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Losing a Job and (Dis)incentives to Move

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Abstract

We examine the economic determinants of interregional mobility. Using plant closures and mass lay-offs for identification, we show that there are obstacles in the labor market that prevent a more efficient reallocation of unemployed individuals and jobs. We find that displacement increases the migration probability by ~80 percent. Displaced workers mostly make migration decisions based on economic (dis)incentives, i.e., higher expected wages and lower expected housing prices outside the origin home location increase the probability of moving after a job loss. In contrast, proximity to family, home ownership and poorly functioning housing markets constitute severe constraints for migration. This outcome is concerning for employment prospects, as, among displaced workers, migration is positively linked to a strong attachment to the labor market.

Tiivistelmä

Työpaikan menetys ja alueellisen muuttoliikkeen kannustimet

Tässä tutkimuksessa tarkastellaan työpaikan menettämisen ja muiden taloudellisten ja ei-taloudellisten kannustimien vaikutuksia alueelliseen muuttoliikkeeseen. Käytämme yhdistettyä työnantaja-työntekijäaineistoa sekä tietoja alueellisista asuntomarkkinoista. Työpaikan menettäneillä tarkoitamme heitä, jotka menettävät työpaikkansa toimipaikan sulkemisen tai joukkoirtisanomisen takia. Työpaikan menetys lisää henkilön muuttoalttiutta noin 80 prosentilla. Työpaikan menettäneet näyttäisivätkin reagoivan taloudellisiin kannustimiin, sillä alhainen oletettu palkkataso ja korkeat asuntojen hinnat alueella ovat yhteydessä lisääntyneeseen muuttoalttiuteen alueelta, josta henkilö on jäänyt työttömäksi. Toisaalta läheiset sukulaisuussuhteet, omistusasuminen ja pitkä asuntojen myyntiaika alueella jarruttavat työttömien muuttotodennäköisyyttä. Asuntomarkkinoiden jäykkyys jarruttaa erityisesti pienempi palkkaisista töistä työttömäksi jääneiden muuttoalttiutta. Suomen työmarkkinoilla havaitaan siis esteitä, jotka voivat merkittävästi vähentää työttömien ja avointen työpaikkojen uudelleenkohdentumista. Näiden esteiden purkaminen on tärkeää, sillä asuinpaikkaa vaihtaneet työllistyvät uudelleen todennäköisemmin kuin alueelle jääneet.

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Asiasanat: Toimipaikan sulkeminen, Alueellinen liikkuvuus, Asuntomarkkinat, Odotetut tulot, Sosiaalinen pääoma, Työmarkkinatulemat

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1. Introduction

The persistence of structural unemployment in European countries suggests that the mismatch in the labor market is a pervasive problem. Mismatch has become an even greater potential threat in the new industrial revolution and occupational restructuring era, which is characterized by accelerating technological progress, globalization, aging population and stagnant economic growth. A key factor contributing to the mismatch is that many unemployed individuals live in different regions than the potential jobs. Thus, the residence location of individuals significantly affects their opportunities in life (see Chetty and Hendren 2018a, 2018b). Moreover, if individuals respond consistently to economic incentives emerging from differences in job opportunities across regions, they should migrate to better opportunity areas (Hicks 1932, Mueller 1982, Pissarides and McMaster 1990). Thus, regional mobility can improve the functioning of labor markets if unemployment encourages internal migration and, accordingly, decreases the mismatch in the labor market.

To describe the current interregional mobility and unemployment in the Finnish setting, Figure 1 depicts the relationship between out-migration and in-migration rates with the share of unemployed people using region-year observations, as measured by commuting zones, for the Finnish population over the 1996-2013 period. At the aggregate level, out-migration is not closely linked to regional unemployment rates, while in-migration declines with unemployment rates. This pattern raises the question regarding to what extent people react to labor market conditions and move out of high unemployment regions to regions with better opportunities.

[Figure 1 in here]

Among unemployed people, those who are long-term unemployed face exacerbated difficulties in finding employment in any region. Hence, it is important to focus on previously employed workers who experience exogenous job loss because these workers constitute the potential margin of adjustment that responds to economic (dis)incentives. Indeed, as already studied in Fackler and Rippe (2016), Huttunen, Møen and Salvanes (2018) and Bratsberg, Raaum and Røed (2018), job displacement increases the propensity to move. However, little is known about why many unemployed individuals remain in high unemployment regions, as Figure 1 suggests. We lack a comprehensive picture of how migration decisions after job displacement depend on mediating factors, such as expected earnings and price levels across regions, housing characteristics, local conditions and proximity to family.[1]

In this paper, we analyze the effect of job displacement[2] on geographical mobility in Finland. The Finnish economy provides an excellent case study as, in many ways, it is representative of modern advanced Nordic countries but with high pervasive unemployment in some regions and one of the highest employment mismatch rates in Europe, as measured by the relation between unemployment and the job vacancy rates (Eurostat). We use comprehensive matched employer-employee panel data for the Finnish population over the period of 1995-2014, including information on the individual's family members (siblings, mother and/or father). To these data, we match region-level information on expected housing prices and housing liquidity conditions.

[1] One interesting exception includes Dahl and Sorenson (2010), who examined to what extent different economic and social factors are related to the moving propensity of Danish technical workers after job displacement.

[2] We use data on plant closures and mass lay-off to identify the involuntary separations from the voluntary worker outflows.

Together, these data create an opportunity to contribute to the literature by performing an extensive analysis of (dis)incentives to move after displacement at a very detailed level. As an extension to the previous literature, we also examine whether interregional moving choice patterns after displacement contribute to skill sorting across regions.

In the second part of our analysis, we examine the earnings and employment developments between displaced movers and displaced stayers. This is an important extension of the literature because if people follow economic incentives and move to better opportunity areas, we would expect to see stronger labor market attachment and wage gains for displaced movers. We acknowledge that comparing migrants to stayers without accounting for selection into migration is likely to bias the estimates for income and employment depending on whether the migrants are positively or negatively selected among displaced workers. Empirical evidence on the selectivity of moving will improve our understanding of this important labor market adjustment mechanism.

As in most previous studies, we find that migration flows depend on unemployment. Our estimates show that job loss increases the migration probability by ~80 percent. The moving decisions of displaced workers are often made based on economic incentives (positive selection), but these incentives vary across skill groups. We find that more skilled workers are more prone to move to another location if their expected earnings are higher there. The moving decisions of less skilled workers are more likely driven by poor housing liquidity. These findings could reflect the fact that less skilled individuals are originally more financially constrained than more skilled individuals. However, we also find that all displaced workers are less likely to leave their region of residence if they have family living in the same region, if they are homeowners and if the expected housing prices are lower there.

Our findings reveal that there are severe obstacles in the labor market that prevent a more efficient reallocation of unemployed individuals and jobs. Indeed, people who choose to move after a job loss have better labor market attachment in those locations than do the otherwise comparable individuals who choose to stay in their origin region. We nevertheless find that migration is immediately negatively associated with earnings but also that earnings losses diminish over time. Although the moving decisions of more skilled individuals are driven by regional differences in income, the earnings gains are not necessarily being realized among those individuals. In other words, there may be a mismatch among highly skilled displaced movers and the reward structure offered in their new destination location.

The rest of this paper is organized as follows. Section two discusses the relevant empirical and theoretical literature and outlines the conceptual framework for our analysis. Section three describes the Finnish register data and presents aggregate-level evidence based on the FLEED (Finnish Employer-Employee Data) data. The fourth section explains our empirical approach and provides the estimation results. The final section concludes the paper by setting our findings into a larger context.

2. Relevant Empirical Literature and Conceptual Framework

According to standard economic theory, migrants move from low expected wage regions to high expected wage regions to maximize their lifetime utility (Hicks 1932, Todaro 1969). Migration incentives should also increase with rising regional differences in employment. Unemployment conveys information about job opportunities, which influences the expected income across regions (Pissarides and McMaster 1990). The standard view thus suggests that the propensity to migrate

should be higher for the unemployed population. To summarize, the equilibrating effect of migration flows depends on regional differences in both earnings and unemployment.

Kennan and Walker (2011) have examined how expected income differences across regions affect migration decisions after a job loss. They developed a model that allows for many alternative location choices, and they find that the migration decision is largely affected by the expected income (see also Dahl and Sorenson 2010). Recently, a few studies have examined the effect of involuntary job loss on internal migration. These studies used plant closures and mass lay-offs for identification and found that displacement increases the propensity to move in Norway (Huttunen *et al*. 2018, Bratsberg *et al*. 2018) and in Germany (Fackler and Rippe 2016). In contrast, Meekes and Hassink (2019) found that job displacement decreases the decision to move but, on the other hand, it increases the probability of commuting in the Netherlands.

Based on the Borjas-type framework, more skilled individuals are more attracted to moving to regions with higher mean wages and higher wage inequalities (Borjas 1992). Arntz (2010) examined the interregional moving patterns of job movers after they had experienced unemployment (for reasons other than displacement). She found that the moving decisions of high-skilled workers were mainly driven by regional differences in income, while the moving decisions of less-skilled workers were mainly driven by regional differences in job opportunities.

Migration theory has proposed several other factors that could be related to migration decisions. We contribute to the literature by introducing mediating factors that may discourage or encourage internal migration after a job loss. To emphasize, we examine the abovementioned expected income, housing markets, local labor

market conditions and social factors. Therefore, we focus below only on the studies that are most relevant for our research setting.

Housing markets have been found to be a significant impediment to migration (e.g., Zabel 2012). Evidence shows that home owners are less likely to move compared to renters (e.g., Böheim and Taylor 2002, Munch, Rosholm and Svarer 2008), that home owners accept job offers from other cities at lower rates compared to renters (Head and Lloyd-Ellis 2012), and that the moving decision depends on the housing liquidity, i.e., how quickly the home owners can sell their houses (Head and Lloyd-Ellis 2012). An increase in regional housing prices has also been considered a further factor in reducing migration for some (Cannari, Nucci and Sestito 2000, Hämäläinen and Böckerman 2004).

Aside from expected income and housing price differences, another important mediating factor of the displacement effect that is related to local market conditions is industry mix (e.g., Neffke Otto and Hidalgo 2018). A local industry mix can significantly affect the decision to move after a job loss. Neffke *et al*. (2018) find that a large concentration of a worker's origin industry makes it easier for them to find a new job after displacement, thus decreasing their propensity to move.

A study by Lundholm *et al*. (2004) focuses on five Nordic countries and shows that the main motives for long-distance migration are reasons other than employment incentives (see, also, Greenwood 1985). The literature maintains that the existence of relatives or friends in the place of residence is negatively related to the migration decision and that the propensity to migrate increases when relatives or friends are already living in the destination location (e.g., Palloni *et al*. 2001, Haug 2008, Dahl and Sorenson 2010, Huttunen *et al*. 2018). Return and repeat migration also account for a large part of the observed migration flows (Kennan and Walker 2011).

We then analyze the links between migration and subsequent labor market outcomes for those who have lost their jobs. Pekkala and Tervo (2002) examined whether internal migration is related to increased employment probability using a sample of unemployed Finns. The evidence indicated that movers were more likely to find a new job compared to stayers.[3] Boman (2011) used data from Sweden and found that women suffer income losses after a geographic move that follows an involuntary job loss. In contrast, the relationship between earnings and migration was slightly positive for men. Income losses are, on the other hand, quite similar for both displaced movers and displaced stayers in Germany (Fackler and Rippe 2016). The Norwegian results suggest that displaced movers suffer higher income losses than displaced stayers, and this negative relationship is likely to be explained by migration flows to more rural areas (Huttunen *et al*. 2018). As the migration decision is potentially endogenous, we avoid making causal claims herein. However, we look descriptively at the selection of displaced workers into migration.

[3] Nivalainen (2005) analyzed the interregional migration and post-move employment of Finnish husbands and their wives. The results showed that movers are less likely to be employed compared to stayers, and that the relationship is more pronounced for wives. In a related study, Nivalainen (2004) found that in the family context, migration mostly takes place due to demands related to the husband's career. However, in the analysis, individuals in the pre-move sample were not restricted to those who were unemployed.

3. Data

3.1 Register Sources

The primary data are the Finnish Longitudinal Employer-Employee Data (FLEED) constructed by Statistics Finland. The data are created by combining registers that have been linked together using unique identification codes for individuals, firms and plants. The registers include wage and employment statistics, education and occupational registers, the region of residence, demographic characteristics, and the Business Register, which contains comprehensive information on firms and plants. We identify each worker's employer in the private sector by using plant codes, and we examine whether plants are downsizing their workforce or closing down their entire business. The FLEED covers the Finnish labor force over the period of 1988-2014 (under the age of 70).

The data include yearly records of the individual's labor market status, whether they are wage earners, unemployed, self-employed or not participating in the labor force. The information on region is based on the 70 NUTS (Nomenclature of Territorial Units for Statistics) 4-level classifications. These regions are commuting areas, according to the official description by Statistics Finland.

The measure for income in the FLEED is the annual taxable wage and salary earnings. The data also include yearly employment months; thus, we use monthly wages as a measure of income. The earnings are deflated to 2014 prices using the cost of living index by Statistics Finland.

The empirical specification for the migration decision includes the key individual-level controls (age, gender, education, marital status, having children and

the individual's previous migration pattern) and the pretreatment plant controls (size of the plant, industry dummies and turnover). Industry is based on the Standard Industrial Classification and is categorized into 14 groups based on a 1-digit classification. To these data, we match an indicator variable for the region of residence of a family member (mother, father and/or siblings), the housing liquidity rate in the commuting area, the industry mix and the unemployment rate in the pretreatment commuting area and the expected income and price levels. These control variables are discussed in more detail in Section 4.

3.2 Sample Construction

We use data for the 1995-2014 period. Because being a student or early retiree may affect our empirical findings, we restrict the sample to individuals who are between 25 and 55 years old. Those who are defined as retired persons, for example, in the form of disability pensions, are also excluded.

We examine the effect of displacement on internal migration. The seminal contributions of the literature are those of Podgursky and Swaim (1987), Addison and Portugal (1989) and Jacobson, LaLonde and Sullivan (1993), among others, who have examined the earnings losses of displaced workers. Building on the literature, we define displaced workers as those who lose their jobs after a plant closure or mass layoff and become ultimately unemployed. Mass layoff is defined as the plant downsizing its workforce by 30 percent or more. The treatment group also includes early leavers, who are defined as workers who leave a plant that downsizes or closes

down within a one-year window before the closure (Schwerdt 2011).[4] The costs of job loss are usually lower for early leavers than for ultimately displaced workers (Pfann and Hamermesh 2008, Schwerdt 2011). A plausible explanation for this difference is the compositional difference in productivity-related characteristics; high-skilled workers with better outside options are often early leavers. If the early leavers are excluded from the treatment group and included in the control group, this could lead to conservative estimates on the effects of job loss on migration decisions and labor market outcomes.

The year of displacement for the treatment group and the nondisplacement year for the control group is denoted by *b* (the base year). We restrict the pretreatment sample to full-year wage-earners who are attached to plants with at least 10 employees, and the workers must have worked in these same plants for two years before the base year. We use as our control group all otherwise similar workers who were not displaced from their work in *b*.

The labor market status originates from the Employment Statistics and is measured during the last week of each year. This implies that some people may be displaced from their work, for example, during the early part of *b* and, after experiencing a short unemployment spell, find a new work by the end of *b*. In the data, these individuals are observed as employed in year *b*, regardless of their short unemployment spell after displacement. The data have yearly registered numbers of employment and unemployment months. Therefore, we also add to the treatment group

[4] Workers may quit to work at another plant *within* the same firm. Therefore, we define displaced workers and early leavers as persons who ultimately enter unemployment from employment. This restriction means, for example, that early leavers do not move from plant to plant and remain in the same firm.

workers who i) were displaced from their work in *b*, ii) have at least one unemployment month and less than 12 employment months in year *b*, and iii) are observed as employed at the end of year *b*. The share of displaced workers in the sample is 1.1 percent. If we exclude the short-term unemployment cases from the group of displaced workers, the share falls to 0.5 percent. These figures show that approximately one-half of displaced workers find a new job within one year after displacement. The share of displaced workers matches well with the earlier empirical facts using the Finnish data (Korkeamäki and Kyyrä 2014).

Two relevant facts on the composition of displaced workers are worth noting. First, 98 percent of all displaced workers in the sample experienced involuntary job loss once, and approximately 2 percent of them experienced involuntary job losses twice. Therefore, involuntary unemployment spells do not tend to accumulate for the same persons. Otherwise, the treatment group would be a highly selected group of persons. Second, only 1.5 percent of displaced workers who eventually enter employment after a job loss remain employed within the same firm.

3.3 Descriptive Evidence

Table 1 documents the shares of internal moves over the 1995-2014 period. Approximately 20 percent of individuals from the total sample of 25-55-year-old people moved to another commuting area at least once during the observation window.[5] A considerable share of the migration flow is explained by repeat migration

[5] Cross-national comparisons in internal migration flows is challenging. Robust comparisons are hampered by, e.g., different numbers, sizes and shapes of zones that are chosen for analyses (Rees *et al*. 2017). Rees *et al*. (2017) propose a new generalized measure for net migration rate, which is

(cf. Kennan and Walker 2012). The sample is further restricted to persons with a change to unemployment from employment (column 2) and to persons with a change to unemployment due to displacement (column 3). These individuals are tracked until 2014. We find that the migration rate is significantly higher for those who have experienced at least one unemployment spell.

Figure 2 shows the share of people who live in different commuting areas compared to year *b-1*. The origin region of residence is measured in *b-1*, as people may move to another region by the end of *b* after their displacement incidence. We follow these workers up to the year 2014, which is a maximum of 17 years after *b* and three years prior to *b*.[6] As the baseline, we also examine the regional mobility of all people who become unemployed but not necessarily due to exogenous reasons. As expected, displaced workers are more likely to move to another commuting area compared to nondisplaced workers. However, the migration rate is evidently higher for those who have become unemployed largely due to nonexogenous reasons (cf. Table 1).

[Table 1 and Figure 2 in here]

decomposed into migration intensity and migration effectiveness parts. The authors find that western and northern European countries, including Finland, show largely similar migration patterns, with higher intensity and lower effectiveness.

[6] Not all displaced and nondisplaced workers lived in the same region in years *b-3* and *b-2* compared to year *b-1*, even when they worked for the same plant. This pattern is explained by commuting, which is quite common in Finland.

Table 2 reports the sample means of selected pretreatment (in *b-1*) and posttreatment (in *b+2*) characteristics for the displaced and nondisplaced workers by migration status. The share of workers who have moved to another region within two years is 3.1 percent for nondisplaced workers and 6.8 percent for displaced workers. Thus, an unconditional relationship indicates an ~120 percent increase in the probability of moving after experiencing a job loss.

We find that workers who work in plants that are downsizing or closing down within one year earn less annually compared to their nondisplaced counterparts. They are also less educated and less likely to be homeowners. The plants that are downsizing or closing down their business within one year are smaller and have lower turnover compared to the plants in the control group (see, also, Abowd, McKinley and Vilhuber 2009, Carneiro and Portugal 2010). The observation that plants in the treatment group are smaller is in accordance with the higher bankruptcy risks of small firms (e.g., Mueller and Stegmaier 2015). These facts provide the key motivation to control for the predisplacement plant characteristics in the model to make the individuals more comparable in both the control and treatment groups.

The table further shows that stayers and movers differ in many key characteristics, regardless of whether they are displaced. For example, movers are younger and more educated compared to stayers. The movers' predisplacement wages are lower, they are less likely to be homeowners, and a lower share of them have a family member living in the same home location compared to stayers.

Unsurprisingly, nondisplaced workers are more likely to be employed, and they also earn more at time *b+2* compared to displaced workers. However, nondisplaced movers seem to have a weaker labor market position at time *b+2* compared to

nondisplaced stayers. There are no clear differences in the postdisplacement wages or employment status between displaced movers and stayers at the aggregate level.

Table 2 also reports the means of key regional characteristics by migration and displacement status. One important empirical pattern stands out, which is that the displaced movers tend to migrate to lower opportunity regions that have higher unemployment rates and lower wages but also higher housing price levels. In contrast, we find that nondisplaced movers are more likely to migrate to regions with better opportunities that have lower unemployment rates and slightly higher housing prices and expected wage levels. These aggregate findings demonstrate that the migration decision of displaced workers may be driven by different economic and noneconomic incentives compared to nondisplaced workers.

4. Empirical Analysis

4.1 Specifications

We first examine the effect of exogenous job loss on regional mobility using the following empirical specification:

$$M_{i(b-1)+3} = \alpha D_{ib} + \beta' X_{i(b-1)} + \delta' P_{b-1} + \vartheta FR_{i(b-1)} + R_{(b-1)} + \epsilon_{ib}\,, \qquad (1)$$

where $M_{i(b-1)+3}$ is a dummy variable indicating whether an individual *i* has moved to a new location by the end of three years after the prebase year *b-1*. The origin region of residence is measured in *b-1* because displaced workers may have moved to another location by the end of year *b*. D_{ib} is a dummy variable indicating whether worker *i* was

displaced in *b*. $X_{i(b-1)}$ is a vector of the individual control variables measured in *b-1*. These controls include the individual's previous regional mobility pattern (five categories: 1 = has not migrated before, 2 = has migrated once before, …, 5 = has migrated at least four times before), age, gender, education level (five categories: 1 = primary education, 2 = secondary education, 3 = lowest level tertiary education, 4 = lower degree level tertiary education, 5 = upper degree level tertiary education), marital status, having children (two categories: 1 = children under 7 years old and 1 = school-age children) and an indicator for home ownership. Accordingly, predisplacement earnings rank (1-100) within the origin region is included in the model as an additional control for skills that are not captured by formal education. Boman (2011) used actual predisplacement earnings in the model as a proxy for skill level. We include the worker's earnings rank to capture the worker's initial skill level within the origin region.

$P_{(b-1)}$ stands for the predisplacement plant characteristics, including the size of the plant, the logarithm of turnover and a full set of industry dummy variables. An indicator variable for family region, $FR_{i(b-1)}$, stands for a measure of social capital and family connections. The data have information on the region of residence of the father, mother and all siblings. We set the indicator variable to be one if at least one family member lives in the same predisplacement region.[7] $R_{(b-1)}$ stands for region-specific characteristics in *b-1,* including the unemployment rate, industry mix and

[7] Approximately 18% of the observations did not have information on any family member. This means that they have no siblings, and/or their parents are over 70 years old or are deceased. We simply treated these observations as not having a family member living in the same region. We also re-ran all the models for the sample of people for which we had information on some family member. The results were similar to the ones that are reported in the tables.

housing liquidity. Industry mix is measured as the industry's share of regional employment in *b-1* (Neffke *et al*. 2018). Housing liquidity is measured by the turnover rate (sales per housing stock) in commuting areas. This information is provided by Statistics Finland. Oikarinen (2012) previously used sales volume as a proxy variable for housing liquidity in the Finnish setting.

Finally, we add control variables to the vector $R_{(b-1)}$ that describe the expected wage and housing price levels across the regions (cf. Cannari *et al*. 2000, Dahl and Sorenson 2010, Kennan and Walker 2011). To this end, we calculated the logarithm of average monthly wages outside worker *i*'s origin region. Average wages are adjusted for gender, education level, field of education and size of the region, as measured by inhabitants. We calculated the logarithm of average housing prices (outside worker *i*'s origin region) adjusted by the size of the region accordingly. The expected earnings and housing prices are measured in *b-1*.

We first examine the effects of displacement and other background characteristics on the propensity to move. We then examine how economic, housing and social characteristics are related to incentives to move after displacement. In the second specification, we use the sample of displaced workers only, thus excluding the displacement dummy from the model.

In the second part of our analysis, we examine the relationship between migration and labor market outcomes (LMO). We follow Boman (2011) and examine both the short-term and long-term effects of migration using the following specification:

$$\mathrm{LMO}_{itd} = \alpha' M_{itd} + \beta' X_{itd} + \delta' P_{(b-1)d} + \gamma Skill_{i(b-1)d} + r_{(b-1)d} + \epsilon_{itd} \quad (2)$$

LMO_{itd} is either the logarithm of the monthly earnings or the employment status of individual i at year t for the group of displaced workers d. M_{itd} is the categorical variable representing the year since the postdisplacement migration. The variable contains 11 categories, as follows: stayer (no migration), 1 year since migration, …, 10 years since migration. The group of stayers is used as the reference category. X_{itd} is the vector of covariates in t. These covariates include age, gender, education level, marital status, having small and school-age children, home ownership and year dummy variables. $P_{(b-1)d}$ stands for predisplacement plant characteristics, $Skill_{i(b-1)d}$ is the rank order of worker i's initial wage level within the predisplacement region, $r_{(b-1)d}$ is region fixed effect, and ϵ_{itd} is an error term.

Equation (2) is estimated by OLS (ordinary least squares), and the standard errors are clustered at the region level. We acknowledge that identifying the effect of migration on labor market outcomes is challenging because of the self-selection of migration status. Thus, we do not make strong causal claims here.

4.2 Involuntary Job Loss and Migration

Table 3 reports the marginal effects of the characteristics on regional mobility for the total sample (column 1) and for the smaller sample of displaced workers (column 2). As a general pattern, we find that job displacement increases the moving probability by 2.4 percentage points. As an average, nondisplaced workers have a 3.1 percent probability of moving (cf. Table 2), and the estimate represents a sizeable increase in the migration probability of ~80 percent. All the results are highly comparable between females and males.

Across both the samples, individual characteristics, housing characteristics, and economic and social factors are related to an individual's migration choices. For example, previous migration patterns and higher skill levels are positively, while being married and having school-age children are negatively related to the moving probability. Housing characteristics also yield expected effects, as homeowners are less likely to move compared to tenants, with the marginal effect corresponding to a decrease in the moving probability of ~40-50 percent. An increase in the expected housing prices outside the origin region also reduces an individual's probability of moving. Finally, we find that proximity to family and a strong local concentration of the individual's predisplacement industry reduce postdisplacement interregional mobility. Only the sign of the marginal effect of expected wages is not as expected, based on the earlier empirical literature.

As we move from the total sample to a smaller sample of those who were displaced from their work, we note one key difference. Namely, the poorly functioning housing markets (i.e., weak housing liquidity) do not seem to constitute a significant constraint for the migration decisions of an average displaced worker.

To examine the potential self-selection in moving among those who have lost their jobs, the migration model is stratified based on initial skill level. Based on the initial rank order within the predisplacement region, we assign displaced workers to one of three skill categories: low skilled (= initial rank order is between 1-33), middle skilled (= initial rank order is between 34-66) or highly skilled (= initial rank order is between 67-100).[8] The rationale behind this categorization is that empirical evidence on the skill composition of interregional mobility patterns will improve our

[8] In these models, education level is dropped from the specification because it is highly correlated with initial skill level.

understanding of an important labor market adjustment mechanism. Comparing the results in Table 4, we find that the associations between individual characteristics and migration are quite similar across specifications. The only notable exception is the presence of small children (under 7 years old), which yields a positive coefficient for the group of highly skilled individuals and a negative coefficient for the group of low-skilled individuals. Hardly surprising, having school-age children is negatively related to migration probability among all skill groups.

As expected, interregional movers tend to migrate to regions with higher expected wage levels. Interestingly, however, the results in Table 4 show that this effect is statistically significant for middle- and highly skilled individuals but not for low-skilled individuals. This result is in line with those of Arntz (2010). The migration decision after a job loss is also significantly determined by the housing liquidity among low-skilled individuals but not among middle- or highly skilled individuals. Individuals who are more skilled are likely less financially constrained and may therefore face less economic constraints for the short-term decisions related to moving. Interestingly, a higher industry mix is negatively associated with moving decisions only among middle-skilled and highly skilled individuals. This heterogeneous relationship could be explained by spill-over effects if job destruction has a negative domino effect on the entire region, implying that less-skilled individuals in particular may find it more difficult to find a new job after displacement (e.g., Gathmann, Helm and Schönberg 2017, Neffke *et al*. 2018).

4.3 Migration and Labor Market Outcomes Among Displaced Workers

Next, we estimate the earnings model for displaced workers. We use the monthly earnings as an outcome variable because the association between migration and earnings may be due to the differences in labor market attachment instead of larger earnings per unit of labor supplied. In this analysis, we focus on wage earners only. The estimates from the earnings model with the corresponding 95 percent confidence intervals are presented in Figure 3. Although no causal interpretation should be given for these estimates, the pattern in Figure 3 proves to be both interesting and intuitive.

We first observe that migration is negatively related to earnings one year after migration. The earnings for displaced movers are ~6 percent lower immediately after migration compared to those of displaced stayers. The estimated negative relationship diminishes over time and eventually turns positive. The earnings premium is small, being 1-4 percent four to ten years after migration, but the estimates are statistically insignificant. As seen from the figure, the estimates become less precise over time because the numbers of observations decrease in the cells.

As an alternative measure of labor market success, we use employment months as the dependent variable. The results are documented in Figure 4. Again, the estimates show a significant negative association between migration following an involuntary job loss and labor market attachment one year after migration. This relationship becomes positive and is persistent in the long run. The estimates show that displaced workers who migrate after a job loss work approximately 2.5 months more over the 10-year period compared to displaced workers who do not migrate to another location after a job loss. A quite similar pattern is found when we use employment status (= 1 if employed, zero otherwise) as the outcome variable (Figure A1 of Appendix). The

fact that displaced workers who move are more likely to be employed later on may just be due to selection. For example, workers are more likely to move if they have a job lined up in the destination region.

We then estimate the earnings and employment models separately for males and females. The results are presented in Table A1 of the Appendix. The estimates reveal that there is an immediate negative relationship between migration and monthly earnings for both men and women; however, for women, the effect persists for two years, and the quantitative size of the effect is 4-6 percent annually. For the pooled sample, the migration-earnings relationship diminishes over time for both genders and eventually turns positive for men. The earnings premium for men is 2-7 percent five to nine years after migration (see, also, Boman 2011), but the estimates are not always statistically significant. The positive association between migration and employment persists for two to ten years for males and four to ten years for females.

The earnings and employment models are then estimated by the initial skill level accordingly. The results for earnings are presented in Table A2, and the results for employment are presented in Table A3 of the Appendix. The skill groups are determined based on the initial gender-specific wage rank within the region's earnings distribution. The results in Table A2 suggest that the immediate negative association between migration and wages is negative and statistically significant for middle- and highly skilled individuals but not for low-skilled individuals. Three years after migration, the earnings do not seem to differ substantially between displaced stayers or displaced movers across any skill group. The only exception is the group of middle-skilled workers, for whom we find an earnings premium of 6-8 percent for some years. This finding may reflect the fact that the moving decisions of middle-skilled workers are driven by regional differences in income (positive selection). However, this is not

the case for highly skilled individuals, for whom we do not find any earnings gains after migration. This finding suggests that there is a mismatch between expected income and the actual reward structure offered in the new destination location among the highly skilled. In turn, the results for employment months reveal that the positive association between migration and labor market attachment is more profound among middle- and highly skilled individuals than among low-skilled individuals.

4.4 Additional Aspects

To analyze relevant mechanisms between migration and the subsequent earnings of displaced workers, we estimate the models for several subgroups of workers. First, the negative relationship between migration and short-run earnings could be explained by the fact that some people accept job offers from smaller and, thus, potentially less productive firms. We thus focus on all displaced stayers and those displaced movers who work either in micro-sized or small-sized firms (less than 50 employees) versus medium-sized or large-sized firms (more than 50 employees). The results are presented in Table A4 of the Appendix and suggest that displaced movers who are re-employed in micro or small firms earn 7-10 percent less one to two years after migration compared to displaced stayers. We do not find such earnings losses for those displaced movers who are re-employed in larger firms.

Second, the mechanism between migration and subsequent earnings for displaced workers also seems to be explained by the direction of the interregional mobility because displaced workers who moved to more rural areas suffered quite persistent earnings losses of approximately 7 percent years after migration (Table A5). Third, we also examine the potential role of working either in the public or private

sector after migration. Therefore, we estimate the models for a group of displaced stayers and displaced movers who either remained private sector employees or became public sector employees after migration. The most important finding is that the (immediate) negative effect of migration on monthly earnings persisted only among those who worked in the private sector.[9]

The mechanism between migration and subsequent labor market outcomes, such as employment, may also be affected by the spillover effects of mass layoffs and plant closures (e.g., Gathmann *et al*. 2017). A wide-scale job destruction may have a negative domino effect on the entire regional economy, implying that displaced stayers may find it more difficult to find a new job after displacement. Consistent with this contention, Garthmann *et al*. (2017) found by using German data that firms not directly affected by the mass layoffs in regions lost more jobs years after the displacements took place. This relationship may also hold in Finland, i.e., the positive relationship between migration and employment is explained by the deterioration in the outcomes among the displaced stayers.

[9] We also analyze the role of occupational mobility (e.g., occupational shift to a low-paid occupation) in explaining the relationship between earnings and migration for displaced workers. To accomplish this, we estimate the models for all displaced stayers and those displaced movers who either remained within the same occupation or moved to different occupation from that which they were displaced from. The occupation variable was based on the 1-digit ISCO classification. The results remained similar in both specifications.

5. Conclusions

In this paper, we examined the fundamental factors that contribute to the flexibility of labor markets in the European context. We used comprehensively linked employer-employee panel data that were matched to registers on various regional characteristics, such as housing liquidity and the region of residence of family members. We studied the effect of job loss on migration decisions and the factors that discourage internal migration after displacement. In addition, we investigated whether displaced movers obtain earnings and employment gains compared to displaced stayers.

The standard economic theory asserts that economic incentives determine the migration decision. Thus, individuals should migrate from high unemployment regions to low unemployment regions if they lose their job in the home region. However, a complete behavioral model describing the unemployed workers and their subsequent choices following a job loss might not match the predictions of the standard economic theory. The key factors that potentially lead to deviations from the standard economic theory are labor market frictions.

We found mixed evidence concerning whether unemployed workers make choices that are consistent with the standard economic model. We found that experiencing involuntary job loss significantly increases the probability of migration, i.e., the migration probability increases by ~80 percent as a response to job displacement. In conclusion, individuals appear to respond to economic incentives to migrate across regions, although, at the same time, many of them stay in regions with high average unemployment. Thus, the frictions that prevent migration flows are relevant in the European context. These frictions are likely to be related to the housing market not functioning properly, especially among less-skilled individuals, and the

unemployed workers having a strong preference to stay where they reside. For example, many of them reside in regions in which they have social connections with family members.

Another possible explanation is based on the earnings trajectories immediately after the migration, which showed immediate negative development after the migration. Thus, at least for some migrants, there could be substantial income risks associated with migration, and combining these risks with high housing prices, for example, in the capital region, would substantially reduce their economic incentives to migrate. In contrast, we found that the link between migration and long-term employment is positive and persistent. Thus, the results reveal that migration that follows a job loss is related to increased labor market attachment rather than greater earnings per unit of labor supplied.

Our results connect regional unemployment and the internal restructuring of regional labor markets due to the out-migration and in-migration rates. High unemployment increases the mobility of the working-age population of a region. Out-migration is alleviated if the internal labor markets are dynamic, that is, if job and worker flows at the plant level are frequent. However, the internal restructuring of regional labor markets cannot completely offset the pushing effect of high unemployment. The results suggest that labor market frictions could be attenuated by an effective labor market policy that enhances internal migration. Migration that follows unemployment is positively related to long-term employment. The earnings development of movers is not beneficial immediately after the migration but may turn positive over time, depending on, e.g., the direction of interregional movement to more urban areas. Therefore, it would be important to promote more affordable housing options in areas with better job opportunities, thereby also making migration an

economically more feasible option for displaced workers. The results also reveal that social connections with family members are important predictors of the propensity to move (or not to move) to another location. However, it is challenging for public policies to directly influence noneconomic incentives to migrate because doing so would require cultural and societal norms to change.

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Figures

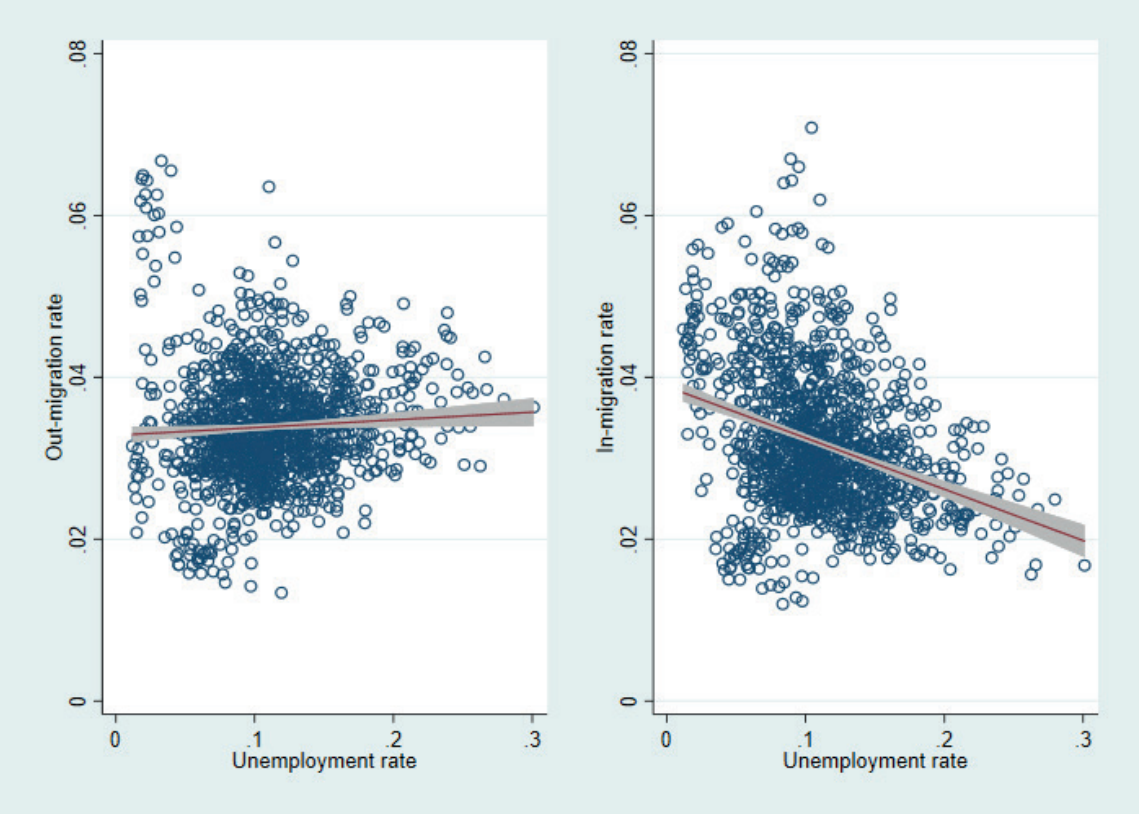

FIGURE 1: Out-migration, in-migration and unemployment rates by region-year observations over the period 1996-2013

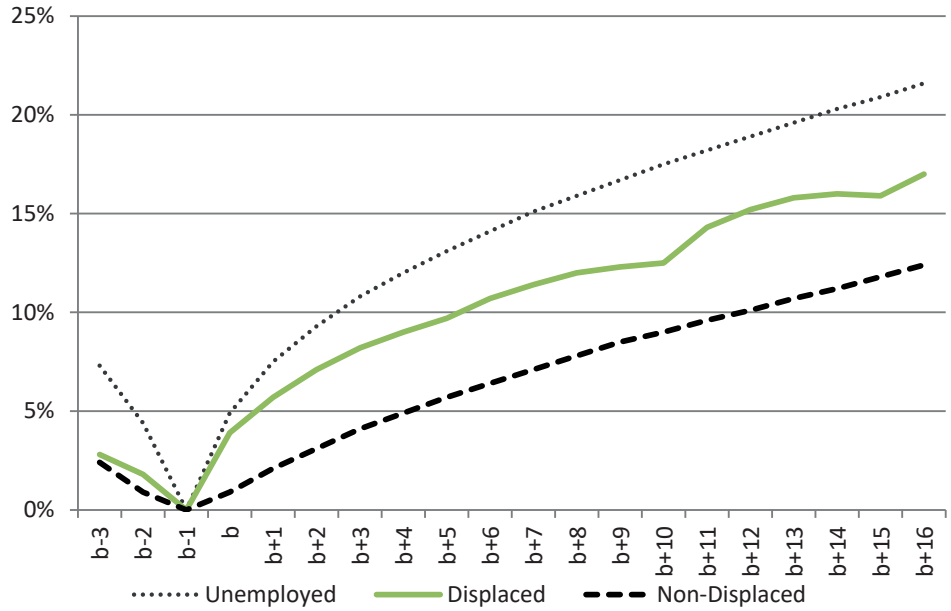

FIGURE 2: The fraction of people living in different NUTS 4-level region than in b-1

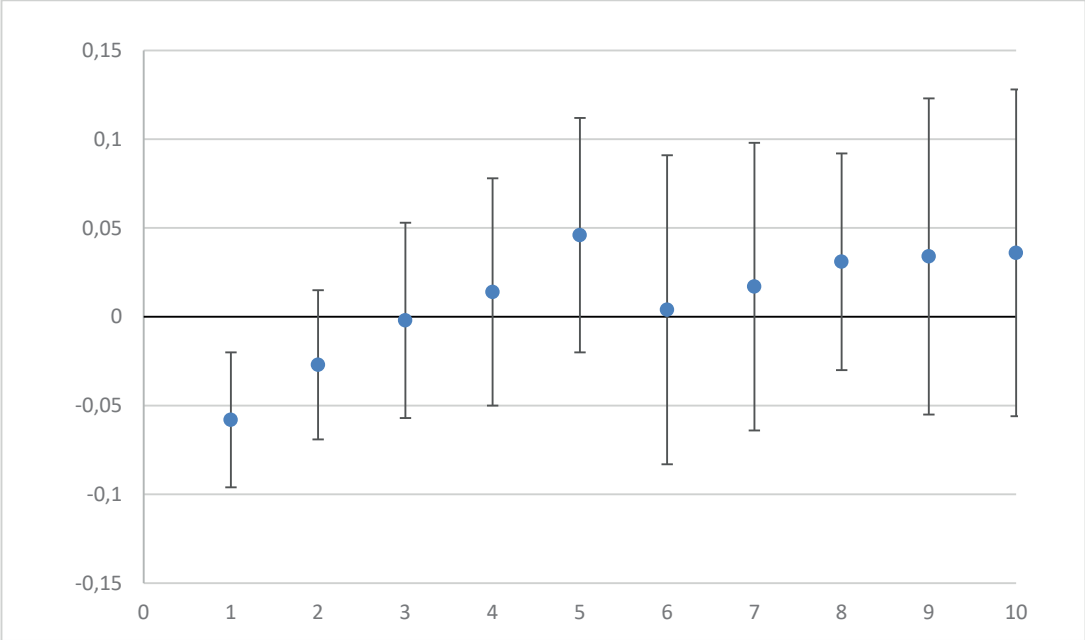

FIGURE 3: The coefficients for monthly wages for displaced movers with the 95% confidence intervals

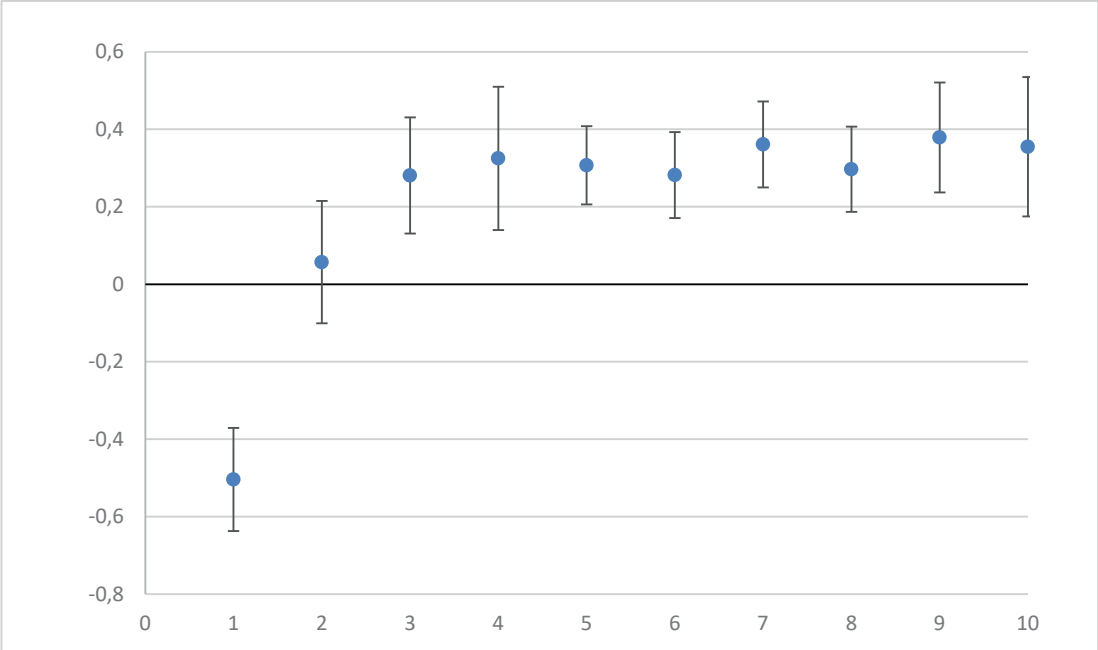

FIGURE 4: The coefficients for employment months for displaced movers with the 95% confidence intervals

Tables

TABLE 1: The magnitude of inter-regional mobility over the period 1995-2014

	Total sample	Unemployment spell > 0	Unemployment spell due to displacement > 0
Share of regional moves			
None	80%	72%	76%
One	12%	15%	14%
At least two	8%	13%	10%
N of obs.	3,505,609	794,540	160,713

TABLE 2: Sample means of selected pre- and post-displacement characteristics

	Displaced		Non-Displaced	
Men	Stayers	Movers	Stayers	Movers
Plant characteristics				
Size (b-1)	258	294	347	351
Log turnover (b-1)	16.3	16.3	16.8	16.7
Region characteristics				
Unemployment rate (b-1)	9.9	10.1	10.5	10.5
Average wage level (b-1)	2876 €	2869 €	2836 €	2814 €
Average housing prices (b-1)	1309 €	1302 €	1218 €	1212 €
Unemployment rate (b+2)	10.0	10.4	9.8	10.1
Average wage level (b+2)	2915 €	2843 €	2935 €	2850 €
Average housing prices (b+2)	1467 €	1421 €	1400 €	1348 €
Individual characteristics				
Homeowner (b-1)	0.72	0.49	0.75	0.56
Relative in region (b-1)	0.56	0.36	0.55	0.36
Age (b-1)	39.3	35.3	39.3	34.6
Education years (b-1)	12.4	12.7	12.7	13.2
Monthly wages (b-1)	2991 €	2833 €	3355 €	3201 €
Monthly wages (b+2)[a]	2850 €	2900 €	3688 €	3600 €
Employed (b+2)	0.72	0.71	0.95	0.88
Unemployed (b+2)	0.19	0.17	0.03	0.07
N of obs.	54,481	3,963	5,136,971	165,201

Notes: [a] Monthly wages at b+2 is observed only for employed individuals. Stayers and movers are defined as persons who have either stayed within the same commuting zone or moved to another commuting zone between the years b-1 and b+2. Potential displacement year is denoted by b.

TABLE 3: Displacement and regional mobility

	Total sample	Displaced workers
Displacement	0.024 ***	
	(0.0005)	
Skill	0.0001 ***	0.0002 ***
	(0.0000)	(0.0000)
Education level		
Secondary educ.	0.001 ***	0.000
	(0.0002)	(0.0029)
Lowest level tertiary educ.	0.007 ***	0.009 *
	(0.0003)	(0.0050)
Lower tertiary educ.	0.010 ***	0.015 ***
	(0.0004)	(0.0056)
Upper tertiary educ.	0.015 ***	0.010
	(0.0006)	(0.0087)
Female	-0.004 ***	-0.003
	(0.0003)	(0.0042)
Age	-0.002 ***	-0.003 ***
	(0.00001)	(0.0002)
Married	-0.010 ***	-0.021 ***
	(0.0002)	(0.0023)
Children < 7 years old	-0.002 ***	0.003
	(0.0002)	(0.0023)
Children 7-18 years old	-0.013 ***	-0.022 ***
	(0.0003)	(0.0036)
Previous migration pattern		
Once before	0.025 ***	0.051 ***
	(0.0002)	(0.0026)
Twice before	0.027 ***	0.048 ***
	(0.0003)	(0.0042)
Three times before	0.035 ***	0.070 ***
	(0.0006)	(0.0073)
At least three times before	0.041 ***	0.089 ***
	(0.0009)	(0.0107)
Homeowner	-0.017 ***	-0.047 ***
	(0.0002)	(0.0022)
Housing liquidity	0.026 ***	0.078
	(0.0037)	(0.0513)
log(exp.housing prices)	-0.037 ***	-0.068 ***
	(0.0005)	(0.0063)
log(exp. wages)	-0.012 ***	-0.003
	(0.0007)	(0.0109)
Industry mix	-0.047 ***	-0.055 ***
	(0.0016)	(0.0210)
Family member in region	-0.022 ***	-0.043 ***
	(0.0002)	(0.0022)
Unemployment rate	0.001	0.031
	(0.0029)	(0.0429)
Plant characteristics	Yes	Yes
Year dummies	Yes	Yes
Number of obs.	5,360,616	58,444

Notes: *** and ** denote statistical significances at least at the 1% and 5% levels. All independent variables are measured during year *b-1*, except Displacement dummy and year dummies. Plant characteristics include industry dummies, size of the plant and log of turnover.

TABLE 4: Regional mobility of displaced workers by skill group

	Low-skilled displaced workers	Med-skilled displaced workers	High-skilled displaced workers
Female	0.003	0.004	0.007
	(0.0060)	(0.0046)	(0.0045)
Age	-0.004 ***	-0.003 ***	-0.003 ***
	(0.0003)	(0.0002)	(0.0003)
Married	-0.015 ***	-0.018 ***	-0.028 ***
	(0.0049)	(0.0035)	(0.0037)
Children < 7 years old	-0.010 *	0.003	0.009 **
	(0.0050)	(0.0034)	(0.0040)
Children 7-18 years old	-0.028 ***	-0.019 ***	-0.021 ***
	(0.0092)	(0.0054)	(0.0057)
Previous migration pattern			
Once before	0.063 ***	0.050 ***	0.044 ***
	(0.0056)	(0.0040)	(0.0045)
Twice before	0.061 ***	0.050 ***	0.042 ***
	(0.0096)	(0.0065)	(0.0067)
Three times before	0.112 ***	0.061 ***	0.054 ***
	(0.0152)	(0.0124)	(0.0115)
At least three times before	0.112 ***	0.065 ***	0.098 ***
	(0.0242)	(0.0185)	(0.0158)
Homeowner	-0.051 ***	-0.047 ***	-0.039 ***
	(0.0048)	(0.0032)	(0.0038)
Housing liquidity	0.333 ***	-0.034	0.133
	(0.1011)	(0.0754)	(0.0863)
log(exp. housing prices)	-0.083 ***	-0.054 ***	-0.088 ***
	(0.0131)	(0.0094)	(0.0104)
log(exp. wages)	0.014	0.023 **	0.024 ***
	(0.0143)	(0.0098)	(0.0077)
Industry mix	0.016	-0.083 **	-0.063 *
	(0.0451)	(0.0321)	(0.0359)
Family member in region	-0.048 ***	-0.043 ***	-0.038 ***
	(0.0047)	(0.0033)	(0.0038)
Unemployment rate	0.079	0.024	0.053
	(0.0986)	(0.0635)	(0.0701)
Plant characteristics	Yes	Yes	Yes
Year dummies	Yes	Yes	Yes
Number of obs.	14,142	24,814	19,488

Notes: ***, ** and * denote statistical significances at least at the 1%, 5% and 10% levels. All independent variables are measured during year *b-1*, except year dummies. Plant characteristics include industry dummies, size of the plant and log of turnover.

Appendix

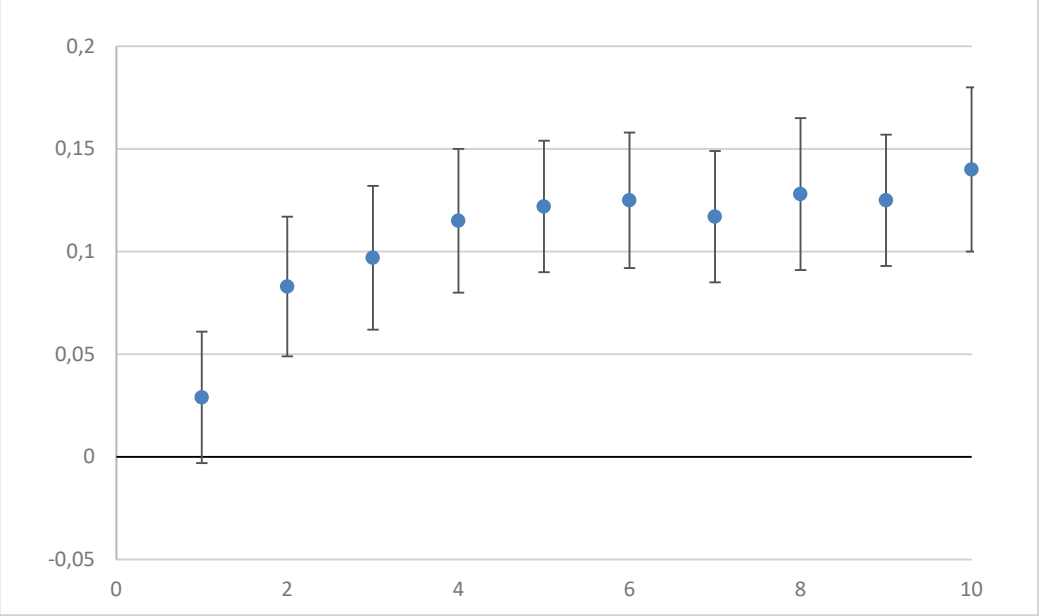

FIGURE A1: The coefficients for employment status for displaced movers with the 95% confidence intervals

TABLE A1: Regional mobility and labor market outcomes for displaced workers

	Monthly wages, men	Monthly wages, women	Employment months, men	Employment months, women
Years after migration				
1 year	-0.057 ***	-0.056 *	-0.516 ***	-0.480 ***
	(0.015)	(0.034)	(0.094)	(0.066)
2 years	-0.017	-0.044 *	0.142 **	-0.099
	(0.021)	(0.026)	(0.055)	(0.147)
3 years	-0.003	-0.001	0.343 ***	0.175
	(0.032)	(0.027)	(0.065)	(0.117)
4 years	0.011	0.018	0.317 ***	0.346 ***
	(0.035)	(0.034)	(0.098)	(0.108)
5 years	0.046 ***	0.038	0.337 ***	0.249 ***
	(0.029)	(0.050)	(0.079)	(0.083)
6 years	0.017	-0.022	0.294 ***	0.254 **
	(0.045)	(0.048)	(0.061)	(0.097)
7 years	0.024	-0.001	0.349 ***	0.373 ***
	(0.041)	(0.050)	(0.063)	(0.097)
8 years	0.065 **	-0.039	0.289 ***	0.294 ***
	(0.028)	(0.047)	(0.072)	(0.102)
9 years	0.074 *	-0.037	0.384 ***	0.372 ***
	(0.038)	(0.065)	(0.070)	(0.133)
10 years	0.031	0.032	0.270 **	0.506 ***
	(0.056)	(0.051)	(0.123)	(0.079)
Individual characteristics	Yes	Yes	Yes	Yes
Plant characteristics	Yes	Yes	Yes	Yes
Region dummies	Yes	Yes	Yes	Yes
Year dummies	Yes	Yes	Yes	Yes
Number of obs.	184,237	105,284	184,429	105,514

Notes: ***, ** and * denote statistical significances at least at the 1%, 5% and 10% levels.

TABLE A2: Regional mobility and earnings for displaced workers by skill group

Dependent variable: log of monthly earnings	Lowly skilled	Middle skilled	Highly skilled
Years after migration			
1 year	-0.040	-0.061 ***	-0.055 ***
	(0.042)	(0.017)	(0.017)
2 years	0.047	-0.052 **	-0.041 *
	(0.039)	(0.022)	(0.022)
3 years	0.056	-0.004	-0.038
	(0.044)	(0.021)	(0.034)
4 years	0.081	0.004	-0.031
	(0.050)	(0.024)	(0.034)
5 years	0.061	0.060 **	0.013
	(0.054)	(0.029)	(0.032)
6 years	0.043	0.002	-0.033
	(0.062)	(0.034)	(0.052)
7 years	0.041	0.018	-0.016
	(0.049)	(0.037)	(0.061)
8 years	0.036	0.067 *	-0.042
	(0.048)	(0.037)	(0.043)
9 years	0.095	0.051	-0.063
	(0.087)	(0.039)	(0.046)
10 years	0.094 **	0.085 **	-0.099
	(0.042)	(0.042)	(0.095)
Individual characteristics	Yes	Yes	Yes
Plant characteristics	Yes	Yes	Yes
Region dummies	Yes	Yes	Yes
Year dummies	Yes	Yes	Yes
Number of obs.	67,488	123,463	98,570

Notes: ***, ** and * denote statistical significances at least at the 1%, 5% and 10% levels.

TABLE A3: Regional mobility and employment months for displaced workers by skill group

Dependent variable: employment months	Lowly skilled	Middle skilled	Highly skilled
Years after migration			
1 year	-0.702 ***	-0.527 ***	-0.323 ***
	(0.113)	(0.073)	(0.095)
2 years	-0.048	-0.014	0.225 **
	(0.128)	(0.085)	(0.112)
3 years	0.0783	0.290 ***	0.422 ***
	(0.175)	(0.078)	(0.069)
4 years	0.273	0.244 **	0.471 ***
	(0.172)	(0.093)	(0.090)
5 years	0.141	0.280 ***	0.475 ***
	(0.110)	(0.058)	(0.086)
6 years	0.311 **	0.220 ***	0.326 ***
	(0.117)	(0.075)	(0.075)
7 years	0.282 ***	0.391 ***	0.359 ***
	(0.105)	(0.062)	(0.107)
8 years	0.256	0.348 ***	0.250 ***
	(0.160)	(0.092)	(0.091)
9 years	0.313 **	0.461 ***	0.283 **
	(0.149)	(0.080)	(0.131)
10 years	0.466 ***	0.359 ***	0.240
	(0.137)	(0.103)	(0.192)
Individual characteristics	Yes	Yes	Yes
Plant characteristics	Yes	Yes	Yes
Region dummies	Yes	Yes	Yes
Year dummies	Yes	Yes	Yes
Number of obs.	67,590	123,618	98,735

Notes: ***, ** and * denote statistical significances at least at the 1%, 5% and 10% levels.

TABLE A4: Regional mobility and earnings for displaced movers

	Small versus big firms		Rural versus urban region		Public versus private sector	
Dependent variable: log of monthly earnings	Small or micro	Medium or big	Rural	Urban	Public	Private
Years after migration						
1 year	-0.102 ***	-0.009	-0.076 ***	-0.031	0.001	-0.067 ***
	(0.024)	(0.016)	(0.016)	(0.033)	(0.027)	(0.020)
2 years	-0.072 **	0.017	-0.065 ***	0.023	-0.001	-0.032
	(0.030)	(0.017)	(0.016)	(0.026)	(0.035)	(0.021)
3 years	-0.041	0.034	-0.057 ***	0.069 **	0.009	-0.005
	(0.035)	(0.026)	(0.014)	(0.032)	(0.029)	(0.030)
4 years	-0.020	0.046	-0.021	0.058	-0.019	0.022
	(0.037)	(0.033)	(0.013)	(0.055)	(0.047)	(0.032)
5 years	0.019	0.069	-0.011	0.114 ***	0.011	0.054 *
	(0.030)	(0.043)	(0.021)	(0.044)	(0.048)	(0.032)
6 years	-0.015	0.021	-0.071 ***	0.092 *	-0.019	0.010
	(0.034)	(0.056)	(0.021)	(0.056)	(0.052)	(0.045)
7 years	0.001	0.030	-0.070 **	0.114 ***	-0.035	0.030
	(0.032)	(0.054)	(0.027)	(0.037)	(0.059)	(0.041)
8 years	0.055 **	0.010	-0.024	0.092 ***	-0.019	0.042
	(0.032)	(0.043)	(0.032)	(0.034)	(0.072)	(0.026)
9 years	-0.024	0.057	-0.024	0.098	0.008	0.041
	(0.035)	(0.054)	(0.035)	(0.064)	(0.067)	(0.044)
10 years	-0.059	0.079	-0.059	0.136 **	0.078 **	0.025
	(0.039)	(0.048)	(0.039)	(0.054)	(0.034)	(0.025)
Individual characteristics	Yes	Yes	Yes	Yes	Yes	Yes
Plant characteristics	Yes	Yes	Yes	Yes	Yes	Yes
Region dummies	Yes	Yes	Yes	Yes	Yes	Yes
Year dummies	Yes	Yes	Yes	Yes	Yes	Yes
Number of obs.	281,202	281,990	282,348	280,844	276,530	286,662

Notes: ***, ** and * denote statistical significances at least at the 1%, 5% and 10% levels.

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