Occupational and regional mobility as substitutes

A new approach to understanding job changes and wage inequality

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Contents

Abstract

Job mobility offers opportunities for workers to obtain wage increases, but returns to job changes differ considerably. We argue that parts of this inequality result from a trade-off between occupational and regional mobility. Both mobility types offer alternative strategies to improve one's labor market position; however, they each contain unique restrictions. High costs for regional mobility can thus evoke occupation changes, even though the resulting human capital devaluation leads to lower wage increases. We use linked retrospective life-course data for Germany (ALWA-ADIAB) and apply competing risks models to show that restrictions on one type of mobility drive individuals toward the other. Using fixed-effects regressions, we show that occupational mobility leads to lower wage increases compared to regional mobility. We conclude that the trade-off between occupational and regional mobility explains part of the differential returns to job mobility and contributes to wage inequality. We expect these mechanisms to become more pronounced in the future as technological and institutional changes alter job requirements and thereby mobility incentives.

Zusammenfassung

Arbeitsplatzmobilität bietet Arbeitnehmern die Möglichkeit höhere Löhne zu erzielen, doch die Höhe der Lohnzuwächse variiert erheblich. Wir argumentieren, dass Teile dieser Ungleichheit aus einem Trade-Off zwischen beruflicher und regionaler Mobilität resultieren. Beide Mobilitätsarten stellen alternative Strategien dar, um die Arbeitsmarktposition zu verbessern. Sie sind aber an spezifische Restriktionen gebunden. Hohe Kosten für regionale Mobilität können deshalb zu beruflicher Mobilität führen, auch wenn die Abschreibung von beruflichem Humankapital niedrigere Lohnanstiege hervorruft. Wir greifen auf verknüpfte retrospektive Lebensverlaufsdaten für Deutschland zurück (ALWA-ADIAB) und benutzen Competing-Risk Regressionen um zu zeigen, dass Restriktionen für eine Mobilitätsart dazu führen, dass Individuen eher die andere Mobilitätsform wählen. Mithilfe von Fixed-Effects-Regressio-nen zeigen wir, dass berufliche Mobilität – verglichen mit regionaler Mobilität – zu niedrigeren Lohnanstiegen führt. Aus den Ergebnissen schlussfolgern wir, dass der Trade-Off zwischen beruflicher und regionaler Mobilität Teile der ungleichen Lohnerträge durch Arbeitsplatzmobilität erklärt und zur Lohnungleichheit beiträgt. Wir erwarten, dass diese Mechanismen zukünftig weiter an Relevanz gewinnen, da technologischer und institutioneller Wandel berufliche Anforderungen verändert und somit Mobilitätsanreize setzt.

1 Introduction

Job mobility is a major source of wage inequality in modern labor markets. Individuals typically change jobs either to improve employment matches – which frequently leads to higher wages (Jovanovic 1979; Sørensen and Sorenson 2007) – or to retain their employment status and avoid unemployment. However, because not all employees are equally mobile and returns to job mobility differ, workers' wages typically diverge over the life course (Abbott and Beach 1994; Fuller 2008; Keith and McWilliams 1995, 1997; Mouw and Kalleberg 2010b; Ruhm 1987; Topel and Ward 1992). Influences on and consequences of job mobility are thus major contributors to social stratification.

We argue that the returns to job mobility are affected by a trade-off between occupational and regional mobility. When there are few alternative local employers hiring in an employee's current occupation, changing the occupation and changing the region are two strategies that offer pathways to other potential vacancies. However, both mobility types are connected to unique sets of constraints. With high cost associated with occupational mobility, regional mobility within the same occupation will become more attractive. In contrast, when the costs of regional mobility are high, changing one's occupation locally will appear more attractive. Because occupational changes typically involve a devaluation of human capital, substituting occupational for regional mobility, however, should lead to lower wage increases and thus contribute to wage inequality (Kambourov and Manovskii 2009b).

In this paper, we argue that occupational mobility and regional mobility are substitutes for one another and that this trade-off explains part of the differential returns to job mobility. We use retrospective survey data for Germany linked to administrative data from the Federal Employment Agency (ALWA-ADIAB). Employing Fine and Gray models for competing risks, we demonstrate this mobility trade-off by showing how the costs associated with either regional or occupational mobility influence both mobility types simultaneously. We can thus explain effects that appear paradoxical when considering these two mobility options independently; for instance, we find that parents with school-aged children have a higher probability of local occupation changes or that occupation-specific human capital promotes regional mobility. Using fixed effects regression, we are then able to estimate the wage effects of occupational and regional mobility to elucidate how this trade-off contributes to differential returns to job mobility. Intra-occupation regional mobility indeed yields higher wage increases compared to local occupational mobility.

Our analysis contributes to our understanding of the influences on and consequences of job mobility (Blau and Duncan 1967; Fuller 2008; Mouw and Kalleberg 2010b). In addition, we link our study to research that identifies occupations as a major source of stratification as we find occupational characteristics to influence mobility and thus to contribute to wage inequality (Bol and Weeden 2014; Ganzeboom and Treiman 1996; Hatt 1950; Kambourov and Manovskii 2009a; Mouw and Kalleberg 2010a; Weeden 2002; Williams 2012). We expect these mechanisms to become

more pronounced in the future as technological and institutional change alters job requirements, creates mismatches and thus increases incentives to become regionally mobile (Acemoglu and Autor 2011; Autor 2013; Fernandez-Macias 2012; Fernandez 2001; Oesch and Rodriguez Menes 2010; Wright and Dwyer 2003).

2 Theoretical Background

2.1 Job mobility and wage inequality

Prior research has consistently argued that job mobility is an important driver of wage inequality (Blau and Duncan 1967; Fuller 2008; Mouw and Kalleberg 2010b). In the labor market, increased skill requirements, overqualification, technological and institutional change and/or actors' incomplete information can lead to suboptimal employer-employee matches (Kalleberg 2008; Mortensen 1988; Vaisey 2006). As a consequence, productivity falls short, employment relationships become insecure and wage growth is lowered (Jovanovic 1979). Therefore, it can be assumed that employees continuously search for better jobs and attempt to leave inferior employment contracts (Burdett 1978; Sørensen and Kalleberg 1981). Accordingly, job mobility increases an employee's chances in the labor market with respect to income, career, and status (Bartel 1979, 1982; Bowles 1970; Brett and Reilly 1988; Keith and McWilliams 1995, 1997, 1999; le Grand and Thålin 2002). Empirically, however, we observe that not all employees are equally likely to change jobs and that not everyone profits to the same degree from job changes. Career status, schooling or gender influence the probability of job mobility (Keith and McWilliams 1999; Royalty 1998; Topel and Ward 1992). Returns to job mobility differ according to the type, timing and reason of mobility as well as labor-force attachment or the position from which workers are searching (Abbott and Beach 1994; Fuller 2008; Keith and McWilliams 1995, 1997; Ruhm 1987; Topel and Ward 1992). Analyzing the influences on and consequences of job mobility thus helps illuminate the emergence of social inequality.

2.2 Occupational and regional mobility as substitutes

We argue that the returns to job mobility are affected by a trade-off between occupational and regional mobility. Notably, occupational and regional mobility frequently remain disconnected in the literature, which is surprising if we consider that the two are in many cases flip sides of the same coin. Employees who seek to improve their labor market positions or avoid unemployment prefer to do so without any mobility costs and attempt to find better jobs within their local regions and existing occupations. However, there are often insufficient local vacancies, posing occupational and regional mobility as alternative strategies to achieve better matches. Employees can either change their occupation and stay within their current region or relocate or commute long-distances to find a job in their existing occupation.

Without considering any mobility costs, employees should thus prefer one or the other strategy. From previous research, however, we know that there are numerous restrictions on both regional and occupational mobility and that mobility will only oc-

cur if the benefits exceed the costs, assuming rationally calculating actors (Bowles 1970; Hunt and Kau 1985; Sjaastad 1962; Yankow 2003). A mixed strategy in which employees change both their occupation and region is thus rather unlikely because they would accept two sets of cost factors. Regional preferences, tied moves or the concentration of high paying jobs in specific regions may evoke regional and occupation changes in rare cases. In most cases, however, only one type of mobility should be chosen as an alternative to local intra-occupation changes. With increasing restrictions to one type of mobility, we thus expect that employees will resort to the other type of mobility as a substitute.

With respect to regional mobility, costs are typically related to relocating one's household, commuting, selling or buying a house and/or the loss of social contacts and familiar places. In general, these can be viewed as investments of location-specific capital and regional ties that are lost with migration (Abraham and Nisic 2007; DaVanzo 1983). Numerous studies reveal that these costs – and the ability to bear them – vary across individuals and depend on their characteristics. Key determinants influencing the likelihood of regional mobility include an employee's qualifications, race, personal attitudes, age, gender, spouses' attitudes, parental status, and social roles (Abraham et al 2010; Bartel 1979; Brett et al 1993; Eby and Russell 2000; Gould and Penley 1985; Hardill 2002; Landau et al 1992; Rogers 1988; South and Deane 1993). We focus on strong restrictions to regional mobility that either strengthen local ties though time spent in a location or through the household composition. The time spent in a location will foster local networks. A partner or school-age children in the household will themselves have local ties that would be lost in case of relocation. Moreover, commuting will reduce the time that can be spent at home and thus as well impose costs. We therefore expect that

> *[H1-H3] having a partner in the household, school age children in the household or an increased residence duration each lead to a lower probability for regional mobility and a higher likelihood of occupation changes within the same region.*

The costs of occupational mobility – not necessarily upward or downward mobility but mere changes to other occupations – are typically connected to the characteristics of occupations themselves. Because human capital is mostly occupation- and/or industry-specific (Kambourov and Manovskii 2008, 2009b), devaluation is particularly high if such capital is accumulated through time spent in a particular job or a specific industry. Moreover, occupations can be understood as institutions that consist of rules that link the education system with the labor market (Abraham et al 2015), facilitating changes within the same occupation and exacerbating changes between them. Before entering the labor market, people acquire defined sets of skills and competences, e.g., through vocational training, academic studies, or internships. These skill sets are frequently mirrored in jobs that require specific sets of competences. The level of skill demands thus captures the part of occupation-specific hu-

man capital that is not covered by the time spent in an occupation and introduces a secondary cost factor for occupational mobility.

Further, some occupations are closed to a certain degree, and entry into these jobs is restricted to employees with defined credentials. Closure is based on the capability of social groups to organize themselves along occupational lines and to establish and defend socially accepted – institutionalized – boundaries. Such institutionalized boundaries increase the opportunities for hoarding benefits such as social status, prestige, employment security and (in particular) wage by forming effective monopolies for occupations. As research has shown, employees in these occupations are indeed able to realize higher rents (Abraham et al 2015; Bol and Weeden 2014; Granovetter and Tilly 1988; Weeden 2002), making it less attractive to abandon these occupations. Accordingly, matching in closed systems yields higher reward attainment (Eliason 1995). Moreover, entering closed occupations generally requires greater investments that are forfeited in case that an employee leaves the occupation. We thus expect that

> *[H4-H6] more occupation-specific human capital, higher skill demands and stronger occupational closure each lead to a lower probability for occupational mobility and a higher likelihood of regional changes within the occupation.*

2.3 Differential returns to occupational and regional mobility

We have argued that occupational and regional mobility should serve as substitutes for workers trying to improve their labor market position or to avoid unemployment. We thus expect both mobility options to on average provide wage increases. Indeed, both regional and occupational mobility can improve matching and yield benefits compared to immobility (Aldashev 2012; Fitzenberger and Kunze 2005; Hunt and Kau 1985; Longhi and Brynin 2010; Longhi and Taylor 2013; Yankow 2003). However, we expect occupational mobility to lead to lower wage increases compared to regional mobility and thus to contribute to differential returns to job mobility.

Regional mobility provides access to a larger pool of potentially lucrative vacancies. Accordingly, Manning (2003) states that commutes and wages are positively correlated, because job opportunities in thin labor markets only arrive occasionally and workers can potentially achieve higher wages at greater geographical distance. Occupational mobility on the other hand provides access to a larger pool of vacancies that may or may not improve the match quality: Since human capital is mostly occupation- or industry-specific, a change in the occupation is typically connected to a devaluation of human capital (Kambourov and Manovskii 2008, 2009b). However, wage improvements may still be achieved, because all occupational skill bundles comprise a share of general human capital and devaluation is thus only partial. Moreover, technical changes and/or increasing demand for a product or service may lead to higher productivity in another occupation. Compared to regional mobility, however, occupation changes should on average lead to lower returns. We thus expect that

[H7] inter-regional changes within the same occupation lead to higher wage increases compared to local occupation changes.

We focus on Germany, a country in which vocational training is highly standardized and vocational credentials play a crucial role in hiring (Manzoni et al 2014). We thus expect a strong effect due to occupation changes. However, studies on closure and occupation-specific human capital show that occupation changes as well lead to wage penalties in other institutionalized contexts, indicating that the mechanism can be assumed general (Kambourov and Manovskii 2009a; Weeden 2002).

3   Data

We draw on multiple data sources that in combination build the basis for our analysis of the effects on regional and occupational mobility and the consequences for individual wage levels. The retrospective survey "Working and Learning in a Changing World" (ALWA) (Antoni et al 2010), retrievable from the Institute of Employment Research (IAB), can be linked to administrative data from the Federal Employment Agency and serves as the primary data set.[1] The so-called ALWA-ADIAB is a combination of complete life-course data and administrative data at the person and firm levels (Antoni et al 2011; Antoni and Seth 2012). The survey was conducted in 2007/2008 and includes 10,177 retrospective computer-assisted telephone interviews (CATI). It used a combination of modularized self-reports and event history calendars (EHC), improving completeness and dating accuracy (Drasch and Matthes 2013). The data encompass monthly residential, education, employment and partnership histories in Germany (Antoni et al 2011). The sample is representative of Germany and covers people who were born between 1956 and 1988 (Kleinert et al 2011). The administrative part of the data dates back to 1975 for West Germany and to 1993 for East Germany.

Moreover, we link the ALWA-ADIAB to regional unemployment rates that are provided by the German Federal Employment Agency (BA). A third data source is the IAB employment history (BeH), which we use to calculate information on regional clustering of certain occupations. We use a ten percent sample of all employees who were subject to social security contributions in 2012. We employ a cross-section of the BeH, because 2012 is the first year to incorporate valid measures for the 2010 classification of occupations (KldB2010), which we use in ALWA.

We restrict our analysis to the time span from January 1993 through the interview dates in 2007/08 because previous administrative data are not available for East Germany. As a side effect, restricting the time span should reduce the remaining errors caused by imprecise recollection. Moreover, we exclude left censored episodes that begin before January 1993. Because we draw on the wage information

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[1]   Access to the dataset is provided via the Research Data Center (FDZ) of German Federal Employment Agency at the IAB and is given through on-site-use and subsequent remote data access. See http://fdz.iab.de/en.aspx for more information.

from the administrative part of ALWA-ADIAB, we consider only employment relationships that are subject to social security contributions and thus exclude the self-employed, public officials and the marginally employed.

3.1 Variables

Dependent Variables. The dependent variables for the analysis of the effects on mobility are subhazards for job transitions, signifying the probability of a change in a certain timeframe, given that the transition has not occurred before. These transitions can occur with or without changing occupations or changing the regional labor market. The former is defined as a change in the two-digit occupation code, according to the KldB2010. A change of the regional labor market is defined as the start of a new employment episode outside of the labor market region of residence – irrespective of where the previous job was situated. Labor market regions form an area around an economic center and consist of one or more administrative districts. The demarcation is based on commuter links and reduces the 402 administrative districts to 141 labor market regions (Kosfeld and Werner 2012).

A new employment episode must begin within the first three months after the termination of the previous job. Otherwise, the event is classified as a transition into labor market inactivity or unemployment. Table 1 shows the four subhazards of interest to us that emerge as a result of this classification. The respective subhazard rates are calculated using the duration from the beginning of an employment period until the beginning of the following period. Changes in unemployment, labor market inactivity or self-employment are treated as competing risks.

Table 1
Subhazard rates for multivariate analysis

	Local changes	Trans-regional changes
Changes without occupational mobility	$\mathrm{SHR}_{\overline{O};\overline{R}}$	$\mathrm{SHR}_{\overline{O};R}$
Changes with occupational mobility	$\mathrm{SHR}_{O;\overline{R}}$	$\mathrm{SHR}_{O;R}$

The dependent variable for analyzing mobility's effects on wage levels is the logarithm of the daily wage, obtained from the administrative data. Because of social security contribution limits, wages are right-censored. We impute the data, deflate the measures and calculate daily wages according to the method proposed by Reichelt (2015b). Because self-employment, informal labor and the employment relationships of civil servants and freelancers cannot be found in the administrative data, our results only hold for employees who are subject to social security contributions. However, such employees represent the majority of employees in Germany.

Independent Variables. The primary independent variables consist of restrictions on occupational and regional mobility. Occupation-specific human capital is measured as the time previously spent in an occupation. Again, we use the two-digit KldB2010 occupation codes. Skill demands of the current job are measured using the fifth digit of the KldB2010 code, which distinguishes between four levels of demands. This measure is defined as the level of formal qualification or equivalent experience that is required to carry out the job. The skill demands classification distinguishes between helper and semi-skilled work, skilled work, the complex work of an expert and highly complex work.[2] We subsume the two intermediate levels and obtain three skill demand levels. For purposes of readability, these are labeled as low, medium and high. Occupational closure is measured using an index, which signifies whether legal and administrative regulations exist that bind access to and practice of the occupation or regulate the bearing of a title (Vicari 2014). Based on the BERUFENET, Vicari retrieves information on whether professional exercise of an occupation must meet specific quality standards to protect the general public. The BERUFENET is equivalent to the US Occupational Information Network (O*Net) and lists all occupational titles in Germany including attributes such as entry requirements. The aggregation of the single occupations results in a regulation index for three-digit occupations, which we use as a measure for the degree of occupational closure.

As restricting factors for regional mobility, we include measures for the household composition as well as residence duration. The former is measured with dummy variables, indicating whether a partner or a child of at least 6 years of age is living in the same household as the respondent. The latter is measured as the duration in years that the respondent has spent in the same labor market region.

The control variables encompass a number of factors that may either influence the choice of whether to search for an appropriate job offer locally or outside of the labor market region or drive self-selection into specific occupations and types of mobility. All continuous variables are centered to produce meaningful baseline transition probabilities that can easily be interpreted. We control for the regional unemployment rate, which is the aggregated and centered proportion of unemployed individuals to the labor force in each regional labor market. The unemployment rate serves as a proxy for the general opportunity structure within the labor market region. As the unemployment rate increases, appropriate local job opportunities become scarcer. Furthermore, we use the regional clustering of occupations to take into account the degree to which an occupation is overrepresented within a labor market region. The variable is calculated from the BeH and is measured using the logarithm

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[2] Examples of jobs with different skill-demands in a three-digit occupation: "Office and administration" (714):
Helper and semi-skilled work: Menial work in office (*Helper)* (71401)
Skilled work: Proofreader and encoder (*Trained assistant*) (71442)
Complex work of an expert: Steno- and audiotypist (*Specialist*) (71433)
Highly complex work: Interpreter, translator (*Expert*) (71424)

of the proportion of one two-digit occupation to all two-digit occupations in a labor market region. This proportion is then compared with the national proportion to calculate regional over- or underrepresentation. To control for the financial means necessary for commuting or relocating, we use for the logarithm of the daily wage. Again, we use wage information from the administrative part of the data. To ensure that the variable that represents skill demands is not merely measuring individual qualification or education effects and to capture self-selection into complex jobs and regional mobility, we include variables for the highest education degree and dummies for vocational and academic training. We also control for the number of previous transitions to preclude unobserved factors from generally increasing the transition probability for a specific group. All other control variables that are included in the analyses are listed in Table 5 in the appendix. They encompass variables at the regional labor market level and factors measured at the occupational and individual levels.

3.2 Analytical Strategy

The aim of the current paper is twofold. We analyze both effects on different types of mobility and the effects of these mobility types on wage levels. For the former analysis, we apply event history analyses, which model transition probabilities over a given time span. Individuals who enter an employment relationship face numerous exit options – e.g., transitioning into one of the four states of interest, into self-employment or into unemployment (or labor market inactivity). We thus face a structure of competing risks and following Reichelt (2015a) apply Fine and Gray models (Fine and Gray 1999) to calculate subhazard rates and marginal effects for the variables of interest. The dependent variable is the hazard $\bar{h}$ of the distribution for event j, which is defined as

$$\bar{h}_j(t) = \lim_{\Delta t \to 0} \left\{ \frac{\Pr(t < T \leq t + \Delta t, \text{event} = j | T > t \cup (T \leq t \cap \text{event} \neq j))}{\Delta t} \right\}$$

or the probability of event j within the small interval $[t; t + \Delta t)$ for all individuals who had not experienced event j or another type of event before. The hazard's risk set at every point in time t thus contains employees who transitioned into another status in addition to those who are indeed at risk. The model can be written as a proportional hazards model

$$\bar{h}_j(t, x) = \bar{h}_{j0}(t) \exp\{x' \beta_j\}$$

with $\bar{h}_{j0}$ being the baseline hazard for event j and $\exp\{x' \beta_j\}$ being the relative risk associated with covariates x. The subhazard ratio (SHR), which we present in the regression models, is the ratio of the subhazard function at two different covariate values:

$$\text{SHR} = \frac{\bar{h}_j(t|x)}{\bar{h}_j(t|x_0)}.$$

Because the SHR is difficult to interpret in terms of the effect size, we report the general transition probability for a reference worker $\prod_e(\bar{x})$ and marginal effects for all covariates of interest. The general transition probability is the cumulative subhazard $\bar{H}_j(t)$ or the integral of the subhazard function $\bar{h}_j(t)$ from 0 to t. We calculate $\prod_e(\bar{x})$ for a period of 120 months to illustrate the size of the effect. For the reference employee, all dummy variables are set to 0, ordinal variables are set to the reference category and all continuous variables and month and year dummies are set to the mean. The marginal effects $\kappa_e = \frac{\delta \prod_e(\bar{x})}{\delta x_i}$ are obtained, comparing the probabilities after changing the dummies from zero to one or increasing the continuous variables by one standard deviation. Because individuals may have multiple failure times, the analytical framework is constructed through clustered duration data from multiple events in which episode lengths are not statistically independent of unobserved individual characteristics. Thus, we use cluster robust standard errors.

For the second part of the analysis, we use a fixed effects regression of the logarithm of daily wage on the number of transitions according to the definition described above. Following Fuller (2008) we differentiate between early transitions during the first five years of labor market experience and later job changes, as wage effects should be largest at the beginning of the career. We control for the actual experience in the labor market in a regular and a squared term, changes in the household composition, the number of previous transitions and year and month dummies.[3] The model can be written as

$$\ln(y)_{it} = \beta_0 + \beta_1 \exp_{it} + \beta_2 \exp_{it}^2 + \beta_k X_{k,it} + \alpha_i + \epsilon_{it}$$

where $\ln(y)_{it}$ is the logarithm of the daily wage of individual i at time t, exp measures the actual time spent in employment relationships, in years, and $X_{k,it}$ represents all k control variables. α_i is the person fixed effect that controls for all time-invariant factors. We use robust standard errors to adjust for serial autocorrelation in wage trajectories.

4 Results

4.1 Descriptive results

Are regional and occupational mobility substitutes for one another in attempts to improve labor market position or avoid unemployment? To answer this question, we calculate competing risk event history models and analyze how cost factors for occupational and regional mobility alter the probability for transitions into employment

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[3] As a robustness check, we calculate models including occupational factors, company factors and part-time employees. We as well calculated the analysis using potential experience on the labor market instead of actual time in employment. The results do not change substantially. In every model, trans-regional changes into the same occupation result in wage increases approximately twice as large compared to wage gains after local changes into other occupations.

relationships in the same or a different occupation and into the same labor market region as the place of residence or a different region.

We observe roughly 12,700 employment episodes. As Table 2 shows, approximately 56 percent of these episodes are uncensored and terminate with either one of the four transitions, a change into self-employment or a change into unemployment (or labor market inactivity). When changing jobs, the majority of employees manage to keep both their occupation and region, followed by local occupation changes and trans-regional transitions into the same occupation. The lowest proportion of employees changes both the region and the occupation. Thus, within-occupation regional mobility and within-region occupational mobility indeed seem to be the main strategies to improve the labor market position, in case that local transitions into the same occupation are not feasible.

Table 2
Types of employment transitions

Type of employment transition	Number of transitions	Proportion in percent
Local, same occupation	1,344	10.6
Local, other occupation	984	7.7
Trans-regional, same occupation	736	5.8
Trans-regional, other occupation	444	3.5
Self-employment	481	3.8
Unemployment or other	3,163	24.9
Censored	5,555	43.7
Total	12,707	100

The probability of these transitions, however, is not distributed equally over time. Figure 1 shows the employment status by months beginning at the start of an employment episode. The maximum duration that we observe in our data is 181 months, which corresponds to an employment relationship that began in January 1993 and remained stable until the interview date in 2008. We observe that most transitions occur at the beginning of an employment relationship and that the probabilities for job changes or transitions into self-employment, unemployment or labor market inactivity continuously decrease over time. After 15 years, approximately 75 percent of all employment transitions are terminated, and the remaining episodes are ongoing. As observed in Figure 1 the transition probabilities are approximately proportional; that is, no transition type is particularly clustered at any point in time.

Figure 1
Employment status by months since start of employment relationship
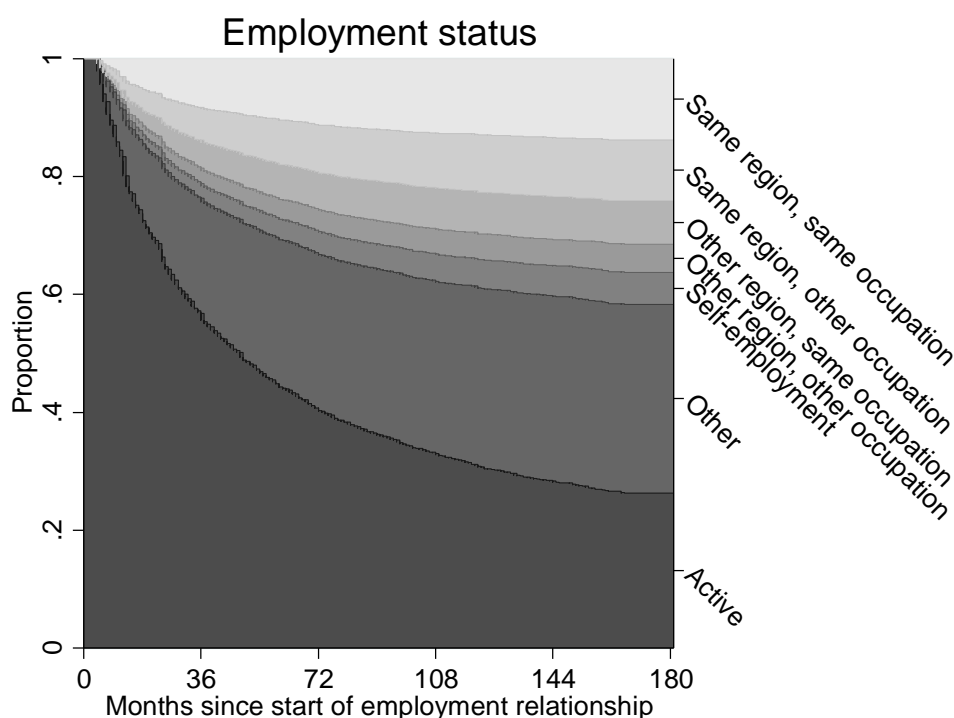
4.2 Results of event history analyses

To determine whether regional and occupational mobility function as substitutes for one another in improving the labor market position or avoiding unemployment, we now analyze the effects of cost factors for regional and occupational mobility on the subhazard rates of different types of job mobility. We expected that the presence of school-age children or a partner in the household and longer residence duration decrease the probability for trans-regional job changes and increase the likelihood for local transitions into other occupations. Accordingly, we expected that more occupation-specific human capital, skill demands and closure correspond to larger cost factors for occupational mobility and thus reduce the probability for transitions into other occupations while simultaneously increasing the probability for trans-regional changes within the same occupation.

Table 3 shows the results of four Fine and Gray models for competing risks. The coefficients depict subhazard ratios that indicate an increase in the transition probability for values above one and a reduction in the probability if the values drop below one. To assess the qualitative effect of the independent factors, we include the baseline transition probability for a reference employee within the first 120 months and marginal effects for all factors of interest. The transition probabilities correspond to our descriptive evidence: The reference worker has a probability of 12.7 percent to locally change into the same occupation and 12.7 percent to locally change into another occupation. Trans-regional changes within the occupation are less likely (3.9 percent), while transitions that are connected to both regional and occupational mobility have the lowest probability (3.1 percent).

Table 3
Fine and Gray models for competing risks: Transitions from employment relationship

Explanatory Variables

	Local, same occupation		Local, other occupation		Trans-regional, same occupation		Trans-regional, other occupation	
	$SHR_{\overline{O};\overline{R}}$	$\kappa_{\overline{O};\overline{R}}$	$SHR_{O;\overline{R}}$	$\kappa_{O;\overline{R}}$	$SHR_{\overline{O};R}$	$\kappa_{\overline{O};R}$	$SHR_{O;R}$	$\kappa_{O;R}$
$\overline{\prod}_t$ for reference employee within 10 years	12.7%		12.7%		3.9%		3.1%	
School age child in household	1.122 (0.109)	- 1.4	1.381** (0.148)	+ 4.4	0.654** (0.095)	- 1.3	0.821 (0.137)	- 0.5
Partner in household	0.977 (0.081)	- 0.3	1.205~ (0.124)	+ 2.4	0.740** (0.082)	- 1.0	0.987 (0.139)	- 0.0
Residence duration in years	1.006~ (0.003)	+ 1.0	1.013*** (0.003)	+ 2.4	0.970*** (0.004)	- 1.3	0.975*** (0.006)	- 0.9
Occupation-specific human capital	1.056*** (0.009)	+ 4.3	0.975** (0.008)	- 1.6	1.066*** (0.011)	+ 1.7	0.978~ (0.013)	- 0.4
Skill demand *(ref: Low)*								
Medium	1.304 (0.249)	+ 3.5	0.604*** (0.088)	- 4.8	2.857* (1.406)	+ 6.9	0.608~ (0.160)	- 1.2
High	1.238 (0.275)	+ 2.8	0.451*** (0.096)	- 6.8	3.197* (1.638)	+ 8.1	0.705 (0.225)	- 0.9
Occupational closure	2.326*** (0.393)	+ 2.9	0.172*** (0.047)	- 4.5	1.804** (0.340)	+ 0.6	0.297*** (0.107)	- 0.8
Regional unemployment rate	0.980* (0.009)	- 0.9	0.955*** (0.010)	- 2.0	1.019~ (0.011)	+ 0.3	1.012 (0.016)	+ 0.1
Regional occupational clustering	1.181 (0.132)	+ 0.8	0.992 (0.120)	+ 0.0	0.749* (0.107)	- 0.4	0.675* (0.129)	- 0.4
Ln daily wage	0.943 (0.115)	- 0.4	1.056 (0.112)	+ 0.4	1.595** (0.228)	+ 1.1	1.691** (0.320)	+ 1.0

Model Summary

N Persons		4,244		
N Episodes		7,903		
N Person periods		377,138		
N Failures	904	660	483	273
Log-Pseudolikelihood	-7704.45	-5630.03	-4036.35	-2276.82

Standard errors in parentheses; Additional control variables include Number of previous transitions, Educational degree, Formal training, Age, Company size and dummies for Reduced hours, Public sector, Sex, Nationality, Year, and Month; Note on significance levels: *** P<0.001, **P<0.01, *P<0.05, ~ P<0.1

First focusing on restrictions to regional mobility, we observe significant negative effects on the probability for trans-regional changes within the occupation and positive effects for local occupation changes for all cost factors. Location-specific capital, which is approximated with school-age children or a partner living in the household

and increased residence duration, indeed seems to not only restrict regional mobility, but also drive employees into local occupational mobility.

For the reference employee, the probability to become regionally mobile within the same occupation is reduced by one percentage point if school-age children live in the same household. Accordingly, the probability is reduced by 1.3 percentage points if a partner is living in the same household and by 1.3 percentage points, when increasing the residence duration by one standard deviation, which corresponds to 14 years. In contrast, we observe an increase in transition probabilities for local occupational mobility. School-age children in the household increase the likelihood for a transition by 4.4 percentage points. Having a partner in the household or an increase in the residence duration by approximately 14 years increases the probability by 2.4 percentage points. The simultaneous shift in transition probabilities supports the first three hypotheses and indicates that both mobility types are substitutes for one another. A partner or school-age children living in the same household do not affect the probability to be both regionally and occupationally mobile, which supports the assumption that the mixed strategy indeed only applies to a specific group – i.e. tied movers.

Focusing on cost factors for occupational mobility, we find opposite effects. For the reference employee, increasing the years spent in an occupation by one standard deviation – which corresponds to approximately six years – results in a reduction of the likelihood for local occupation changes by 1.6 percentage points. Analogous, higher skill demands – which reflect higher individual investments into schooling, formal training, experience and/or training-on-the-job – lower the probability to change the occupation. Being employed in a job with high instead of low skill demands holds a probability reduces the probability by 6.8 percentage points. Further, occupational closure lowers the probability for local occupation changes, supporting our assumption that legal and administrative regulations make it less attractive to abandon the occupation.

Simultaneously, we observe a significant increase in the transition probability for regional mobility within the same occupation. The strongest effect is given for skill demands: Compared to the reference employee, who has an occupation with low skill-demands, the transition probability for an employee in an occupation with high skill-demands is 8.1 percentage points higher. The simultaneous reduction in local occupational mobility and increase in regional mobility within the same occupation support hypotheses four to six and further strenghten our assumption that regional mobility acts as a substitution for occupational mobility when trying to improve the labor market position. Moreover, the probability to change both region and occupation – although already unlikely – is further reduced by occupational cost factors. This supports our assumption that regional and occupational mobility are alternative strategies and employees try to avoid bearing costs for both types of mobility.

Another noteworthy finding is that local transitions into the same occupation become more likely, the higher the occupation-specific human capital and the higher the closure. An explanation for this phenomenon may lie in the decreased competition in the local labor market. Closed occupations should be sheltered from outsiders and, as a consequence, an employee faces more opportunities for job changes. Improving the labor market position is then achievable by changing into the same occupation locally. The same explanation holds for occupation-specific human capital, which improves an employee's market value and thus increases chances on the domestic labor market.

Other interesting effects, which alter incentives for specific types of job transitions, follow in the expected direction. Unemployment rate as a proxy for the local opportunity structure alters both probabilities. As the unemployment rate increases, changes into other regions become more likely, whereas local transitions are reduced. Moreover, local clustering of one's current occupation reduces the probability of becoming regionally mobile. We assume that this is the case because matching within an occupation is already closer to the optimum. Higher daily wages, however, increase the probability of becoming regionally mobile because commuting and relocation become proportionally less costly as overall earnings increase.

4.3 Differential returns to occupational and regional mobility

After having shown that occupational and regional mobility indeed appear to be substitutes for one another, depending on the cost factors, we now focus on the consequences of this mechanism. We expected differential returns to occupational and regional mobility. In general, job changes should result in wage growth (Fuller 2008; le Grand and Thålin 2002), particularly at the beginning of the career and when the labor market position can be improved. However, distinguishing between regional and occupational mobility, the former has a greater likelihood to improve matching and thus to increase productivity and wage. Occupational mobility, by contrast, is frequently accompanied by the devaluation of human capital and should thus lead to lower productivity gains or even losses, particularly if the job transition arises as a reaction to potential unemployment. Restrictions on regional mobility may thus lead to occupation changes with lower wage increases compared with trans-regional changes in the same occupation.

We use the same four types of mobility as introduced above and calculate the effect of these transitions on the logarithm of the individual daily wage. To determine the mere effect of a transition, we use fixed effects regressions that analyze the differences in log wages for different job transitions and distinguish between early transitions during the first five years of labor market experience and later changes. The results are displayed in Table 4.

Table 4
Fixed-effects regressions: Individual deflated log daily wage

Explanatory Variables	β	σ
Years in employment	0.060***	(0.007)
Years in employment²	-0.001***	(0.000)
Early job transition (years 1-5)		
Local, same occupation	0.051**	(0.019)
Local, other occupation	0.049*	(0.021)
Trans-regional, same occupation	0.103***	(0.022)
Trans-regional, other occupation	0.101**	(0.033)
Later job transition (after 5 years)		
Local, same occupation	0.002	(0.010)
Local, other occupation	0.005	(0.014)
Trans-regional, same occupation	0.013	(0.014)
Trans-regional, other occupation	-0.012	(0.034)
Model Summary		
N Groups	3,732	
N Observations	323,664	
R² Within	0.16	

Control variables include school-age children in household, partner in houshold, age (squared), number of previous transitions, year and month dummies; Note on significance levels: *** $P<0.001$, **$P<0.01$, *$P<0.05$, ~ $P<0.1$

We encounter the typical wage trajectory that we would expect to observe over the life course; wages increase over the entire time spent in employment, but growth is reduced the further the career develops. Generally, we observe positive effects on daily wages for all changes within the first five years. However, as expected, regional mobility yields higher wage increases than does occupational mobility. The explanation is straightforward: Regional mobility leads to better matches because employees face a larger pool of adequate vacancies. Local occupational changes lead to lower wage gains; most likely because of a devaluation of occupation-specific human capital. As expected, later job transitions in general show no significant effects on wage increases.

Overall, the results support the assumption that regional and occupational mobility contribute to unequal returns on the labor market. Whereas regional mobility has a strong effect on wage improvement, occupational mobility – especially within the same labor market region – is associated with lower gains. We are aware that potential self-selection of employees into high-mobility patterns and into higher wage growth might partly drive our results. However, previous studies generally find wage penalties for occupation changes (Kambourov and Manovskii 2009a), which support our findings and the assumption that substituting occupational for regional mobility leads to unequal returns to job mobility.

5 Conclusion

In the labor market, job mobility is central to the matching quality between employees and jobs and thereby plays an important role in productivity and individual wage trajectories. However, returns to job mobility differ considerably and in this context, both regional and occupational mobility are major sources of wage differentials that have thus far only been regarded separately. We argued that the two types are not independent from one another but instead act as substitutes when employees aim to improve their labor market position or avoid unemployment. In this context, costs for occupational mobility and barriers to spatial mobility alter mobility patterns by pushing employees either toward new jobs in new local labor markets or into other occupations. Because of human capital devaluation, occupational mobility yields lower returns than regional mobility. We thus argued that substituting one type of mobility for the other constitutes a mechanism for labor market stratification and inequality that has thus far been neglected in the literature.

We drew on linked retrospective life-course data for Germany with Fine and Gray models for competing risks, we first showed that occupation-specific human capital, skill-demands, and occupational closure as well as household composition and residence duration indeed simultaneously affected probabilities for both local occupation changes and trans-regional job changes within the occupation, revealing their substitutionary function. Second, using fixed effects wage regressions, we demonstrated that these types of mobility indeed led to unequal wage increases. Especially regional mobility early in the career led to the greatest wage gains. Increases from local occupational mobility, however, were only half as large. We thus stress the point that the interrelationship is a major factor that influences the type of and the returns to job mobility and should be considered when analyzing mobility effects.

We expect these mechanisms to become even more pronounced in the future, because technological and institutional change alter job requirements and thus create mismatches on the labor market and incentives to become mobile. First, technological acceleration in some occupations decreases the amount of human capital that is transferrable between occupations making occupation changes more costly (Violante 2002). Second, skills acquired before entering a job may lose their relevance due to changing technology, increasing the likelihood of mismatches in existing employment relationships (Witte and Kalleberg 1995).

We were only able to reveal a snapshot of the possible consequences of the trade-off between occupational and regional mobility, and it is vital that future research extends this knowledge by applying the mechanisms found here to other outcomes. The substitution function may have implications for household or family outcomes given that regional mobility is seldom decided detached from household actors. Further, we emphasize that we were able to reveal these mechanisms for Germany, a country in which vocational training is highly standardized and occupational mobility may be lower than in other industrialized countries. We generally expect occupational and regional mobility to serve as substitutes for one another. However, institu-

tional contexts may alter the costs for both regional and occupational mobility and when transferring the mechanisms and consequences found here to other labor markets, one must take into account different mobility regimes (DiPrete 2002). Thus, we encourage further research to focus on the international comparability of the mechanisms and consequences of occupational and regional mobility serving as substitutes for one another.

Appendix

Table 5
Descriptive statistics for independent variables

Variable	Mean/ Proportion	Std. Dev.	Mini- mum	Maxi- mum
Regional labor market level				
Regional unemployment rate *(centered)*	-0.410	4.325	-8.078	17.35
Regional occupational clustering *(centered)*	0	0.317	-1.979	1.833
Occupation level				
Skill demand *(ref: Low)*				
Medium	0.683	0.465	0	1
High	0.256	0.436	0	1
Occupational closure *(centered)*	0	0.262	-0.161	0.839
Individual level				
Occupation-specific human capital *(centered)*	0	5.837	-6.842	29.241
Number of previous transitions	0.892	1.225	0	18
Log daily wage (centered)	0	0.555	-1.977	3.801
Education degree *(ref: Medium Secondary)*				
No degree / Lower secondary	0.010	0.097	0	1
Upper secondary	0.470	0.499	0	1
Other	0.006	0.075	0	1
Formal training *(ref: Vocational)*				
Non-formal	0.114	0.318	0	1
Academic	0.251	0.434	0	1
Reduced hours (<30h)	0.203	0.402	0	1
Company size *(ref: 1–4 employees)*				
5–9	0.114	0.318	0	1
10–19	0.116	0.320	0	1
20–99	0.225	0.418	0	1
100–199	0.114	0.318	0	1
200–1999	0.231	0.421	0	1
2000 +	0.114	0.318	0	1
Public sector *(ref: private sector)*	0.138	0.345	0	1
Age (centered)	0	7.621	-16.342	17.992
Female	0.557	0.497	0	1
Partner in household	0.675	0.468	0	1
School age child in household	0.390	0.488	0	1
Residence duration in years *(centered)*	0	14.117	-21.335	30.915
Nationality: German	0.968	0.177	0	1
Year dummies	-	-	0	1
Calendar dummies	-	-	0	1

Standard deviations are not adjusted for clustering.

References

Abbott, Michael G.; Beach, Charles M. (1994): Wage changes and job changes of Canadian women: evidence from the 1986-87 Labour Market Activity Survey. In: The Journal of Human Ressources 29(2): p. 429–60.

Abraham, Martin; Auspurg, Katrin; Hinz, Thomas (2010): Migration Decisions Within Dual-Earner Partnerships: A Test of Bargaining Theory. In: Journal of Marriage and Family 72(4): p. 876–92.

Abraham, Martin; Damelang, Andreas; Schulz, Florian; Vicari, Basha (2015): Occupations as labour market institutions. Unpublished work.

Abraham, Martin; Nisic, Natascha (2007): Regional Ties, Geographical Mobility and the Labour Market. Analyses for Switzerland and Germany. In: Swiss Journal of Sociology 33(1): p. 69–88.

Acemoglu, Daron; Autor, David (2011): Skills, tasks and technologies: implications for employment and earnings. Pp. 1043-171. Handbook of Labor Economics, Volume 4. C. David and A. Orley editors. Elsevier.

Aldashev, Alisher (2012): Occupational and Locational Substitution: Measuring the Effect of Occupational and Regional Mobility. In: Labour 26(1): p. 108–23.

Antoni, Manfred; Drasch, Katrin; Kleinert, Corinna; Matthes, Britta; Ruland, Michael; Trahms, Annette (2010): Arbeiten und Lernen im Wandel * Teil I: Überblick über die Studie - März 2011 (2. aktualisierte Fassung des Berichtes vom Mai 2010). FDZ-Methodenreport 2010(5).

Antoni, Manfred; Jacobebbinghaus, Peter; Seth, Stefan (2011): ALWA-Befragungsdaten verknüpft mit administrativen Daten des IAB (ALWA-ADIAB) 1975–2009. FDZ-Datenreport 05/2011.

Antoni, Manfred; Seth, Stefan (2012): ALWA-ADIAB – Linked Individual Survey and Administrative Data for Substantive and Methodological Research. In: Schmollers Jahrbuch 132: p. 141–46.

Autor, David H. (2013): The "task approach" to labor markets: an overview. In: Journal for Labour Market Research 46(3): p. 185–99.

Bartel, Ann P. (1982): Wages, Nonwage Job Characteristics, and Labor Mobility. In: Industrial and Labor Relations Review 35(4): p. 578–89.

Bartel, Ann P. (1979): The migration decision: what role does job mobility play? In: The American Economic Review 69(5): p. 775–86.

Blau, Peter M.; Duncan, Otis Dudley (1967): The American Occupational Structure. John Wiley & Sons, Inc., 605 Third Avenue, New York.

Bol, Thijs; Weeden, Kim A. (2014): Occupational closure and wage inequality in Germany and the United Kingdom. European Sociological Review. online first.

Bowles, Samuel (1970): Migration as Investment: Empirical Tests of the Human Investment Approach to Geographical Mobility. In: The Review of Economics and Statistics 52(3): p. 356–62.

Brett, Jeanne M.; Reilly, Anne, H. (1988): On the road again: Predicting the job transfer decision. In: Journal of Applied Psychology 73: p. 614–20.

Brett, Jeanne M.; Stroh, Linda K.; Reilly, Anne H. (1993): Pulling up roots in the 1990s: Who's willing to relocate? In: Journal of Organizational Behavior 14: p. 49–60.

Burdett, Kenneth (1978): A theory of employee job search and quit rates. In: The American Economic Review 68(1): p. 212–20.

DaVanzo, Julie (1983): Repeat Migration in the United States: Who Moves Back and Who Moves On? In: The Review of Economics and Statistics 65(4): p. 552–59.

DiPrete, Thomas A. (2002): Life Course Risks, Mobility Regimes, and Mobility Consequences: A Comparison of Sweden, Germany, and the United States. In: American Journal of Sociology 108(2): p. 267–309.

Drasch, Katrin; Matthes, Britta (2013): Improving retrospective life course data by combining modularized self-reports and event history calendars. Quality & Quantity. In: International Journal of Methodology 47(2): p. 817–38.

Eby, Lillian T.; Russell, Joyce E. A. (2000): Predictors of Employee Willingness to Relocate for the Firm. In: Journal of Vocational Behavior 57(1): p. 42–61.

Eliason, Scott R. (1995): An extension of the Sørensen-Kalleberg theory of the labor market matching and attainment processes. In: American Sociological Review 60(2): p. 247–71.

Fernandez, Roberto M. (2001): Skill-biased technological change and wage inequality: evidence from a plant retooling. In: American Journal of Sociology 107(2): p. 273–320.

Fernandez-Macias, Enrique (2012): Job polarization in Europe? Changes in the employment structure and job quality, 1995-2007. In: Work and Occupations 39(2): p. 157–82.

Fine, Jason P.; Gray, Robert J. (1999): A proportional hazards model for the subdistribution of a competing risk. In: Journal of the American Statistical Association 94(446): p. 496–509.

Fitzenberger, Bernd; Kunze, Astrid (2005): Vocational training and gender: wages and occupational mobility among young workers. Oxford Review of Economic Policy 21(3).

Fuller, Sylvia (2008): Job Mobility and Wage Trajectories for Men and Women in the United States. In: American Sociological Review 73(1): p. 158–83.

Ganzeboom, Harry B. G.; Treiman, Donald J. (1996): Internationally comparable measures of occupational status for the 1988 International Standard Classification of Occupations. In: Social Science Research 25: p. 201–39.

Gould, Sam; Penley, Larry E. (1985): A Study of the Correlates of the Willingness to Relocate. In: The Academy of Management Journal 28(2): p. 472–78.

Granovetter, Mark; Tilly, Charles (1988): Inequality and Labor Processes. Pp. 175–221. Handbook of Sociology. Neil Smelser editor. Sage Publications.

Hardill, Irene (2002): Gender, migration and the dual career household. Routledge.

Hatt, Paul K. (1950): Occupations and social stratification. In: American Journal of Sociology 55(6): p. 533–43.

Hunt, Janet C.; Kau, James B. (1985): Migration and Wage Growth: A Human Capital Approach. In: Southern Economic Journal 51(3): p. 697–710.

Jovanovic, Boyan (1979): Job Matching and the Theory of Turnover. In: Journal of Political Economy 87(5): p. 1.

Kalleberg, Arne L. (2008): The Mismatched Worker: When People Don't Fit Their Jobs. In: Academy of Management Perspectives 22(1): p. 24–40.

Kambourov, Gueorgui; Manovskii, Iourii (2009a): Occupational Mobility and Wage Inequality. In: Review of Economic Studies 76: p. 731–59.

Kambourov, Gueorgui; Manovskii, Iourii (2009b): Occupational Specificity of Human Capital. In: International Economic Review 50: p. 63–115.

Kambourov, Gueorgui; Manovskii, Iourii (2008): Rising Occupational and Industry Mobility in the United States: 1968-97. In: International Economic Review 49(1): p. 41–79.

Keith, Kristen; McWilliams, Abagail (1999): The returns to mobility and job search by gender. In: Industrial and Labor Relations Review 52(3): p. 460–77.

Keith, Kristen; McWilliams, Abagail (1997): Job mobility and gender based wage growth. In: Economic Inquiry 35: p. 320–33.

Keith, Kristen; McWilliams, Abagail (1995): The wage effects of cumulative job mobility. In: Industrial and Labor Relations Review 49(1): p. 121–37.

Kleinert, Corinna; Matthes, Britta; Antoni, Manfred; Drasch, Katrin; Ruland, Michael; Trahms, Annette (2011): ALWA – new life course data for Germany. In: Schmollers Jahrbuch 131(4): p. 625–34.

Kosfeld, Reinhold; Werner, Alexander (2012): Deutsche Arbeitsmarktregionen – Neuabgrenzung nach den Kreisgebietsreformen 2007–2011. In: Raumforschung und Raumordnung 70(1): p. 49–64.

Landau, Jacqueline C.; Shamir, Boas ; Arthur, Michael B. (1992): Predictors of willingness to relocate for managerial and professional employees. In: Journal of Organizational Behavior 13(7): p. 667–80.

le Grand, Carl; Thålin, Michael (2002): Job mobility and earnings growth. In: European Sociological Review 18(4): p. 381–400.

Longhi, Simonetta; Brynin, Malcolm (2010): Occupational change in Britain and Germany. In: Labour Economics 17(4): p. 655–66.

Longhi, Simonetta; Taylor, Mark (2013): Occupational change and mobility among employed and unemployed job seekers. In: Scottish Journal of Political Economy 60(1): p. 71–100.

Manning, Alan (2003): The real thin theory: monopsony in modern labour markets. In: Labour Economics 10(2): p. 105–31.

Manzoni, Anna; Harkonen, Juho; Mayer, Karl-Ulrich (2014): Moving On? A Growth-Curve Analysis of Occupational Attainment and Career Progression Patterns in West Germany. In: Social Forces 92(4): p. 1285–312.

Mortensen, Dale T. (1988): Matching: finding a partner for life or otherwise. In: American Journal of Sociology 94: S215–S40.

Mouw, Ted; Kalleberg, Arne L. (2010a): Occupations and the Structure of Wage Inequality in the United States, 1980s to 2000s. In: American Sociological Review 75(3): p. 402–31.

Mouw, Ted; Kalleberg, Arne L. (2010b): Do Changes in Job Mobility Explain the Growth of Wage Inequality among Men in the United States, 1977-2005? In: Social Forces 88(5): p. 2053–78.

Oesch, Daniel; Rodriguez Menes, Jorge (2010): Upgrading or polarization? Occupational change in Britain, Germany, Spain and Switzerland, 1990-2008. In: Socio-Economic Review 9(3): p. 503–31.

Reichelt, Malte (2015a): Career progression from temporary employment: How bridge and trap functions differ by task complexity. European Sociological Review, in press.

Reichelt, Malte (2015b): Using longitudinal wage information in linked data sets. FDZ-Methodenreport 2015(1).

Rogers, Andrei (1988): Age Patterns of Elderly Migration: An International Comparison. In: Demography 25(3): p. 355–70.

Royalty, Anne Beeson (1998): Job-to-Job and Job-to-Nonemployment Turnover by Gender and Education Level. In: Journal of Labor Economics 16(2): p. 392–433.

Ruhm, Christopher J. (1987): The economic consequences of labor mobility. In: Industrial and Labor Relations Review 41(1): p. 30–46.

Sjaastad, Larry A. (1962): The costs and returns of human migration. In: Journal of Political Economy 70(5): p. 80–93.

Sørensen, Jesper B.; Kalleberg, A. L. (1981): An outline of a theory of the matching of persons to jobs. Pp. 49-74. Sociological perspectives on labor markets. I. Berg editor. Academic Press.

Sørensen, Jesper B.; Sorenson, Olav (2007): Corporate demography and income inequality. In: American Sociological Review 72: p. 766–83.

South, Scott J.; Deane, Glenn D. (1993): Race and Residential Mobility: Individual Determinants and Structural Constraints. In: Social Forces 72(1): p. 147–67.

Topel, Robert; Ward, Michael, P. (1992): Job Mobility and the Careers of Young Men. In: The Quarterly Journal of Economics 107(2): p. 439–79.

Vaisey, Stephen (2006): Education and its discontents: overqualification in America, 1972-2002. In: Social Forces 85(2): p. 835–64.

Vicari, Basha (2014): Degree of standardised certification of occupations * An indicator for measuring institutional characteristics of occupations (KldB 2010, KldB 1988). FDZ-Methodenreport 4(2014).

Violante, Giovanni L. (2002): Technological Acceleration, Skill Transferability, and the Rise in Residual Inequality. In: The Quarterly Journal of Economics 117(1): p. 297–338.

Weeden, Kim A. (2002): Why do some occupations pay more than others? Social closure and earnings inequality in the United States. In: American Journal of Sociology 108(1): p. 55–101.

Williams, Mark (2012): Occupations and British wage inequality, 1970s-2000s. In: European Sociological Review 29(4): p. 841–57.

Witte, James C.; Kalleberg, Arne L. (1995): Matching Training and Jobs: The Fit Between Vocational Education and Employment in the German Labour Market. In: European Sociological Review 11(3): p. 293–317.

Wright, Erik Olin; Dwyer, Rachel E. (2003): The patterns of job expansions in the USA: a comparison of the 1960s and 1990s. In: Socio-Economic Review 1: p. 289–325.

Yankow, Jeffrey J. (2003): Migration, job change, and wage growth a new perspectrive on the pecuniary return to Geographic Mobility. In: Journal of Regional Science 43(3):p. 483–516.

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