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Reallocation patterns across occupations in Germany

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HIGHLIGHTS

- Reallocation costs in terms of unemployment duration are high.
- Workers that switch occupation out of unemployment face wage losses.
- The wage loss persists for approximately 5 years after the switch.

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1. Introduction

The Great Recession triggered the US unemployment rate to be characterized, on the one hand, by high unemployment duration and, on the other hand, by unevenly concentrated unemployment incidence across occupations and industries. The standard search and matching model (Pissarides, 2000) is able (at least qualitatively) to explain the first fact, but it is unable to explain the second one because it lacks a multi-market structure. Thus, recent studies in the macro-labor literature merge models based on a Lucas and Prescott (1974) island framework that offers such a multi-market structure with the search and matching model (e.g., Alvarez and Shimer, 2011; Wong, 2011; Pilossoph, 2012; Wiczer, 2013; Carrillo-Tudela and Visschers, 2013).

Generally speaking, in these models, reallocation is determined by workers' decisions to move to another "island" instead of

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ABSTRACT

Using high-quality German administrative data, I analyze workers' opportunity costs of reallocation across occupations by measuring the additional time spent in unemployment before being hired in a new occupation. Furthermore, I inspect the wage changes after reallocation and find that workers who change occupations through unemployment face wage losses that appear to be persistent over a 5-year horizon. © 2016 Elsevier B.V. All rights reserved.

remaining on their respective "island". The worker's choice is based on a comparison of the net present value of search across different islands to the net present value of search within an island. However, as it is costly to move, the net present value across islands is reduced by the costs to enter an island. Because, in these models, a worker typically reallocates through unemployment, these reallocation costs refer to the time a worker spends in unemployment while s/he is searching across islands. Summarizing, worker reallocation is pinned down by the variables that either influence the net present value of search or the costs of moving to a different island. However, little is known about the reallocation of workers out of unemployment. Thus, the contribution of my paper is (1) to shed light on the question of how high reallocation costs, measured in terms of unemployment duration, may be. Using comprehensive German administrative data, I assess how much time is spent on average in unemployment between two spells of employment conditioned on an occupational switch; (2) to analyze the gains of switching occupations with respect to individual and aggregate labor market outcomes.

My results suggest that, in Germany, workers who reallocate through unemployment bear the opportunity costs of being







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unemployed for at least two months longer than otherwise equal workers (who return to the same occupation after unemployment). However, reallocating workers cannot compensate for these costs, as they further face a wage loss of up to 1.6% upon moving, which is relatively persistent over time.

2. Theoretical background

In a Lucas and Prescott (1974) island model, the worker has an incentive to reallocate to another labor market ("island") whenever the net present value of search in another market is higher than in the current market. Additionally, the gain from moving has to compensate for the costs of moving.

Using the value of unemployment *U* out of a canonical search and matching model (e.g., Pissarides, 2000) in a simplistic steady state environment that features only two separate labor markets, it follows that:

$$U_1 < U_2 \tag{1}$$

$$\frac{b(1-\beta(1-s_1))+\beta f_1 w_1}{(1-\beta)+\beta(s_1+f_1)} < \frac{b(1-\beta(1-s_2))+\beta f_2 w_2}{(1-\beta)+\beta(s_2+f_2)}$$
(2)

Moving from labor market 1 to labor market 2 is beneficial for the worker, provided that either s/he receives a higher wage $w_1 < w_2$, it is easier to find a job in the other market, $f_1 < f_2$, or the probability of separating from the match is lower, $s_1 > s_2$.

Because the gain from moving has to compensate for the cost *c*, it holds that:

$$\frac{b(1-\beta(1-s_2))+\beta f_2 w_2}{(1-\beta)+\beta(s_2+f_2)} - \frac{b(1-\beta(1-s_1))+\beta f_1 w_1}{(1-\beta)+\beta(s_1+f_1)} > c.$$
(3)

Typically, the costs c are interpreted as the time a worker spends in unemployment while retraining (Pilossoph, 2012, p. 8). Given this relationship, I analyze the cost component by looking at unemployment durations, the gains of moving by looking at individual wages, and I check whether additional components, such as the job-finding and separation rate have an influence.

3. Data

I use the Sample of Integrated Labour Market Biographies (vom Berge et al., 2013), which represents the employment biographies (i.e., employment and unemployment episodes) of approximately 2% of the German workforce. I refine the sample to include only employment and job search spells, such that people can be identified as either employed or unemployed. Unemployment refers to the state of being registered at the local employment agency as "available and searching for a job". Employment means full-time employment subject to social security payments. Afterwards I restrict my analysis to the period spanning from 2000 to 2010 as information on job search is reliable only after 2000. After all refinements (see Appendix A for details on all refinements), the data set comprises 640,979 individuals with 7,055,376 spells. To structure the labor market, I employ occupations instead of industries because the occupation information in the data relates to the worker while the industry information is a firm characteristic. Occupations are defined by the German 2-digit classification of occupations (KldB88¹), which includes 86 different occupations (e.g., teacher, banker & insurance broker, electrician, etc.).

As my study focuses not only on the movement across occupations but also across the states of employment and





Source: Own illustration.

Fig. 1. Worker categorization.

Table 1

Average unemployment duration of UE-movers (in comparison to UE-stayers). *Source:* IEB (2012), own calculations.

	OLS	AFT	FE	AFT-FE
UE-mover	94.7084 ^{***}	0.3954 ^{***}	58.9720 ^{***}	0.2749 ^{***}
R ²	0.1400	0.1373	0.1794	0.1351

Note: dependent variable: unemployment measured in days; covariates: age (squared), destination occupation, lagged occupational residual wages, general labor market experience (measured as days in employment from 1979 onwards, squared), the spell number (squared), schooling, sex, nationality, and calendar year dummies; standard errors are clustered by person id; the reference group is UE-stayers; full table of coefficients available on request.

^{*} p < 0.01.

unemployment, I categorize workers in the following way: Given the worker has an intervening spell of unemployment between two jobs, I first transcribe the occupation information over to the unemployment spell. Afterwards I compare the occupation of the unemployment spell to the proceeding employment spell. If the occupation information is different, I call the worker a UE-mover, if it is the same, I refer to the worker as a UE-stayer (see Fig. 1). Similarly, when there is no intervening spell of unemployment, I compare the occupation of the current spell to the proceeding one. While employment spells last for at most one year and might then be renewed, unemployment spell can last for several years without being renewed. The average duration of employment spells in my sample is 237 days, and for unemployment spells 89 days.

4. Results

4.1. Costs in terms of duration

I assess unemployment duration for UE-stayers and UEmovers. Given the categorization, unemployment duration is always enclosed by employment spells such that my analysis does not have to address truncation. The unemployment duration is measured as the sum of days in unemployment between two employment spells. I estimate OLS (ordinary least squares) regressions and AFT (accelerated failure time) models in lognormal form as well as FE (fixed-effects) models for the duration in unemployment. The main effect is absorbed by a dummy variable indicating whether individual *i* is a UE-mover in a given spell *s*. The reference group consists of UE-stayers.

$$duration_{i,s} = \beta_0 + \beta_1 UE\text{-}mover_{i,s} + covariates + \epsilon_{i,s}.$$
 (4)

The regressions yield the following results (see Table 1).

¹ See http://metadaten.bibb.de/klassifikation/5 for details.

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