). His results carry over to the above case of spatial job search with moving costs.

[11]Note that it is not necessary for the total amount of job search to affect the marginal benefit or cost of searching any region, i.e. the constraint on the total amount of job search need not be binding in order to generate an interaction between both markets. This argument has been discussed in detail in Fallick (1988).

worker's search strategy. Based on this framework, we may now derive the following main hypotheses to be tested regarding the effect of local labor market conditions and local active labor market policies on the migration and the local job finding hazard:

1. Local labor market conditions influence the migration probability by affecting the allocation of search effort across regional markets. Deteriorating local job finding opportunities result in lower reservation wages in all markets and higher search effort in other regional labor markets. This increases the migration hazard.

2. Entering a labor market programme may serve as a substitute for regular employment[12]. Thus, the provision of local labor market programs increases the expected value of unemployment and thus increases the reservation wage in both the local and the distant labor market. This reduces both the local job finding hazard and the migration hazard. Since participating in such programs is a possibility to avoid or postpone moving, individuals also shift search effort to the local area in order to find such a program. This further reduces the migration hazard and thus results in a regional locking-in effect.

3 Data

3.1 The IAB employment subsample 1981-1997 - regional file

The analysis is based on the IAB employment subsample 1981-1997 - regional file (IABESR) which is described in detail in Bender et al. (2000). This register data set is well-suited for the proposed analysis of interregional mobility because due to its sample size, even relatively rare events of interregional mobility are observed in sufficient numbers to analyze migratory behavior of unemployed individuals. In particular, the IABESR contains spell information on a 1 % sample of the population working in jobs that are subject to social insurance payments. As a consequence, the sample does not represent individuals who are not subject to social insurance contributions such as self-employed individuals and life-time civil servants. For West Germany, the sample includes spell information on about 500,000 individuals for whom employment histories can be reconstructed on a daily basis including the micro-census region of the workplace. In addition, the data contains spell information on periods for which the individual received unemployment compensation from the federal employment office (*Bundesagentur für Arbeit*) such as unemployment benefits UB (*Arbeitslosengeld*), unemployment assistance UA (*Arbeitslosenhilfe*) and maintenance payments during further training MP (*Unterhaltsgeld*).

[12]This is a reasonable assumption since during the period under study participating in such programs was paid similar to a regular job and also renewed the entitlement period for unemployment transfer payments just as a non-subsidized job did (see German labor promotion act (Arbeitsförderungsgesetz)).

Unfortunately, these information do not allow for identifying periods of registered unemployment. This is because UA is means-tested and thus only applies to a selective group of individuals who lack other financial resources such as, for example, spouse income. As a consequence, it is not possible to distinguish between those who have left the labor force and those still unemployed but not receiving any unemployment compensation since both of these states are unobserved in the IABESR. Therefore, it is necessary to define proxies for unemployment. Fitzenberger and Wilke (2004) introduce two extreme benchmarks, unemployment between jobs (UBJ) and non-emploment (NE) which cover a lower and an upper bound of unemployment. Since these definitions may be too extreme for the purpose of this analysis, I choose a definition of unemployment that lies in between these two benchmarks and which has been introduced previously by Lee and Wilke (2005). They define unemployment as unemployment between permanent income transfers (UPIT). Accordingly, unemployment encompasses all periods of continuous transfer receipt after an employment spell. Gaps between periods of transfer receipt may not exceed 4 weeks (in the case of suspension[13] up to 6 weeks). The unemployment spell is considered right-censored if the last spell observed involves unemployment compensation or if the gap between the end of transfer receipt and the beginning of employment exceeds 4 weeks. This last restriction tends to treat spells of long-term unemployed as censored, but at the same time censors spells of individuals who are no longer actively seeking employment.

Another drawback of the data that has to be mentioned is that it is not possible to distinguish between exits to employment and exits to a labor market program. As a consequence, local job finding hazards also include program participation hazards. Therefore, the effect of local labor market programs on the local job finding hazard is difficult to interpret. The effect on the migration hazard also needs to be interpreted with some care. Unlike other studies that examine the effect of participating in such programs on the migration hazard, the data structure of the IABESR only allows for examining the effect of the local provision of such programs on the search strategy of the unemployed jobseeker prior to entering such programs.

I restrict the analysis to West German[14] unemployment spells starting between 1982 to 1995. In addition, I only include individuals aged 26 to 41 years at the time of job loss. These restrictions ensure that the sample is rather homogenous with respect to the institutional framework in which these individuals act (see Lüdemann at al. 2004). Applying the above unemployment definition, these restrictions yield a sample of 82.444 unemployment spells. Due to missing data in major variables such as the workplace location, educational background, marital status and the sector of activity in the previous job, the final sample is further reduced

[13]Unemployment compensation may be temporarily suspended if an unemployed worker rejects an acceptable job offer (*Sperrzeiten*).

[14]I exclude unemployment spells from West Berlin because the geographical location of Berlin suggests that interregional mobility patterns may not be analyzed without the East German surrounding.

to 80.360 unemployment spells. 27.7 % of these unemployment spells are right-censored.

The IABESR includes information on the micro-census region of the workplace so that comparing the workplace location of the old and the new employer allows for identifying interregional mobility. However, the location of the last workplace is simply carried over to the subsequent unemployment spell so that the regional identifier of an unemployment spell does not contain any information on the actual whereabouts of the unemployed individual during this unemployment period. As a consequence, it is not possible to distinguish between migration that is induced by a successful job match (contracted migration) and mobility prior to finding a job in order to seek employment in a different local labor market (speculative migration). Analyzing interregional mobility based on the IABESR thus always refers to both speculative and contracted mobility[15]. I define interregional mobility as movements between extended labor market regions (LMR), i.e. movements between LMRs that are not located adjacently. LMRs comprise typical daily commuting ranges such that for the majority of individuals the workplace is located within the LMR. Therefore, finding employment outside the extended LMR, i.e. outside a 50 to 80 km radius, should usually necessitate residential mobility. In West Germany, there are 180 labor market regions (LMR) that lump together 270 micro-census regions. Among the 80.360 unemployment spells, 63.6 % exit to a local job within the extended local labor market region and 8.7 % exit to a job in a distant labor market region.

3.2 Covariates

Individual-level covariates used in the subsequent analysis include age, marital status, formal education, previous job status and previous sector of activity. Unfortunately, the IABESR does not include several important determinants of mobility such as home ownership and other household-related variables. On the other hand, the data structure of the IABESR allows for constructing covariates regarding the employment history of the unemployed jobseeker. Such indicators capture some heterogeneity across individuals regarding their productivity, but also regarding their mobility cost.

In particular, I include previous wage income because having the necessary resources to migrate may be an important determinant of mobility. Additional covariates such as tenure in the previous job held and an indicator of whether someone has been recalled from his previous employer may capture individual heterogeneity in the attachment to the local area. An extended job tenure may be expected to have a negative effect on the migration hazard because a long job tenure stands for a long duration of residential immobility. Similarly, having been recalled from the previous employer may increase someone's local attachment due to waiting for another

[15] According to Molho (1986) contracted migration is much more common in Europe than speculative migration.

future recall.

In addition, I use an indicator of whether an individual has previously been unemployed and the total previous unemployment duration. Previous unemployment may actually help in finding re-employment in the local area due to previous experiences with job placement agencies which increase the efficiency of local job search. Total previous unemployment duration, however, is likely to reduce general job finding chances due to a depreciation of human capital and possible stigma effects.

Several regional indicators have been added to the micro data set in order to test the main hypotheses that have been developed in the previous section[16]. Data sources include the federal labor office[17] and the New Cronos database that is released by Eurostat. In addition, several indicators have been calculated based on the IABESR itself. Table 1 gives the exact definition and data sources of all regional and aggregate variables. All regional indicators have been aggregated to the level of labor market regions. These regional entities are likely to be the most relevant for the job search behavior of unemployed jobseekers.

The analysis uses several **regional indicators** that capture local re-employment opportunities. According to the theoretical framework, a local labor market with unfavorable job finding chances should be associated with a high migration hazard. In particular, I use the **relative uv-ratio**, i.e. the local unemployment-vacancy ratio divided by the unemployment-vacancy ratio in all other regions, as an indicator of local labor demand conditions relative to all other labor markets. A high relative uv-ratio should come with relatively low local job-offer arrival rates. This shifts search effort towards other regions with better labor demand conditions and thus increases the migration hazard. In addition, I also include the **local unemployment-vacancy ratio**. When controlling for the relative labor demand situation, larger imbalances between local labor supply and local labor demand indicate deteriorating overall labor demand conditions. This should result in lower job-offer arrival rates and decreasing job finding hazards anywhere in the economy and thus leave the migration probability unaffected. An additional indicator of local re-employment opportunities that is included in the analysis is local **employment growth**. Higher local employment growth comes with improving local employment opportunities. This increases the attractiveness of local search and thus discourages migration.

In order to test whether the provision of labor market programs leads to a regional locking-in

[16]Many thanks to Ralf Wilke and Tobias Hagen who were very helpful in collecting these data.

[17]Data from the federal labor office (FLO) is coded at the level of FLO districts (*Arbeitsamtsbezirke*). Since there is no exact merging rule available to merge data between FLO districts and the micro-census regions that are used in the IABESR, Arntz and Wilke (2005) develop various merging rules for these two regional entities based on a digital map intersection. They test the sensitivity of estimation results with regard to the merging rule applied and find estimation results to be very robust. For this analysis, a simple area weight has been used to merge regional data with the IABESR. According to Arntz and Wilke (2005) the choice of merging rule should not significantly affect the estimation results.

effect, I use the **WCS accommodation ratio**, i.e. the ratio between the number of individuals in work creation schemes (WCS) and the number of individuals who are either unemployed or participating in such programs, as an indicator of the local accommodation of labor market programs. Unfortunately, a time series encompassing the years between 1982 and 1995 is only available for work creation programs but not for training programs (TP) which are much more prevalent in West Germany than WCS[18]. On the other hand, regions with a high WCS accommodation ratio tend to have a high TP accommodation ratio so that using the WCS accommodation ratio may proxy for the local accommodation of labor market programs[19].

In addition, I use several regional indicators to control for further differences between local labor markets. In particular, I control for the sectoral composition, the share of all unemployed who are male, the population-job density as well as for regional labor turnover.

Higher **labor turnover** at a given imbalance between labor supply and labor demand means higher job offer arrival rates and higher job destruction rates in the local area. This comes with opposing effects on the reservation wages, but increases the local job finding hazard due to the positive direct effect of higher job-offer arrival rates. The migration hazard is only unaffected if higher labor turnover is due to an equivalent rise in both the job offer arrival and the job destruction rate. Otherwise, the migration hazard may either increase or decrease.

The **population-job-density** measures the number of residents per job. This indicator reflects some structural differences between local labor markets. In particular, a low population-job density is likely to prevail in urban job centers where the net flow of commuters to and from the region is positive. In such employment centers, local job search is likely to generate more job offers so that a lower population job-density should be associated with a lower migration hazard.

A high **share of male unemployed** typically prevails in regions with structural problems in male-dominated industries such as, for example, old-industrialized regions in North-Rhine Westphalia and Saarland. This should reduce local job finding chances, especially among men, and thus increase the migration hazard.

At the aggregate level, the total **aggregate hiring rate** is used to control for the macroeconomic situation. According to Jackman and Savouri (1989), interregional job matching is more likely during macroeconomic booms with high aggregate hiring rates. Therefore, during economic recessions, lower migration hazards may be expected.

Summary statistics of all covariates used in the analysis are shown in table 2 and 3 in the appendix.

[18]In 1997, almost 270.000 persons entered training programs, while around 75.000 persons entered work creation schemes in West Germany (Caliendo et al. 2003)

[19]For the years for which both WCS and TP are available on a disaggregated level, the correlation coefficient is around +0.5.

4 Econometric specification

4.1 A stratified Cox proportional hazards model

The econometric analysis focuses on two competing hazard rates, the hazard of finding a job within the extended LMR (h_l) and the hazard of finding a job in a distant LMR (h_d), i.e. the migration hazard, as a function of time spent in unemployment. Since the focus of the analysis is not on the shape of the hazard function, a competing-risk form of the semi-parametric Cox proportional hazard model (Cox, 1972) is an appropriate choice for the proposed analysis. A clear advantage of the semi-parametric Cox estimator compared to parametric specifications is that the baseline hazard is specified fully flexible. This avoids any biases that result from misspecifying the shape of the baseline hazard in parametric specifications.

Assuming that the two competing risks are independent conditional on all covariates included in the model[20], the exit-specific hazard rate of the Cox proportional hazard model for individual i may be written as

$$h_k(t_i|x_i) \quad = \quad h_k(t_i)exp(x_i(t)\beta_k)$$

where t_i is the elapsed duration of unemployment for individual i, $h_k(t)$ is the exit-specific baseline hazard with $k = d, l$ and $x_i(t)$ is a vector of both time invariant and time-varying covariates. β_k is the vector of parameters of interest. An important assumption underlying any proportional hazards model is that covariates shift the baseline hazard in a proportional manner. Using the above specification, estimation results may be biased due to unobserved individual and unobserved regional heterogeneity. Therefore, I modify the above specification by estimating a fully flexible baseline hazard for each local labor market (LMR) j. This stratified Cox partial likelihood estimator (SPLE) removes any biases that result from unobserved, time-invariant characteristics of the local labor market region (LMR). A competing-risk form of the SPLE may be written as:

$$h_{kj}(t_{ij}|x_{ij}, \nu_j) \quad = \quad h_{kj}(t_{ij}, \nu_j)exp(x_{ij}(t_{ij})\beta_k)$$

with t_{ij} as the duration of unemployment of the ith individual in the jth LMR. $h_{kj}(t_{ij}, \nu_j)$ is the baseline hazard in LMR j and is allowed to depend on an unobserved location-specific fixed effect ν_j. This nuisance parameter along with the baseline hazard cancels out of the likelihood function. The possibility to remove stratum-specific fixed effects has already been discussed by

[20]This is a critical assumption since estimation results will only be consistent estimates of the true parameters if all relevant decision variables of whether to stay in the region or not are included in the model (see Gangl, 2004). Since a number of important variables for the migration decision are missing in the specification such as home ownership or number of children, future research needs to take a closer look at the robustness of results when this assumption is relaxed.

Kalbfleisch and Prentice (1980) and Chamberlain (1985). Ridder and Tunali (1999) discuss the conditions under which such an approach is appropriate when using time-varying covariates. In particular, covariates have to be weakly exogenous, i.e. an explanatory variable x_t may not depend on observed exits from unemployment in the same labor market region in period $\tau \geq t$. This exogeneity condition may be problematic for some regional indicators. Therefore, I use lagged variables for those regional indicators for which such an endogeneity issue is likely to arise (see table 1).

Throughout the subsequent sections, model specification A refers to a Cox partial likelihood estimator that is stratified by labor market region. The corresponding inference is based on robust standard errors that take into account the clustering of individuals within labor market regions (see Lin and Wei, 1989). Otherwise, standard errors of covariates at the regional level may be biased downward (Moulton, 1990).

4.2 Log-logistic accelerated failure time model

One major caveat of the proposed estimation strategy is that it does not take into account unobserved heterogeneity at the individual level. Thus, a pure sorting effect may result in negative duration dependence and parameter estimates may be biased (Lancaster, 1990). Therefore, as a robustness check, I also estimate a parametric accelerated failure time (AFT) model that models the unemployment duration of an individual i as

$$log(t_i) \quad = \quad \beta x_{ij} + u_i$$

with u_i having density $f(.)$. Since descriptive evidence regarding the shape of the hazard function suggests a non-monotonic shape that initially rises and declines afterwards, I use the log-logistic density with shape parameter γ because it allows for a non-monotonic shape of the hazard function. Moreover, it allows for incorporating unobserved heterogeneity as a multiplicative factor in the hazard rate, i.e. $h(t|\alpha) = \alpha h(t)$. The frailty term α is assumed to follow a gamma distribution with expectation one and variance θ. In my analysis, the individual frailty α takes into account that individuals may have multiple unemployment spells. Moreover, I include labor market dummies in order to take account of location-specific fixed effects[21]. Throughout the subsequent sections, model specification B refers to the AFT log-logistic model that takes into account unobserved heterogeneity at the level of individuals as well as location-specific fixed-effects. Unlike model specification A, this specification does not take into account that individuals are clustered in labor market regions due to the shared

[21]The difference to the stratification technique is that the inclusion of labor market dummies only allows for estimating separate intercepts for each labor market, while the stratified model estimates separate baseline hazards for each stratum in a fully flexible way.

individual-specific frailty term. Thus, standard errors of covariates at the regional level may be biased downward (Moulton, 1990).

4.3 Marginal effects on interregional mobility

When estimating an independent competing-risk hazard model with separate parameter vectors β_k, the parameter vector for the migration hazard β_d may not be interpreted as the qualitative effect of covariates on the migration probability. In particular, if the estimated effect of covariate x_i is negative for both h_d and h_l, the qualitative effect on the migration probability might even be positive. This is because the likelihood of exit via a specific type of exit depends on covariate estimates for all exit-specific risks (Lancaster, 1990; Thomas, 1996). In particular, the probability that an unemployed with characteristics x leaves unemployment for a job in a distant labor market, i.e. the migration probability is given by

$$\Pi_d(x) = \int_0^t h_d(t,x)S(t,x)dt$$

with $h_d(t,x)$ as the migration hazard and $S(t,x)$ as the overall survival function. Thus, the migration probability is also a function of the covariate parameter for the local job finding hazard. As a consequence, one possibility to interpret the effect of a covariate on the migration probability is to look at the marginal effect of a covariate on $\Pi_d(x)$:

$$\kappa_d = \frac{\partial \Pi_d(x)}{\partial x_i}$$

I simulate these marginal effects for both model specifications by calculating the difference between the probability $\Pi_d(\bar{x})$ for a reference worker[22] and the respective probability after varying the x_i of interest[23]. Due to the stratification technique in model specification A, I obtain separate simulated marginal effects for each local labor market region. In this case, I calculate the average marginal effect across all strata $\bar{\kappa}_d$ by averaging across all j labor market specific marginal effects κ_{d_j}[24].

One confusion in the competing-risk literature on interregional mobility is that the shape of the migration hazard is often interpreted as the probability of migration across search time.

[22]The reference worker always refers to an individuals with all dummy variables set to the reference category and all continuous varibales set to the average value (see table 2).

[23]For all continuous variables, I simulate the marginal effect of increasing x_i by a standard deviation.

[24]Alternatively, I estimated an unstratified Cox proportional hazards model in order to get a single marginal effect. I included dummies for labor market regions in order to capture location-specific fixed effects. However, the clustering test statistic proposed by Ridder and Tunali (1999) suggested that the stratified specification with fully flexible baseline hazards for each stratum is significantly better than the unstratified estimation including only proportional shift-factors for each labor market region. Therefore, I decided to average marginal effects across strata instead of reporting the marginal effects of the unstratified model.

However, the probability of exiting to a specific exit type in a competing-risk framework always depends on all exit-specific hazards. Thus, in order to interpret the relationship between mobility and search duration it is more informative to look at the probability of migration conditional on exiting at time t. This conditional probability $P_d(t)$ is a function of time t and may be written:

$$P_d(t,x) = \frac{h_d(t,x)}{h_d(t,x) + h_l(t,x)}.$$

For a given individual with characteristics x_i, the shape of this function gives us an idea about the relative importance of exiting to a distant compared to a local job. For the proportional hazards model the conditional migration probability for a reference worker is given by:

$$P_d(t) = \frac{h_{0d}(t)}{h_{0d}(t) + h_{0d}(t)}.$$

with $h_{0k}(t)$ being the baseline hazard for exit type k. Thus, the conditional migration probability only depends on the shape of both exit-specific baseline hazards.

5 Estimation Results

Table 4 and 5 contain estimation results for the local job finding and the migration hazard for males and females, respectively. Each table contains coefficient estimates from both models A and B. According to the clustering test statistic proposed by Ridder and Tunali (1999), the inclusion of labor-market specific strata in model A is highly significant. Thus, parameter estimates for the unstratified Cox regression contains an additional bias and are therefore not displayed. Also, since for the AFT log-logistic model unobserved heterogeneity across individuals is highly significant for both men and women, I only display results from the model with individual heterogeneity[25]. Note that the interpretation of the coefficients is reversed when comparing the results to model A, i.e. a positive (negative) coefficient decreases (increases) the hazard rate and thus lengthens (shortens) the unemployment duration. The third and sixth column shows the marginal effect on the likelihood of interregional mobility within two years of job search[26] corresponding to model A and B. Since the findings are quite robust across both specifications, I discuss findings based on model A if not stated otherwise.

[25]Estimation results for the AFT log-logistic model without individual heterogeneity and the unstratified Cox proportional hazards model may be obtained from the author upon request.

[26]This time restriction is necessary to make results between both models comparable because for the Cox model there is no possibility to predict the probabilities beyond the last exit time of an individual in the sample.

5.1 Mobility effects of individual-level covariates

Several individual-level characteristics seem to have a strong influence on mobility and thus deserve a brief discussion. In particular, formal education has a strong influence on both the local job finding and the migration hazard for both males and females. Having only a high-school degree compared to a vocational training significantly reduces both hazards and thus leads to longer unemployment durations. This is in line with findings from a single-risk specification of unemployment durations by Lüdemann et al. (2004). The competing-risk approach in this paper now allows for identifying the marginal effect of being low-skilled on the probability of finding employment in a distant labor market. As expected, we find that a low level of formal education decreases the likelihood of mobility for men (women) by 2 (3) percentage points while a higher education increases the likelihood of being mobile by 3.7 (2.5). Compared to the reference worker with a probability of being interregionally mobile of 12.8% (12.3%), higher education thus leads to a 28.9% (20.3%) increase in the probability of being mobile for men (women). Thus, as expected, education is an important mobility-enhancing factor.

According to single-risk specifications of unemployment durations with the same data set (see Lüdemann et al., 2004; Biewen and Wilke, 2004), higher previous wage income leads to shorter unemployment durations. The estimation results for the competing-risk model suggest that this effect is due to a higher migration hazard rather than due to a higher local job finding hazard of individuals in a higher wage quintile. The likelihood of leaving the local labor market region for a distant job even increases by 6.4 (5.8) percentage points for men (women) in the fifth wage quintile compared to a median wage earner. These effects even exceed the marginal effect of formal education. This is consistent with a previous study by Windzio (2004) who finds a significant effect of previous wage income on the hazard of being mobile between north and south Germany. He suggests that previous wage income proxies for financial resources that are necessary to bear mobility cost. On the other hand, the percentage of homeowners should be higher among well-earning individuals. Since home-ownership may be expected to lower mobility levels, the strong mobility-enhancing effect of previous wage income is somewhat surprising. Apparently, having the necessary financial resources for mobility dominates any other effects that are captured with previous wage income. While these resources make it possible to seek and accept employment elsewhere, this exit out of unemployment is not a feasible option for less well-earning individuals who instead face prolonged unemployment durations.

The previous job status has a strong effect on search outcomes. White-collar worker and former apprentices, for example, are significantly more mobile than skilled blue-collar workers (the reference category). Female apprentices, for example, are around 70% more likely to find employment in a distant labor market than someone who was previously working in a skilled

blue-collar job. This suggests that previous educational investments such as an apprenticeship, increase the willingness to move to another region in order to realize the returns to this investment.

Interestingly, previous unemployment periods reduce the probability of moving by -2.5 (-1.1) percentage points for men (women). This is mainly due to significant increases in the local job finding hazard. Apparently, previous unemployment helps in finding employment locally. This may be due to previous experiences with job placement agencies that tend to increase the efficiency of local job search.

Total previous unemployment duration significantly decreases both the local job finding and the migration hazard and thus leads to longer unemployment durations. This is in line with findings by Biewen and Wilke (2004) for a single-risk specification of unemployment durations using the same data set and suggests that the length of previous unemployment aggravates general job finding chances due to, for example, the depreciation of human capital. Moreover, an increase in total unemployment duration by one standard deviation, reduces the migration probability by 0.9 (1.5) percentage points for men (women). Prolonged periods of previous unemployment may have depleted financial resources that are necessary for interregional mobility. Moreover, having experienced previous unemployment suggests an increased likelihood of future unemployment. These expectations may deter someone from investing in mobility.

Having ever been recalled from the previous employer significantly reduces the probability of interregional mobility by 8.2 (6.5) percentage points for men (women). As expected, individuals who have experienced a recall lately, wait for another recall so that their search strategies tend to be concentrated on the local area.

To sum up, there are a number of individual characteristics that have a major influence on the likelihood of interregional mobility. Moreover, the findings are quite robust across both model specifications. Well earning, highly educated males and females who have never been unemployed nor recalled face the highest probability of being mobile. But how do local labor market conditions affect the search strategy of individuals with given characteristics?

5.2 Mobility effects of local labor market conditions

The major hypothesis to be tested in this paper is that individuals in local labor markets with unfavorable re-employment opportunities choose search strategies that favor migrating out of the region if the labor demand situation is more favorable in other regions. Indeed, the estimation results indicate that a higher relative uv-ratio leads to a significantly higher migration hazard (p-values < 0.01) and a significantly reduced local job finding hazard (p-values < 0.05) among men. Thus, better labor demand conditions elsewhere compared to the local area shift search effort towards other regions and consequently increases the probability of

interregional mobility among men by a marginal effect of 1.4. For women, an unfavorable labor demand situation compared to other regions also comes with higher mobility levels. However, regional labor demand conditions appear to be less important for women than for men with a marginal effect of 0.8 percentage points only. Moreover, this mobility effect is due to a significant negative effect on the local job finding hazard (p-value < 0.05) and not due to a significant positive effect on the migration hazard. Thus, for women the evidence is less clear-cut than for men. Still, we can conclude that contrary to the findings by Windzio (2004) regarding mobility between north and south Germany and in line with findings by Decressin (1994) on interregional migration flows in West Germany, men and to a lesser extent women in West Germany react to local labor demand conditions in the expected direction and adjust search strategies accordingly. These findings are robust across both specifications with the marginal effects for model B being +1.1 for men and +0.8 for women.

When controlling for relative labor demand conditions, a higher ratio between unemployed jobseekers and vacancies in the local area indicates deteriorating overall labor demand conditions. This should result in lower job finding hazards everywhere in the economy and thus leave the migration probability unaffected. As expected, an overall increase in the imbalance between jobseekers and vacancies at given relative conditions between local labor markets significantly decreases both the local job finding and the migration hazard for both sexes and thus prolongs unemployment durations. Regarding the effect on the migration probability, the marginal effect is negligible for men and negative (-1.0) for women. Apparently, unfavorable overall job finding conditions also discourage women to search for jobs in distant labor markets. One explanation might be that unemployed females who are married have less of an influence on the relocation decision of the household during times of unfavorable job finding chances that also aggravate a job change of the male breadwinner.

From a theoretical perspective, it has been argued that higher employment growth increases the local job finding hazard and results in search strategies that favor staying in the local labor market. Indeed, higher employment growth significantly increases the local job finding hazard, while there is a negative but insignificant effect on the migration hazard for both men and women. Thus the evidence in favor of a significant change in the allocation of search effort across regions is inconclusive. Instead, the marginal effect of -0.7 (-0.6) for men (women) of higher local employment growth on the probability of interregional mobility is mainly due to faster local job exits. Still, the findings do not contradict the notion that individuals react to local employment growth conditions in the expected way.

These estimation results partially resemble and partially contradict the findings by other studies that use a competing-risk approach for the analysis of interregional mobility of unemployed jobseekers. The US study by Yankow (2002), for example, also finds no conclusive evidence that local employment growth affects the allocation of search effort across regions. Higher

employment levels, on the other hand, significantly reduces the migration hazard. Yankow concludes that individuals in the US adapt search strategies to local labor market conditions. The findings in this paper confirm that West German jobseekers are also responsive to local labor market conditions. In particular, unfavorable local labor demand conditions relative to other regional labor markets have a significant and large impact on the probability of interregional mobility. This contradicts the study by Kettunen (2002) who does not find evidence that unemployed Finish jobseekers react to local labor demand conditions. However, he uses local labor demand as an indicator only and does not test the influence of relative labor demand conditions in the economy.

The second major hypothesis to be tested in this paper concerns the effect of the local accommodation of labor market programs on the migration hazard and the probability of being mobile across regions. The theoretical framework in section 2 suggests that the possibility of participating in such programs may lead to search strategies that favor entering such a program in order to avoid or postpone migration.

However, at least for men, an increase in the WCS accommodation ratio does not significantly affect the migration hazard but significantly increases the local job finding hazard only. As discussed in the data section, this latter effect is difficult to interpret since entering a local labor market program is indistinguishable from an exit into regular employment. Thus, the local job finding hazard is a mixture of the effect of local labor market programs on the search strategy and the program entering rate. Despite these difficulties, the insignificant effect on the migration hazard clearly suggests that there is no evidence in favor of a locking-in effect of active labor market policies for men[27].

Contrary to men, an increase in the WCS accommodation ratio significantly reduces the female local job finding hazard. One explanation for the difference between the female and male local-job finding hazard might be that participating in a labor market program is more attractive for women than for the male breadwinner. In this case, a high local accommodation with such programs should have a stronger positive effect on reservation wages for unemployed women than for unemployed men. However, interpreting the effect comes with the same difficulties than for men. More importantly, therefore, we find a negative effect of local work creation schemes on the female migration hazard. However, since this effect is significant at a 10% level for the stratified Cox model only, this should be considered as weak evidence in favor of a

[27]One might argue that the lack of any significant effect is due to an endogeneity issue that arises from the fact that the local accommodation of ALMP is negatively related to the value of local job search (e.g. lower local offer arrival rates). Not controlling for all relevant regional indicators that affect the local level of ALMP may then lead to an upward biased estimate for the effect of ALMP on the migration hazard. While I cannot rule out that this might pose a problem, I do think that the specification includes most of the relevant regional indicators such that this problem should not be of any serious concern. Also, lagging the WCS accommodation ratio mitigates a potential simultaneity issue that may also bias estimation results.

locking-in effect of active labor market policies for women.

Of course, these results do not contradict findings by Lindgren and Westerlund (2003) regarding a locking-in effect of actually participating in labor market programs. As I discussed in the data section, the structure of the IABESR only allows for testing whether local active labor market programs exert a significant influence on the search strategies of unemployed jobseekers prior to entering such programs. No convincing evidence in favor of such locking-in effects is found. This is in line with a study by Widerstedt (1998). Accordingly, an extensive local use of labor market programs does not exert any significant influence on individual migration decisions in Sweden.

Among the other regional control variables some deserve a short discussion. As expected, local labor turnover does not have a clear effect on the search strategy of either men or women. Apparently, the opposing effects of higher destruction rates and higher job-offer arrival rates on the allocation of search effort result in insignificant effects on the migration hazard. Labor turnover only significantly increases the local job finding hazard for women, thus resulting in marginally lower migration probabilities for women (-0.7).

In contrast, a high population-job density, clearly enhances mobility among both females and males. As discussed in section 3.2, a high number of residents per local job seems to necessitate a geographically broader job search strategy in order to generate job offers. Also, as expected, the share of unemployed who are male does not have any influence on search strategies of women. For men, however, regions with a high share of male unemployment seem to reflect regions with unfavorable local re-employment opportunities so that the local job finding hazard is significantly reduced. Interestingly, there is also a significant negative effect on the male migration hazard such that the marginal effect on the migration probability amounts to -1.9. This might be explained by the idea that regions with a high proportion of male unemployed tend to be regions with declining male-dominated industries. As a consequence, many displaced workers seek employment in industries that are also declining in other regions. Thus, the migration hazard in these regions may be particularly low.

Concerning the effect of the macroeconomic situation on the local job finding and the migration hazard, the results suggest that interregional migration is positively related to the business cycle, especially for men. This is consistent with previous evidence by Jackman and Savouri (1992) for the UK and Büttner (1999) for Germany.

In conclusion, interregional mobility seems to be mainly driven by individual level characteristics. However, individuals are also sensitive to local labor market conditions. In particular, individuals choose search strategies that favor migrating out of regions with a relatively unfavorable labor demand situation compared to other regions. Given the high level of unemployment among low-skilled individuals in Germany, the responsiveness of this group of jobseekers to local labor market conditions may be particularly important for the equilibrating role of migration.

Therefore, table 6 compares the marginal effects of labor market related covariates between a sub-sample of individuals with only a high-school degree and a sub-sample of individuals with a higher education.

First of all, note that for the reference low-skilled worker the probability of leaving the local labor market within two years in Model A (B) is only 10.3% (1.9%) compared to 24.9% (24.8%) for the high-skilled reference worker. Besides these large differences in the migration probability, there are also differences in the effects of labor market conditions. In particular, low-skilled individuals seem to choose search strategies that favor staying in regions with high employment growth. However, a relatively unfavorable local labor demand situation only insignificantly lowers the migration hazard. Thus, the marginal effect on the migration probability of +0.5 for model A is mainly due to a significantly lower local job finding hazard for low-skilled jobseekers. The corresponding effects on the local job finding and the migration hazard of high-skilled individuals are also insignificant but have the expected negative and positive signs such that the marginal effect is +1.8. Thus, model A gives weak evidence that low-skilled individuals are less responsive to relatively unfavorable local labor demand conditions than high-skilled unemployed. For model B, however, no clear differences between both samples are detectable. Still, the findings suggest a weak responsiveness of low-skilled individuals to relative labor demand conditions. Given the high unemployment levels and the low level of mobility among low-skilled as compared to high-skilled unemployed, this may be of some concern.

5.3 Mobility and unemployment duration

As discussed in the introduction to this paper, the likelihood of interregional mobility is unlikely to be constant across search time. Bailey (1991), for example, suggests that migration is a last resort after local job opportunities have been exhausted. Thus, mobility levels should increase with search time. As discussed in the section on marginal effects, the probability of leaving the local labor market area for a job in a distant region conditional on finding employment at time t is given by the conditional migration probability $P_d(t)$. Figure 1 shows the estimated hazard functions for the local job finding and the migration hazard as well as the smoothed conditional migration probability for a men with average characteristics for both model specifications[28].

First of all, note that the estimated local job finding hazard for the Cox model initially increases and declines afterwards, but that the migration hazard shows a second peak before declining again. Thus, the conditional migration probability is increasing with search time during the first two years of job search but declines afterwards. The falling shape of both hazard functions as well as of the conditional migration probability at high unemployment

[28]In this case, the baseline hazard estimates for the Cox model refer to an unstratified model with additional labor market dummies in order to obtain one single estimated baseline hazard instead of 180 separate baseline hazards for the stratified model.

durations may of course be due to unobserved individual heterogeneity which is not taken into account in the Cox model. As a consequence a pure sorting effect may result in a falling migration probability at higher unemployment durations since the sample may increasingly contain immobile individuals. Indeed, the figures for the log-logistic model with unobserved heterogeneity suggest that this sorting effect may be relevant. While both hazards initially rise and decline afterwards, the slope for the local job finding hazard is flatter than in the Cox model. More importantly, the migration hazard only slightly decreases after an initial rise and remains on a high level. As a consequence, the migration probability monotonously increases with search time. Put differently, a male jobseeker who finds employment only after a long unemployment duration is increasingly likely to do so in other regions. I consider this as strong evidence that migration is indeed some kind of last resort that becomes a more relevant option after a long duration of unsuccessful job search. Figure 2 confirms these findings for women. Again, the conditional migration probabilities for both models are increasing with search time.

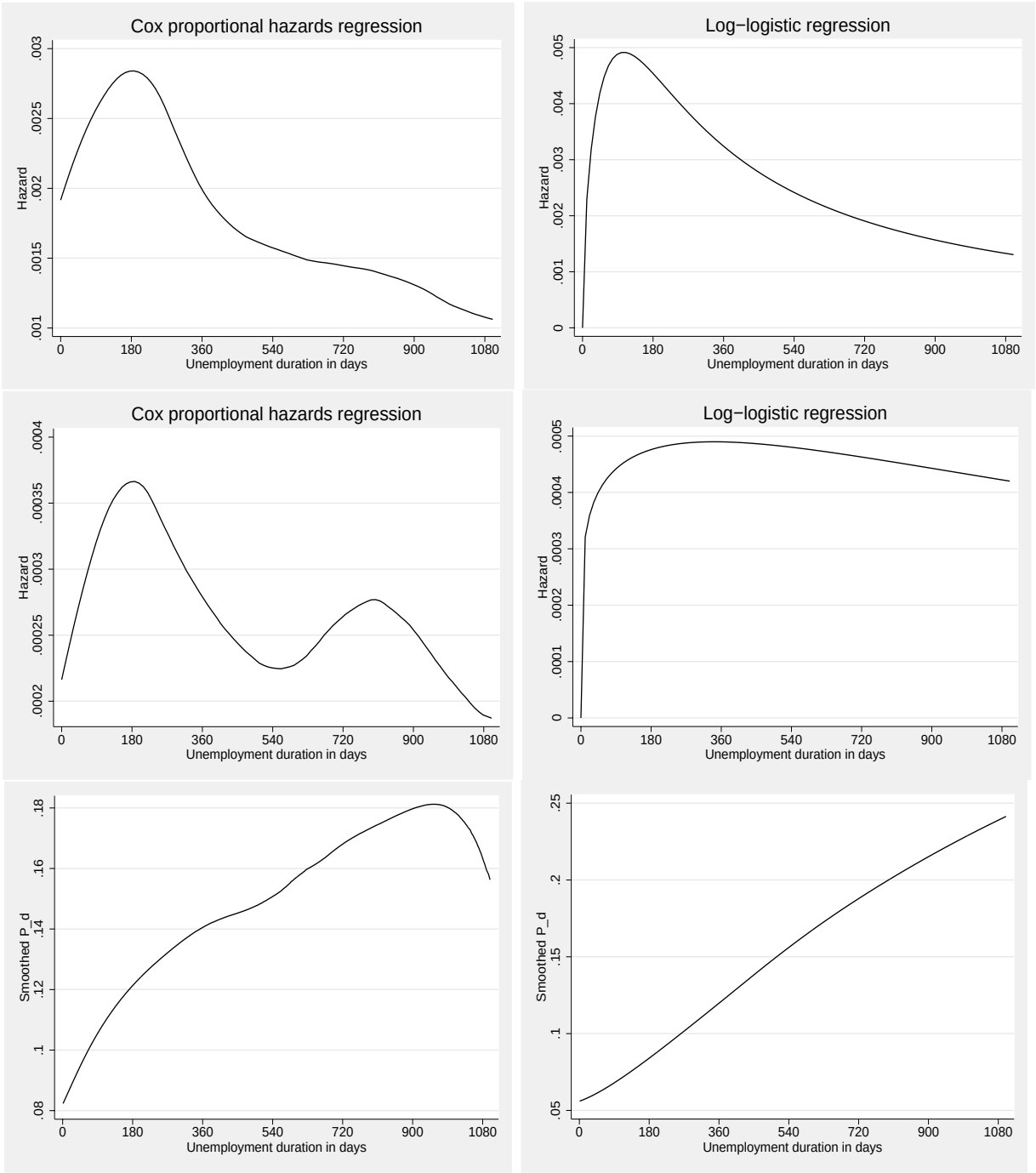

Figure 1: Local job finding hazard (top), migration hazard (center) and conditional migration probabilities (bottom) for men with average characteristics, Cox model (first column) and log-logistic model (second column), IABS 1982-1995

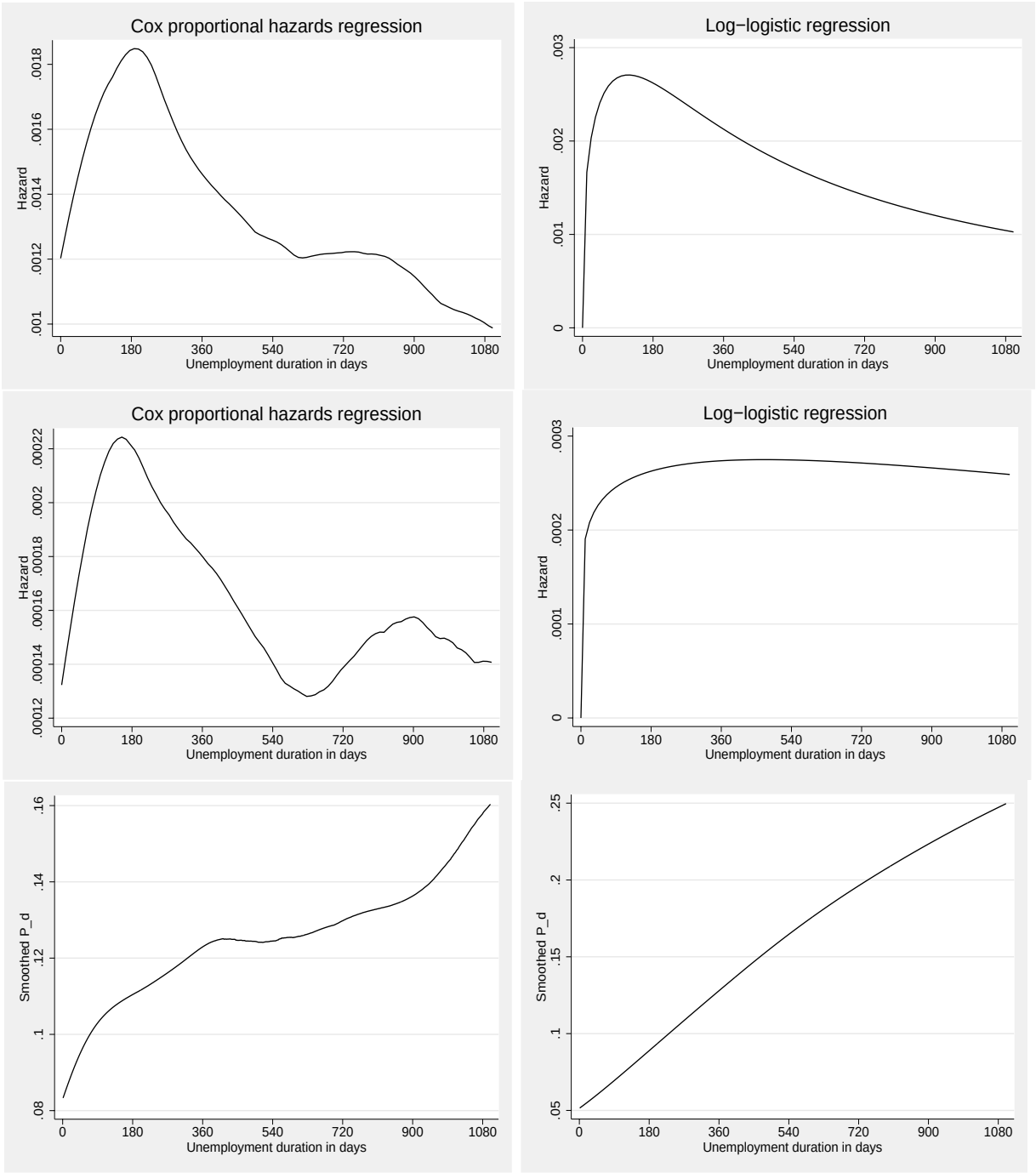

Figure 2: Local job finding hazard (top), migration hazard (center) and conditional migration probabilities (bottom) for a women with average characteristics, Cox model (first column) and log-logistic model (second column), IABS 1982-1995

6 Conclusion

This paper has looked at a competing-risk model of exiting unemployment to either a job in a local or a distant labor market area in order to test whether unemployed individuals in West Germany adjust their search strategy to favor migrating out of depressed regions. The equilibrating role of interregional migration critically hinges on such search strategies. In addition, this paper has also examined whether the local provision of labor market programs discourages migration by shifting search effort towards the local labor market area. Using both a stratified Cox model that takes into account location-specific fixed effects as well as a log-logistic accelerated failure time model that takes into account unobserved heterogeneity across individuals, the paper derives at the following conclusions:

- While local employment growth does not significantly affect the search strategy of unemployed jobseekers in West Germany, an unfavorable labor demand situation compared to other regions clearly shifts search effort towards other regions and increases the likelihood of mobility among the unemployed. This responsiveness is more pronounced for men and high-skilled individuals than for women and low-skilled individuals. Given the high level of unemployment among low-skilled individuals in Germany, the weak responsiveness of low-skilled individuals may be of some concern. In particular, due to low mobility levels among low-skilled individuals, this group is highly dependent on local labor market conditions. Deteriorating local conditions may then result in prolonged unemployment durations for low-skilled as compared to high-skilled individuals who are much more likely to leave the region. Recent labor market reforms demand unemployed individuals in Germany to accept job offers in distant labor market regions. Otherwise, transfer payments may be interrupted or even cut permanently. These measures might be justified in order to counteract an increase in long-term unemployment of low-skilled individuals who are stuck in a local labor market region with unfavorable employment prospects.

- There is no evidence in favor of a locking in effect of active labor market programs on the interregional mobility among male unemployed in West Germany. For female jobseekers, there is weak evidence in favor of a minor locking-in effect. Still, it seems safe to conclude that the extensive local use of ALMP does not significantly affect search strategies of unemployed individuals. Due to the structure of the data set used for the analysis this result only applies to individuals prior to entering a labor market program. Thus, there may well be locking-in effects on individuals who are actually participating in such programs. This necessitates further research.

- The marginal effects of individual-level characteristics on the migration probability clearly dominate any labor market related effects. In particular, higher formal education, a

previous white-collar job or apprenticeship as well as higher previous wage income strongly enhance interregional mobility among unemployed workers, while previous unemployment and a recall from the previous employer discourage interregional mobility.

- The likelihood that an unemployed individual is mobile across regions is found to increase with search time. This confirms the notion that migration is considered only after local job search turned out to be unsuccessful. This is also consistent with the finding by Möller (1995) that interregional migration in Germany is an important but slow adjustment mechanism after regional shocks.

Despite the robustness of estimation results across model specifications, there are a number of methodological and data caveat that point at some future research directions. First of all, instead of using a proportional hazards model that assumes covariates to shift the baseline hazard in a proportional manner, censored quantile regression may be an interesting alternative because it allows for detecting whether the effect of certain covariates on interregional mobility vary with search time. Secondly, future research should check whether relaxing the critical assumption of independent competing risks significantly alters estimation results. Clearly, not controlling for some relevant household-related characteristics suggests that this independence assumption may be questionable in this analysis. Thirdly, not having periods of registered unemployment but only using a proxy for unemployment periods may be problematic. Therefore, estimation results based on the IABESR should be compared to results based on registered unemployment data.

This paper also points at some future research directions regarding the migratory behavior of unemployed individuals. First of all, the focus of the analysis was on the effect of local employment opportunities on interregional mobility. This analysis should be extended to examine whether unemployed individuals in West Germany adjust their search strategy to regional wage differentials rather than to regional differentials in labor demand conditions. Moreover, apart from the relative unemployment-vacancy ratio, this paper only looked at the effect of push factors, i.e. conditions in the local labor market that encourage or discourage individuals to leave the area. Future research should also examine the effect of pull factors by explicitly looking at the destination choice of unemployed individuals who leave their local labor market for a distant job.

7 Appendix

Table 1: Description and data source of regional and aggregate variables[a]

Variables	Description	Data Source
Share of agriculture	Percentage share of employment in agriculture	IABS[b]
Share of inv. goods ind.	Percentage share of employment in the investment goods industry	IABS[b]
Share of cons. goods ind.	Percentage share of employment in the consumption goods industry	IABS[b]
Share of construction	Percentage share of employment in the construction sector	IABS[b]
Share of retail	Percentage share of employment in retail	IABS[b]
Share of other services	Percentage share of employment in other services	IABS[b]
Share of high-skilled employment	Percentage share of high-skilled individuals among all employees	IABS[b]
Population-job-density	Population[d] divided by total employment[c]	New Cronos[d], FLO[c]
Share of male unemp.[e]	Number of male unemployed divided by total unemployed $*100$	FLO[c]
U_l/V_l[e]	Ratio between unemployment jobseekers and vacancies in the local area	FLO[c]
$\frac{U_l/V_l}{U_d/V_d}$[e]	Local unemployment-vacancy ratio divided by unemployment-vacancy ratio in all other regions	FLO[c]
Employment growth	Yearly percentage change in the stock of employees	IABS[b]
Labor turnover	Hirings + separations during the year divided by the stock of employees in the same year $*100$	IABS[b]
WCS accommodation ratio[e]	Number of participants in work creation schemes divided by number of unemployed plus participants in WCS $*100$	FLO[c]
Aggregate hiring rate	Aggregate hirings during the year divided by the number of employed on Jan 1st of the year $*100$	IABS[b]

[a] All regional indicators have been aggregated to the level of labor market regions.

[b] Variables have been calculated on the basis of the IABESR.

[c] Data are coded at the level of federal labor office districts and are released by the federal labor office (FLO). Data have been merged using the merging schemes proposed by Arntz and Wilke (2005).

[d] New Cronos database is released by Eurostat.

[e] Variables with a 1 year lag.

Table 2: Descriptive statistics of variables included in the estimation, IABS 1982-1995, Males

			Spells ending ...			
	All Spells		in migration		locally	
Variables	Mean	St. Dev.	Mean	St. Dev.	Mean	St. Dev.
Married[1]	0.506	0.500	0.495	0.500	0.523	0.500
Age 26-29 [1]	0.355	0.478	0.324	0.468	0.366	0.482
Age 30-33[1,2]	0.208	0.406	0.221	0.415	0.207	0.405
Age 34-37[1]	0.222	0.415	0.232	0.422	0.218	0.413
Age 38-41[1]	0.216	0.411	0.223	0.416	0.209	0.407
Formal education						
High school degree[1]	0.291	0.454	0.207	0.405	0.293	0.455
Vocational training[1,2]	0.649	0.477	0.641	0.480	0.668	0.471
Higher education[1]	0.060	0.237	0.153	0.360	0.039	0.193
Wage quintile						
1st[1]	0.201	0.401	0.181	0.385	0.182	0.386
2nd[1]	0.342	0.474	0.293	0.455	0.351	0.477
3rd[1,2]	0.196	0.397	0.171	0.377	0.210	0.407
4th[1]	0.133	0.340	0.147	0.354	0.138	0.345
5th[1]	0.128	0.334	0.208	0.406	0.118	0.323
Previous job status						
Apprentice[1]	0.016	0.126	0.018	0.133	0.016	0.124
Unskilled blue-collar job[1]	0.367	0.482	0.273	0.446	0.373	0.484
Skilled blue-collar job[1,2]	0.431	0.495	0.335	0.472	0.474	0.499
White-collar job[1]	0.165	0.371	0.343	0.475	0.121	0.326
Part-time job[1]	0.021	0.144	0.031	0.172	0.017	0.129
Previous sector of activity						
Agriculture[1]	0.042	0.201	0.024	0.154	0.048	0.215
Investment goods ind.[1]	0.207	0.405	0.188	0.391	0.207	0.405
Consumption goods ind.[1]	0.088	0.284	0.083	0.275	0.085	0.280
Construction[1]	0.262	0.440	0.185	0.388	0.299	0.458
Retail[1,2]	0.175	0.380	0.201	0.401	0.166	0.372
Other services[1]	0.225	0.417	0.319	0.466	0.194	0.395
Tenure in previous job (mths)	19.11	28.44	16.73	23.57	18.62	28.03
Prev. unemployment spell[1]	0.716	0.451	0.607	0.488	0.751	0.432

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... table 2 continued

Tot. prev. unemp. dur. (mths)	11.69	15.74	8.973	14.24	12.23	15.49
Recall from prev. employer[1]	0.239	0.427	0.081	0.273	0.293	0.455
1983[1,2]	0.074	0.262	0.070	0.256	0.076	0.265
1984-1987[1]	0.306	0.461	0.286	0.452	0.325	0.468
1988-1991[1]	0.262	0.440	0.243	0.429	0.269	0.443
1992-1995[1]	0.358	0.479	0.401	0.490	0.330	0.470
Fourth quarter[1]	0.171	0.376	0.197	0.398	0.137	0.344
Sectoral composition						
Share of agriculture[4]	3.230	2.941	3.137	2.913	3.256	2.945
Share of inv. goods ind.[4]	24.98	8.439	25.01	8.483	24.97	8.451
Share of cons. goods ind.[4]	11.28	6.576	10.28	5.823	11.77	6.846
Share of construction[4]	7.975	2.239	7.663	1.947	8.132	2.326
Share of retail[4]	18.61	4.455	19.20	4.525	18.35	4.442
Share of other services[4]	33.92	7.175	34.71	7.024	33.52	7.169
Other regional characteristics						
Share of high-skilled emp.[4]	6.355	3.013	6.923	3.053	6.070	2.944
Population-job density[4]	3.015	0.993	3.011	0.998	3.027	0.994
Share of male unemployment[3,4]	55.01	5.522	54.48	5.145	55.11	5.687
Employment growth[4]	0.337	2.439	0.136	2.419	0.470	2.447
Labor turnover[4]	59.20	9.865	58.14	9.217	59.80	10.13
U_l/V_l[3,4]	16.58	13.14	15.44	12.41	17.02	13.43
$\frac{U_l/V_l}{U_d/V_d}$[3,4]	1.242	0.641	1.229	0.657	1.244	0.637
WCS accommodation ratio[3,4]	3.313	2.404	3.269	2.449	3.387	2.460
Aggregate indicators						
Aggregate hiring rate[4]	30.99	2.425	30.91	2.425	31.01	2.452
Number of spells	49617		4757		34907	

[1]Dummy Variable

[2]Reference category in the following estimation.

[3]Lagged variable (lag: 1 year)

[4]Time-varying variables: U_l/V_l, $\frac{U_l/V_l}{U_d/V_d}$ and WCS accommodation ratio on a quarterly basis, all others on a yearly basis.

Table 3: Descriptive statistics of variables, IABS 1982-1995, Females

			Spells ending ...			
	All Spells		in migration		locally	
Variables	Mean	St. Dev.	Mean	St. Dev.	Mean	St. Dev.
Married[1]	0.601	0.490	0.432	0.496	0.524	0.499
Age 26-29[1]	0.371	0.483	0.432	0.496	0.341	0.474
Age 30-33[1,2]	0.212	0.409	0.214	0.411	0.202	0.402
Age 34-37[1]	0.205	0.404	0.179	0.383	0.217	0.412
Age 38-41[1]	0.212	0.409	0.175	0.380	0.240	0.427
Formal education						
High school degree[1]	0.276	0.447	0.173	0.378	0.280	0.449
Vocational training[1,2]	0.644	0.644	0.672	0.470	0.647	0.478
Higher education[1]	0.080	0.271	0.155	0.362	0.074	0.262
Wage quintile						
1st[1]	0.594	0.491	0.412	0.492	0.569	0.495
2nd[1]	0.238	0.426	0.279	0.449	0.267	0.443
3rd[1,2]	0.078	0.268	0.118	0.323	0.082	0.275
4th[1]	0.047	0.213	0.099	0.298	0.046	0.210
5th[1]	0.043	0.203	0.092	0.290	0.036	0.185
Previous job status						
Apprentice[1]	0.026	0.160	0.039	0.193	0.031	0.173
Unskilled blue-collar job[1]	0.236	0.425	0.141	0.348	0.244	0.430
Skilled blue-collar job[1,2]	0.088	0.283	0.061	0.240	0.099	0.299
White-collar job[1]	0.458	0.498	0.613	0.487	0.430	0.495
Part-time job[1]	0.192	0.394	0.145	0.353	0.195	0.396
Previous sector of activity						
Agriculture[1]	0.013	0.113	0.009	0.097	0.016	0.124
Investment goods ind.[1]	0.134	0.340	0.100	0.301	0.117	0.321
Consumption goods ind.[1]	0.128	0.334	0.086	0.280	0.127	0.333
Construction[1]	0.019	0.135	0.014	0.119	0.022	0.146
Retail[1,2]	0.220	0.414	0.228	0.420	0.221	0.415
Other services[1]	0.486	0.500	0.562	0.496	0.497	0.500
Tenure in previous job (mths)	27.43	36.72	24.59	31.65	22.30	32.98
Prev. unemployment spell[1]	0.571	0.495	0.539	0.499	0.639	0.480

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... table 3 continued

Tot. prev. unemp. dur. (mths)	7.242	11.51	6.304	10.68	8.534	12.18
Recall from prev. employer[1]	0.193	0.395	0.087	0.281	0.215	0.411
1983[1,2]	0.067	0.250	0.059	0.236	0.056	0.231
1984-1987[1]	0.277	0.448	0.264	0.441	0.254	0.435
1988-1991[1]	0.292	0.455	0.297	0.457	0.303	0.459
1992-1995[1]	0.363	0.481	0.380	0.485	0.387	0.487
Fourth quarter[1]	0.231	0.421	0.225	0.418	0.210	0.407
Sectoral composition						
Share of agriculture[4]	3.061	2.760	2.821	2.436	2.961	2.578
Share of inv. goods ind.[4]	25.21	8.580	24.73	8.052	24.93	8.403
Share of cons. goods ind.[4]	10.67	6.066	9.996	5.665	10.82	6.145
Share of construction[4]	7.674	1.972	7.462	1.802	7.737	2.006
Share of retail[4]	18.89	4.421	19.33	4.446	18.89	4.412
Share of other services[4]	34.49	7.120	35.67	7.132	34.66	7.095
Other regional characteristics						
Share of high-skilled emp.[4]	6.682	2.954	7.279	3.118	6.653	2.934
Population-job density[4]	2.981	0.979	2.933	0.986	2.966	0.970
Share of male unemployment[3,4]	54.17	5.281	54.26	4.885	54.19	5.367
Employment growth[4]	0.351	2.409	0.261	2.386	0.383	2.415
Labor turnover[4]	58.71	9.437	58.63	8.818	59.46	9.664
U_l/V_l[3,4]	15.44	12.50	14.27	11.52	14.49	11.78
$\frac{U_l/V_l}{U_d/V_d}$[3,4]	1.222	0.660	1.182	0.657	1.196	0.660
WCS accommodation ratio[3,4]	3.310	2.328	3.137	2.225	3.317	2.331
Aggregate indicators						
Aggregate hiring rate[4]	31.17	2.548	31.13	2.590	31.20	2.596
Number of spells	30743		2229		16172	

[1]Dummy Variable

[2]Reference category in the following estimation.

[3]Lagged variable (lag: 1 year)

[4]Time-varying variables: U_l/V_l, $\frac{U_l/V_l}{U_d/V_d}$ and WCS accommodation ratio on a quarterly basis, all others on a yearly basis.

Table 4: Estimation results for the local job finding hazard (h_l) and the migration hazard (h_d) including marginal effects on the migration probability (κ_d), IABS 1982-1995, Males

	Model A			Model B		
Variables	$\hat{\beta}_l$	$\hat{\beta}_d$	$\hat{\kappa}_d$	$\hat{\beta}_l$	$\hat{\beta}_d$	$\hat{\kappa}_d$
$\bar{\Pi}_d$ for reference worker			12.8%			7.7%
Married	0.179**	0.138**	-0.2	-0.185**	-0.179**	0.3
Age 26-29 years	0.047**	0.003	-0.4	-0.067**	-0.006	-0.3
Age 34-37 years	-0.032†	-0.058	-0.4	0.035†	0.058	-0.2
Age 38-41 years	-0.083**	-0.106*	-0.4	0.081**	0.080	-0.1
High school degree	-0.114**	-0.280**	-2.0	0.130**	0.308**	-1.5
Higher education	-0.270**	0.152†	3.7	0.285**	-0.239**	3.4
1st wage quintile	-0.292**	-0.259**	-0.3	0.288**	0.228**	-0.1
2nd wage quintile	-0.104**	-0.169**	-0.9	0.077**	0.172**	-0.8
4th wage quintile	0.006	0.185**	2.3	0.032	-0.172**	1.7
5th wage quintile	-0.007	0.456**	6.4	0.068**	-0.415**	4.3
Apprentice	-0.084†	0.099	2.2	0.139*	-0.238†	2.8
Unskilled job	-0.097**	-0.146**	-0.7	0.082**	0.128**	-0.5
White collar job	-0.426**	0.250**	8.0	0.436**	-0.245**	5.2
Part-time job	-0.235**	0.159*	4.9	0.267**	-0.048	2.5
Prev. job in agriculture	0.204**	-0.104	-3.0	-0.164**	0.152	-1.9
Prev. job in inv. goods ind.	-0.073**	-0.213**	-1.6	0.055*	0.197**	-1.1
Prev. job in cons. goods ind.	-0.146**	-0.177**	-0.7	0.103**	0.171*	-0.7
Prev. job in construction	0.091**	-0.017	-1.1	-0.051*	0.029	-0.5
Prev. job in services	-0.088**	-0.011	0.7	0.063**	0.011	0.3
Tenure in previous job	-0.002**	-0.011**	-3.0	0.002**	0.012**	-2.2
Total unemp. duration	-0.007**	-0.011**	-0.9	0.008**	0.011**	-0.5
Recall from prev. employer	0.379**	-0.744**	-8.2	-0.178**	0.667**	-4.4
Prev. unemployment spell	0.211**	-0.072†	-2.5	-0.122**	0.177**	-1.9

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... table 4 continued

	Model A			Model B		
Fourth quarter	-0.597**	-0.312**	1.4	0.582**	0.310**	0.9
Share of Agriculture	0.034**	0.013	-0.5	-0.025*	-0.023	0.1
Share of Inv. goods ind.	0.004	-0.015	-1.8	0.002	0.015	-0.8
Share of Cons. goods ind.	0.009	-0.047*	-3.6	0.006	0.063**	-2.5
Share of Construction	0.039**	0.013	-0.5	-0.024*	-0.019	0.0
Share of Services	0.013	-0.020	-2.4	-0.002	0.028	-1.5
Share of high-skilled emp.	-0.013	-0.009	0.0	0.012	0.029	-0.5
Population-job-density	0.024	0.085*	0.8	-0.013	-0.087	0.6
Share of male unemployment	-0.016**	-0.045**	-1.9	0.028**	0.046**	-1.0
Employment growth	0.021**	-0.005	-0.7	-0.022**	0.009	-0.5
Labor turnover	0.001	-0.005	-0.7	-0.000	0.003	-0.2
U_l/V_l	-0.005**	-0.003	0.2	0.004**	0.003	0.0
$\frac{U_l/V_l}{U_d/V_d}$	-0.057*	0.129**	1.4	0.093**	-0.128*	1.1
WCS accommodation ratio	0.012*	0.006	-0.1	-0.017**	-0.014	0.0
Aggregate hiring rate	0.014**	0.043**	0.9	-0.011**	-0.050**	0.8
Time period dummies	X	X		X	X	
180 LMR dummies				X	X	
Constant				4.736**	7.357**	
γ				0.660	0.857	
θ				0.387	1.800	
P-value of H_0: No unobs. het.				0.000	0.000	
Number of strata (LMR)	180	180				
$\chi^2(df)$ clustering test	296.1(41)	75.9(41)				
Number of spells	49617	49617		49617	49617	
Number of exits	34907	4757		34907	4757	
Log-likelihood	-174295.5	-23138.4		-66956.5	-17190.5	
$\chi^2(df)$	4368.8(41)	2215.6(41)		50706(216)	1729.2(216)	

Significance levels : † : 10% ∗ : 5% ∗∗ : 1%

Table 5: Estimation results for the local job finding hazard (h_l) and the migration hazard (h_d) including marginal effects on the migration probability (κ_d), IABS 1982-1995, Females

	Model A			Model B		
Variables	$\hat{\beta}_l$	$\hat{\beta}_d$	$\hat{\kappa}_d$	$\hat{\beta}_l$	$\hat{\beta}_d$	$\hat{\kappa}_d$
$\bar{\Pi}_d$ for reference worker			12.3%			7.7%
Married	-0.240**	-0.363**	-2.0	0.383**	0.405**	-1.0
Age 26-29 years	0.011	0.241**	2.8	-0.040	-0.292**	2.2
Age 34-37 years	0.119**	-0.133	-2.3	-0.164**	0.153*	-1.8
Age 38-41 years	0.229**	-0.126†	-3.0	-0.311**	0.071	-1.9
High school degree	-0.146**	-0.398**	-3.0	0.189**	0.429**	-2.0
Higher education	-0.207**	0.079	2.5	0.225**	-0.155†	2.5
1st wage quintile	-0.252**	-0.660**	-4.4	0.301**	0.693**	-2.9
2nd wage quintile	0.016	-0.148†	-1.6	-0.024	0.072	-0.6
4th wage quintile	-0.046	0.257**	3.4	0.067	-0.226*	2.1
5th wage quintile	-0.126*	0.375**	5.8	0.154*	-0.337**	3.6
Apprentice	0.131*	0.698**	9.0	-0.199**	-0.867**	6.9
Unskilled job	-0.115*	-0.026	0.7	0.094*	-0.002	0.5
White collar job	-0.245**	0.245*	5.7	0.243**	-0.302**	4.4
Part-time job	-0.074†	0.210†	3.4	0.021	-0.263*	2.3
Prev. job in agriculture	0.295**	0.115	-1.3	-0.235**	-0.222	0.3
Prev. job in inv. goods ind.	-0.306**	-0.352**	-1.5	0.402**	0.349**	-0.5
Prev. job in cons. goods ind.	-0.106**	-0.232**	-1.7	0.119**	0.203*	-0.8
Prev. job in construction	0.059	-0.357†	-3.8	-0.052	0.487*	-3.0
Prev. job in services	-0.034	-0.012	0.1	0.083**	-0.017	0.6
Tenure in previous job	-0.006**	-0.006**	-0.7	0.007**	0.007**	-0.4
Total unemp. duration	-0.004**	-0.013**	-1.5	0.003**	0.013**	-1.0
Recall from prev. employer	0.188**	-0.663**	-6.5	-0.070**	0.659**	-4.0
Prev. unemployment spell	0.277**	0.106†	-1.1	-0.201**	-0.039	-0.8

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... table 5 continued

	Model A			Model B		
Fourth quarter	-0.245**	-0.138*	0.3	0.259**	0.112*	0.5
Share of Agriculture	-0.001	-0.090	-2.5	-0.010	0.001	0.2
Share of Inv. goods ind.	0.007	-0.025	-2.5	0.009	0.027	-1.2
Share of Cons. goods ind.	0.007	-0.026	-2.0	-0.010	0.042	-2.1
Share of Construction	0.001	0.012	0.3	-0.007	-0.040	0.6
Share of Services	-0.003	-0.019	-1.3	0.007	0.009	0.8
Share of high-skilled emp.	0.031†	0.038	0.5	-0.024	-0.029	0.2
Population - job density	0.010	0.113*	1.2	0.008	-0.132†	1.0
Share of male unemployment	0.000	-0.005	-0.3	0.000	0.009	-0.4
Employment growth	0.014**	-0.011	-0.6	-0.015*	0.009	-0.4
Labor turnover	0.011**	0.001	-0.7	-0.012**	-0.004	-0.3
U/V	-0.005**	-0.011*	-1.0	0.005**	0.010*	-0.6
$\frac{U_l/V_l}{U_d/V_d}$	-0.080*	0.044	0.8	0.098**	-0.078	0.8
WCS accommodation ratio	-0.018**	-0.044†	-0.8	0.019*	0.031	-0.3
Aggregate hiring rate	0.014†	0.028	0.5	-0.014†	-0.032†	0.4
Time period dummies	X	X		X	X	
180 LMR dummies				X	X	
Constant				4.805**	7.492**	
γ				0.760	0.884	
θ				0.459	2.130	
P-value of H_0: No unobs. het.				0.000	0.000	
Number of strata (LMR)	180	180				
$\chi^2(df)$ clustering test	155.5(41)	62.1(41)				
Number of spells	30743	30743		30743	30743	
Number of exits	16172	2229		16172	2229	
Log-likelihood	-75701.5	-10275.8		-37201.0	-8833.9	
$\chi^2(df)$	2357.3(41)	1679.2(41)		-3037.8(212)	1277.1(212)	

Significance levels : † : 10% * : 5% ** : 1%

Table 6: Estimation results[a] and marginal effects[b] on the probability of leaving the local area for a distant job within two years of unemployed job search by education, IABS 1982-1995

	Low-skilled[c]				High-skilled[c]			
	Model A			Model B	Model A			Model B
Variables	h_l	h_d	$\bar{\kappa}_d$	$\bar{\kappa}_d$	h_l	h_d	$\bar{\kappa}_d$	$\bar{\kappa}_d$
$\bar{\Pi}_d$ for reference worker[b]			10.3%	1.9%			24.9%	24.8%
Population - job density	-0.042†	-0.071	-0.3	-0.1	0.100*	0.160	2.6	1.3
Share of male unemployment	-0.007†	-0.034**	-1.5	-0.2	0.005	-0.024†	-2.9	-3.9
Employment growth	0.028**	-0.037†	-1.3	-0.3	0.004	0.025	1.2	1.7
Labor turnover	0.004†	0.004	0.1	0.2	0.002	-0.009	-2.0	-1.3
U/V	-0.004*	0.000	0.4	0.0	-0.009**	-0.002	0.6	2.1
$\frac{U_l/V_l}{U_d/V_d}$	-0.110**	-0.012	0.5	0.2	-0.023	0.121	1.8	0.7
WCS accommodation ratio	0.006	0.035	0.7	0.3	-0.018	-0.023	-0.8	-1.4
Aggregate hiring rate	0.010	0.048*	1.0	0.3	0.033†	0.067*	2.8	2.4
Number of spells	22916	22916			5423	5423		
Number of exits	14767	1370			2551	1071		
Log-likelihood for h_l	-62926.5	-5632.1			-8547.02	-3303.0		
$\chi^2(df)$	2288.7(40)	707.1(40)			616.1(40)	524.5(40)		

Significance levels : $\dagger$: 10% $*$: 5% $**$: 1%

[a] Full estimation results may be obtained from the author upon request.

[b] Marginal effects are displayed in percentage points.

[c] Sub-samples are restricted to low-skilled individuals with only a high-school degree or to high-skilled individuals with a higher education. Except for the education variable, the reference worker refers to a worker with all dummy variables set to the reference category and all continuous variables set to the average value (see table 3 and 2).

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