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Navigating Regional Barriers to Job Mobility: The Role of Opportunity Structures in Individual Job-to-Job Transitions

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Abstract: Job-to-job transitions are associated with career progression and wage gains. Thus, regional differences in job mobility potentially contribute to and reinforce regional and social inequalities. This study aims to close the research gap in the understanding of the regional contexts in which individual job mobility occurs. Using the theoretical concept of regional opportunity structures, three key aspects of region-related job changes are investigated: regional determinants of (1) general job mobility; (2) job mobility with wage gains; and (3) simultaneous job and residential mobility. This study is based on individual data from the German Socio-Economic Panel study, enriched with regional indicators. The results show that job changes are negatively associated with labour market tightness, indicating that workers are less likely to change jobs in regions with a high ratio of job vacancies to unemployed workers. Fewer job-to-job transitions in tighter labour markets suggests that regional factors such as job availability and security play an important role in shaping job mobility, and that policies aimed at promoting job transitions may need to consider the specificities of local labour markets. The effects of other indicators of economic opportunities remain insignificant, and there are no clear effects of other aspects of regional opportunity structures.

Keywords: regional opportunity structures; job-to-job transitions; labour mobility; structural effects; spatial inequalities; labour market; job-to-job flows; labour market tightness



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1. Introduction

Social inequality in Germany is large and persistent. More and more people are experiencing persistent poverty, while individual wealth is becoming more solidified at the same time (Spannagel 2018). One factor contributing to these inequalities is the comparatively low social mobility between generations in Germany. A person's educational attainment, occupational status, and wealth are highly dependent on the respective achievements of their parents (e.g., Braun and Stuhler 2018; Heineck and Riphahn 2009; Nolan et al. 2021).

Thus, intragenerational mobility, i.e., the social ascent and descent of a person during his or her life, is of high significance for the permeability of society. An important determinant of income and social status is a person's occupation. Changing jobs has been found to be a main mechanism for workers to progress in their careers and to increase their earnings (Azzopardi et al. 2020; Haltiwanger et al. 2018). A change of job can therefore be a means of improving status. Understanding the factors that encourage and discourage workers to move between jobs is therefore very important in developing public policies aimed at making prosperity accessible to all.

Job changes are shaped not only by individual-level factors; they are also shaped by the broader economic, social, and institutional context in which workers are embedded. This context enables or limits the scope of workers' actions. In particular, the availability and regional distribution of job vacancies affect the opportunities for job mobility (Ng et al. 2007). When a labour market is fluid, employees can move freely from low to high productivity firms and thereby increase aggregate productivity and incomes (Decker et al. 2017) and move up the occupational hierarchy (McCollum et al. 2018). In case of a lack of mobility, regional labour market imbalances are expected to persist over time (Kronenberg

and Carree 2012). Understanding the role of regional opportunity structures in the decision for job change can help to explain why certain regions may have higher or lower rates of job change than others. Not including a regional perspective in the analysis of determinants of job-to-job transitions thus carries the risk of overlooking spatial dependencies and neglecting potential explanatory factors. Such a perspective enriches the traditionally two-fold approach to space in sociology, which privileges the urban and cross-national scales (Lobao et al. 2008). Only a few studies so far have examined how regional opportunity structures affect individual job change (Dütsch and Struck 2014; Kattenbach et al. 2014; Kronenberg and Carree 2012; Ganesch 2018), none of which used a comprehensive set of regional factors.

This paper aims to contribute to closing the research gap in the understanding of how contexts matter for individual job mobility. Using the theoretical concept of regional opportunity structures (Bernard et al. 2022), this study pays particular attention to exploring how home region characteristics impact job-to-job mobility and investigates three key aspects of region-related job change: the regional determinants of (1) job mobility; (2) upward job mobility; and (3) simultaneous job and regional mobility. This empirical study employs a unique combination of data sources. Data from the German Socio-Economic Panel (SOEP; Goebel et al. 2019) are combined with regional indicators, which allow for individual job changes to be considered in a regional context. By focusing in greater detail on structural effects, this article contributes to current research on the determinants of job change. By including both an economic perspective and other aspects of regional opportunities, this concept helps to shed light on the complex mechanisms through which regions shape job-to-job mobility.

Below, a theoretical framework outlining the general processes by which job mobility occurs is introduced. This is followed by an outline of the theoretical concept of regional opportunity structures, which is useful for examining regional determinants of job-to-job mobility. Section 3 provides information on the materials and methods used in this study. The data and sample construction are also described, as well as the employed measure and modelling strategy. In the subsequent section, the results from both descriptive and regression analyses are presented. These results are discussed in the final section, which also outlines an agenda for future research. Since a structural perspective is the focus of this study, considerable attention is devoted to the discussion of these determinants of job mobility throughout the whole paper.

2. Determinants of Job-to-Job Mobility

For the purpose of this study, job-to-job transitions are defined as job changes by employees in full-time positions. This includes transitions within the same organization as well as transitions to a new employer. Previous research on the determinants of job-to-job transitions has identified several factors that influence the propensity to change jobs. For the description of job mobility, Ng et al. (2007) proposed a multilevel theoretical framework. They suggest that job mobility is rarely determined by one or two factors. Rather, a constellation of potential structural and individual factors must be largely favourable before a worker will engage in some job mobility. Accordingly, there are three different levels of individual job mobility.

2.1. Three Levels of Job-to-Job Mobility

Individual perspective. Individual differences play a role in job mobility as dispositional attributes affect a person's preferences for and subsequent behaviours associated with job mobility. Previous research points to several key individual factors that are consistently found to be determinants of occupational progression. First, there are gender differences in job changing behaviour. Men are more likely to consider a job change (Xing and Yang 2005), they change jobs more often (Park et al. 2015), and they have more chances of upward labour mobility than women (Sacchi et al. 2016). Another important predictor of job mobility is age. The probability of job transitions declines steadily through the course of

one's working life (Kattenbach et al. 2014; Xing and Yang 2005) and age is negatively related to the frequency of job changes (Steenackers and Guerry 2016). For education, it has been shown that higher educated individuals transition to other jobs less frequently, because they tend to be already well-matched with their employers (Stijepic 2015). Highly educated workers are not inherently unable to reallocate but are even more likely to find a new job if they are searching and have greater chances of promotion within a firm (Ferreira 2009).

Decisional perspective. The decisional perspective on job mobility is grounded in the theory of planned behaviour. The decision for job mobility is based on the evaluation of three factors: subjective norms, the desirability of the mobility option, and the individual's readiness for change (Ng et al. 2007). Following a rational choice approach, an employee will decide to change jobs if the expected net benefits derived from the new position exceed the net benefits derived from the present job. The cost side is shaped by various factors, including information costs or the time required to find a new job. Benefits of job transition can be a higher salary, better promotion opportunities, or a shorter commuting distance. Kronenberg and Carree (2012) showed, for the Netherlands, that individuals assess the advantages and disadvantages of changing one's job by taking into account the strength of their family- and job-related ties as well as the presence of internal and external career options. Workers with low levels of satisfaction with the job and working environment and job security are more likely to consider a change in employment and to actively look for other jobs (Xing and Yang 2005). Additionally, conflicts with the supervisor, higher physical and emotional strain, and lower degrees of commitment are found to also be determinants of job change (SwSwaen et al. 2002). Pilar de Luis Carnicer et al. (2004) found that an employee's perceptions about job satisfaction, pay fairness, and work-family conflicts are actually more explanatory of labour mobility than traditional job-related factors such as pay or social benefits.

Structural perspective. The third perspective on job mobility is the structural perspective, which accounts for macro-level factors that determine the opportunity structure of job change in the labour market. This can include, among others, economic conditions and industry differences. It could be shown that workers can minimize the impact of individual determinants and endogenous causalities on their employment trajectories by taking advantage of good opportunity structures and framework conditions (Dütsch and Struck 2014). For an in-depth understanding of regional effects that this paper seeks to achieve, the structural level can be broken down further.

While a person's achievements are considered in terms of her socio-economic outcomes and her integration into social relations as resulting from her individual traits, the same achievements can be seen as dependent on the opportunities the person has available to develop and apply these traits (Bernard et al. 2022). Beyond their individual characteristics, a person's life chances are affected by the structural attributes of their place of living. Therefore, Bernard et al. (2022) argue that social inequalities can be regarded as a function of individual capital and available opportunities, and the interactions between them. Such opportunities arise from the person's social environment, and they are often spatially diverse. The concept of regional opportunity structures developed by Bernard et al. (2022) serves as a heuristic and analytical tool for deepening the understanding of the spatiality of social inequality and to identify the regional mechanisms that produce inequality. The term 'geography of opportunity' was originally coined by Galster and Killen (1995) and addressed the fact that opportunities are distributed spatially and not always in a balanced way. The concept of regional opportunity structures helps to grasp the broader context in which individual actions take place and is applied to investigate the regional mechanisms that affect job-to-job mobility in this study, which is one inequality-shaping process.

2.2. Regional Opportunity Structures of Job-to-Job Mobility

Regional opportunity structures refer to three interrelated aspects that highlight the links between the spatial context and the (non-)utilisation of opportunities by individuals: the unequal availability, accessibility, and quality of different institutionalised opportunities

(Bernard et al. 2022). While people are embedded in a given regional context of opportunity structures, they are active agents within it, and their perceptions and uses of opportunity structures are contingent on their capacities, interests, and ideals (Bernard et al. 2022). As the theoretical concept of regional opportunity structures suggests, previous studies could find that locational factors enable and constrain the ability and propensity of individual job mobility. Structural factors affect the opportunities for job mobility and, thus, differences in the level of regional development may manifest themselves as regional differences in job mobility as well (Ng et al. 2007). Despite the attention that determinants of job mobility have received by empirical research, a number of authors point to a lack of attention on locational factors and the broader context in which job mobility occurs (Dütsch and Struck 2014; Kattenbach et al. 2014; Ng et al. 2007). Following Bernard et al. (2022), regional opportunity structures consist of four types: economic opportunities, including regional labour markets providing jobs; public and private services; institutionalised opportunities for community and civic engagement; and the natural and the built environment.

The first and most relevant aspect of opportunity structures in the question of context effects on job-to-job mobility are economic opportunities. In this regard, Bernard et al. (2022) formulated two hypotheses to explain, in more depth, the effects of regional labour markets on the economic situations of individuals and households. First, the sectoral composition of a given labour market and its dynamics significantly affect the availability of jobs, income, and job security (Curtis et al. 2019). The spatial concentration of higher wage and lower wage industrial sectors helps to explain the existing regional differences in social inequalities. Moreover, the rise and fall of individual sectors shape spatial inequalities to a significant extent. Second, the density of the labour market is a strong predictor of efficiency and productivity, and thus influences the potential returns to employees. As cities and urban regions benefit from agglomeration economies and better job-match quality, their labour markets are more productive and, in turn, their wages are higher than those of rural areas (Andersson et al. 2007).

Besides affecting the reality of the labour market via the expansion or downsizing of firms, economic conditions also affect people's job mobility through influencing their willingness to try new job mobility options (Kattenbach et al. 2014; Ng et al. 2007). Perceptions of favourable economic conditions can increase employees' aspirations for more fulfilling work and generate higher rates of career progression (Feldman 2002; McCollum et al. 2018). More densely populated areas offer more and better employment opportunities, especially in periods of economic growth. During periods of economic decline, employees in rural areas face a greater risk of unemployment. In general, job-to-job hires display significant cyclical variation (Azzopardi et al. 2020). Thus, the business cycle possibly amplifies unequal employment opportunities in differently structured regions (Dütsch and Struck 2014). Additionally, employees profit from a higher regional level of human capital during an economic downturn, because transitions between firms become more frequent (Dütsch and Struck 2014). Therefore, the spatially uneven nature of economic and labour market opportunities implies that besides being highly skilled, it is also important to work in specific types of places. However, Ganesch et al. (2020) found that after a move, company characteristics are more important for income growth than the economic structural environment in the destination region.

The most relevant aspect of the regional economy for job mobility is the constitution of the labour market. Sociologists have long suggested that job mobility is vacancy driven. However, the availability of job mobility options is a necessary, but not a sufficient, condition to motivate employees to pursue job mobility options (Ng et al. 2007). Since there is a cost of regional mobility, a person's employment opportunities tend to be in the region where they live, but the degree of options can vary greatly between regions of the same country (Gordon et al. 2015).

Larger urban areas offer opportunities for accelerated job mobility for those who work there. Individuals make use of the abundance of nearby alternative offers in the job market; thus, there is a higher propensity to change jobs in urban areas (Kronenberg and Carree

2012). Increasing house prices in the destination region relative to the origin region is not associated with slower worker mobility in this regard (Coleman and Zheng 2020).

The second aspect of regional opportunity structures is the availability of, access to, and the quality of public and private services. Services are provided by a wide range of institutions that offer people opportunities to both achieve their desired socio-economic outcomes and also to satisfy people's individual needs and ambitions in terms of education, health, consumer services, and housing (Bernard et al. 2022). Housing is a cross-cutting issue that arises when considering spatial opportunity structures, as the place of residence is a decisive factor in the availability, accessibility, and quality of the range of opportunities. Yet housing itself is an institutionalised opportunity structure as it depends on housing policies (Bernard et al. 2022).

The third aspect of regional opportunity structures are institutionalised opportunities for community and civic engagement. Such participation is difficult to provide without physical meeting spaces, i.e., community centres, clubs, town halls, cafes, theatres, and churches, which depend on public and private funding. These spaces are unequally distributed in space, and they are harder to maintain in rural regions than in metropolitan regions, which entails an urban-rural divide (Knabe et al. 2021).

The fourth aspect of regional opportunity structures are the natural and the built environment. The natural environment is a major opportunity that is regularly attributed to rural areas. Rural areas are not only associated with nature and its beauty, but also with the ecosystem services (Gutman 2007) they provide for the entire society. The latter and more functional understanding of the role of rural areas also includes the provision of food and fresh water and recreational and leisure opportunities (Bernard et al. 2022). In addition to the natural environment, the built features of regions can provide opportunities, particularly regarding housing. Being able to own a home is again part of the institutional opportunity structure of rural areas. However, rural gentrification, whereby the better off make use of the opportunities of beautiful natural scenery in the countryside, contributes to selectively rising house prices and the displacement of lower income groups (Bernard et al. 2022).

From the theoretical concept of regional opportunity structures and the findings of previous empirical studies, the question arises as to how regional opportunity structures affect the propensity for job transition. Taking the considerations above into account, it appears that job transitions are, to a high degree, determined by the availability of job opportunities and thereby by the state of the regional economy. In regions with a strong economy, more jobs are created, and these vacancies offer more opportunities for job changes for employees. Workers may be more likely to switch jobs to take advantage of new opportunities and higher wages in such situations. However, an increase in the number of job vacancies in a local labour market might motivate employers to invest in their existing employees and to incentivize them to stay in their position. Employers would thereby protect the specific human capital their employees hold. Thus, despite a growing number of opportunities for job-to-job transitions, individuals may be less likely to change jobs in regions with good economic opportunities. Overall, the findings from previous research lead to the following hypothesis:

Hypothesis H1. *A stronger economy with a higher number of job vacancies constitutes a good economic opportunity structure for workers, which makes individual job changes more likely.*

Job change and income increase. As stated above, job transitions are one way to increase income and thereby move upwards socially. Job-to-job flows tend to be a main mechanism for workers to increase their earnings and to engage in career progression (Haltiwanger et al. 2018). This mechanism is particularly important for young people to move up the job ladder; for example, young people aged from 14 to 24 account for almost a third of all job-to-job moves in the U.S., but less than 15% of total employment. (Azzopardi et al. 2020). However, even though job transitions are generally associated with income increases, a non-negligible number of job changes are associated with a reduction

in income. In New Zealand, these account for approximately 40% of all job changes, but are presumably due to a change in the number of working hours (Coleman and Zheng 2020).

For a better understanding of regional income disparities, it is worthwhile to investigate whether and how regions affect the propensity to realise an increase in income when changing jobs. Regional economic conditions, job availability, and industry composition can affect the types of jobs available, the wages they offer, and the opportunities for career advancement, all of which can impact an individual's opportunities for upward job mobility.

In regions with a strong economy and high demand for skilled workers, employers may be willing to offer higher salaries or better benefits to attract and retain employees. This can create a more competitive environment in which employees are more likely to stay in their jobs and use their relatively high bargaining power to pursue higher wages or better working conditions in their company. In Germany, individuals who start their careers in a tight labour market enjoy higher wage growth than workers in more relaxed labor markets (Brunow et al. 2022). Conversely, in regions with a weak economy or limited job opportunities, individuals may be motivated to change jobs due to dissatisfaction with their current position. However, due to the relatively low number of vacancies in these labour markets, it might be more challenging to find a new job with comparable wages and benefits and workers may be motivated to leave the region for a new job. This article therefore addresses the question of how regional opportunity structures affect the propensity for an income increase when changing jobs. Applying the theoretical and empirical considerations, better economic conditions are expected to increase the probability of job change with an increase in income.

Hypothesis H2. *A stronger economy with a higher number of vacancies constitutes a better economic opportunity structure for workers and is an indicator for rising wages. This makes job changes with an increase in income more likely than staying in the current position and job changes without an increase in income less likely than staying.*

Job change and relocation. Kronenberg and Carree (2012) point out the close relation of job and residential mobility. In the U.S., around 16% of all recorded job-to-job moves between 2010 and 2016 were between employers located in different states (Azzopardi et al. 2020). The two types of mobility can function as both complements and substitutes for each other. There is a need to differentiate between interfirm mobility not involving migration and job changes requiring the residential relocation of the employee and possible additional family members (Kronenberg and Carree 2012). The availability of job opportunities in a particular region can be a key driver of job changes and relocations, but they have differing effects on job changes with and without residential mobility. While the presence of internal career opportunities impedes job changes, relocation is promoted by the existence of external options (Kronenberg and Carree 2012). Symmetrically, a high unemployment rate indicating a lack of career opportunities motivates the tendency for joint job and residential mobility, especially of younger employees (Ganesch 2018). Moreover, simultaneous job change and relocation is much more likely for workers living in small cities than for those living in large cities, but there is little wage premium associated with changing cities and thus workers gain little additional return from shifting locations (Coleman and Zheng 2020; Kronenberg and Carree 2012). However, workers moving longer distances tend to generally benefit from a sizeable earnings boost (Azzopardi et al. 2020).

It is reasonable to assume that regional characteristics affect simultaneous job and residential mobility as structural factors can play a significant role in shaping the labour market conditions and quality of life factors that influence both job change and relocation decisions. Regions with strong labour markets and high demand for workers may offer more workplace security, making job changes and relocations less likely. Conversely, regions with weaker labour markets and limited job opportunities may be less attractive to individuals and thereby motivate workers to change jobs and relocate to pursue better

career prospects. Other contextual factors can also play a significant role in joint job and regional mobility decisions. As mobility decisions potentially affect all members of the worker's household, other factors aside from economic conditions can be expected to be of more importance. For example, limited housing availability may be unattractive to workers, making them more likely to relocate. In contrast, in regions with ample housing availability, individuals may be more hesitant to relocate, even if they are offered higher salaries or better job opportunities. This study therefore investigates how regional opportunity structures affect the propensity to change jobs and relocate at the same time. All four dimensions of regional opportunity structure affect the quality of life and the resources for individual wellbeing and the achievement of socio-economic outcomes. Thus, better opportunities in any of the dimensions are expected to make outmigration less likely than staying in the current place of living.

Hypothesis H3. *Better economic opportunities, better public and private services, better opportunities for community and civic engagement, and better natural and built environment make joint job and residential mobility less likely than staying in the current position and make job changes without relocations more likely than not changing jobs.*

3. Materials and Methods

3.1. Data and Sample

For the empirical analysis of regional determinants of job change, data from three different sources are combined. The primary data source is the German Socio-Economic Panel (SOEP, [Liebig et al. 2021](#)), which is an ongoing longitudinal survey of randomly sampled private households in Germany. The SOEP has been conducted annually since 1984 and interviews about 30,000 individuals about their income, employment, personality, education, health, and various other aspects ([Goebel et al. 2019](#)). The study at hand primarily relies on information about the participants' employment situation and history as well as their place of residence between the survey years 2013 and 2019.

For the addition of structural indicators to the models, the SOEP survey data are supplemented with regional indicators from the Indicators and Maps for Spatial and Urban Development (INKAR) database provided by the Federal Institute for Research on Building, Urban Affairs and Spatial Development ([BBSR Bonn 2021](#); [Nguyen 2023](#)). Since an important aspect of regional opportunity structures for the change of jobs is the respective labour market in general and job vacancies in particular, these data are enriched by job vacancy data provided by the German Federal Employment Agency ([Statistik der Bundesagentur für Arbeit 2022](#); [Nguyen and Tsolak 2023](#)). These data are available for this study between the years 2013 and 2019, which determines this study's observation period.

The spatial linkage of individual-level survey data and regional indicators requires the use of sensitive information on SOEP respondents' place of living. The individual-level information from the SOEP and the regional indicators are merged at the NUTS-3 level (Nomenclature des Unités territoriales statistiques). NUTS-3 corresponds to the 401 "Kreise" and "kreisfreie Städte" (county level) German administrative units; NUTS-3 was also suggested by [Bernard et al. \(2022\)](#) as a meaningful regional level of analysis. The availability of individual-level data on such a low regional aggregate level is an advantage of the SOEP data. The job vacancy information is merged to the SOEP data such that it shows the number of open positions in the individual's occupation in their home region in the respective year. The two digit version of the German classification of occupations (Klassifizierung der Berufe (KldB)) is used for this purpose, which differentiates between 37 occupational groups.

The combined data cover the years from 2013 to 2019. The relevant data are not complete for earlier years, which sets the lower limit for the observation period. Three indicators from the INKAR database were imputed for parts of the period using Kalman Smoothing: General practitioners per 10 inhabitants (2012–2014), Natural area per capita (2012–2015), and New built flats in one-/two-family houses (2012–2014). Besides this, the

sample is restricted to full-time employees aged from 25 to 55 at the time of interview. These restrictions were chosen to capture job mobility of the core working population, which is neither related to vocational training, temporary student jobs, early career decisions, nor to considerations of (early) retirement. The sample covering the years 2013 through 2019 contains data from 10,228 individual workers, of which 2190 transition from a full-time position. Descriptive statistics for the sample are displayed in Table A1 in Appendix A.

3.2. Measures

For the operationalisation of job change, one particular question from the SOEP questionnaire is used. Participants are asked annually whether they have changed their job during the previous year and to specify the change. Three dependent variables are derived from this. First, a dichotomous variable indicating job change, and second, a categorical variable with three values indicating whether a person has not changed job, changed job without an increase in income, or changed job with a simultaneous increase in income. An increase in income is defined as an increase of more than 5% of the net labour income to adjust for a rise of wage for inflation and to account for wage increases unrelated to job changes (Lluis 2005)¹. The third variable is also categorical, and takes on different values for no change in job, a job change without relocation to a different region, and a job change with simultaneous relocation to a different region. A relocation is defined as a change in NUTS-3 region, which corresponds to a move across a county ("Kreis") border.

In line with the theoretical considerations and results from previous research outlined above, a range of independent variables is included to represent the three levels of regional opportunity structures. One of the major challenges when applying the concept of regional opportunity structures is to distinguish the indicators of opportunities from the social situation of the population that is dependent on them. As an example, the authors claim that the unemployment rate does not sufficiently distinguish between opportunity and outcome. A more appropriate approach would be to use indicators related to the region's job supply and job accessibility (Bernard et al. 2022). This underlines the importance of choosing indicators thoughtfully.

As argued in Section 2, economic opportunities are mainly constituted by the business cycle and job vacancies. To indicate the business cycle, the growth of the regional gross domestic product (GDP) per employee is added to the models. Cornelissen et al. (2007) have shown that the pattern of seasonal changes in the GDP repeats over the years. Thus, seasonal changes can be disregarded, or rather subsumed, under their respective years when considering a trend over several years. Since economic development is expected to have a delayed effect on the labour market, a variable indicating the GDP growth in the year before the job transition is used. It is defined as the growth in GDP by 100,000 Euro per employed person in the respective region. In addition to the GDP growth, two variables representing the local labour market situation are introduced in the models. The availability of job change options is one main driver of job mobility; thus, the number of job vacancies in the individual's respective occupation is generated. Occupation is defined using the two digit version of the KldB-2010 taxonomy. The number of vacancies is matched to the individual workers by region, survey year, and occupational code. Additionally, local labour market tightness is added to the model. This variable is calculated by dividing the total number of job vacancies by the total number of unemployed (Cahuc et al. 2014). Thus, a labour market tightness value of one indicates that there are as many vacancies as unemployed workers in a region, values smaller than one indicate less vacancies than unemployed, and values greater than one indicate more vacancies than unemployed. Greater labour market tightness values therefore point to a situation with more vacancies to choose from for both unemployed and employed workers living in the respective region.

A region's public and private services are reflected in the presence of institutions that serve people's needs and ambitions in terms of education, health, consumer services, and housing. Two indicators of health infrastructure (the number of hospital beds per capita and the number of general practitioners per 10 inhabitants) are included. In addition, the

number of newly built flats in multi-family houses per capita serves as an indicator for housing opportunities. Despite the need for measures of education and consumer services, no adequate time series data for the operationalization of these variables were available. Thus, not all aspects of this regional opportunity structure are covered in this study.

Civic engagement unfolds in regional contexts. Previous research showed that there are significant regional differences in Germany (Barreto et al. 2022; Hameister and Tesch-Römer 2017), which points to regional differences in opportunities for community and civic engagement. The availability of various forms of infrastructure, such as community anchor institutions and broadband access, affects the propensity to join clubs and organisations (Whitacre and Manlove 2016). While options to meet socially are much more numerous in urban areas and opportunities for community and civic engagement are often limited in peripheral rural regions (Bernard et al. 2022; Kleiner 2021), there is evidence that there is more community engagement in rural areas than in urban areas (Hameister and Tesch-Römer 2017; Paarlberg et al. 2022). In the absence of time series data on places offering opportunities for engagement, such as clubhouses and community centres on a NUTS-3 level in Germany, it therefore stands to reason to use the population density as an indicator for opportunities for community and civic engagement. Population density is measured in 1000 inhabitants per km². The use of this proxy disregards the different aspects of opportunities for community and civic engagement, which are subsumed under one variable in this case.

The fourth aspect of regional opportunity structures is the natural and built environment. The natural environment is represented by the nature-like area in km² per capita per region. A nature-like area is defined as a water surface excluding harbour basins plus vegetation areas excluding agriculture and forest areas. As Bernard et al. (2022) pointed out, the rural environment is, to a great extent, characterised by the ability to own one's place of living. Since this is usually the case for one-family houses, the number of newly built flats in one- or two-family houses per capita serves as a second indicator for a region's natural and built environment.

Accounting for the individual-level aspects of job mobility, the models control for various personal characteristics. As the theory and the results of previous studies on the determinants of job change suggest, the models control for sex, age, age squared, migration background, years of education, marital status, and occupation (Bächmann and Frodermann 2020; Ferreira 2009; Ganesch et al. 2020; Sacchi et al. 2016). As in Ferreira (2009), a variable is introduced to account for some heterogeneity in the propensity that each worker experiences job mobility. This is a dummy variable, which assumes the value of one if the worker has previously experienced job mobility at least once and zero otherwise. Additionally, the models control for the year of the occurrence of the job change to account for overall characteristics of the economy and society.

The whole set of predictor variables shows no sign of multicollinearity. The general variance inflation factors are reported in Table A2.

3.3. Modelling Strategy

For each dependent variable, one regression model is established. First, a logistic regression model is used to explain the first dependent variable, which indicates whether a worker changed job. The second and third models are multinomial logit models for the second and third dependent variables. Both variables take on three different values and indicate job change and simultaneous income change or relocation, respectively. The models assume unordered outcomes and incorporate only individual- and region-specific characteristics, but no choice-specific attributes. All three models follow the same setup and include the full set of independent variables and controls introduced above. For the independent variables, values from the year before a job change was reported are considered. To consider dependencies of region characteristics in the data, the models are computed with cluster-robust standard errors at the regional level.

4. Results

4.1. Descriptives

One fifth of all surveyed workers in the observation period (2190 of 10,288) experience a job-to-job transition, making this a relatively regular event in employees' occupational lives. However, the average number of job changes among those who experience at least one is 1.26, indicating that job mobility did not happen regularly to the individual worker in the 7 year period. In total, 2614 job-to-job transitions were observed in the time period in the SOEP, which equals 373 job changes on average per year. However, the number of job-to-job transitions declines throughout the observation period. While the number of observed cases is over 400 for the years 2013, 2014, 2015, and 2017, it drops below 400 in 2016 and 2018 and drops to 247 in 2019. Of the 2614 job-to-job changes, 1341 were job changes without an increase in income; in 1273 cases, the workers did realize an increase in income. On the other hand, 2400 (92%) of the job changes happened without a relocation, while 214 (8%) of the job-to-job transitions came with a change in place of living. Thus, the probability of a wage gain when changing jobs is only about 50%, while joint job and residential mobility is a relatively rare event in the sample.

4.2. Results from Regression Models on Job-to-Job Transitions

For all three independent variables of job transitions, one regression model is estimated. Table 1 displays the findings for the first model, the logistic regression of regional characteristics on job change. The analysis reveals that four indicators of regional opportunity structures have a significant effect on the odds of changing job. Higher values of regional labour market tightness decrease the odds of job-to-job transitions by 25%. The number of general practitioners per 10 inhabitants shows a positive effect on the odds of job change, while an increase in the number of newly built flats in multi-family houses halves the odds of changing jobs. Moreover, the amount of natural area per capita has a negative effect on the propensity of job change. In regions with more natural area per capita, the odds of job mobility are decreased.

Table 1. Logistic regression of job change.

DV: Job Change	Odds Ratio	<i>p</i>
Economic conditions		
Matching Job Vacancies	1.000	0.643
Labour Market Tightness	0.746	0.036
GDP Growth	0.998	0.105
Public and Private Services		
Hospital Beds	1.052	0.652
General Practitioners	1.063	0.008
Multi-Family Housing	0.517	0.008
Engagement Opportunities		
Population Density	0.999	0.081
Natural and Built Environment		
One-/Two-Family Housing	1.032	0.939
Natural Area	0.012	0.000

Notes: N = 29,537, thereof 2614 cases of job change. Standard errors clustered on the regional level. Model 1 in Table A3 in Appendix A displays the estimates for individual-level controls and time fixed effects. Sources: SOEP v29–v36, INKAR, Federal Employment Agency.

While these effects point to the relevance of regional opportunity structures in the propensity of job transition, the picture is not clear due to differing significance and direction of effects in the different categories of opportunity structure. Despite its non-significance, the negative sign of the effect of GDP growth indicates smaller odds of job transition in times of economic growth. Taken together with the negative effect of

labour market tightness, the effects of the economic opportunity structures contradict the assumed association. The effect of public and private services on the propensity to change jobs is twofold. On the one hand, more general practitioners per 20 inhabitants are associated with higher odds of job transition. This is supported by the positive effect of the number of hospital beds per capita, which is, however, not statistically significant. The number of newly built flats in multi-family housing per capita has no significant effect, but points to lower odds of job transitions at higher rates of housing. Moreover, the model shows no statistically significant effect for population density, which is the indicator of opportunities for community and civic engagement in a region. Concerning the natural and built environment, the negative effect of the amount of natural area per capita is accompanied by a positive, but not significant, effect of the number of newly built flats in one- or two-family houses.

The results of the second model, a multinomial model of regional characteristics on job change with and without income increase compared to no job change, are displayed in Table 2.

Table 2. Multinomial regression, job change and income increase.

	Job Change without Income Increase	Job Change with Income Increase
Economic Conditions		
Matching Job Vacancies	1.000 (0.719)	1.000 (0.654)
Labour Market Tightness	0.812 (0.000)	0.677 (0.000)
GDP Growth	0.997 (0.046)	0.999 (0.587)
Public and Private Services		
Hospital Beds	1.041 (0.519)	1.061 (0.312)
General Practitioners	1.067 (0.000)	1.050 (0.000)
Multi-Family Housing	0.363 (0.000)	0.729 (0.000)
Engagement Opportunities		
Population Density	0.999 (0.643)	0.999 (0.003)
Natural and Built Environment		
One-/Two-Family Housing	1.495 (0.000)	0.704 (0.000)
Natural Area	0.027 (0.000)	0.005 (0.000)

Notes: Reference category: no job change. N = 29,537, thereof 1341 cases of job change without income increase, 1273 cases of job change with income increase. Standard errors clustered on the regional level. Odds Ratios, *p*-values in brackets. Model 5 in Table A4 in Appendix A displays the estimates for individual-level controls and time fixed effects. Sources: SOEP v29–v36, INKAR, Federal Employment Agency.

The analysis reveals similar effects to the logistic regression on job change. Higher values of labour market tightness decrease the odds of both job change without and with income increase by 19% and 32%, respectively, relative to the odds of staying in the current position. In addition, GDP growth has a statistically significant negative effect on the propensity of changing jobs without realizing an income increase. However, an increase in GDP growth per employee is associated with a decrease in the odds of less than 1%. The results show that GDP growth has no significant effect on the odds of job changes with an increase in income and that the number of matching job vacancies does not affect the likelihood of either job changes without or with income increases when compared to not changing jobs. These results confirm that better economic conditions make job changes with an income increase less likely. However, a decrease in the likelihood of job changes without an income increase when GDP growth is increasing supports the assumed association.

The results for public and private service indicators reveal a similar pattern to Model 1. On the one hand, there are positive effects of the number of general practitioners on both the odds of changing jobs with and without income increase over staying in the current position. On the other hand, an increase in the number of newly built flats in multi-family houses decreases the odds of job transitions without income increase by about 64% and the

odds of job transitions with income increase by 27%. The number of hospital beds shows no significant effect on the odds ratio of job change with and without income increase over no job change. Furthermore, the analysis reveals no significant effect of the population density on the odds of changing jobs without income increase over staying in the current position. However, an increase in population density has a significant effect and reduces the odds of job changes with income increases slightly (by less than 1%) which indicates a small effect of opportunities of community and civic engagement on job transitions. For the indicators of the natural and the built environment, the model shows significant effects only. An increase in the number of newly built flats in one- or two-family houses makes job-to-job transitions without income increases 1.5 times more likely than staying in the current position. On the other hand, it decreases the odds of changing jobs and realizing an income increase over not changing jobs by about 30%. The amount of natural area per capita has a significant negative effect on both job changes with and without income increase. More natural area is associated with a decrease in the odds of job transitions without an income increase and a decrease in the odds of changing jobs with an income increase.

Table 3 displays the results of the third model, a multinomial regression on a categorical dependent variable indicating whether a worker changed jobs and stayed in their region, changed jobs and relocated to a different region, or stayed in the job.

Table 3. Multinomial regression, job change and relocation.

	Job Change without Relocation	Job Change with Relocation
Economic Conditions		
Matching Job Vacancies	1.000 (0.569)	1.000 (0.906)
Labour Market Tightness	0.693 (0.000)	1.312 (0.000)
GDP Growth	0.998 (0.102)	0.999 (0.814)
Public and Private Services		
Hospital Beds	0.000 (0.997)	0.699 (0.000)
General Practitioners	1.048 (0.000)	1.249 (0.000)
Multi-Family Housing	0.496 (0.000)	0.754 (0.000)
Engagement Opportunities		
Population Density	0.999 (0.106)	0.999 (0.030)
Natural and Built Environment		
One-/Two-Family Housing	1.228 (0.000)	0.120 (0.000)
Natural Area	0.014 (0.000)	0.001 (0.000)

Notes: Reference category: no job change. N = 29,537, thereof 2400 cases of job change without relocation, 214 cases of job change with relocation. Standard errors clustered on the regional level. Odds Ratios, *p*-values in brackets. Model 10 in Table A7 in Appendix A displays the estimates for individual-level controls and time fixed effects. Sources: SOEP v29–v36, INKAR, Federal Employment Agency.

Concerning regional economic opportunities, the analysis reveals the significant effect of labour market tightness on job changes with and without relocation only. Higher values of regional labour market tightness decrease the odds of changing jobs without relocating over staying in the current position by about 30%. On the other hand, higher labour market tightness makes simultaneous job and residential mobility 1.312 times more likely than not changing jobs. While the direction and size of the effects of the number of job vacancies and GDP growth per employee are similar to the effects in the first two models, neither of these effects reached statistical significance. Thus, the number of matching job vacancies and GDP growth do not affect the propensity to change jobs with and without relocating at the same time. For the indicators of regional health services, the analysis shows mixed results. The number of hospital beds has no effect on the propensity to change jobs without relocating but does significantly decrease the odds of job change with relocation over not changing jobs by about 30%. As in the first two models, a higher number of general practitioners per 10 inhabitants increases the odds of both job transitions with and without simultaneous

regional mobility. In addition, the analysis reveals that the number of newly built flats in multi-family housing per capita negatively affects the propensity of job changes with and without relocation. A higher amount of multi-family housing per capita halves the odds of job transitions without residential mobility and decreases the odds of job change with relocation by 25%. The results again show no significant effect of population density on the odds of either of the job mobility options relative to the odds of not changing jobs. Moreover, the analysis reveals significant effects for both indicators of the natural and the built environment on both outcomes. A higher number of newly built flats in one- or two-family houses per capita increases the odds of job changes without relocation by 1.228 times. However, it decreases the odds of simultaneous job and residential mobility by almost 90%. The amount of natural area per capita on the other hand has significant negative effects on both types of job mobility. More natural area per capita in a region is associated with a decrease in the odds of job change without relocation by about 99% and a decrease in the odds of job change with relocation by almost 100%.

In the following section, the results are discussed alongside the different aspects of regional opportunity structures to further evaluate their impact. When looking at the effects of economic opportunities, it is noticeable that the number of matching job vacancies does not show a significant effect in any of the three models. The number of matching job vacancies in the employees' home region does not affect their likelihood to change jobs. Similarly, the analyses reveal no statistically significant effects of the change in GDP per employee on the odds of job-to-job transitions. However, a growth in GDP is associated with reduced odds of job changes without an income increase relative to staying in the current position. This indicates that in times of economic growth, workers are more likely to stay in their job than change to a job with a lower income. The third indicator of regional economic opportunities, labour market tightness, has significant effects on all cases of job-to-job transitions. High values of labour market tightness imply a high vacancy-to-unemployed ratio meaning that there are relatively many unfilled vacancies in the labour market compared to few unemployed. Labour market tightness has negative effects on all cases of job mobility but has a positive effect on the odds of simultaneous job and residential mobility. These results show that job-to-job transitions are not only less likely in regions with high labour market tightness, but that workers are even more likely to move away and take up a job in a different region than to stay in their position. While the negative effect contradicts it, the positive effect supports the hypothesised association of labour market tightness and job changes.

For a better understanding of the negative effect of labour market tightness on the odds of job-to-job transitions, several checks for the robustness of the findings are conducted.

First, the models are additionally controlled for the total amount of unemployed workers, which defines the denominator of the labour market tightness. Models 2, 6, and 11 in Tables A3, A4 and A7 in Appendix A show the results of the extended models and reveal that the effects of labour market tightness only change marginally when adding the number of unemployed while the effects of all other predictors also remain the same in size, direction, and level of significance. Moreover, the number of unemployed workers does not influence job changes. This shows that the negative effect of labour market tightness is driven by the total number of job vacancies in a given region. Thus, an increase in job vacancies at a fixed number of unemployed workers makes job changes less likely for workers who already hold a full-time position in the labour market.

Second, part-time workers are added to the sample of full-time workers. While the original sample consists of full-time workers only, the number of vacancies is derived from both full- and part-time vacancies that were reported to the German Federal Employment Agency. Thus, the model controls for whether the effects of the labour market indicators are driven by the absence of part-time employees in the sample. The results for the resulting Models 3, 7, and 12 can be found in Tables A3, A5 and A8 in Appendix A. The results reveal that most effects are robust to the composition of the sample concerning their size, direction, and level of significance. While the effect of labour market tightness remains the same, it is

no longer statistically significant in Model 3, the logistic regression of job change. In turn, the negative effect of GDP growth reaches significance. Looking at the multinomial models of job change and income increase or relocation, almost all effects remain the same when looking at size, direction, and level of significance. This applies particularly to the effects of labour market tightness, which are only about 10 percent smaller than in the original model. Third, characteristics of previous employment are added to the list of predictor variables. These include tenure, a categorical variable indicating firm size, as well as a categorical variable indicating personal income relative to the income distribution of one's occupation. While employment characteristics cannot be regarded as opportunity structures, they are important structural factors that are likely to impact a worker's motivation to leave a job. Models 4, 8, and 13, in Tables A3, A5 and A8 in Appendix A, show the results of these extended models. All added variables show statistically significant effects. By adding these variables, all indicators of regional opportunity structures lose their statistical significance in Model 4. However, the effects remain similar in size, direction, and level of significance in the multinomial models of job change and income increases or relocations.

In terms of a region's public and private services, both the number of general practitioners per 10 inhabitants and the number of newly built flats in multi-family houses per capita show significant effects on the propensity of job-to-job transitions. A higher number of general practitioners in a region is associated with higher odds of changing jobs than staying in the current position in all the analysed cases. The opposite is true for the amount of multi-family housing. The more newly built flats in multi-family housing per capita in a region, the lower the odds of job-to-job transitions in all the observed cases. This indicates that workers are less likely to change jobs in regions with good prospects for renting a flat. While the significant effect of the number of general practitioners indicate a positive effect of health care services on the odds of job change, the effect of the number of hospital beds per capita remain non-significant. However, it does have a negative effect on the odds of simultaneous job and residential mobility, which contradicts the positive effect of the number of general practitioners.

Population density, the measure for opportunities for community and civic engagement, has a significant negative effect on the propensity to change jobs and realise an increase in income, but no effect on the other observed cases of job mobility. This shows that job-to-job transitions with increases in income are less likely than staying in the current position in densely populated regions. However, population density does not affect any other analysed case of job change and this effect might thus be driven by an effect of population density on the probability of realising income increases.

While the number of newly built flats in one- or two-family homes per capita has no effect on the general propensity to change jobs, it shows significant effects on the other observed cases of job-to-job transitions. Higher numbers of one- or two-family houses increases the odds of job transitions without income increase and relocation and decreases the odds of job mobility with income increase and relocation when compared to the odds of staying in the current position. Moreover, the analyses reveal significant negative effects for the amount of natural area per capita on all observed cases of job-to-job transitions. Thus, changing jobs is less likely than staying in the current job in regions with relatively greater natural area.

5. Discussion

This study on regional determinants of job-to-job transitions in Germany identifies key factors affecting the propensity of job change. By understanding how regional context factors affect job change decisions, employers, policymakers, and job seekers can make more informed decisions about career paths, workforce development, and economic development strategies. This knowledge can help individuals and organisations make more strategic decisions about recruitment, retention, and career advancement, as well as inform policies aimed at promoting job growth and improving labour market outcomes.

The most prominent finding of the analyses of the regional determinants of different types of job-to-job transitions is the negative effect of labour market tightness on all but one type of job change. Higher labour market tightness is associated with a lower propensity to change jobs, but also with a higher propensity to change jobs and move at the same time. These effects have proven robust to different sample compositions and different sets of predictor variables. They hold for full-time workers as well as the complete labour force and for controlling for the number of unemployed and individual employment characteristics. Different explanatory approaches can be used to understand the mechanisms behind this finding, which contradicts the hypotheses put forward.

One way to understand the mechanism would be to assume that a reduction of job seekers and thereby an increase in labour market tightness is caused by a fall in the rate of on-the-job searches and job-to-job transitions. This approach accounts for the fact that it is not only unemployed workers who compete for vacant jobs, but also those workers who already hold a position. [Abraham et al. \(2020\)](#) have pointed out the absence of employees in the construction of labour market tightness. Measured vacancies already include the effects of separations leading to a job-to-job transition, as they include the job openings created when employers must replace departing employees. However, using the number of unemployed as a measurement of effective searchers does not take into account the contribution of on-the-job searchers to the overall pool of effective searchers ([Abraham et al. 2020](#)). When defining labour market tightness as the ratio of job vacancies to job seekers, where job seekers are composed of unemployed and employed workers searching for a job, less on-the-job searches would lead to higher labour market tightness at a stable number of unemployed job seekers. In this way, high labour market tightness indicates relatively low fluidity and high transaction costs for employees, which reduces job-to-job mobility.

Another way to look at the lower likelihood of job-to-job changes in regions with tight labour markets would be to focus on the employer perspective. An increase in labour market tightness increases the competition between employers for employees as the ratio between vacancies and unemployed workers is high. This creates a costly hiring process for employers when they want to fill a vacancy for skilled workers. The expenses of the search for employees are positively associated with labour market tightness ([Muehlemann and Strupler Leiser 2018](#)) and are therefore expected to motivate the employers to retain their existing workforce. While unemployed workers have a high probability of finding a job in tight labour markets ([Cahuc et al. 2014](#)), this study's results suggest that existing jobs experience greater security.

At the same time, the results show that higher labour market tightness in a worker's home region makes joint job and residential mobility more likely than staying in the current position. This finding indicates that higher labour market tightness does not only act as a barrier to local job mobility, but also fosters outmigration of labour. A probable reason for moving is the prospect of higher income. For a better understanding of the underlying mechanisms of joint job and residential mobility, there is a need for further research of the interdependencies of income increases and regional mobility.

A potential limitation of the interpretation of the effects of labour market tightness is that not all vacant jobs are registered with the German Federal Employment Agency. The number of vacancies might therefore be underestimated, which could potentially influence the results. However, this would only lead to an underestimation of the found effects.

The other two indicators of regional economic opportunities, the growth in GDP per employee and the number of matching vacancies, do not influence the propensity to change jobs. The hypothesis that better regional economic opportunities make a job-to-job transition less likely is thereby not unambiguously confirmed. There is a need for a better understanding of the competition of unemployed and employed workers for vacant positions in regional labour markets. Based on the finding of fewer job-to-job transitions in tighter labour markets, more research on the underlying motivations and actions on the employers' and employees' side is necessary. Adding employer characteristics as well as

the employee's job change intentions and on-the-job search intensity could help disentangle the association of labour market tightness and job mobility.

Aside from the labour market tightness, other indicators of regional opportunity structures have effects on the propensity to change jobs. A higher number of general practitioners per 10 inhabitants makes a job change more likely while more natural area per capita makes job changes less likely. These findings indicate that the propensity to change jobs is lower in regions with thin infrastructure and much nature. However, the absence of effects of population density and the number of hospital beds per capita, as well as the negative effects of the amount of multi-family housing, do not support this explanatory approach. This underlines the need for more research into the characteristics of regions with high job-to-job mobility rates and how local infrastructure impacts job mobility.

Moreover, the analyses reveal no clear effects of regional opportunity structures on the propensity of wage gains and relocation when changing jobs. These, as well as the above-mentioned disparate findings, need to be interpreted in the light of the limitations in the operationalisation of the theoretical concept of regional opportunity structures. First, as mentioned in Section 3.2, public and private services, as well as opportunities for community and civic engagement, are not operationalised in a comprehensive way in the sense of the theoretical concept. Second, this paper analyses the direct effects of the different aspects of regional opportunity structures; this is not considering the dependencies among them, as suggested by Bernard et al. (2022). The four types of regional opportunity structures overlap and interact in people's daily lives and practices. Neglecting interactions between the different aspects of a region's opportunity structure might lead to an overlooking of effects. It must be considered that these two limitations restrict the interpretability of this study's findings. Future research extending the presented study with suitable variables and interactions of the four regional opportunity structures on job-to-job mobility is needed to further disentangle the effects found in this study. The role of place of living and the prevailing opportunities in wage gains and residential mobility associated with job changes remains unclear and subject for further research.

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Data Availability Statement: The analyses rely on data from the German Socio-Economic Panel (SOEP), the Indicators and Maps for Spatial and Urban Development (INKAR), and the German Federal Employment Agency. The SOEP data can be accessed for scientific use only after signing data disclosure contracts. Requests to access these datasets should be directed to www.diw.de/en/soep, accessed on 23 February 2023. The INKAR data is publicly available at www.inkar.de, accessed on 23 February 2023, and via the R package *inkr* (Nguyen 2023). The data from the Federal Employment Agency used in this study can be accessed via the R package *badata* (Nguyen and Tsolak 2023).

Conflicts of Interest: The author declares no conflict of interest.

Appendix A

Table A1. Descriptive statistics.

	Mean	Standard Deviation
Job change	0.09	0.28
Female	0.28	0.45
Age in years	42.18	8.03
Migration background	0.26	0.44
Years of education	12.89	2.82
Married	0.63	0.48
Changed job before	0.19	0.40

Table A1. *Cont.*

	Mean	Standard Deviation
Job vacancies (matched on KldB2010 two digits)	133.95	230.51
GDP growth (per employee)	8.95	20.16
Labour market tightness	0.29	0.22
Hospital beds (per capita)	0.56	0.32
General practitioners (per 10 inhabitants)	0.04	0.01
New built flats in multi-family houses (per capita)	0.13	0.12
Population density	82.26	113.84
New built flats in one-/two-family houses (per capita)	0.12	0.09
Natural area (per capita)	0.02	0.03

Notes N = 29,537. Sources: SOEP v29–v36, INKAR, Federal Employment Agency.

Table A2. Variance Inflation Factors.

	GVIF
Female	1.124
Age in years	124.800
Age in years squared	124.001
Migration background	1.177
Years of education	1.161
Married	1.235
Changed job before	2.131
Job vacancies (matched on KldB2010 two digits)	1.459
GDP growth (per employee)	1.028
Labour market tightness	1.271
Hospital beds (per capita)	1.183
General practitioners (per 10 inhabitants)	1.055
New built flats in multi-family houses (per capita)	1.286
Population density	1.922
New built flats in one-/two-family houses (per capita)	1.505
Natural area (per capita)	1.200

Notes: Sources: SOEP v29–v36, INKAR, Federal Employment Agency.

Table A3. Logistic regression of job change.

DV: Job Change	Model 1	Model 2	Model 3	Model 4
Intercept	0.000 ***	0.000 ***	0.000 ***	0.000 ***
Individual-Level				
Female	1.169 *	1.169 *	0.949	1.183 *
Age	0.747 ***	0.746 ***	0.748 ***	0.925
Age squared ²	1.003 ***	1.003 ***	1.003 ***	1.001
Migration Background	1.368 ***	1.369 ***	1.308 ***	1.561 ***
Years of Education	0.967 **	0.967 **	0.973 *	0.986
Married	0.869 *	0.869 *	0.834 **	0.889
Job Transition Before	$8.856 \times 10^{+16}$ ***	$8.854 \times 10^{+16}$ ***	$8.023 \times 10^{+16}$ ***	$1.536 \times 10^{+17}$ ***

Table A3. Cont.

DV: Job Change	Model 1	Model 2	Model 3	Model 4
Previous Employment				
Tenure				1.082 ***
Firm Size 20–199				0.767 *
Firm Size 200–1999				0.536 ***
Firm Size ≥ 2000				0.440 ***
Income Quantile 2				0.792 *
Income Quantile 3				0.581 ***
Income Quantile 4				0.605 ***
Survey Years (reference 2013)				
2014	0.000 ***	0.000 ***	0.000 ***	0.000 ***
2015	0.000 ***	0.000 ***	0.000 ***	0.000 ***
2016	0.000 ***	0.000 ***	0.000 ***	0.000 ***
2017	0.000 ***	0.000 ***	0.000 ***	0.000 ***
2018	0.000 ***	0.000 ***	0.000 ***	0.000 ***
2019	0.000 ***	0.000 ***	0.000 ***	0.000 ***
Economic conditions				
Job Vacancies	1.000	1.000	1.000	1.000
Labour Market Tightness	0.746 *	0.754 *	0.815	0.812
GDP Growth	0.998	0.998	0.998 *	0.998
Unemployed		1.000		
Public and Private Services				
Hospital Beds	1.052	1.056	0.957	0.998
General Practitioners	1.063 **	1.063 **	1.039 *	1.053
Multi-Family Housing	0.517 **	0.516 **	0.620 *	0.735
Engagement Opportunities				
Population Density	0.999	0.999	0.999	0.999
Natural and Built Environment				
One-/Two-Family Housing	1.032	1.038	1.305	0.996
Natural Area	0.012 ***	0.012 ***	0.000 ***	0.000 ***

Notes: Odds ratios, significance levels (SEs clustered on regional level): * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$. Reference category Firm Size: less than 20 employees. Sources: SOEP v29–v36, INKAR, Federal Employment Agency. Model 1, 2, and 5: N = 29,537 thereof 2614 cases of job change. Model 3: N = 31,465, thereof 2824. Model 4: N = 29,099, thereof 2540 cases of job change.

Table A4. Multinomial regression, job change and income increase.

Reference: No Job Change	Model 5		Model 6	
	Job Change without Income Increase	Job Change with Income Increase	Job Change without Income Increase	Job Change with Income Increase
Intercept	0.000 ***	0.000 ***	0.000 ***	0.000 ***
Individual-Level				
Female	1.320 ***	1.026	1.320 ***	1.026 ***
Age	0.777 ***	0.719 ***	0.777 ***	0.719 ***
Age squared	1.003 ***	1.004 ***	1.003 ***	1.004 ***
Migration Background	1.364 ***	1.373 ***	1.366 ***	1.373 ***

Table A4. Cont.

Reference: No Job Change	Model 5		Model 6	
	Job Change without Income Increase	Job Change with Income Increase	Job Change without Income Increase	Job Change with Income Increase
Years of Education	0.943 ***	0.992	0.943 ***	0.992 ***
Married	0.921	0.820 **	0.922 ***	0.821 ***
Job Transition Before	$8.955 \times 10^{+15}$ ***	$1.157 \times 10^{+19}$ ***	$7.430 \times 10^{+15}$ ***	$4.981 \times 10^{+15}$ ***
Survey Years (reference 2013)				
2014	0.000 ***	0.000 ***	0.000 ***	0.000 ***
2015	0.000 ***	0.000 ***	0.000 ***	0.000 ***
2016	0.000 ***	0.000 ***	0.000 ***	0.000 ***
2017	0.000 ***	0.000 ***	0.000 ***	0.000 ***
2018	0.000 ***	0.000 ***	0.000 ***	0.000 ***
2019	0.000 ***	0.000 ***	0.000 ***	0.000 ***
Economic conditions				
Job Vacancies	1.000	1.000	0.999	1.000
Labour Market Tightness	0.812 ***	0.677 ***	0.826 ***	0.677 ***
GDP Growth	0.997 *	0.999	0.997 **	0.999
Unemployed			1.000	1.000
Public and Private Services				
Hospital Beds	1.041	1.061	1.048 ***	1.061 ***
General Practitioners	1.067 ***	1.050 ***	1.067 ***	1.051 ***
Multi-Family Housing	0.363 ***	0.729 ***	0.365 ***	0.723 ***
Engagement Opportunities				
Population Density	0.999	0.999 **	0.999	0.999 **
Natural and Built Environment				
One-/Two-Family Housing	1.495 ***	0.704 ***	1.503 ***	0.706 ***
Natural Area	0.027 ***	0.005 ***	0.027 ***	0.005 ***

Notes: Odds ratios, significance levels (SEs clustered on regional level): * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$. Reference category Firm Size: less than 20 employees. Sources: SOEP v29–v36, INKAR, Federal Employment Agency. N = 29,537 thereof 2614 cases of job change.

Table A5. Multinomial regression, job change and income increase.

Reference: No Job Change	Model 7		Model 8	
	Job Change without Income Increase	Job Change with Income Increase	Job Change without Income Increase	Job Change with Income Increase
Intercept	0.000 ***	0.000 ***	0.000 ***	0.000 ***
Individual-Level				
Female	1.056 ***	0.853 ***	1.373 ***	1.023
Age	0.775 ***	0.721 ***	0.923 ***	0.927 ***
Age squared	1.003 ***	1.004 ***	1.001 ***	1.000 **
Migration Background	1.295 ***	1.366 ***	1.605 ***	1.567 ***
Years of Education	0.948 ***	1.366	0.940 ***	1.038 ***
Married	0.888 ***	0.791 ***	0.912	0.886
Job Transition Before	$2.795 \times 10^{+16}$ ***	$2.090 \times 10^{+15}$ ***	$3.811 \times 10^{+24}$ ***	$7.633 \times 10^{+16}$ ***

Table A5. Cont.

Reference: No Job Change	Model 7		Model 8	
	Job Change without Income Increase	Job Change with Income Increase	Job Change without Income Increase	Job Change with Income Increase
Previous Employment				
Tenure			1.084 ***	1.080 ***
Firm Size 20–199			0.748 ***	0.765 ***
Firm Size 200–1999			0.546 ***	0.525 ***
Firm Size ≥ 2000			0.448 ***	0.431 ***
Income Quantile 2			1.140 **	0.618 ***
Income Quantile 3			0.977	0.397 ***
Income Quantile 4			1.230 ***	0.329 ***
Survey Years (reference 2013)				
2014	0.000 ***	0.000 ***	0.000 ***	0.000 ***
2015	0.000 ***	0.000 ***	0.000 ***	0.000 ***
2016	0.000 ***	0.000 ***	0.000 ***	0.000 ***
2017	0.000 ***	0.000 ***	0.000 ***	0.000 ***
2018	0.000 ***	0.000 ***	0.000 ***	0.000 ***
2019	0.000 ***	0.000 ***	0.000 ***	0.000 ***
Economic conditions				
Job Vacancies	1.000	1.000	1.000	1.000
Labour Market Tightness	0.935 ***	0.777 ***	0.894 ***	0.824 ***
GDP Growth	0.996 **	0.999	0.997	0.999
Public and Private Services				
Hospital Beds	0.935 ***	0.956 ***	1.020	0.954
General Practitioners	1.052 ***	1.019 ***	1.055 ***	1.043 ***
Multi-Family Housing	0.489 ***	0.949 ***	0.450 ***	1.479 ***
Engagement Opportunities				
Population Density	1.000	1.000	1.000	1.000
Natural and Built Environment				
One-/Two-Family Housing	1.518 ***	0.594 ***	0.856 ***	0.551 ***
Natural Area	0.999 ***	0.998 ***	0.999 ***	0.997 ***

Notes: Odds ratios, significance levels (SEs clustered on regional level): * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$. Reference category Firm Size: less than 20 employees. Sources: SOEP v29–v36, INKAR, Federal Employment Agency. Model 7: N = 31,465, thereof 2824. Model 8: N = 29,099, thereof 2540 cases of job change.

Table A6. Multinomial regression, job change and income increase.

Reference: No Job Change	Model 9	
	Job Change without Income Increase	Job Change with Income Increase
Intercept	0.000 ***	0.000 ***
Individual-Level		
Female	1.268 ***	1.015 ***
Age	0.906 ***	0.895 ***
Age squared	1.001 ***	1.001 ***
Migration Background	1.334 ***	1.444 ***

Table A6. Cont.

Reference: No Job Change	Model 9	
	Job Change without Income Increase	Job Change with Income Increase
Years of Education	0.957 ***	0.989 ***
Married	0.923 ***	0.851 ***
Job Transition Before	$5.742 \times 10^{+46}$ ***	$2.242 \times 10^{+25}$ ***
Survey Years (reference 2013)		
2014	0.000 ***	0.000 ***
2015	0.000 ***	0.000 ***
2016	0.000 ***	0.000 ***
2017	0.000 ***	0.000 ***
2018	0.000 ***	0.000 ***
2019	0.000 ***	0.000 ***
Economic conditions		
Job Vacancies	1.000	1.000
Labour Market Tightness	0.825 ***	0.719 ***
GDP Growth	0.998	1.000
Public and Private Services		
Hospital Beds	1.010 ***	1.126 ***
General Practitioners	1.059 ***	1.059 ***
Multi-Family Housing	0.522 ***	0.974 ***
Engagement Opportunities		
Population Density	1.000	1.000
Natural and Built Environment		
One-/Two-Family Housing	1.142 ***	0.334 ***
Natural Area	0.996 ***	0.997 ***

Notes: Odds ratios, significance levels (SEs clustered on regional level): * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$. Reference category Firm Size: less than 20 employees. Sources: SOEP v29–v36, INKAR, Federal Employment Agency. N = 29,537 thereof 2614 cases of job change.

Table A7. Multinomial regression, job change and relocation.

Reference: No Job Change	Model 10		Model 11	
	Job Change without Relocation	Job Change with Relocation	Job Change without Relocation	Job Change with Relocation
Intercept	0.000 ***	0.000 ***	0.000 ***	0.000 ***
Individual-Level				
Female	1.150 **	1.387 ***	1.150 ***	1.390 ***
Age	0.754 ***	0.750 ***	0.753 ***	0.751 ***
Age squared	1.003 ***	1.003 ***	1.003 ***	1.003 ***
Migration Background	1.376 ***	1.293 ***	1.378 ***	1.003 ***
Years of Education	0.959 ***	1.057 **	0.959 ***	1.058 ***
Married	0.884 *	0.704 ***	0.885 ***	0.702 ***
Job Transition Before	$6.947 \times 10^{+26}$ ***	$1.810 \times 10^{+16}$ ***	$7.605 \times 10^{+40}$ ***	$7.726 \times 10^{+19}$ ***

Table A7. Cont.

Reference: No Job Change	Model 10		Model 11	
	Job Change without Relocation	Job Change with Relocation	Job Change without Relocation	Job Change with Relocation
Survey Years (reference 2013)				
2014	0.000 ***	0.000 ***	0.000 ***	0.000 ***
2015	0.000 ***	0.000 ***	0.000 ***	0.000 ***
2016	0.000 ***	0.000 ***	0.000 ***	0.000 ***
2017	0.000 ***	0.000 ***	0.000 ***	0.000 ***
2018	0.000 ***	0.000 ***	0.000 ***	0.000 ***
2019	0.000 ***	0.000 ***	0.000 ***	0.000 ***
Economic conditions				
Job Vacancies	1.000	1.000	1.000	1.000
Labour Market Tightness	0.693 ***	1.312 ***	0.704 ***	1.288 ***
GDP Growth	0.998	0.999	0.998 *	0.999
Unemployed			1.000	0.999
Public and Private Services				
Hospital Beds	0.000	0.699 ***	1.006 ***	1.669 ***
General Practitioners	1.048 ***	1.249 ***	1.048 ***	1.249 ***
Multi-Family Housing	0.496 ***	0.754 ***	0.497 ***	0.727 ***
Engagement Opportunities				
Population Density	0.999	0.999 *	0.999 *	0.999 *
Natural and Built Environment				
One-/Two-Family Housing	1.228 ***	0.120 ***	1.234 ***	0.118 ***
Natural Area	0.014 ***	0.001 ***	0.014 ***	0.001 ***

Notes: Odds ratios, significance levels (SEs clustered on regional level): * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$. Reference category Firm Size: less than 20 employees. Sources: SOEP v29–v36, INKAR, Federal Employment Agency. N = 29,537, thereof 2,614 cases of job change.

Table A8. Multinomial regression, job change and relocation.

Reference: No Job Change	Model 12		Model 13	
	Job Change without Relocation	Job Change with Relocation	Job Change without Relocation	Job Change with Relocation
Intercept	0.000 ***	0.000 ***	0.000 ***	0.000 ***
Individual-Level				
Female	0.934 ***	1.169 ***	1.173 **	1.413 ***
Age	0.752 ***	0.774 ***	0.931 ***	0.921 ***
Age squared	1.003 ***	1.002 ***	1.001 ***	1.000
Migration Background	1.331 ***	1.322 ***	1.605 ***	1.424 ***
Years of Education	0.966 ***	1.067 ***	0.979 *	1.057 **
Married	0.852 ***	0.685 ***	0.913	0.711 ***
Job Transition Before	$1.724 \times 10^{+47}$ ***	$6.136 \times 10^{+19}$ ***	$4.623 \times 10^{+29}$ ***	$2.065 \times 10^{+16}$ ***

Table A8. Cont.

Reference: No Job Change	Model 12		Model 13	
	Job Change without Relocation	Job Change with Relocation	Job Change without Relocation	Job Change with Relocation
Employment Tenure			1.084 ***	1.060 ***
Firm Size 20–199			0.737 ***	1.399 ***
Firm Size 200–1999			0.512 ***	1.154 ***
Firm Size ≥ 2000			0.412 ***	1.135 **
Income Quantile 2			0.797 ***	1.399
Income Quantile 3			0.601 ***	0.588 ***
Income Quantile 4			0.607 ***	0.969
Survey Years (reference 2013)				
2014	0.000 ***	0.000 ***	0.000 ***	0.000 ***
2015	0.000 ***	0.000 ***	0.000 ***	0.000 ***
2016	0.000 ***	0.000 ***	0.000 ***	0.000 ***
2017	0.000 ***	0.000 ***	0.000 ***	0.000 ***
2018	0.000 ***	0.000 ***	0.000 ***	0.000 ***
2019	0.000 ***	0.000 ***	0.000 ***	0.000 ***
Economic conditions				
Job Vacancies	1.000	1.000	1.000	1.000
Labour Market Tightness	0.805 ***	1.433 ***	0.803 ***	1.412 ***
GDP Growth	0.998	0.998	0.998	0.997
Public and Private Services				
Hospital Beds	0.903 ***	1.469 ***	0.930	1.76 ***
General Practitioners	1.023 ***	1.242 ***	1.037 ***	1.241 ***
Multi-Family Housing	0.659 ***	0.965 ***	0.792 ***	1.058 ***
Engagement Opportunities				
Population Density	1.000	1.000	1.000	0.999
Natural and Built Environment				
One-/Two-Family Housing	1.126 ***	0.138 ***	0.810 ***	0.105 ***
Natural Area	0.992 ***	0.999 ***	0.995 ***	0.999 ***

Notes: Odds ratios, significance levels (SEs clustered on regional level): * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$. Reference category Firm Size: less than 20 employees. Sources: SOEP v29–v36, INKAR, Federal Employment Agency. Model 12: N = 31,465, thereof 2824. Model 13: N = 29,099, thereof 2540 cases of job change.

Note

¹ The results are not sensitive to the choice of threshold for the increase in income, find the results for a cut-off at 10% in Table A6, Model 9.

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