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Research Article

Migration, daily commuting, or second residence? The role of location-specific capital and distance to workplace in regional mobility decisions

Thomas Skora

Knut Petzold

Heiko Rüger

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Thomas Skora[1]

Knut Petzold[2]

Heiko Rüger[3]

Abstract

BACKGROUND
If a new job is located in a different region from the place of residence, individuals or households can choose between moving or commuting. However, so far mobility alternatives and their drivers remain under-researched from a comparative perspective.

OBJECTIVE
We investigate the determinants of the mobility choices of individuals who have taken a distant job (50 km or more), considering three options, (1) permanent migration, (2) daily commuting, (3) weekly commuting (i.e., a second residence), thereby focusing on the interplay between migration costs linked to different sources of location-specific capital (property ownership, working partner, school-age children) and transition costs linked to the distance travelled.

METHODS
We use longitudinal data from the German Socio-economic Panel (SOEP, 2001–2019) and estimate probit regression models with Heckman correction to account for sample selection.

RESULTS
We find that a large distance to the workplace favors the decision to migrate or to commute weekly, while a high endowment with location-specific capital favors daily or weekly commuting. Weekly commuting is particularly chosen when both migration and transition costs are very high. However, parents of school-age children are more inclined

[1] Corresponding author. GESIS – Leibniz Institute for the Social Sciences, Mannheim and Federal Institute for Population Research (BiB), Wiesbaden, Germany. Email: Thomas.Skora@gesis.org.
[2] Zittau/Goerlitz University of Applied Sciences (HSZG) and Catholic University of Eichstätt-Ingolstadt (KU), Germany. Email: Knut.Petzold@hszg.de.
[3] Federal Institute for Population Research (BiB), Wiesbaden and Johannes Gutenberg University Mainz, Germany. Email: Heiko.Rueger@bib.bund.de.

to commute daily, suggesting that they are often more willing to accept high transition costs than to be separated from their family during the week.

CONTRIBUTION

This study is one of the first to differentiate between daily and weekly commuting in a comparative analysis of mobility determinants. It complements previous findings by relying on a precise measure of spatial distance and examining real mobility behavior instead of self-reported mobility intentions.

1. Introduction

If jobseekers are faced with a lack of suitable jobs in the local labor market, searching for and accepting jobs at a greater geographical distance is a proper solution to participating in the labor market (van Ham, Mulder, and Hooimeijer 2001). An individual who takes a new job at a greater distance may choose to move to a new residence near the new work location or maintain his or her current residence and cover the distance by daily commuting or by establishing a second residence near the place of work with (typically) weekly commutes (Petzold 2020).

Peoples' spatial mobility, and its determinants, are central to population research because they are key drivers of change within a population in a region. Moreover, different types of spatial mobility have different consequences for the regional distribution of a population, and thus different implications for policy and planning (Eliasson, Lindgren, and Westerlund 2003). Empirical studies of many Western countries have reported a trend of declining (United States: Cooke 2013b; Sweden: Lundholm 2010) or stable (Germany: Sander 2018) internal migration rates, while commuting distances and/or times have increased (United States: Burd, Burrows, and McKenzie 2021; Germany: Federal Institute for Population Research 2018; Sweden: Lundholm 2010). These trends are largely seen as the result of a deliberate choice between mobility alternatives at the individual level: People are less willing to migrate and, in turn, more willing to commute longer distances to meet work location requirements while avoiding migration (Green, Hogarth, and Shackleton 1999; Lundholm 2010; Sandow and Westin 2010).

A core concept in research on spatial mobility is 'location-specific capital', according to which people are tied to a particular place, making moving more costly (DaVanzo 1981; DaVanzo and Morrison 1981). We consider three sources of location-specific capital that have been repeatedly reported in previous studies as important barriers to migration (Fischer and Malmberg 2001; Green, Hogarth, and Shackleton 1999; van Ham and Hooimeijer 2009; Nivalainen 2004): property ownership, a working

partner, and school-age children. For example, various studies have suggested that commuting may be a common strategy for dual-earner households to accommodate both partners' employment careers without relying on work-related migration, which often would imply that one partner would have to bear the costs of a potential disruption of his or her own career (Green, Hogarth, and Shackleton 1999; van der Klis and Mulder 2008).

However, since the determinants and interdependencies of the various mobility types are still rather understudied, our study aims to improve knowledge about the factors that lead people to choose one mobility alternative over another when accepting a job far from home.

First, most studies have focused on specific types of mobility: migration (Fischer and Malmberg 2001; Nivalainen 2004) or commuting (Green, Hogarth, and Shackleton 1999; Sandow and Westin 2010). Moreover, the few existing studies that compare both types of mobility[4] arrive at inconclusive results. Accordingly, the characteristics reflecting strong local ties to a place of residence – among them home ownership, children, and partners' employment – have shown the expected negative impact on migration, while the corresponding positive effect on commuting has repeatedly remained absent (e.g., van Ham and Hooimeijer 2009; Pfaff 2012). These results might be due to methodological reasons if no distinction is made between the decision to become mobile in the first place and a subsequent decision to choose a mobility type. Local ties, such as living with a working partner, may generally reduce the willingness to accept a distant job, which in turn implies a lower probability of observing a positive effect of these ties on the length of the commute. However, if the analyses are limited to individuals for whom the incentive to accept a job is sufficiently high, the picture may change, and commuting may be preferred to moving. Accordingly, in our study we separate the decision on the type of mobility from the (preceding) decision to accept a distant job in the first place.

Second, although the important role of geographical distance between the place of residence and the place of work has been emphasized repeatedly in attempts to understand the interdependencies of migration and commuting (Clark, Huang, and Withers 2003; Gawryszewski 1978; Petzold 2020), many studies have operationalized this distance using rather crude binary measures, such as commuting and migrating across regional (or municipality) borders (de Castro Lameira and Golgher 2022; Eliasson, Lindgren, and Westerlund 2003; Romaní, Suriñach, and Artiís 2003) or using specific thresholds (e.g., a minimum distance of 50 km) to identify long-distance moves and long-distance commuting (van Ham and Hooimeijer 2009; Pfaff 2012; Sandow and Westin 2010).

[4] In the following, we focus on situations where the different mobility types occur as alternatives to overcoming spatial distance (i.e., a migration is chosen to avoid long daily or weekly commuting, or vice versa). However, it should be noted that different types of mobility can also be complementary. For example, studies have shown that (non-work related) relocations are on average associated with a (temporary) increase in commuting distance (Champion, Coombes, and Brown 2009; Newbold 2022).

However, insufficient consideration of distance can lead to biased results.[5] Moreover, new evidence suggests that commonly known factors influencing a mobility decision interact with geographical distance (Petzold 2020). As a consequence, our study models more thoroughly the choice process between the different types of regional mobility by systematically accounting for the role of particular distance. More specifically, our contribution sheds light on hitherto ambiguous findings by examining how different sources of location-specific capital interact with the geographical distance between the place of residence and the place of work to influence mobility decisions.

Third, very few studies have distinguished between daily commuting and weekly commuting, i.e., establishing a secondary residence near a workplace combined with commuting back to the primary (family) residence (usually) on weekends. This omission is a shortcoming because these two types of mobility involve fundamentally different cost structures (Rüger and Ruppenthal 2010). To our best knowledge, only one study has systematically compared both daily commuting and second residence ownership with permanent migration (Petzold 2020). We contribute to this rising strand of research by distinguishing between daily commuting, weekly commuting, and permanent migration to more appropriately capture the diversity of potentially available mobility types.

Fourth, some studies have compared the determinants of commuting and migration using survey data that only capture mobility intentions (Abraham and Nisic 2012; Huber and Nowotny 2013; Nowotny 2014; Petzold 2020). However, generalizing the intentions to become mobile to actual mobility behavior must necessarily result in uncertainty (Coulter and Scott 2015; van Dalen and Henkens 2013). By contrast, our analysis draws on broad empirical information about actual mobility behavior as reported in the German Socio-Economic Panel (SOEP) between 2001 and 2019. Thus, the present study complements previous findings that rely on mobility intentions.

2. Theory and hypotheses

2.1 Theoretical considerations

Regional mobility decisions often are considered to be a rational choice (Chemers, Ayman, and Werner 1978; van Ommeren, Rietveld, and Nijkamp 2000; Sjaastad 1962; van der Veen and Evers 1983). When people are confronted with the offer of a (distant)

[5] If, for example, only certain thresholds are used, the distance covered by persons with a generally low willingness to be mobile can be expected to be often close to the threshold, whereas persons with a higher willingness to be mobile are more likely to accept jobs that are farther away. Thus, to correctly determine the effects of certain characteristics given equal distance, the distance must be considered (i.e., controlled for) at a more detailed level in the statistical models.

job, they weigh the expected returns of the job against the expected costs. Returns include both monetary (i.e., wages) and non-monetary (e.g., occupational prestige and intrinsically satisfying work) rewards. Costs arise, among other things (e.g., costs associated with getting acclimated to the new work environment), from the need to cover the distance. In this situation, individuals can choose between either moving to the vicinity of a new workplace or forgoing such a move and bridging the distance by commuting daily or weekly (Eliasson, Lindgren, and Westerlund 2003; Huber and Nowotny 2013; Petzold 2020; Reitsma and Vergoossen 1988). A job offer is accepted if the expected cumulative costs of at least one mobility alternative are outweighed by the expected cumulative returns of the job, which can be assumed to be independent of the mobility type. In this case, the mobility alternative with the lowest costs will be selected. Thus, it is crucial to understand how costs typically are associated with different mobility alternatives and how the interplay of costs affects the relative attractiveness of the various mobility types.

Daily commuting includes the costs of regular travel between the place of residence and the place of work, which can be referred to as transition costs (Petzold 2020). These include the material costs related to travel activities (e.g., travel expenses), immaterial costs arising from the loss of time for alternative beneficial activities while traveling, as well as physical and/or psychological strain due to long travel times (Espino et al. 2002; Ivancevich, Konopaske, and Defrank 2003). Usually, it is assumed that transition costs increase with longer commuting distances (e.g., Clark, Huang, and Withers 2003; Huber and Nowotny 2013; Kalter 1994; Reitsma and Vergoossen 1988).

Migration costs, on the one hand, include various short-term costs associated with setting up a new residence at the destination, such as the time spent looking for a new home and the monetary and non-monetary costs of relocating. Beyond these costs, migration is usually also accompanied by the loss of so-called location-specific capital.

Location-specific capital refers to assets that are valued higher in the current place of residence than elsewhere and that are not transferable to another region without losses. As a generic term, location-specific capital refers to diverse things that bind people to a specific place (DaVanzo 1981; DaVanzo and Morrison 1981). The greater the number of location-specific ties and their strength, the greater the losses of permanent relocation (McHugh 1990). Thus, location-specific capital reflects the costs of migration (DaVanzo 1981). For our purpose it is helpful to distinguish between two types of location-specific capital (Mulder and Wagner 2012). The first type refers to ties that are associated with the home itself, such as home ownership. The second type refers to ties based on the residential location, such as local social relationships with family and friends, and to job-related assets. Location-specific capital increases the migration costs incurred by a household: for instance, if a partner has to quit a job or if children are uprooted from their accustomed environment.

Weekly commuting can be understood as a kind of compromise between migration and daily commuting (Green, Hogarth, and Shackleton 1999; van der Klis and Mulder 2008; Petzold 2020), which involves transition costs incurred on a regular basis. However, the frequency of travel is much lower than daily commuting. Furthermore, similar to migration, there are costs associated with establishing a second residence. However, maintaining the previous residence can avoid an extensive loss of location-specific capital at the original place of living. Nevertheless, weekly commuting involves significant additional costs. On the one hand, there are the financial costs of simultaneously maintaining two residences (e.g., double rent). On the other hand, high immaterial costs may result from the foregone benefits and psychological costs associated with being away from family and friends during the week, which hereafter we refer to as absence costs.[6] Consequently, weekly commuting might be most attractive when strong local ties exist due to location-specific capital, but the distance is too far to commute daily. In other words, weekly commuting is likely when both migration costs and transition costs are high. By contrast, weekly commuting might not be considered a dominant strategy as an alternative to migration or daily commuting when either transition costs or migration costs are low (Petzold 2020). Figure 1 illustrates the theoretical considerations of mobility alternatives as a function of transition and migration costs.

Figure 1: Dominant mobility options depending on transition and migration costs

		Transition costs: *Low*	Transition costs: *High*
Migration costs *Low*		- Migration - Daily commuting	- Migration
Migration costs *High*		- Daily commuting	- Weekly commuting

In the following section, we adopt this model to generate hypotheses regarding both the impact of distance to the workplace as a measure of transition costs and the three sources of location-specific capital as measures of migration costs on the mobility decision. We extend the model by considering the impact of absence costs.

[6] The assumption that weekly commuting is associated with comparatively high costs is supported by empirical findings that show that a willingness to commute weekly is particularly low among workers compared to their willingness to engage in other types of intensive work-related spatial mobility, including daily long-distance commuting and migration (Schneider et al. 2008).

2.2 Hypotheses

2.2.1 Spatial distance

Our first hypothesis concerns the relevance of transition costs to the mobility decision. It can be assumed that in modern societies, the subjectively perceived costs of travel result above all from the loss of time, which in turn is usually associated with travel distance (e.g., Rietveld et al. 1999). The distance between the place of residence and the place of work has already been described by Gawryszewski (1978) as the most important factor in the interrelation between permanent migration and commuting. If the distance is short the transition costs are low, but with a longer distance transition costs increase. Accordingly, the willingness to commute decreases with distance, and a move becomes more likely (Clark, Huang, and Withers 2003; Kalter 1994). Perceived distance can reach the point at which regular daily commuting becomes unacceptable, so this option is no longer weighed against migration (Evers and van der Veen 1985; van Ommeren, Rietveld, and Nijkamp 1997; Reitsma and Vergoossen 1988). Since the high transition costs of daily commuting can be reduced not only by moving closer to the workplace but also by reducing the frequency of travel to a weekly occurrence, we assume the following hypothesis:

H1: The greater the distance to the workplace, the less likely people are to commute daily and the more likely they are to migrate or commute weekly.

The remaining hypotheses deal with the effects of the different sources of location-specific capital and their interrelationship with distance.

2.2.2 Homeownership

It has often been argued that homeownership inhibits work-related spatial mobility by discouraging people from migrating (Haas and Osland 2014; Helderman, Mulder, and van Ham 2004; van Ommeren, Rietveld, and Nijkamp 1999). Homeownership implies various long-term financial and non-financial commitments and extensive adjustments of the home to individual preferences (Helderman, Mulder, and van Ham 2004). Indeed, homeowners have consistently been found to be to be less willing to relocate than renters (Abraham and Nisic 2012; Clark and Davies Withers 2007; Mulder and Wagner 2012; Nivalainen 2004). However, previous studies have not confirmed an effect of homeownership on the likelihood of commuting (van Ham and Hooimeijer 2009; Pfaff 2012). One reason for this could be that homeowners are often more involved in locally

oriented networks than renters (Blum and Kingston 1984; Ghimire and Skinner 2022). If these networks are used to search for a job, the probability of finding a job in another region is reduced (Abraham and Nisic 2007). Thus, homeownership could be a barrier to interregional workplace mobility in general. If, however, a decision has already been made for a new place of work, it seems reasonable that a homeowner would be more likely to accept daily or weekly commuting as a substitute for migration:

H2a: Homeownership reduces the probability of migration and increases the probability of daily and weekly commuting.

However, while homeownership lowers the propensity to migrate, homeowners may still tend to avoid the high cost of weekly commuting. They may be more likely to commute the distance daily as long as the resulting transition costs are somehow bearable. However, if migration costs and transition costs are unbearably high, we expect weekly commuting to be considered the proper mobility solution (Petzold 2020, see also Figure 1). Since transition costs increase with the distance to the workplace, we assume that:

H2b: The effect of homeownership on the probability of weekly commuting becomes more positive as the distance to the workplace increases.[7]

2.2.3 Couple household and partner employment

Many mobility decisions occur in the context of households with more than one member. Two- or multi-person households can be expected to be less likely to move than single-person households, since each additional family member increases the number of local ties that would lose value in a move (Mincer 1978). While this argument already implies a lower propensity to migrate among couple households compared to single households in general (Lundholm 2010; Nowotny 2014; Sandefur and Scott 1981), location-specific capital might be even higher when both partners work (Mincer 1978). Accordingly, the propensity to migrate for work reasons is likely to be particularly low if the partner living in the household is also employed, since migration for him or her (the 'trailing partner' or 'tied mover') could affect career prospects and interrupt local professional networks (Green, Hogarth, and Shackleton 1999; van der Klis and Mulder 2008). Many couples choose not to move in such a situation, even if it means foregoing the benefits associated

[7] Renters, by contrast, are assumed to perceive relatively low levels of migration costs. Thus, even in the case of relatively low transition costs, migration is more likely among renters. Consequently, homeownership will reduce the propensity to migrate in both scenarios; i.e., with relatively low and relatively high transition costs. Therefore, we do not expect a similar interaction effect for migration as for weekly commuting.

with the geographically distant job offer for one partner (the 'tied stayer') (Abraham, Bähr, and Trappmann 2019; Cooke 2013a). In this situation, commuting to the new workplace may be a possible solution to avoid such a mobility conflict (Abraham and Nisic 2012; Green, Hogarth, and Shackleton 1999; van der Klis and Mulder 2008).

In line with these considerations, it has been found repeatedly that being in a partnership lowers the propensity to migrate (Fischer and Malmberg 2001; Lundholm 2010; Nowotny 2014). Likewise, the migration-inhibiting effect of a partner's involvement in the labor market has been confirmed repeatedly (Fischer and Malmberg 2001; Nivalainen 2004; Pfaff 2012). However, a partner's employment has also frequently been reported to have a negative effect on the propensity to commute longer distances (Abraham and Nisic 2007; van Ham and Hooimeijer 2009; Kalter 1994; Pfaff 2012). As with homeownership, a working partner could reduce the overall propensity to take up a distant job (see Pfaff 2012).[8] While our empirical analysis also provides insights in this regard, we hypothesize the following with respect to the decision regarding mobility alternatives after accepting a new distant job:

H3a: Living with a partner in the household reduces the probability of migration and increases the probability of daily and weekly commuting, especially if the partner is gainfully employed.

As with homeownership as a barrier to migration, we assume that weekly commuting in particular comes into play as an alternative when a working partner in the household makes it difficult to move, and the distance is too far to commute daily:

H3b: The effect of a working partner in the household on the probability of weekly commuting becomes more positive as the distance to the workplace increases.

2.2.4 School-age children

The presence of children creates a strong attachment to the current residence (McHugh 1990), and this is likely to be particularly true for school-age children. Children's increasing involvement in friendship networks reduces the willingness to move from a neighborhood (Dawkins 2006), and a change of school is associated with relatively high organizational efforts. In Germany especially, the federal education system makes migration across federal states even more difficult (Kley 2009; Schneider, Limmer, and Ruckdeschel 2002). Overall, school-age children are likely to increase migration costs,

[8] According to Abraham and Schönholzer (2012), one possible explanation is that although increasing the commuting distance may be used as a substitute for household migration, it may be a source of conflict itself.

which makes migration less likely (Mincer 1978; van Ommeren, Rietveld, and Nijkamp 1999) and commuting more likely. Consistently, children often have been reported to be a strong deterrent to moving a household (e.g., de Castro Lameira and Golgher 2022; van Ham and Hooimeijer 2009; Lundholm 2010; Mulder and Wagner 2012). This is particularly true for school-age children, while less inhibiting effects on household moves are found for pre-school children (Fischer and Malmberg 2001; Nivalainen 2004; Pfaff 2012). With regard to commuting, some evidence exists that children reduce the propensity to commute (Melzer and Hinz 2019), especially among women (van Ham and Hooimeijer 2009), whereas other studies have not found any clear effects of children on the tendency to commute (Huber and Nowotny 2013; Nowotny 2014; Pfaff 2012).

However, there is also reason to believe that the immaterial costs of regular absence from the family home during the working week – in the case of weekly commuting – are perceived as particularly high if children live in the household. This assumption corresponds with the empirical finding that weekly commuting is pursued notably more often in the context of childless partnerships than when children are present in the household (Rüger and Sulak 2017). Also, a lack of time to spend with their children is most frequently cited as a mobility disadvantage by weekly commuters (Rüger and Ruppenthal 2010). Since children in the household increase both migration and absence costs, their presence should especially increase the propensity to commute daily. Therefore, we expect that:

H4a: The presence of school-age children in the household reduces the probability of migration and increases the probability of daily commuting. No effect or even a negative effect will emerge with respect to weekly commuting.

Based on our theoretical argumentation, we assume a strong preference for moving among the childless. By contrast, when transition costs are very high, no dominant strategy exists for parents with regard to the alternatives of moving or weekly commuting, which implies that parents are more likely than the childless to choose weekly commuting when daily commuting is no longer possible because of the distance.

H4b: The effect of living with school-age children in the household on the probability of weekly commuting becomes more positive as the distance to the workplace increases.

3. Data, measures, and methods

3.1 Data

The empirical analyses are based on data from the German Socio-economic Panel (SOEP)[9], a representative longitudinal survey of randomly selected and yearly interviewed households in Germany starting in 1984 (Goebel et al. 2019). The present study exploits the panel design of the data by matching recent job starts, migration events, and commuting distances recorded at one survey wave with individual and household characteristics from the preceding wave. Thus, our analysis accounts for the temporal sequence of mobility decisions under given conditions. Detailed information on commuting behavior and the distance of household moves is available from 2001 onward. Therefore, our analyses are based on the waves 2001–2019.[10] The sample is restricted to adult persons of working age (ages 18–64) living in a private household.[11] Furthermore, we only include respondents who are either so-called heads of households[12] or their partners. This selection is intended to focus our analysis on persons who have a decisive influence on the household's migration decisions. Finally, only respondents who have participated in at least two waves are included. After these selections and additionally dropping observations with missing values, our sample comprises 193,139 observations (women – 108,090, men – 85,049) from 37,930 persons (women – 20,746, men – 17,184).

3.2 Measures

3.2.1 Dependent variables

In our study, we define workplace mobility as taking up a new job that is located a long distance from the place of residence. In the following, we only consider new jobs of at

[9] SOEP-Core, v36 (Remote Edition), doi:10.5684/soep.core.v36r.

[10] However, no information on commuting behavior was collected in 2014, 2016, and 2018. Therefore, we have to refrain from including characteristics measured in the respective previous years (2013, 2015, and 2017).

[11] We test whether a different age cut of the sample would lead to different results (see Sensitivity Analyses section).

[12] In the SOEP, the head of household is defined as the person who knows best about the general conditions in the household. He/she is expected to answer a questionnaire covering various aspects of housing and the situation in the household (i.e., a household questionnaire) in each year (German Institute for Economic Research (DIW) 2024). Sixty-one percent of all the observations in our full analytical sample, and 71% of all the observations matched to workplace mobility (see the Measures section) are from household heads.

least 20 hours per week, excluding self-employment.[13] By adapting a frequently used threshold for identifying long-distance moves and/or long-distance commuting (Kalter 1994; Pelikh and Kulu 2018; Pfaff 2012), we consider jobs to be long distance if the (road) distance between the place of residence and the place of work is 50 km or more.

We distinguish between three types of mobility. Migration for a distant job is considered to occur if a move of at least 50 km for work-related reasons is realized within a time window of up to three months before and up to three months after the job has started, and the commuting distance immediately after this move (i.e., at the first observation after the occupational and residential change) is less than 50 km. In all waves with additional information on the motives for migration (not available in 2014, 2016, and 2018), we additionally restrict the focus to moves for which occupational reasons were mentioned as an important motive.[14] Daily commuting for a distant job is considered to occur if no migration occurred in the above-defined time window around the job change, and the commuting distance immediately after the job start was at least 50 km and was covered daily. Weekly commuting for a distant job also presupposes that no migration event occurred around the job change and that the commuting distance is at least 50 km immediately after the job start, and the distance is covered weekly (or even less frequently). However, since the recording of weekly commuting/work-related multi-locality varies across years, weekly commuters are identified in some waves (2003, 2015, 2017, 2019) by the presence of a work-related second residence instead of by commuting frequency.

In the framework of this operationalization, the three mobility alternatives are mutually exclusive. Thus, this operationalization is consistent with the assumption that the three types of mobility are substitutes for each other. A change to a job located at least 50 km from home is recorded for a total of 1,161 observations (women – 371, men – 790). A total of 273 moving events (women – 119, men – 154), 539 daily commuting starts (women – 191, men – 348), and 349 weekly commuting starts (women – 61, men – 288) are recorded.

3.2.2 Independent variables

We examine three different sources of location-specific capital as key factors influencing mobility choice. Information on the property ownership of the dwelling is provided in the

[13] We make this restriction because we have to assume an increased probability that the information on weekly commuting regarding marginally employed and self-employed persons would not be based on a multi-local living arrangement.
[14] Information on the key motives for moving is regularly included in the household questionnaire.

household questionnaire, which is answered by the household head.[15] We differentiate the partnership situation by the categories: (1) no partner lives in the household, (2) a non-working partner lives in the household (this partner is in education, job-seeking, or economically inactive), and (3) a working partner lives in the household (with an actual amount of work of at least 1 hour per week).[16] Finally, with regard to school-age children living in the household, we differentiate between households that have (1) no children, (2) children aged 0–6, (3) (school-age) children aged 7–16, and (4) children of both age ranges (0–6 and 7–16).

As an indicator of transition costs, we consider the distance to the new job, which corresponds to the commuting distance in the case of daily or weekly commuting and to the moving distance in the case of a migration event. While the commuting distances reported by respondents reflect road distances, relocation distances in the data are provided as Euclidean distance. In the event of migration, we approximate the road distances by multiplying the Euclidean distance (in km) by 1.3 (Rabe, Klüter, and Tietze 2017).[17]

In our multivariate analysis, we use a set of sociodemographic, socioeconomic, and spatial characteristics as control variables known to be correlated with spatial mobility: age, gender, being of non-German nationality, education (measured as the amount of education or training in years), (log of) needs-weighted net household income, duration of residence in years, community type,[18] region (East vs. West Germany), and calendar year.

[15] First, we assume that in many partnerships, property is shared by both partners; and second, even if only one partner is a formal owner, this status affects the mobility of the non-owning partner in a similar way. Nevertheless, as a robustness check, we additionally conducted all analyses based on household heads alone (see Sensitivity Analyses section).

[16] For about 5% of all the observations in the sample we have information that a partner lives in the household, but his or her employment status is unknown. Due to the relatively high proportion, we keep these observations in the analytical sample to avoid selectivity and assign them to a separate category.

[17] To remove outliers and ensure the convergence of subsequent regression models, distance values exceeding 650 km are set to this value (650). This applies to 2.9% (N = 34) of all mobility observations.

[18] We add community type as a control to account for potential differences regarding the availability of transport infrastructure near a residence. To specify the community type, we use information derived from the so-called BIK regions classification system and provided by the SOEP-Core Remote Edition. Our classification differentiates between seven community sizes, with the three largest community size classes (50,000 inhabitants or more) being further differentiated into central area and surrounding communities.

Table 1: Sample characteristics

	Complete sample		Workplace mobility observed	
	Mean	SD	Mean	SD
Distance to the new job	--	--	195.46	175.43
Property ownership				
Renter	49.73		67.61	
Owner	50.27		32.39	
Partnership situation				
No partner lives in household	19.34		26.61	
Non-working partner lives in household	21.02		24.63	
Working partner lives in household	54.08		44.53	
Work status of partner is unknown	5.55		4.22	
Children living in the household				
No children live in household	55.44		57.28	
Children of age 0–6 live in household	12.49		16.62	
Children of age 7–16 live in household	22.53		17.83	
Children of both ages live in household	9.54		8.27	
Age	44.23	10.88	37.27	9.60
Gender				
Female	55.96		31.96	
Male	44.04		68.04	
Education in years	12.53	2.72	13.76	2.91
Nationality				
German	92.06		94.23	
Non-German	7.94		5.77	
Household income (log)	7.28	0.50	7.24	0.53
Duration of residence	11.56	11.04	6.40	6.79
Community type				
≥ 500,000, central	25.42		22.91	
≥ 500,000, surrounding	9.71		10.08	
100,000–500,000, central	14.37		16.97	
100,000–500,000, surrounding	12.84		11.46	
50,000–100,000, central	2.74		3.53	
50,000–100,000, surrounding	5.81		6.12	
20,000–50,000	11.12		11.02	
5,000–20,000	9.91		8.18	
2,000–5,000	4.21		5.00	
< 2,000	3.87		4.74	
Region				
West Germany	77.24		66.75	
East Germany	22.76		33.25	
Calendar year				
2001	6.94		6.89	
2002	7.31		7.67	
2003	7.03		5.08	
2004	6.62		5.86	
2005	6.23		6.37	
2006	6.48		7.92	
2007	5.99		6.89	
2008	5.53		6.89	
2009	5.65		4.57	
2010	4.73		5.00	
2011	8.60		10.34	
2012	8.35		8.35	
2014	7.76		7.58	
2016	6.52		5.60	
2018	6.26		5.00	
Observations	193,139		1,161	

Table 1 presents the composition of the entire analytical sample and additionally of the observations where workplace mobility occurred between the current and the next wave. In the entire analytical sample, every second observation is classified as a

homeowner, dual-earner couples dominate quantitatively, and school-age children live in almost every third household. However, the composition is noticeably different when looking at the observations linked to workplace mobility. These differences reflect the associations of the covariates with the propensity to take a distant job. Accordingly, being a renter and having no partner and/or no children in the household clearly increases the propensity for workplace mobility. Associations consistent with the findings from previous studies (e.g., van Ham, Mulder, and Hooimeijer 2001; Pfaff 2012) can also be found for the other control variables. Thus, people who accept a remote job are on average younger, predominantly male, and tend to be more highly educated. Furthermore, living outside major metropolitan areas and living in eastern Germany tend to promote workplace mobility.

3.3 Estimation method

The choice of mobility type can only be analyzed for individuals who have searched and accepted a remote job. However, these individuals are not necessarily a random subsample of all working-age people. Rather, it is likely that the subsample is selective (van Ham, Mulder, and Hooimeijer 2001, see also Table 1). To avoid bias caused by sample selection, we apply a correction device with a probit analysis (cf. Dubin and Rivers 1989; van de Ven and van Praag 1981) originally introduced by Heckman (1979) when explaining a non-dichotomous variable. In this two-step procedure a substantive equation with the dependent variable of interest and a selection equation with a dependent variable of the selection process are distinguished. The probability that respondents are selected in the subsample is estimated in a first step and implemented in a second step as a control term that reflects the effects of all unmeasured characteristics in the substantive equation.

In our case, with the substantive equation,

$$Y_{1i}^{*} = \beta_1 X_{1i} + u_{1j}, \tag{1}$$

we aim to estimate the probability of becoming geographically mobile in a specific way (Y_1*) based on a vector of predictors X_1. Y_1^* is principally unobserved and only the binary outcome of the finally chosen mobility type Y_1 is observed. Therefore, using a probit estimation, the conditional probability of observing a substantial mobility behavior Y_1 = 1 for respondent *i* given predictors X_1 is given by

$$P(Y_{1i} \mid X_{1i}) = P(\beta_1 X_{1i} + u_{1i} > 0 \mid X_{1i}) = \Phi\left(\frac{\beta_1 X_{1i}}{\sigma_1}\right), \tag{2}$$

where Φ is the cumulative normal distribution function. However, since we are interested in the effects of predictors of the type of spatial mobility, e.g., the spatial distance, mobility is observed only for the selection of respondents who changed their job (Y_2^*). In our application, the respective selection equation,

$$Y_{2i}^* = \beta_2 X_{2i} + u_{2i}, \tag{3}$$

models the propensity to search and accept a remote job (Y_2^*), where X_2 reflects a set of variables responsible for the selection process. According to Heckman (1979), the conditional expectation of Y_1^* will yield biased results if the error terms u_1 and u_2 of the substantive Equation (1) and the selection Equation (3) are correlated. Heckman suggests using the inverse of Mill's ratio λ to estimate the respective conditional error term u_1,

$$E(u_{1i} \mid u_{2i} > -\beta_2 X_{2i}) = \frac{\sigma_{12}}{\sigma_2}\lambda(\beta_2 X_{2i} / \sigma_2) = \frac{\sigma_{12}}{\sigma_2}\frac{\phi(-(\beta_2 X_{2i} / \sigma_2))}{1-\Phi(-(\beta_2 X_{2i} / \sigma_2))}, \tag{4}$$

where ϕ and Φ are the density and distribution function of a standard normal variable.

Finally, this term is implemented as a control factor in the substantive equation:

$$P(Y_{1i} \mid X_{1i}) = P(\beta_1 X_{1i} + \frac{\sigma_{12}}{\sigma_2}\lambda(\beta_2 X_{2i} / \sigma_2) + \varepsilon_1). \tag{5}$$

According to this approach, the sample selection problem is a special case of an omitted variable problem with λ being the omitted variable on the subsample for which $Y_2 > 0$. Given that the error terms are bivariate normally distributed, the corrected probit Equation (5) provides unbiased estimators. In our case, the substantial equation on the binary outcome of a specific type of mobility is augmented by the estimated non-selection hazard to account for all the unmeasured characteristics that are related to both processes – the decision to search and accept a remote job, and the selection of mobility type.

However, the two-step approach suffers from inflated standard errors when the covariates X_2 in the selection equation and X_1 in the regression equation are identical. The best solution to this problem is to define exclusion restrictions (Bushway, Johnson, and Slocum 2007). Therefore, we add detailed information on the labor force status and

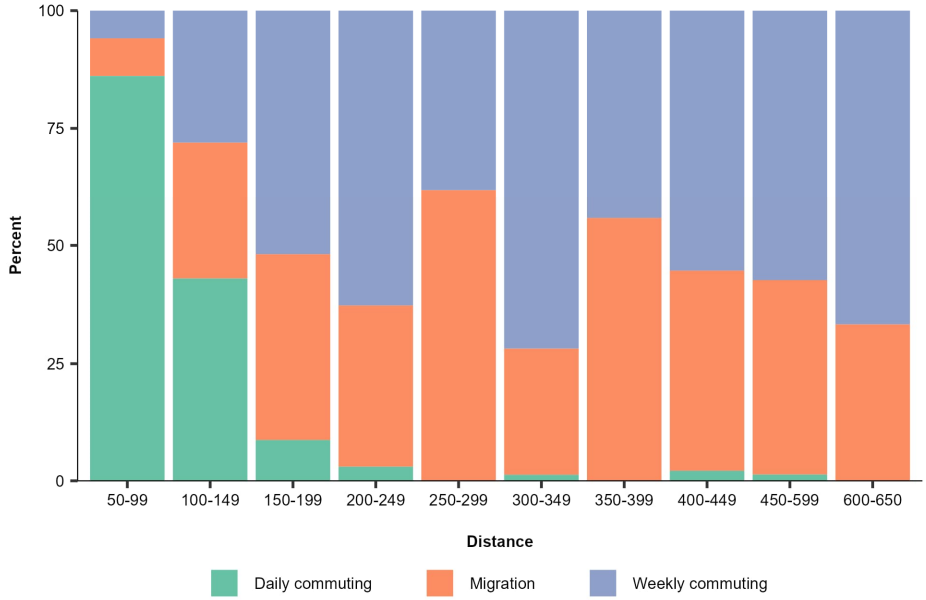
contract situation of the respondents measured prior to eventual workplace mobility as exclusion restrictions to identify the sample selection model. We assume that these conditions affect the probability of switching to a new (distant) job, but do not have a direct effect on the choice of mobility type. All models are estimated with robust standard errors (Bushway, Johnson, and Slocum 2007).

4. Results

4.1 Descriptive results

First evidence on the role of transition costs in mobility decisions (cf. H1) can be obtained by looking at the prevalence of the three mobility alternatives across distance (Figure 2). At the shortest distances, daily commuting is highly prevalent. However, the prevalence of daily commuting decreases sharply with increasing distance and is almost non-existent at distances of 200 km or more. When distances are this long, people mostly opt for migration or weekly commuting, and the ratio of these two alternatives is fairly balanced in our data. Thus, these findings provide the first evidence for our first hypothesis. However, an additional feature becomes apparent: If the distance exceeds the point at which daily commuting becomes practically impossible, differences in distance have no further influence on the decision between the remaining mobility alternatives, moving and weekly commuting, which indicates that transition costs are irrelevant to the choice between these two options under this condition. We account for this finding in the following parametric modeling by additionally including a squared term of the distance variable, which enables the modeling of nonlinear relationships.

Figure 2: Occurrence of mobility events by distance 50 km–650 km (percent)



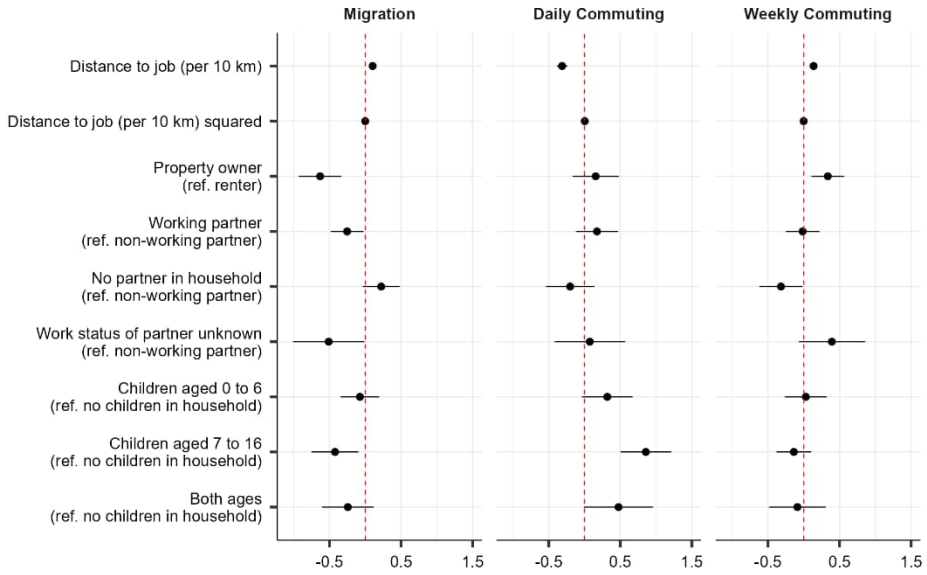
Source: SOEP 2001–2019, authors' own calculations.

4.2 Results of multivariate regression models

By applying the Heckman probit model we check whether our hypotheses hold empirically, accounting for control characteristics and correcting for potential sample selection. In a first step we estimate the main effects of the transition costs and of the three different sources of location-specific capital on the choice of mobility type. Figure 3 depicts the effects that are central to the research question (see Table A-1 in the Appendix for the full model estimates for all three mobility alternatives).

With regard to the transition costs, the tendency to commute daily decreases with increasing distance to the workplace, whereas the likelihood of choosing migration or weekly commuting increases. The found effect of the squared distance term in all three regression models ($p < 0.001$) additionally indicates a curvilinear relationship between the level of transition costs and the respective mobility propensity, as was already evident in the descriptive results: The negative effect of distance on the propensity to commute daily and the positive effect of distance on the propensity to migrate or commute weekly diminish in the long-distance range.

Figure 3: Results of the Heckman-corrected regression models on mobility choices (probit effect coefficients with 95% confidence intervals)



Note: Effects of selected variables. See Table A-1 in the Appendix for the full models.
Source: SOEP 2001–2019, authors' own calculations.

In terms of location-specific capital indicators, homeownership notably reduces the propensity to migrate, and commuting becomes a viable option. In particular, weekly commuting is chosen as an alternative to migration if the existence of residential property makes moving too costly.

A lower propensity to migrate also is evident among those who live with a partner, and this tendency is even stronger if the partner is employed. Unlike homeownership, however, living with a working partner tends to promote daily commuting in comparable situations.

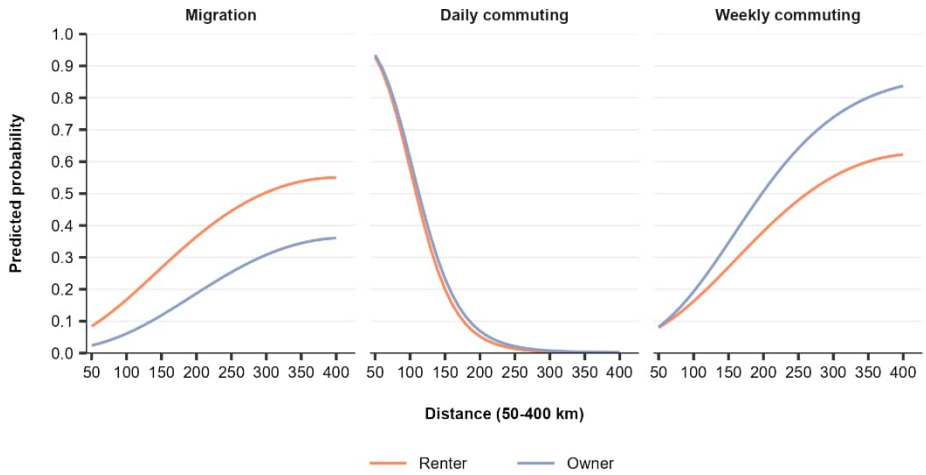
The presence of school-age children also lowers the propensity to migrate. With respect to the preferred mobility alternative, a particularly strong tendency toward daily commuting can be observed among parents of school-age children.

All in all, our analysis shows that the different sources of location-specific capital not only constrain the propensity to migrate but also favor different commuting arrangements to varying degrees.

To test the hypothesis that the propensity to commute weekly is particularly high when high migration and transition costs occur simultaneously, we include interaction terms of the distance with all three indicators of location-specific capital. Again, we estimate models for all three mobility types and calculate predicted probabilities.

Figure 4 shows the predicted probabilities for the three mobility types under the joint conditions of homeownership status and distance.[19] With respect to weekly commuting, a substantial interaction effect is apparent (p = 0.002). Consequently, for renters and homeowners the propensity to commute weekly increases with distance to the workplace, but more so for the latter, who are assumed to have higher migration costs. By contrast, no such interaction effect occurs regarding migration and daily commuting, which suggests that the observed differences in the mobility propensity of both groups persist at any distance.

Figure 4: Interaction of property ownership and distance on mobility choices



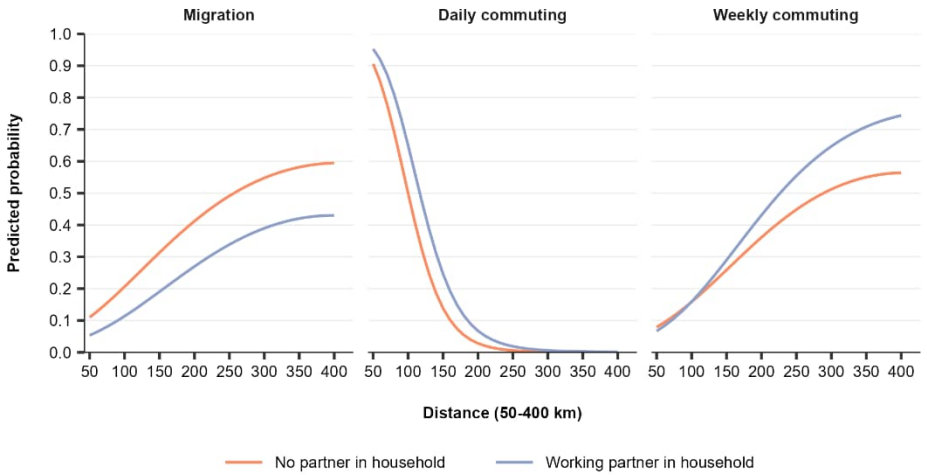
Note: See Table A-2 in the Appendix for the underlying regression coefficients.
Source: SOEP 2001–2019, authors' own calculations.

Figure 5 depicts the predicted probabilities for the three mobility types at different distances for individuals living with a working partner and those living without a partner. As with homeownership, an interaction between distance and living with a working partner can be found for weekly commuting (p = 0.010). Living with a partner in the

[19] To provide a better visualization of the effects, the following figures (Figures 4–6) are limited to the distance range up to 400 km. For the regression coefficients, see Table A-2 in the Appendix.

household favors a decision to commute weekly, especially when transition costs are very high. Again, in the models estimating migration and daily commuting propensity we do not find any substantial interaction effect of distance and living with an employed partner.

Figure 5: Interaction of working partner in household and distance on mobility choices



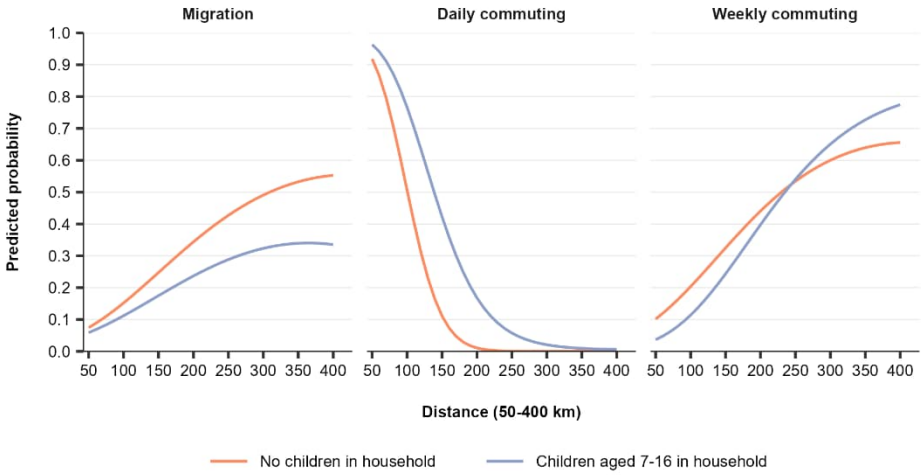
Note: See Table A-2 in the Appendix for the underlying regression coefficients.
Source: SOEP 2001–2019, authors' own calculations.

Figure 6 shows the predicted probabilities for the types of mobility considered as a function of distance and the presence of school-age children. We find an interaction of distance with the presence of school-age children in regard to weekly commuting (p = 0.003) and also daily commuting (p = 0.031).[20] Accordingly, the propensity to commute daily decreases much faster with increasing distance among childless individuals than among parents with school-age children. Furthermore, over large parts of the distances we consider, parents of school-age children show a lower propensity to commute weekly than those without children. However, this relationship reverses for distances above the 250 km mark. At such large distances, parents of school-age children show a higher propensity to commute weekly than the childless. Overall, these findings suggest that parents of school-age children still commute daily even over very long distances so as to avoid both a household move and weekly commuting, whereas childless individuals opt

[20] To some extent the results also suggest that the difference in the propensity to migrate between parents with school-age children and those without increases with distance (p = 0.160).

more often for moving and also for weekly commuting when faced with comparable distances. However, when transition costs are so high that daily commuting is no longer feasible, parents of school-age children are more likely to opt for weekly commuting, whereas those without children are much more likely to opt for migration instead.

Figure 6: Interaction of school-age children in household and distance on mobility choices



Note: See Table A-2 in the Appendix for the underlying regression coefficients.
Source: SOEP 2001–2019, authors' own calculations.

4.3 Sensitivity analyses

To assess the robustness of our results, we perform a series of additional analyses.

In a first check, we re-estimate all the probit regression models on the choice of mobility type without Heckman correction to gain a better insight into the implications of this procedure. Although this re-estimation produces similar results, two important deviations become apparent, both of which can be explained by the processes of sample selection. First, in the models without correction, women show a much higher propensity to opt for migration (b = 0.351, p = 0.003 vs. b = 0.084, p = 0.573 for the model with correction). However, women who search for and accept a distant job are not a random sample of all women. They can be considered as highly work-orientated and having high bargaining power in the context of household migration decisions. Not taking into

account this selectivity leads to an overestimation bias of the gender effect on the probability of migrating. Second, in the models without correction, we find the positive effect of education years on the propensity to opt for migration to be substantially lower ($b = 0.011$, $p = 0.601$ vs. $b = 0.048$, $p = 0.013$ for the model with correction). Since the probability of searching for and accepting a distant job increases with education, individuals who have a low education but nevertheless have decided to become geographically mobile for job reasons can be considered as very selective. They may differ from other individuals with the same educational level and resemble the higher educated with regard to certain attributes, like openness to new experiences, which should result in a levelling of the education effect on the choice of mobility type. Overall, these findings justify models with Heckman correction.

In a second check, we estimate all (Heckman-corrected) regression models using a reduced sample that includes only household heads, since ownership information is strictly available only for them (see the Measures section). In this analysis the negative effect of homeownership on the propensity to migrate is somewhat smaller ($b = –0.483$, $p = 0.010$ vs. $b = –0.630$, $p < 0.001$ for the models including partners).

In a third check, we repeat the analyses with a different age cut-off, lowering the upper age limit to 54, since job mobility is likely to be highly selective toward the end of a professional career. Nevertheless, this modification does not substantially change the results.

As a fourth check, we test an alternative classification of the partnership situation, in which all respondents with a partner in education are removed from the category (2) 'a non-working partner lives in the household' and assigned to a separate category. Although the changed composition of the reference group results in a somewhat weaker negative effect of having a working partner on the migration propensity ($b = –0.197$, $p = 0.174$), it does not change the overall interpretation.

Finally, we re-estimate all models separately by gender, as numerous studies have shown gender differences in migration and commuting behavior, especially among parents (Abraham, Bähr, and Trappmann 2019; Cooke 2008; Fan 2017; Skora, Rüger, and Stawarz 2020). The results do not differ substantially in terms of home ownership and the presence of school-age children. However, there are some interesting differences in the effects associated with the partnership situation. For women, the presence of a partner in the household reduces the propensity to migrate (no partner in household vs. non-working partner [ref.]: $b = 0.351$, $p = 0.107$), while the employment status of the partner has no additional substantial influence on the decision to migrate (working partner vs. non-working partner [ref.]: $b = –0.096$, $p = 0.651$). For men, by contrast, the presence of a partner alone has no effect (no partner in household vs. non-working partner [ref.]: $b = 0.003$, $p = 0.978$). Only the employment of the partner proves to be a barrier to migration (working partner vs. non-working partner [ref.]: $b = –308$, $p = 0.019$). In terms

of the importance of the employment status of the female partner, our findings correspond to those of Cooke (2008), who finds that (in the case of egalitarian couples) the probability of a family move is lower if the female partner is employed. However, previous findings have also shown that family migration decisions are not gender-symmetrical in terms of relative economic resources, suggesting the additional influence of the (traditional) gender-role ideology that sees the breadwinner role as the responsibility of the male partner (Bielby and Bielby 1992; Cooke 2003). The finding that women's propensity to migrate for their job is reduced solely by the presence of a (male) partner, irrespective of his employment status, fits in with this.

5. Discussion

This study aims to improve our knowledge of the factors that lead people to choose one mobility alternative over another when accepting a job far from home: migration, daily commuting, or weekly commuting. For this purpose, we use large-scale panel data from the SOEP (2001–2019) and estimate probit regression models with Heckman correction to account for sample selection. First, we contribute to the literature by examining how different sources of location-specific capital (homeownership, employed partner, school-age children) interact with the geographical distance between the place of residence and the place of work to influence mobility decisions. Second, by systematically distinguishing between daily commuting, weekly commuting (i.e., a second residence), and permanent migration, we more comprehensively capture the diversity of the mobility alternatives. Third, by methodological means, we separate the decision on the type of mobility from the (preceding) decision to accept a distant job in the first place. In most of the previous literature a lack of this distinction may have contributed to inconclusive results: The characteristics reflecting a strong local attachment to the place of residence show the expected negative effect on migration, whereas the corresponding expected positive effect on commuting is repeatedly not found, which has led to a call for further research (e.g., Lundholm 2010; Pfaff 2012; Sandow and Westin 2010). Fourth, the present study contributes to research by drawing on actual mobility behavior instead of mobility intentions.

Referring to a theoretical framework based on rational choice theory (cf. Petzold 2020), we derive hypotheses about the effects of distance to the workplace as a measure of transition costs and about the various sources of location-specific capital as a measure of migration costs on the mobility decision. We extend this framework by additionally considering the impact of absence costs; i.e., the cost of being away during the work week in the case of weekly commuting.

Our results show that transition costs are a decision-relevant factor, confirming hypothesis H1, which states that the greater the distance to the workplace, the less daily commuting is an option and the more likely a decision to migrate or commute weekly. This finding is in line with the literature (e.g., Huber and Nowotny 2013; Reitsma and Vergoossen 1988; Zax 1991). By contrast, a high endowment of location-specific capital – the presence of homeownership, a working partner, or school-age children – favors a decision to commute rather than migrate, confirming hypotheses H2a, H3a, and H4a. Moreover, weekly commuting proves to be a solution that especially comes into play when both migration costs and transition costs are high; i.e., the distance to the workplace can no longer be bridged on a daily basis and the prospect of capital losses makes a move unacceptable. These results confirm the interaction effect expected in hypotheses H2b, H3b, and H4b, which are in line with previous experimental results (cf. Petzold 2020): The positive effect of homeownership, an employed partner, and school-age children on the likelihood of weekly commuting increases as the distance to the workplace increases. In addition, the results also provide evidence that the different manifestations of location-specific capital have different implications for whether weekly or daily commuting is the preferred alternative when migration costs are high. In particular, we find that parents of school-age children have a relatively high propensity to commute daily rather than weekly, even when the distance to the workplace is very long. An explanation could be that the costs of being away from the family during the work week are perceived to be even higher than the daily transition costs.

The two-stage modeling we choose, separating the decision on the type of mobility from the (preceding) decision to accept a distant job in the first place, has proven insightful for better understanding the different effects on the propensity to migrate and the propensity to commute. Previous research often does not support the notion that a lower propensity to migrate due to a high endowment of location-specific capital is compensated by a corresponding increase in commuting. Our analyses illustrate that the sources of location-specific capital we consider tend to reduce (to varying degrees) the propensity to switch to a geographically distant job, with a particularly strong negative effect related to the presence of homeownership (cf. Table 2). However, with respect to the choice between mobility alternatives, we find property ownership, living in a dual-earner partnership, and having school-age children to be strong barriers to migration, instead favoring a decision to commute long distances.

Our study has limitations. First, the data we use does not allow us to determine which mobility alternatives are actually considered during the decision-making process. Second, our study analyzes mobility choices at the time of taking a new job (i.e., the mobility type practiced shortly after accepting the job). Whereas individuals may initially choose to commute to work despite long distances, high transition costs may still favor a decision to move closer to the workplace at a later stage (Brueckner and Šťastná 2020;

Marjavaara and Lundholm 2016; McHugh 1990). Such 'delayed' moves with commuting as a precursor are not accounted for in our analyses. Accordingly, our study captures a particular window of a potentially more complex adjustment process, which may have led to an overestimation of the negative impact of location-specific capital on long-term migration propensity. Third, based on the available data we cannot say with certainty that the move associated with a job change is actually caused by that job change. For example, a move could be motivated by the partner's favorable career prospects at the destination. Fourth, jobseekers who show a general reluctance to migrate or to commute weekly are likely to restrict their job search to a smaller spatial radius (cf. Huinink, Vidal, and Kley 2014), so we cannot rule out that the effects between the distance to the new workplace and the preference for certain mobility options are at least bi-directional. Nevertheless, analyses based on experimental data have indicated a causal effect of workplace distance on the preference for mobility alternatives (cf. Petzold 2020).

With regard to implications for future research, in addition to the two-stage modeling, the differentiation between the three mobility alternatives, and the systematic consideration of distance as a moderator variable have proven fruitful. For example, in the additive model the presence of an employed partner has no effect on the propensity to commute weekly. However, the interaction model shows that the presence of an employed partner may well promote the propensity to commute weekly when transition costs are very high. The interplay of geographical distance with other conditions of spatial mobility deserves further investigation. Furthermore, for a deeper understanding of how the different manifestations of location-specific capital influence mobility decisions, future research should consider how these manifestations are (inter)related to the costs of being away from the home (i.e., absence costs). It would also be useful to take greater account of the regional context of the mobility decision, such as transportation infrastructure. Finally, given the significant increase in telecommuting and hybrid work solutions in particular due to the COVID-19 pandemic, their role in the decision to take a distant job and decisions regarding the type of mobility should be considered in future research, using COVID and post-COVID survey data. A reduction in the number of working days requiring presence at the workplace could reduce the transition costs (accumulated over more than one working day). In addition, overnight costs could be reduced if the number of nights at a second residence can be substantially reduced due to the possibility of working from home. As a result, more workers may be willing to accept distant job offers, preferring commuting over migration. Finally, workplace distance may be a poorer predictor of mobility choices in the post-COVID era as the periods the workforce spend at the workplace become more heterogeneous.

Our findings also have implications for policy and practice. If parents want to take advantage of distant job opportunities, they often see no better alternative than daily commuting, even for long distances. However, daily commuting may be associated with

adverse consequences for health and subjective well-being, particularly for women and those with children (e.g., Chatterjee et al. 2020; Rüger et al. 2017). Therefore, special attention should be paid to the particular mobility constraints of parents, and supportive measures should be offered. For example, working from home could be an effective instrument to reduce high transition costs and family– work conflict (e.g., Gajendran and Harrison 2007; Laß and Wooden 2023). Policy efforts to increase the share of homeowners and to promote female employment, and thus dual-career couples, could lead to regional labor market mobility decisions that more often favor non-mobility or, if mobility is chosen, more often favor commuting mobility.

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Appendix

Table A-1: Regression models with Heckman correction (probit effect coefficients with 95% confidence intervals in parentheses)

	1 Migration	2 Daily commuting	3 Weekly commuting	4 Workplace mobility (selection)
Distance to the new job (per 10 km) [a]	0.103 (0.068, 0.138)	–0.313 (–0.385, –0.240)	0.137 (0.115, 0.160)	--
Distance to the new job (per 10 km) squared [a]	–0.001 (–0.002, –0.001)	0.004 (0.003, 0.004)	–0.002 (–0.002, –0.001)	--
Property ownership (ref. renter)				
Owner	–0.631 (–0.930, –0.332)	0.156 (–0.168, 0.481)	0.336 (0.107, 0.566)	–0.088 (–0.143, –0.032)
Partnership situation (ref. non-working partner lives in household)				
Working partner lives in household	–0.253 (–0.483, –0.024)	0.174 (–0.119, 0.468)	–0.016 (–0.252, 0.220)	–0.059 (–0.118, 0.001)
No partner lives in household	0.222 (–0.035, 0.480)	–0.201 (–0.541, 0.138)	–0.318 (–0.621, –0.015)	–0.032 (–0.099, 0.035)
Work status of partner is unknown	–0.511 (–1.010, –0.012)	0.074 (–0.418, 0.566)	0.393 (–0.069, 0.855)	–0.171 (–0.286, –0.057)
Children living in the household (ref. no children live in household)				
Children of age 0–6 live in household	–0.074 (–0.343, 0.194)	0.318 (–0.036, 0.672)	0.029 (–0.264, 0.322)	–0.104 (–0.174, –0.033)
Children of age 7–16 live in household	–0.423 (–0.750, –0.096)	0.856 (0.502, 1.211)	–0.139 (–0.381, 0.104)	–0.012 (–0.075, 0.051)
Children of both ages live in household	–0.243 (–0.606, 0.120)	0.475 (–0.007, 0.958)	–0.089 (–0.487, 0.310)	–0.121 (–0.205, –0.036)
Age	–0.031 (–0.043, –0.018)	0.016 (0.001, 0.031)	0.028 (0.014, 0.042)	–0.018 (–0.020, –0.015)
Gender (ref. male)				
Female	0.084 (–0.207, 0.374)	0.226 (–0.065, 0.516)	–0.413 (–0.713, –0.112)	–0.367 (–0.417, –0.316)
Education in years	0.048 (0.010, 0.085)	0.022 (–0.038, 0.081)	–0.058 (–0.107, –0.010)	0.065 (0.056, 0.074)
Nationality (ref. German)				
Non-German	0.152 (–0.209, 0.513)	–0.164 (–0.752, 0.424)	0.040 (–0.418, 0.498)	0.008 (–0.087, 0.102)
Household income (log)	–0.037 (–0.217, 0.142)	–0.036 (–0.308, 0.236)	0.203 (–0.030, 0.437)	0.056 (–0.008, 0.120)
Duration of residence	–0.053 (–0.079, –0.027)	0.010 (–0.013, 0.033)	0.006 (–0.011, 0.022)	–0.008 (–0.011, –0.005)
Community type (ref. ≥ 500,000, central)				
≥ 500,000, surrounding	–0.197 (–0.551, 0.158)	–0.109 (–0.562, 0.344)	0.139 (–0.246, 0.523)	0.212 (0.129, 0.296)
100,000–500,000, central	0.356 (0.111, 0.600)	–0.624 (–0.991, –0.256)	–0.089 (–0.423, 0.246)	0.103 (0.032, 0.174)
100,000–500,000, surrounding	0.037 (–0.293, 0.368)	–0.007 (–0.417, 0.402)	0.073 (–0.289, 0.435)	0.169 (0.089, 0.249)
50,000–100,000, central	0.124 (–0.331, 0.579)	–0.244 (–0.896, 0.408)	0.225 (–0.312, 0.763)	0.191 (0.062, 0.320)
50,000–100,000, surrounding	–0.221 (–0.669, 0.227)	–0.028 (–0.514, 0.457)	0.029 (–0.361, 0.419)	0.192 (0.091, 0.293)
20,000–50,000	–0.041 (–0.370, 0.287)	–0.261 (–0.685, 0.163)	0.424 (0.060, 0.788)	0.174 (0.093, 0.255)
5,000–20,000	–0.205 (–0.587, 0.177)	–0.277 (–0.732, 0.179)	0.462 (0.070, 0.854)	0.153 (0.064, 0.243)
2,000–5,000	–0.296 (–0.821, 0.230)	–0.39 (–0.944, 0.164)	0.452 (–0.043, 0.947)	0.298 (0.187, 0.409)
< 2,000	–0.077 (–0.628, 0.475)	–0.121 (–0.630, 0.389)	0.285 (–0.203, 0.774)	0.291 (0.175, 0.406)

Table A-1: (Continued)

	1 Migration	2 Daily commuting	3 Weekly commuting	4 Workplace mobility (selection)
Region (ref. West Germany)				
East Germany	–0.399 (–0.691, –0.106)	–0.173 (–0.424, 0.077)	0.557 (0.314, 0.800)	0.120 (0.070, 0.171)
Employment situation (ref. fulltime employed / permanent contract) [b]				
Fulltime employed / fixed-term contract	--	--	--	0.388 (0.304, 0.472)
Part-time employed / permanent contract	--	--	--	–0.176 (–0.299, –0.054)
Part-time employed / fixed-term contract	--	--	--	0.246 (0.060, 0.432)
Marginal employed	--	--	--	–0.123 (–0.293, 0.046)
Self-employed or "no contract"	--	--	--	–0.038 (–0.128, 0.052)
Vocational training / education	--	--	--	0.274 (0.192, 0.356)
Unemployed	--	--	--	0.509 (0.429, 0.589)
Non-working	--	--	--	–0.141 (–0.248, –0.033)
Constant	–2.224 (–3.693, –0.756)	2.950 (0.628, 5.272)	–3.870 (–6.072, –1.669)	–2.971 (–3.415, –2.526)
Wald Chi^2	191.804	271.128	356.003	--
N selected	1,161	1,161	1,161	--
Observations	193,139	193,139	193,139	193,139

Note: Columns 1–3: Heckman-corrected probit coefficients (*b*) with respect to the options 'Migration', 'Daily commuting' and 'Weekly commuting' with 95% confidence intervals in parentheses. All three models additionally control for survey year (coefficients omitted from the table). Column 4 ('Workplace mobility') shows the probit coefficients and 95% confidence intervals of the selection equation that applies to all three (1–3) models. [a] variable is only included in main equations; [b] variable is only included in selection equation (exclusion restriction).
Source: SOEP 2001–2019, authors' own calculations.

Table A-2: Interaction of location-specific capital (property ownership, working partner and presence of school age children) and distance to the new job (per 10 km) (probit effect coefficients with 95% confidence intervals in parentheses)

	5 Migration	6 Daily commuting	7 Weekly commuting
Distance to the new job (per 10 km)	0.112	–0.328	0.109
	(0.073, 0.151)	(–0.416, –0.240)	(0.082, 0.135)
Distance to the new job (per 10 km) squared	–0.001	0.003	–0.001
	(–0.002, –0.001)	(0.002, 0.004)	(–0.002, –0.001)
Property ownership (ref. renter)			
Owner	–0.660	0.028	–0.088
	(–1.114, –0.206)	(–0.411, 0.467)	(–0.457, 0.281)
Interaction: property ownership x distance (ref. renter × distance)			
Owner × distance	0.001	0.009	0.024
	(–0.013, 0.015)	(–0.025, 0.043)	(0.009, 0.039)
Partnership situation (ref. non-working partner lives in household)			
Working partner lives in household	–0.106	0.402	–0.337
	(–0.473, 0.262)	(–0.121, 0.924)	(–0.724, 0.050)
No partner lives in household	0.287	0.053	–0.128
	(–0.112, 0.685)	(–0.622, 0.728)	(–0.583, 0.326)
Work status of partner is unknown	–0.264	0.488	0.064
	(–0.991, 0.464)	(–0.797, 1.773)	(–0.626, 0.754)
Interaction: partnership × distance (ref. non-working partner × distance)			
Working partner × distance	–0.007	–0.018	0.015
	(–0.019, 0.006)	(–0.059, 0.024)	(0.001, 0.030)
No partner × distance	–0.003	–0.026	–0.006
	(–0.016, 0.010)	(–0.096, 0.044)	(–0.023, 0.010)
Work status of partner is unknown × distance	–0.013	–0.045	0.018
	(–0.038, 0.013)	(–0.178, 0.088)	(–0.010, 0.046)
Children living in the household (ref. no children live in household)			
Children of age 0–6 live in household	0.138	–0.169	–0.184
	(–0.292, 0.568)	(–0.799, 0.461)	(–0.625, 0.258)
Children of age 7–16 live in household	–0.059	0.096	–0.748
	(–0.607, 0.489)	(–0.569, 0.762)	(–1.188, –0.308)
Children of both ages live in household	–0.142	0.288	–0.430
	(–0.762, 0.477)	(–0.689, 1.265)	(–1.122, 0.262)
Interaction: children × distance (ref. no children × distance)			
Children of age 0–6 × distance	–0.009	0.055	0.007
	(–0.024, 0.005)	(–0.006, 0.117)	(–0.008, 0.023)
Children of age 7–16 × distance	–0.015	0.067	0.031
	(–0.036, 0.006)	(0.006, 0.128)	(0.010, 0.051)
Children of both ages × distance	–0.004	0.026	0.011
	(–0.022, 0.013)	(–0.055, 0.106)	(–0.010, 0.033)
Constant	–2.397	3.125	–3.090
	(–3.877, –0.917)	(0.879, 5.371)	(–5.296, –0.884)
Wald Chi^2	198.987	249.086	372.045
N selected	1,161	1,161	1,161
Observations	193,139	193,139	193,139

Note: Columns 1–3: Heckman-corrected probit coefficients (b) with respect to the options 'Migration', 'Daily commuting' and 'Weekly commuting' with 95% confidence intervals in parentheses. All three models additionally control for respondent characteristics and survey year (coefficients omitted from the table). Probit coefficients and 95% confidence intervals of the selection equation can be taken from Column 4 ('Workplace mobility') of Table A-1.
Source: SOEP 2001–2019, authors' own calculations.