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Abstract

This paper provides one of the first tests of adaptation to the complete set of residential transitions. We use long-run SOEP panel data and consider the impact of all housing transitions, whether or not they involve a change in housing tenure or geographical movement, on both life satisfaction and housing satisfaction. Controlling for individual characteristics and housing quality, some residential transitions affect life satisfaction only little, while all transitions have a significant effect on housing satisfaction. This latter is particularly large for renters who become homeowners and move geographically, and for renters who move without changing tenure status. Regarding housing satisfaction, we find very little evidence of adaptation even after five years. Losing homeowner status is the only transition that produces lower housing satisfaction, and here the effect seems to become even more negative over time.

Keywords: Housing, Adaptation, well-being, SOEP.

JEL Classification Codes: D19, R21.

1. Introduction

Interest in adaptation in social sciences has increased notably in recent years. If individuals adapt to changes in their living conditions, then the associated initial short-run impact of an event on subjective wellbeing will diminish over time. If the long-run effect is zero, then conditions and circumstances will not matter in the long run, so that adaptation is complete; on the contrary, if there is no adaptation then an event that starts bad will remain equally bad and one that starts good will remain equally good.

The speed of adaptation may reflect the importance of the event to the individual: adaptation could be faster to a change in the job environment than to unemployment, for example. In the context of housing, which is what we consider here, individuals may adapt faster to a move that does not involve changing tenure status than to a move that involves becoming a homeowner (or no longer being one). The speed of adaptation to life events can also depend on individual personality (Headey and Wearing, 1989), with the optimistic adapting faster to unpleasant events while the pessimistic may adapt faster to pleasant events. Adaptation may then contain substantial individual heterogeneity, which is generally not observed by the analyst. Equally, it has been argued that adaptation to positive events may be faster than that to negative events (Lyubomirsky, 2011).[1]

Some research on adaptation in social science has used cross-section data, where the test consists of the comparison of different groups of individuals at the same moment who experienced the event in question at different points in the past. However, this comparison is muddied by the difficulty in distinguishing whether the observed differences across groups in terms of the time elapsed since a specific event reflect adaptation or rather initial differences in subjective well-being (SWB): see Clark *et al*.

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[1] A survey of some of this adaptation literature can be found in Clark (2016).

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(2008). Panel data avoid this difficulty by following the well-being of the same individual over time, leading up to and following the life-course event. As the focus is on within-individual changes, panel estimation allows us to control for time-invariant unobserved individual heterogeneity that may reflect personality traits, e.g. optimism or pessimism.

We will here estimate linear models with individual fixed-effects (as in Clark *et al.*, 2008, and Clark and Georgellis, 2013) to analyse adaptation to life-events related to housing. These are of interest as housing is not only one of the most important decisions that individuals make in their life (along with partnership and occupation), but also probably their largest financial investment. In developed economies, homeownership is not only a way of accumulating wealth but also a sign of personal success (although negative externalities via status concerns may also be at play here: see Wei *et al.*, 2012, Foye *et al.*, 2018, Bellet, 2019, and Bao and Meng, 2021). There is in addition a general consensus that home-ownership is beneficial for both individuals (Dietz and Haurin, 2003, Elsinga and Hoekstra, 2005, Diaz-Serrano, 2009, Diaz-Serrano and Stoyanova, 2010, and Hu, 2013) and society (Rohe and Stewart, 1996, Rosi and Weber, 1996, DiPascuale and Glaeser, 1999, Glaeser and Sacerdote, 2000, and Dietz and Haurin, 2003). However, this may not always be the case. For example, Oswald (1997) explicitly links unemployment to home ownership, arguing that the latter acts as an impediment to mobility and so increases unemployment. At the individual level, the debt that many households take on may have long-lasting effects, for example via labour supply, household consumption and fertility decisions. Equally, there is a literature on "mis-wanting" that emphasises, in the domain of housing, individuals' under-estimation of their adaptation to house size and their over-estimation of their adaptation to commuting (Stutzer and Frey, 2008). Despite the potentially-important link between

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housing and well-being, the dynamic analysis of the relationship between the two remains relatively little-analysed.

Our empirical analysis below will cover all of the following types of housing transitions: renters becoming homeowners, homeowners becoming renters, and housing mobility that does not produce a change in housing tenure, either for renters or homeowners. For renters who become homeowners, we also distinguish between those who buy the dwelling where they were residing as renters, and those who buy a different dwelling. Our use of this complete set of housing transitions allows us to disentangle mobility and housing-tenure effects on subjective well-being. We find that all of these transitions have large effects on housing satisfaction, but their relationship to life satisfaction is generally more modest or even zero. As such, either housing is only a fairly small part of overall life satisfaction, or greater housing satisfaction is being offset by movements in some other domain.

In terms of adaptation, we find lead effects with respect to most of the transitions, for both housing satisfaction and life satisfaction. These are of the usual type (as found for quitting one's job and marital transitions: see Clark, 2001, Clark and Georgellis, 2013, and Stutzer and Odermatt, 2019, for example), with lower satisfaction preceding a change in housing. There is relatively little evidence of lag effects in terms of life satisfaction, with the effect of housing mostly being transitory. On the contrary, there is little adaptation in housing satisfaction for all of the transitions we analyse here. There are two exceptions. Entering homeownership with geographical movement at the same time seems to produce a long-run boost for both types of satisfaction (which is larger than that from buying the house/flat that you were previously renting). Equally, moving from homeownership to renting is associated with a long-run fall in both life and

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housing satisfaction. These results are important, as well-being relating to housing is used as a barometer to assess housing programmes and policies.

The remainder of the paper is structured as follows. Section 2 presents the conceptual framework and reviews the main research in the field of housing satisfaction. Section 3 then describes the data and the empirical framework, and Section 4 sets out the empirical results. Last, Section 5 concludes.

2. Related Literature

Much of the existing empirical work of the effect of housing on satisfaction has used cross-section data, and as such compares the satisfaction of different individuals at a given point in time. The impact of homeownership is usually estimated by including a dummy variable reflecting housing-tenure status. The estimated effects here are often ambiguous, depending on whether the outcome variable is housing/residential satisfaction or life satisfaction/happiness. Some work has uncovered only a weak or zero effect of homeownership on happiness (Rossi and Weber, 1996, and Bucchianeri, 2009), but a significant and positive one for housing satisfaction (Kinsey and Lane, 1983, Danes and Morris, 1986, and Elsinga and Hoekstra, 2005).

One obvious shortcoming in these comparisons is that they do not shed light on any pre-existing group differences in satisfaction and selection into different housing statuses, which can substantially bias the results. As noted in the introduction, the individual response to life-course events, including housing, may well depend on personality traits, which are generally not observable by the researcher. Individual circumstances, both observable and unobservable, may also render homeownership more attractive, or feasible, for some individuals. In addition, housing mobility,

irrespective of tenure status, is determined by other life-course events such as job mobility, changes in family composition and marital status and so on. This dynamic nature of residential decisions, plagued by unobserved heterogeneity across individuals, can be tackled using panel data. The latter not only allow us to observe the individual as the residential transition occurs, but also to purge the estimated coefficients from individual unobserved heterogeneity via individual fixed effects.

A first stab at dynamic analysis can be found in Rohe and Basolo (1997), who considered data for the same individuals over two periods and observed a significant difference in housing satisfaction between the renters who became owners and those who remained renters.[2] The limitations here are that there are only two time periods, and the regression analysis is a cross-section analysis of the level of satisfaction (in the second period) as a function of the change in housing status (which does not control for individual unobserved heterogeneity). Equally, the comparison is between a group of renters who rent for a period of 18 months and a group of renters who not only became homeowners but who also moved to a new address. We cannot therefore distinguish the change in tenure status from the change in the accommodation. This is actually a general limitation in existing work, on either cross-section or panel data, which focuses only on homeownership and does not separately estimate the effect of moving house. One exception is Diaz-Serrano (2009), who uses European Community Household Panel (ECHP) data to establish a positive relationship between homeownership and residential satisfaction, separating the mobility and homeownership effects. He concludes that 50% of the residential-satisfaction impact of homeownership is actually attributable to moving house, irrespective of housing-tenure status.

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[2] These are quasi-experimental data from about 200 interviews with low-income households.

Other longitudinal work has also found an impact of residential mobility on life satisfaction. Frijters *et al*. (2011) use data from the Household, Income and Labour Dynamics in Australia (HILDA) survey, and uncover a statistically-significant effect of a change in residence on life satisfaction. However, no clear pattern of adaptation was seen. Nowok *et al*. (2013) consider the impact of moving house on SWB in the UK, using the British Household Panel Survey (BHPS), and found no statistically-significant link for either short- or long-distance mobility.

The German Socio-Economic Panel (SOEP) is the most common dataset used in the few existing panel analyses. Using this data, Zumbro (2014) shows that homeownership has a direct impact on life satisfaction; however, he does not test for adaptation. Also using the SOEP, Nakazato *et al*. (2010) find that moving to a new residence does not affect life satisfaction, but does have an impact on housing satisfaction. However, no evidence of adaptation is found. Wolbring (2016) considers the impact of moving house on housing satisfaction, and finds a sizeable immediate impact on housing satisfaction that subsequently falls sharply over time (producing full adaptation). Last, Stotz (2019) focuses on the long- and short-term impacts of homeownership on housing satisfaction. He finds a significant positive effect, and although the coefficients on the post-ownership transition dummies become a little smaller five years afterwards, they still remain fairly high.

Even though all of these contributions use the same (SOEP) dataset, their results are not unanimous. While a positive SWB impact of ownership or moving house is consistently established, the results regarding adaptation are mixed. We believe that this is for two reasons. First, the empirical models used are not always the same (some include covariates and others do not); second, these papers do not consider homeownership and moving house as separate life events. Those who move house can

be owners or renters, and in the same way those who become homeowners may buy a new house or that which they were already renting.[3]

We therefore propose to fill this gap in the literature by considering all of the possible housing transitions: as such, even though we use the same dataset (with more waves), our results may only partially coincide with those from the contributions mentioned above. As we will show below, our results regarding the transition to ownership that involves a change of residence are in line with those in Stotz (2019), but are different to those in Wolbring (2016).[4] Our results are not directly comparable to Frijters *et al*. (2011), Nowok *et al*. (2013) and Nakazato *et al*. (2010), since these authors only consider changes in geographical residence without considering whether this also comes with a change in tenure status.

3. Empirical Framework and Data

3.1. Data

Our empirical analysis uses 1984-2015 SOEP data, and our sample consists of men and women aged over 16. We only consider household heads and their partners. This produces a sample of 364,771 observations, consisting of 56,705 individuals with valid observations for all our contemporaneous variables used in the analysis (i.e. before we consider mobility and the lags and leads). This is an unbalanced panel, so that we have multiple observations for each individual but not all individuals appear in all 32 years of the panel. These 56,705 individuals are grouped in 43,320 households.

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[3] Nowok *et al*. (2018) do make the distinction between geographical mobility in general and changes in housing tenure, using BHPS data. They do not analyse both at the same time though, and control for housing characteristics, such as space shortage, that may be thought to mediate part of the effect of housing transitions.

[4] Wolbring (2016) only looks at renter-renter transitions. The full-adaptation conclusion refers to regressions without any covariates. When he introduces controls, the adaptation to renter-renter moves becomes only partial, which is what we will also conclude for this type of housing-market transition below.

As this is a long panel, some individuals in our sample experience the housing events considered here more than once, although geographic mobility is more frequent than changes in housing tenure. We may well expect the impact of and adaption to life events to be different according to whether the event is experienced for the first or second time. We here deal with this issue (as in Clark *et al.*, 2008) by considering only the first housing change in those cases where the individual has experienced more than one during our sample period (1984-2015).[5]

Our dependent variable is subjective well-being, measured by both overall life satisfaction and housing satisfaction. The former comes from the question "*How satisfied are you with your life, all things considered*?" and the latter from "*How satisfied are you today with your place or dwelling*?". These are asked of all SOEP respondents every year, with the answers being on a 0-10 scale, where 0 corresponds to completely dissatisfied and 10 completely satisfied.

Once we exclude observations with missing values for the covariates and outcomes in the regressions, the missing values mechanically generated when we create the lags and leads, and considering only the first observed housing transition, we end up with a sample of around 300 000 observations on 42 000 different individuals, which can be smaller depending on type of transition analysed in the regressions. Figure 1 depicts the distribution of life and housing satisfaction in this sample. As is common for this kind of data, the distribution is left-skewed with bunching towards the top of the scale: the modal response is 8 on the 0–10 scale for both satisfaction measures. Only relatively few respondents report the maximum life-satisfaction score of 10, while the

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[5] Some individuals do of course experience multiple housing movements in the SOEP. It is not immediately obvious how to deal with lags and leads when there are multiple events. Someone who moved three years ago and will move again next year is simultaneously anticipating and adapting to housing movements; in two years' time they will be adapting to two different moves. The situation becomes even more complicated when there are more than two shocks. In practice, keeping multiple movers in the analysis does not much change the results (as there are only relatively few of them).

distribution of housing satisfaction is more skewed, with more respondents reporting scores of 9 or 10.

[Figure 1 around here]

Table 1 shows, for comparison purposes, the descriptive statistics in our analysis sample for all seven of the satisfaction questions that appear in the SOEP, all of which have modal scores of 8. Housing satisfaction has the highest mean score, at 7.8, compared to the others that are in the range of 6.4 to 7.0. Housing satisfaction also exhibits the greatest negative skewness (-1.2), with the analogous figures for the other satisfaction measures ranging from -0.6 to -1.0.

[Table 1 around here]

We now turn to the estimation of the impact of housing on life and housing satisfaction. We consider both housing-tenure transitions and geographic mobility. We disentangle the two (Diaz-Serrano, 2009) by distinguishing between individuals who enter or leave homeownership, and those who experience geographical mobility (i.e. house movers). The pure effect of moving house on SWB is then captured by the effect of housing mobility for movers who do not change tenure status (i.e. homeowner to homeowner, or renter to renter).

We carry out a within-subject analysis, which requires that individuals be observed both before and after the event in question occurs. We follow the same approach as in Clark *et al.* (2008). For instance, letting *OWN* be the home-ownership dummy, individual *i* transits into homeownership if $OWN_{i,t}=1$ and $OWN_{i,t-1}=0$. For recent homeowners, we define homeownership duration of one to two years by $OWN_{i,t}=1$, $OWN_{i,t-1}=1$ and $OWN_{i,t-2}=0$, and so on for longer lags. The analogous transitions and their

lags for changes in housing tenure are calculated in the same way. The calculations for the lead variables, which will be used to test for anticipation, is similar but now refers to the number of years before the housing transition in question.

Table 2 shows the number of housing events observed in our sample (without taking into account the missing values described above). Due to the long time-span of the SOEP, we have a considerable number of these. The column labeled "% between" shows the percentage of households who experienced this transition at least once during the sample period (1984-2015). Almost 25% (10,839) of the households experienced at least one housing transition of some type. Over all of the sample households, 2,539 (6%) changed from renting to homeownership (with or without a move), while 7,355 (17.3%) moved from one rented accommodation to another (i.e. without changing tenure status). 2,711 households (6.4%) changed from homeownership to renting, and 694 (1.6%) from one owned property to another. The 2,539 who became homeowners are split into 1,096 (2.6%) who bought the flat or house that they were already renting and 1,443 (3.4%) who became homeowners while moving house.

[Table 2 around here]

The panel nature of the data allows us to track individuals' reported life and housing satisfaction both before and after the housing event. Given our 32 waves of panel data, we can potentially follow individuals for up to 31 years before or after the event occurred. In practice, the vast majority of individuals can be tracked for far shorter periods. As in Clark *et al*. (2008), we here focus on the four years preceding the event in question regarding anticipation, and all years following the event to identify adaptation (grouping together all of the observations five or more years after the event for cell-size reasons).

3.2. Hypotheses

We estimate movements in housing and life satisfaction before, during and after housing mobility. We do so using panel data, so that all comparisons are within-individual, avoiding issues regarding selection into different types of housing. In addition, we distinguish between changes in housing tenure and geographical house moves. This is important, as these changes most often occur at the same time (see Table 1). We ask the three following questions: (i) Are housing events contemporaneously correlated with life and housing satisfaction? (ii) Is there anticipation regarding future housing events? and (iii) How fast do individuals adapt to changes in housing?

Question (i) is probably the least original, as it has been extensively covered in existing work. The other two questions are to our mind more innovative, and especially in the sense that we separate geographical moves and housing tenure. The only contribution that we are aware of regarding question (ii) is Diaz-Serrano and Stoyanova (2010), who use ECHP data to show that individuals with lower housing satisfaction were more likely to move in the short-run. Last, question (iii) has been addressed considering homeownership or changing residence as a whole, but no previous work has split up these two factors by distinguishing all possible housing/tenure status transitions. This is the most innovative part of our empirical analysis. As in Clark *et al*. (2008) we propose a straightforward test, which is explained in more detail below.

3.3. Empirical Model

We will pick up the presence of both anticipation and adaptation by using a series of appropriate dummies in a fixed-effects regression. We model satisfaction (S_{it}^*) at period *t* as follows:

$$S_{it}^{*} = \beta'X_{it} + \delta'Z_{it} + \sum_{k=-4}^{5} \gamma_k H_{k,it} + \mu_i + \varepsilon_{it} \tag{1}$$

where S_{it}^{*} is either life and housing satisfaction, X_{it} a matrix of standard individual controls, to be described below, μ_i are the individual fixed-effects and ε_{it} is a random error term. In Equation (1), instead of entering a simple home-ownership dummy that would pick up the average well-being effect over all of those who experience a certain life-course event related to housing (H_{it}), we split this dummy up into ten groups: four that capture this housing event in the future (0-1, 1-2, 2-3 and 3-4 years before the event occurs) and six reflecting adaptation (0-1 years, 1-2 years, and so on up to the last group, who experienced the housing event five or more years ago). Equation (1) differs in implementation from the empirical model used in Clark *et al*. (2008) in that we include the lags (k=0 to 5) and leads (k=-4 to -1) in the housing events at the same time, whereas Clark *et al*. (2008) estimated lags and leads separately.[6] We consider the first housing transition that individuals experience in our sample, to avoid any habituation bias (whereby individuals may react differently after multiple moves as they get used to experiencing changes in housing). Here, in each regression, households with a particular type of transition (the treated group) are compared to those that do not experience any transition at all during the sample period (the control group). As such, we avoid analyzing the effect of renter-renter transitions (say) including not only those with no transitions but also the renter-homeowner, homeowner-homeowner and homeowner-renter individuals in the control group. We believe that this is a clean empirical strategy. As the number of households in each specific transition group is not the same, the number of observations is different in each of Table 3's regressions.

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[6] Including leads and lags in separate regressions implies that the omitted category for the lags is all of the periods prior to the event. If some of these periods were miserable due to lead effects, then we will overestimate the lags. This point was made by Qari (2014), and explicitly addressed by Clark and Georgellis (2013) in their lags and leads analysis of British Household Panel Survey data.

This estimation allows us to carry out simple tests of the degree of adaptation/habituation and anticipation to housing events. If there is no adaptation, we expect the estimated lag parameters γ_0 to γ_5 in equation (1) for a particular housing event to all take on similar values. On the contrary, under adaptation the absolute size of these coefficients will fall over time (so that the event has a diminishing effect on satisfaction over time). Analogously, under anticipation the lead housing-mobility coefficients γ_{-4} to γ_{-1} in equation (1) will become larger as the event comes closer in time. Appendix Table A1 lists the number of observations in each lead and lag cell in the analysis.

The individual-level control variables (X_{it}) in equation (1) include age, education, a German-citizenship dummy, labour-force status, marital status, number of children in the household, household income, and State of residence and year dummies. We hold these variables constant as we wish to isolate the subjective well-being consequences of the change in housing independently of potential confounders: housing moves could result from losing a job, retiring, divorcing or marrying, or a change in the number of children for example.[7]

4. Regression Results

We consider all possible types of housing transitions. We first look at the effect of any housing transition, be it in terms of housing tenure, geographical mobility or both. We then explicitly look at changes in tenure status via the following types of transitions.

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[7] An alternative to controlling for these variables would be to model all of family, labour-market and housing transitions at the same time. In the same spirit as note 5 above, we believe that this would be very unwieldy, with multiple lag and lead effects being interacted producing a plethora of mostly lightly-populated cells. Holding the other variables constant is likely a more practical solution. As we will discuss below, the adaptation results with and without family and labour-market variables turn out to be very similar.

First, the change from renting to homeownership (RH), distinguishing between those who buy the dwelling that they used to rent (RH-SH) and those who move house as they change from renter to homeowner (RH-DH). Our second transition group is the mirror change from homeownership to renting (HR). The last group consists of those whose tenure status does not change as they move house, from renting to renting (RR) or homeownership to homeownership (HH).

The estimation results of Equation (1) for life and housing satisfaction appear in Table 3. This table only lists the estimated coefficients on the lags and leads in housing transitions, with those on the other variables appearing in Appendix Table A2. As the estimated coefficients on these controls are very similar in all of the different life-satisfaction specifications, and equally across the housing-satisfaction specifications, Table A2 includes only one set of estimated coefficients on the non-housing variables for each satisfaction measure: those that correspond to columns (1) and (2) of Table 3.

The results in Table A2 show that the determinants of life and housing satisfaction are not always the same. Age is entered as a set of dummies, and is significant for both satisfaction measures. There is a U-shaped relationship between age and both life and housing satisfaction, as is very common in the literature (see Blanchflower, 2021, and Clark, 2019, for example). Compared to when they were married, individuals who are widowed or separated are less satisfied with their lives, although the estimated coefficient on divorced is insignificantly positive (showing, perhaps, that those who divorce on average have not made a bad decision, as in Clark *et al*., 2008, and Clark and Georgellis, 2013). Divorce is on the contrary associated with lower housing satisfaction. Household income attracts a positive statistically-significant estimated coefficient in both equations, but is much larger in size in the life-satisfaction equation. It is notable that the number of children significantly reduces housing satisfaction much more than it does life satisfaction. Education attracts positive estimate

coefficients in both equations (although it often varies only little within individual, making the effect more difficult to estimate in fixed-effects equations). Relative to working, unemployment is associated with sharply lower life satisfaction of one half of a point, but has no relationship with housing satisfaction.

4.1. *Anticipation and Adaptation to Housing*

The life- and housing-satisfaction estimates in Table 3 are labelled LS and HS respectively. First, in general, residential transitions are more strongly correlated with housing satisfaction than with life satisfaction: this is particularly the case for the lag coefficients. Second, all transitions have a positive impact on housing satisfaction except that of homeowners becoming renters. Third, there is actually not that much evidence of adaptation. The only specific transition that is associated with notable adaptation is a renter-to-renter movement (as analysed in Wolbring, 2016), where the coefficient from three years after the move onwards is around two-thirds the size of the immediate impact. Notably, homeowners who become renters do not adapt, with the estimated coefficients instead showing reduced satisfaction that instead seems to keep falling over time.

In columns 1 and 2, a housing transition of any kind has a positive impact on both housing and life satisfaction, with the effect size being much larger for the former. We find anticipation for both satisfaction measures, in the sense of lower levels of satisfaction preceding transitions (along the same lines as those found in the literature for job quits and marital transitions). For housing satisfaction there is on average adaptation after a housing transition (from 1.06 in the transition year to 0.72 five or more years after the transition). The results for the separate transitions discussed below will make clear that this apparent adaptation to housing transitions mostly represents some

adaptation in renter-renter moves and an "anti-adaptation" profile for homeowner-renter moves, where the initial negative effect worsens over time.

The fixed-effects models of housing transitions on both life and housing satisfaction in Table 3 produce a lot of numbers. We therefore illustrate the main results in Figures 2 and 3. Figure 2 depicts the estimated coefficients for life satisfaction, while Figure 3 shows those for housing satisfaction. On the X-axis, the values from -4 to -1 correspond to anticipation (our lead effects), while those from 0 to 5 show adaptation (the lag effects). The horizontal line is at zero, corresponding to average life satisfaction (conditional on the control variables) five or more years before the transition in question. The vertical scale is the same in all six graphs, so that we can visually compare the impact of the six residential transitions. The vertical bars around each point refer to the 95% confidence intervals. The vertical dotted line is at zero, the year of the housing transition.

4.2. Becoming a Homeowner

There are two types of transition here: households who buy the dwelling that they were previously renting (RH-SH, in columns 3 and 4 of Table 3), and those who move when becoming homeowners (RH-DH in columns 5 and 6). The results are not the same, underling the importance of considering housing tenure and geographical movement separately. The RH-SH transition has no effect on life satisfaction but raises housing satisfaction durably by around 0.3 to 0.6 of a point (i.e. 15 to 30% of a standard deviation, from column 2 of Table 1). On the contrary, the estimated coefficients for the RH-DH transition are at systematically over one housing-satisfaction point, with only slight evidence of adaptation: as in Diaz-Serrano (2009), a large part of the satisfaction effect of becoming a homeowner is the associated change of accommodation. This RH-DH transition also attracts significant life-satisfaction coefficients that are 0.2 to 0.3 points higher after renters become homeowners of a different dwelling.

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There are also notable housing-satisfaction anticipation effects before the transition RH-DH, (from -0.13 four years before the transition to --1.04 the year before). For life satisfaction, we do not find negative lead coefficients, but rather a slight positive anticipation in the two years before the transition.

4.3. Moving without Changing Housing Tenure

Moving without changing housing tenure also has a notable effect on housing satisfaction. The immediate estimated housing-satisfaction coefficients for renter-renter movers (columns 9 and 10), are notably larger than those for homeowner-homeowner switchers (in columns 7 and 8). There is however some adaptation for RR, but none for HH, which renders the estimated housing-satisfaction effects more similar over time. Neither of these transitions has a substantial effect on life satisfaction after the event. There are anticipation effects for both types of move for both satisfaction measures, but substantially larger for housing satisfaction than for life satisfaction.

4.4. Losing Home-ownership

Our final results refer to those who switch from homeownership to renting (in columns 11 and 12 of Table 3). Losing homeownership status is the only residential transition associated with lower housing satisfaction, and in addition the only transition for which we observe the opposite to adaptation, with the drop in satisfaction increasing in size over time. The estimated housing-satisfaction effect in the first year after the transition is -0.135, but -0.600 five or more years after the transition. There is also evidence of persistent lower life satisfaction of around 0.1 to 0.15 points following the loss of homeownership. Contrary to the other housing transitions, there is negative anticipation only one year before the transition for both life (-0.214) and housing

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satisfaction (-0.135). As such, the loss of homeowner status may well be more of a shock than the other types of housing transitions that we analyse here.

[Table 3 around here]

[Figure 2 around here]

[Figure 3 around here]

The main regressions in Table 3 control for both labour-force status and marital status: this is to avoid the housing-satisfaction relationship being confounded by other correlated movements, such as divorce, retirement or job loss. We can evaluate the extent of this potential confounding by not holding these two sets of dummy variables constant. The results from the re-estimation of our panel satisfaction regressions without labour-force status, marital status, household income and number of children are depicted in Appendix Figures A1 and A2 (the estimated coefficients are listed in Appendix Table A3). The lag and lead profiles here are remarkably similar to those in Figures 2 and 3: most of the housing transition effects are then not due to changes in the family or on the labour market.

6. Conclusion

This article has used 32 waves of German Socioeconomic Panel data to consider the relationship between life and housing satisfaction and future, contemporaneous and past housing events. We apply the same analytical method to evaluate anticipation and adaptation to six different housing transitions, some of which involve a change in housing status and some of which do not. For individuals who become homeowners, we distinguish between those who move and those who buy the dwelling that they were

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already renting. We also consider renter-renter and homeowner–homeowner transitions, as well as those from homeowner to renter.

We find anticipation effects for housing satisfaction in all cases, but the extent of anticipation differs. In particular, losing homeownership status seems to be more of a shock than the other housing transitions. Equally, all transitions apart from homeowner to renter produce higher housing satisfaction. We split those who transit from renting to homeownership into those who buy the dwelling they were renting and those who move. The interest in doing so is underlined by the difference in the jump in housing satisfaction following the transition, which is three times larger for the latter group.

We find only little evidence of adaptation in terms of housing status, and no evidence of complete adaptation for any of our five specific housing events. Notably, the fall in housing satisfaction following the loss of homeownership becomes larger over time.

Our most significant effects are for housing satisfaction. However, we do uncover some significant movements in life satisfaction as well. Attaining home-ownership via geographic mobility is associated with durably higher life satisfaction; equally there is some evidence of lower life satisfaction following a move from homeownership to renting. Our separation between geographical mobility and changes in housing tenure also allows us to conclude that the largest part of the jump in housing satisfaction of those who change from renter to homeowner while moving house comes from their geographic mobility, rather than the change in housing status as such (although both are significant). This mirrors the conclusion in Diaz-Serrano (2009) using ECHP data. The fact that the adaptation profile for both groups is similar may also indicate that there is little adaptation to geographical mobility (at least in terms of housing satisfaction).

We believe that this is the first large-scale standardised evidence of lags and leads in life and housing satisfaction with respect to a full set of housing transitions. Our most

general conclusion is that empirical work that relates satisfaction only to an individual's contemporaneous housing situation is in danger of missing a great deal of important information. Just as the word "life" implies a long-term process, housing satisfaction seems to contain a substantial intertemporal dimension. One interesting open question is whether these estimated effects of the housing events observed in Germany would also be found in other countries such as the UK or Spain, where homeownership rates are substantially higher.

The authors declare that they have no conflict of interest.

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Table 1

The distribution of satisfaction in different life domains in the SOEP analysis sample

	Life	Housing	Health	Household Income	Job	Housework	Leisure
Quantiles							
10%	5	5	3	3	4	4	4
25%	6	7	5	5	6	5	6
50%	7	8	7	7	7	7	8
75%	8	9	8	8	8	8	9
90%	9	10	9	9	9	9	10
Mean	7.04	7.77	6.53	6.42	6.99	6.72	7.04
Mode	8	8	8	8	8	8	8
S.D.	1.76	1.95	2.22	2.26	2.13	1.98	2.24
Skewness	-0.87	-1.18	-0.65	-0.62	-0.99	-0.56	-0.74
No. Obs.	240,173	239,555	239,849	238,854	138,962	172,148	217,247

Table 2

Number of Housing Events in the SOEP Analysis Sample

	No. Housing Events	**% between**
	(1)	**(2)**
(a) Any Housing Transition[3]	10,839	25.18
(b) Renter to homeowner (same accommodation)	1,096	2.57
(c) Renter to homeowner (different accommodation)	1,443	3.39
(d) Homeowner to homeowner	694	1.63
(e) Renter to renter	7,355	17.27
(f) Homeowner to renter	2,711	6.36

Notes: (1) Column (1) shows the number of households that move at least once.
(2) These percentages are calculated over the total number of households in the sample
(3) The sum (b)+(c)+ (d)+ (e)+(f) will be generally higher than (a) since households can move more than once and experience different types of transitions. These figures include those households that change status more than once during our sample period, which is why the sum of the specific transitions does not match the number of transitions reported in (a). For those households that move more than once, the regression analysis only considers their first recorded housing transition.

Table 3

Determinants of life (LS) and housing satisfaction (HS) - lag and lead coefficients only

	Any Housing Transition		Renter – Homeowner			
			Same House (RH-SH)		Different House (RH-DH)	
	LS	HS	LS	HS	LS	HS
	(1)	(2)	(3)	(4)	(5)	(6)
Leads						
3-4 years hence	-0.0230	-0.198***	-0.0701	-0.0850*	0.0409	-0.128***
	(0.0143)	(0.0155)	(0.0440)	(0.0439)	(0.0356)	(0.0360)
2-3 years hence	-0.0700***	-0.357***	-0.117***	-0.0993**	0.0302	-0.308***
	(0.0138)	(0.0150)	(0.0437)	(0.0436)	(0.0359)	(0.0363)
1-2 years hence	-0.0722***	-0.606***	-0.0985**	-0.169***	0.0683*	-0.509***
	(0.0137)	(0.0149)	(0.0442)	(0.0442)	(0.0364)	(0.0368)
Within next year	-0.115***	-1.176***	-0.0123	-0.0358	0.121***	-1.041***
	(0.0140)	(0.0152)	(0.0576)	(0.0575)	(0.0376)	(0.0381)
Lags						
0-1 years	0.0973***	1.064***	-0.0110	0.281***	0.309***	2.012***
	(0.0154)	(0.0167)	(0.0597)	(0.0596)	(0.0391)	(0.0396)
1-2 years	0.0482***	0.890***	-0.0299	0.499***	0.185***	1.860***
	(0.0155)	(0.0169)	(0.0658)	(0.0658)	(0.0405)	(0.0410)
2-3 years	0.0604***	0.791***	0.0276	0.416***	0.160***	1.869***
	(0.0160)	(0.0174)	(0.0689)	(0.0688)	(0.0416)	(0.0421)
3-4 years	0.0726***	0.709***	-0.0298	0.471***	0.125***	1.829***
	(0.0170)	(0.0184)	(0.0723)	(0.0722)	(0.0435)	(0.0440)
4-5 years	0.0632***	0.708***	0.0271	0.581***	0.152***	1.793***
	(0.0181)	(0.0196)	(0.0750)	(0.0747)	(0.0452)	(0.0458)
5+ years	0.0598***	0.717***	0.0507	0.618***	0.255***	1.819***
	(0.0152)	(0.0165)	(0.0530)	(0.0530)	(0.0335)	(0.0340)
Observations	312,970	311,465	191,081	190,301	201,910	201,112
R-squared	0.035	42,407	0.034	0.017	0.033	0.074
Individuals	42,424	0.076	31,696	31,686	31,783	31,773

Notes: Standard errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1.

Table 3 (Continued)

Determinants of life (LS) and housing satisfaction (HS) - lag and lead coefficients only

	Homeowner–Homeowner (HH)		Renter – Renter (RR)		Homeowner – Renter (HR)	
	LS	HS	LS	HS	LS	HS
	(7)	(8)	(9)	(10)	(11)	(12)
Leads						
3-4 years hence	-0.00712	-0.0403	-0.0443***	-0.0965***	-0.0248	0.0659*
	(0.0485)	(0.0484)	(0.0167)	(0.0179)	(0.0358)	(0.0361)
2-3 years hence	-0.0429	-0.241***	-0.0693***	-0.178***	-0.0465	0.140***
	(0.0485)	(0.0484)	(0.0159)	(0.0170)	(0.0358)	(0.0360)
1-2 years hence	-0.0149	-0.346***	-0.0809***	-0.324***	-0.0434	0.0798**
	(0.0486)	(0.0486)	(0.0157)	(0.0168)	(0.0363)	(0.0365)
Within next year	-0.0927*	-0.658***	-0.156***	-0.734***	-0.214***	-0.135***
	(0.0497)	(0.0495)	(0.0160)	(0.0171)	(0.0388)	(0.0390)
Lags						
0-1 years	0.116**	0.587***	0.108***	1.350***	-0.0956**	-0.135***
	(0.0524)	(0.0523)	(0.0210)	(0.0224)	(0.0386)	(0.0388)
1-2 years	0.00841	0.692***	0.0521**	1.053***	-0.0567	-0.199***
	(0.0538)	(0.0538)	(0.0208)	(0.0223)	(0.0467)	(0.0469)
2-3 years	0.0246	0.658***	0.0336	0.910***	-0.0453	-0.361***
	(0.0554)	(0.0553)	(0.0216)	(0.0230)	(0.0519)	(0.0522)
3-4 years	-0.00156	0.626***	0.0204	0.841***	-0.00572	-0.570***
	(0.0580)	(0.0579)	(0.0232)	(0.0249)	(0.0585)	(0.0588)
4-5 years	0.00382	0.520***	0.0244	0.847***	-0.145**	-0.517***
	(0.0610)	(0.0609)	(0.0249)	(0.0265)	(0.0659)	(0.0664)
5+ years	0.0576	0.624***	0.0276	0.904***	-0.138***	-0.600***
	(0.0421)	(0.0420)	(0.0209)	(0.0223)	(0.0519)	(0.0521)
Observations	193,325	192,542	248,580	247,280	195,171	194,383
R-squared	0.034	0.020	0.035	0.051	0.034	0.020
Individuals	31,732	31,720	39,233	39,220	32,843	32,831

Notes: Standard errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1.
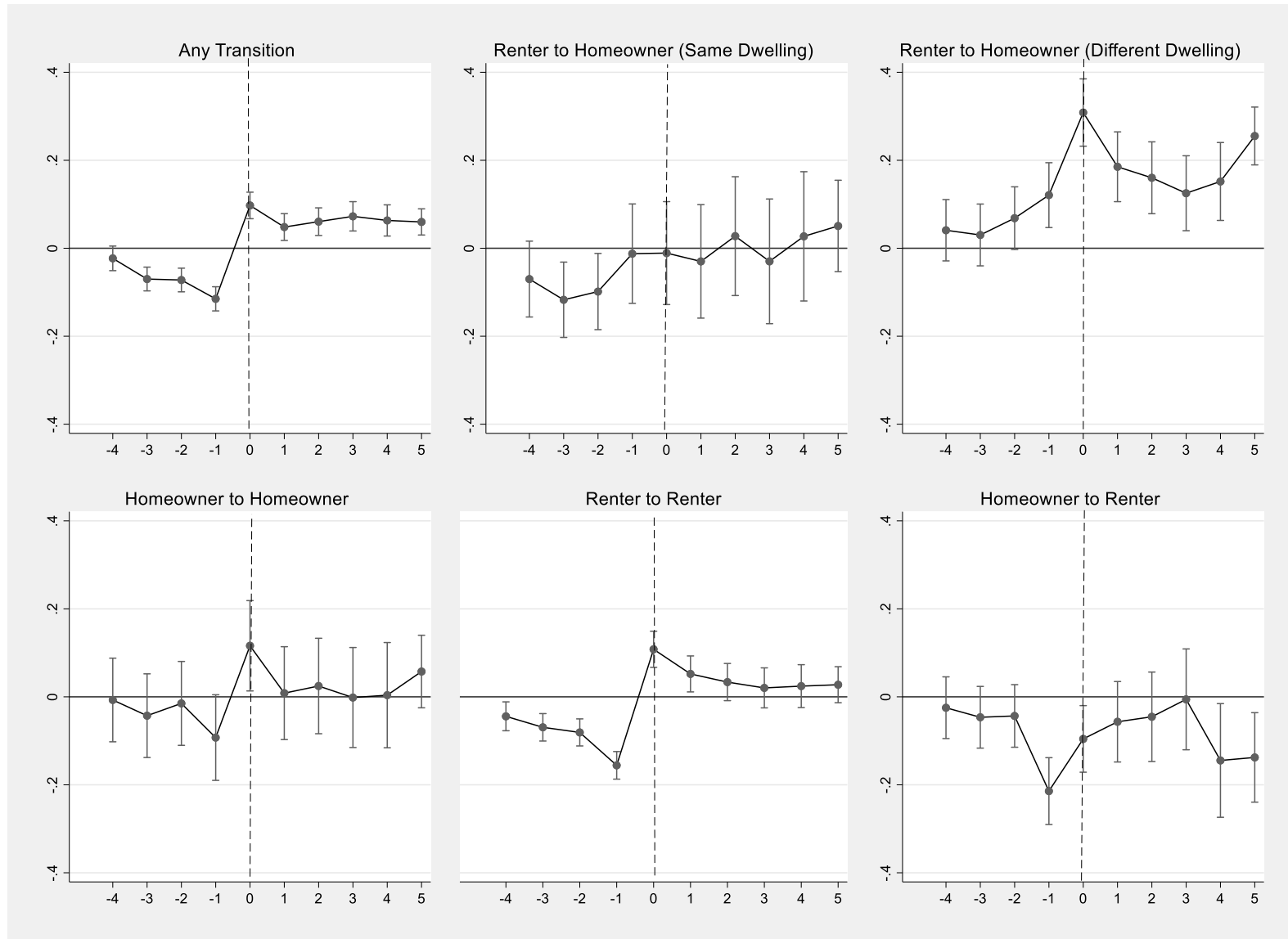
Figure 1

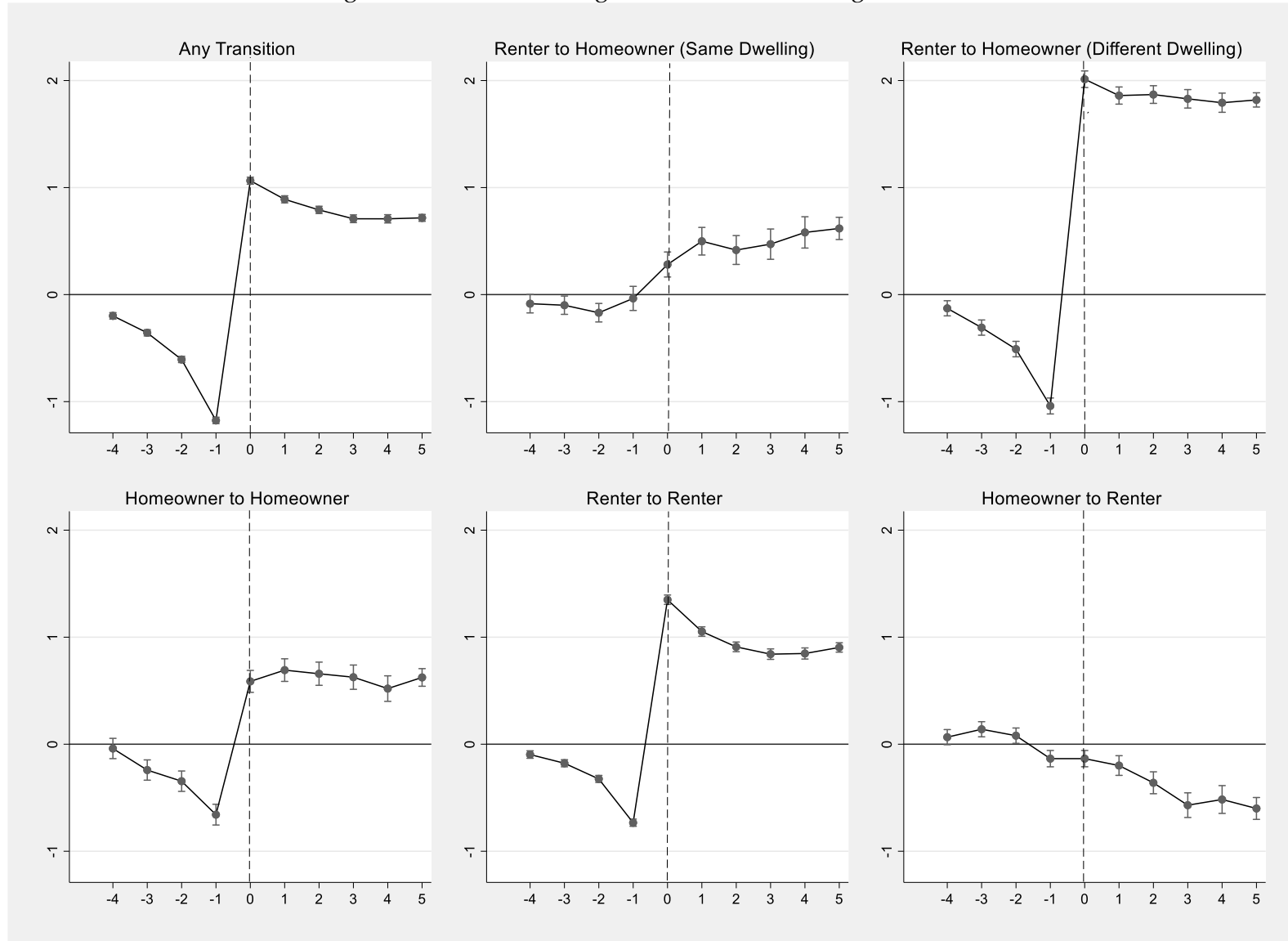The Distribution of Life and Housing Satisfaction in the SOEP Analysis Sample
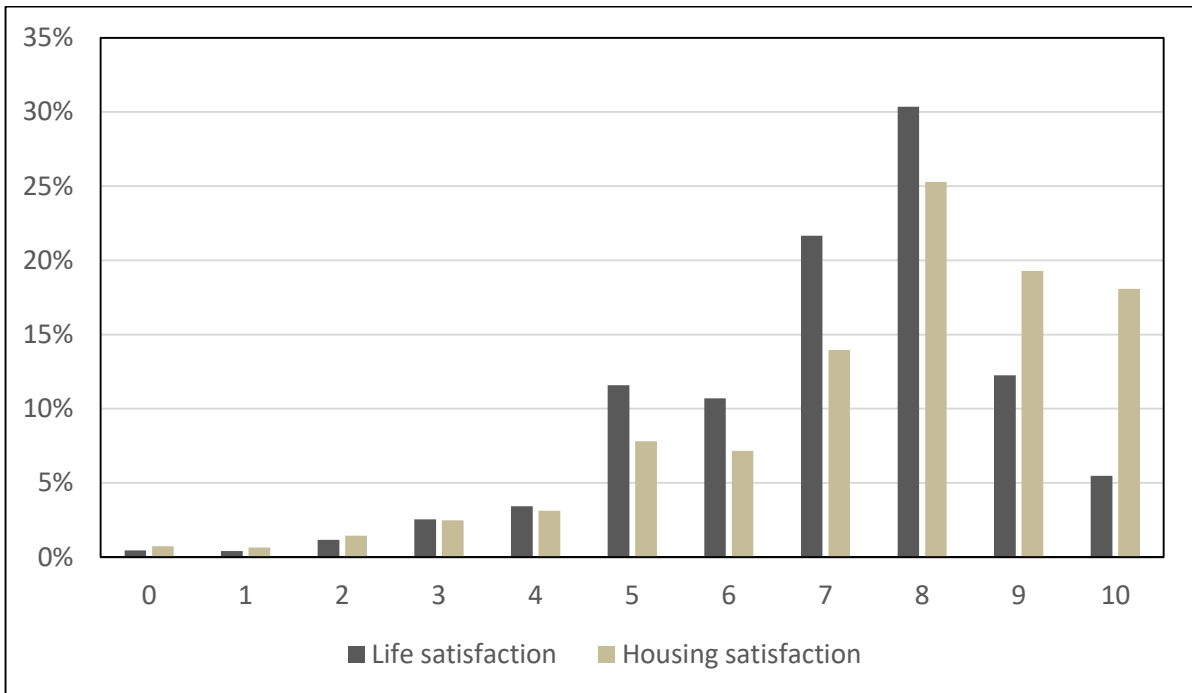
Figure 2
Lags and Leads of Housing Transitions on Life Satisfaction

Figure 3
Lags and Leads of Housing Transitions on Housing Satisfaction

Table A1
The Frequency Analysis of Leads and Lags
(Individuals who report one at least once)

	Any Housing Transition		Rent – Owner				Owner - Rent		Rent – Rent		Owner–Owner	
			Same dwelling		Different dwelling							
	N	(%)	N	(%)	N	(%)	N	(%)	N	(%)	N	(%)
Leads												
3-4 years hence	6 023	31.98	907	5.06	1 715	9.59	986	5.47	986	5.47	644	3.59
2-3 years hence	7 612	38.30	1 111	5.73	2 004	10.36	1 117	5.72	1 117	5.72	723	3.71
1-2 years hence	8 490	35.51	1 319	6.29	2 285	10.91	1 269	6.01	1 269	6.01	772	3.66
Within next year	8 991	42.55	1 671	6.99	2 582	10.80	1 470	6.10	1 470	6.10	821	3.41
Lags												
0-1 years	22 400	79.46	1 580	5.61	2 600	9.22	2 686	9.45	6 514	22.91	1 015	3.57
1-2 years	18 405	65.29	1 196	4.24	2 246	7.97	1 941	6.83	5 487	19.30	817	2.87
2-3 years	15 071	53.46	991	3.52	1 971	6.99	1 566	5.51	4 578	16.10	676	2.38
3-4 years	12 784	45.35	820	2.91	1 691	6.00	1 234	4.34	3 623	12.74	569	2.00
4-5 years	10 710	37.99	705	2.50	1 462	5.19	1 028	3.62	2 784	9.79	484	1.70
5+ years	9 003	31.94	599	2.12	1 253	4.44	824	2.90	2 236	7.86	409	1.44

Fixed-effects estimation of the determinants of life and housing satisfaction:
the estimated coefficients on the non-housing variables

	Life Satisfaction	Housing Satisfaction
Base: Age 16-30		
30-35	-0.979***	-0.133**
	(0.0525)	(0.0569)
35-40	-0.939***	-0.182***
	(0.0472)	(0.0512)
40-45	-0.871***	-0.156***
	(0.0425)	(0.0461)
45-50	-0.823***	-0.148***
	(0.0377)	(0.0409)
50-55	-0.797***	-0.153***
	(0.0332)	(0.0360)
55-60	-0.698***	-0.135***
	(0.0293)	(0.0318)
>60-65	-0.476***	-0.0854***
	(0.0260)	(0.0281)
>65	-0.164***	-0.0201
	(0.0228)	(0.0247)
German citizen	0.131***	-0.0839***
	(0.0221)	(0.0240)
Base: Married		
Single	-0.0138	0.230***
	(0.0226)	(0.0245)
Widowed	-0.207***	0.0449*
	(0.0219)	(0.0237)
Divorced	0.0352	-0.117***
	(0.0236)	(0.0256)
Separated	-0.261***	-0.158***
	(0.0268)	(0.0291)
Number of children in the household	-0.0136**	-0.0972***
	(0.00605)	(0.00659)
Base: Less than high-school		
High-school education	0.0601***	0.00633
	(0.0201)	(0.0218)
More than high-school education	0.231***	0.234***
	(0.0265)	(0.0288)
Log(household income)	0.362***	0.139***
	(0.00977)	(0.0106)
Base: Working		
Non-working	-0.0726***	0.0186
	(0.0120)	(0.0131)

Retired	-0.0961***	0.0471*
	(0.0232)	(0.0251)
In Education-Training	-0.0655*	0.0509
	(0.0383)	(0.0415)
Maternity Leave	0.0891***	-0.0523**
	(0.0231)	(0.0250)
Unemployed	-0.547***	0.0252
	(0.0142)	(0.0154)
Not Working (work from time to time)	-0.0892***	0.00214
	(0.0171)	(0.0186)
Observations	312,970	311,465
Number of individuals	42,424	42,407
R-squared	0.035	0.076

Notes. Standard errors in parentheses; *** $p<0.01$, ** $p<0.05$, * $p<0.1$.

Table A3

Determinants of life (LS) and housing satisfaction (HS) - (lag and lead coefficients only)

	Any Housing Transition		Renter – Homeowner			
			Same House (RH-SH)		Different House (RH-DH)	
	LS	HS	LS	HS	LS	HS
	(1)	(2)	(3)	(4)	(5)	(6)
Leads						
3-4 years hence	-0.0319**	-0.205***	-0.0657	-0.0678	0.0413	-0.140***
	(0.0141)	(0.0152)	(0.0428)	(0.0426)	(0.0350)	(0.0353)
2-3 years hence	-0.0808***	-0.367***	-0.0762*	-0.0682	0.0290	-0.334***
	(0.0136)	(0.0147)	(0.0424)	(0.0423)	(0.0352)	(0.0356)
1-2 years hence	-0.0780***	-0.623***	-0.0919**	-0.156***	0.0840**	-0.538***
	(0.0135)	(0.0146)	(0.0431)	(0.0429)	(0.0356)	(0.0359)
Within next year	-0.122***	-1.193***	-0.00220	-0.0253	0.153***	-1.088***
	(0.0138)	(0.0148)	(0.0559)	(0.0556)	(0.0368)	(0.0371)
Lags						
0-1 years	0.0696***	1.013***	0.0181	0.248***	0.339***	1.926***
	(0.0151)	(0.0163)	(0.0581)	(0.0578)	(0.0383)	(0.0387)
1-2 years	0.0331**	0.845***	0.0199	0.451***	0.243***	1.769***
	(0.0152)	(0.0164)	(0.0642)	(0.0641)	(0.0398)	(0.0401)
2-3 years	0.0491***	0.744***	0.0577	0.358***	0.213***	1.775***
	(0.0157)	(0.0169)	(0.0673)	(0.0670)	(0.0408)	(0.0412)
3-4 years	0.0681***	0.661***	0.00682	0.444***	0.175***	1.722***
	(0.0167)	(0.0180)	(0.0710)	(0.0707)	(0.0425)	(0.0429)
4-5 years	0.0574***	0.653***	0.0842	0.536***	0.211***	1.666***
	(0.0177)	(0.0191)	(0.0739)	(0.0734)	(0.0443)	(0.0447)
5+ years	0.0583***	0.664***	0.125**	0.599***	0.298***	1.699***
	(0.0148)	(0.0160)	(0.0521)	(0.0519)	(0.0327)	(0.0330)
Observations	330,019	326,902	202,517	200,648	213,711	211,823
R-squared	0.02	0.072	0.021	0.014	0.021	0.069
Individuals	44,896	43,327	33,641	32,557	33,711	32,627

Notes: Standard errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1. The estimated coefficients here do not control for marital status, labour-force status, income or the number of children.

Determinants of life (LS) and housing satisfaction (HS) - (lag and lead coefficients only)

	Homeowner–Homeowner (HH)		Renter – Renter (RR)		Homeowner – Renter (HR)	
	LS	HS	LS	HS	LS	HS
	(7)	(8)	(9)	(10)	(11)	(12)
Leads						
3-4 years hence	-0.00222	-0.0438	-0.0478***	-0.0923***	-0.0129	0.0755**
	(0.0476)	(0.0473)	(0.0166)	(0.0176)	(0.0348)	(0.0349)
2-3 years hence	-0.0310	-0.253***	-0.0724***	-0.177***	-0.0431	0.131***
	(0.0473)	(0.0469)	(0.0157)	(0.0167)	(0.0348)	(0.0349)
1-2 years hence	-0.00375	-0.373***	-0.0769***	-0.316***	-0.0355	0.0813**
	(0.0472)	(0.0469)	(0.0155)	(0.0165)	(0.0352)	(0.0352)
Within next year	-0.109**	-0.673***	-0.155***	-0.740***	-0.248***	-0.116***
	(0.0484)	(0.0481)	(0.0158)	(0.0168)	(0.0375)	(0.0376)
Lags						
0-1 years	0.0879*	0.587***	0.105***	1.310***	-0.187***	-0.0982***
	(0.0510)	(0.0507)	(0.0207)	(0.0220)	(0.0374)	(0.0375)
1-2 years	0.0152	0.678***	0.0582***	1.023***	-0.115**	-0.161***
	(0.0527)	(0.0525)	(0.0205)	(0.0219)	(0.0455)	(0.0455)
2-3 years	0.000365	0.643***	0.0438**	0.867***	-0.112**	-0.371***
	(0.0543)	(0.0540)	(0.0212)	(0.0226)	(0.0507)	(0.0509)
3-4 years	0.00196	0.593***	0.0411*	0.794***	-0.0553	-0.587***
	(0.0568)	(0.0565)	(0.0229)	(0.0245)	(0.0575)	(0.0576)
4-5 years	-0.0169	0.499***	0.0436*	0.793***	-0.162**	-0.551***
	(0.0599)	(0.0596)	(0.0245)	(0.0260)	(0.0650)	(0.0651)
5+ years	0.0661	0.592***	0.0465**	0.853***	-0.182***	-0.642***
	(0.0409)	(0.0406)	(0.0206)	(0.0219)	(0.0510)	(0.0510)
Observations	204,791	202,920	262,254	259,519	206,732	204,853
R-squared	0.021	0.018	0.020	0.047	0.022	0.017
Individuals	33,687	32,600	41,622	40,209	34,815	33,725

Notes: Standard errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1. The estimated coefficients here do not control for marital status, labour-force status, income or the number of children.
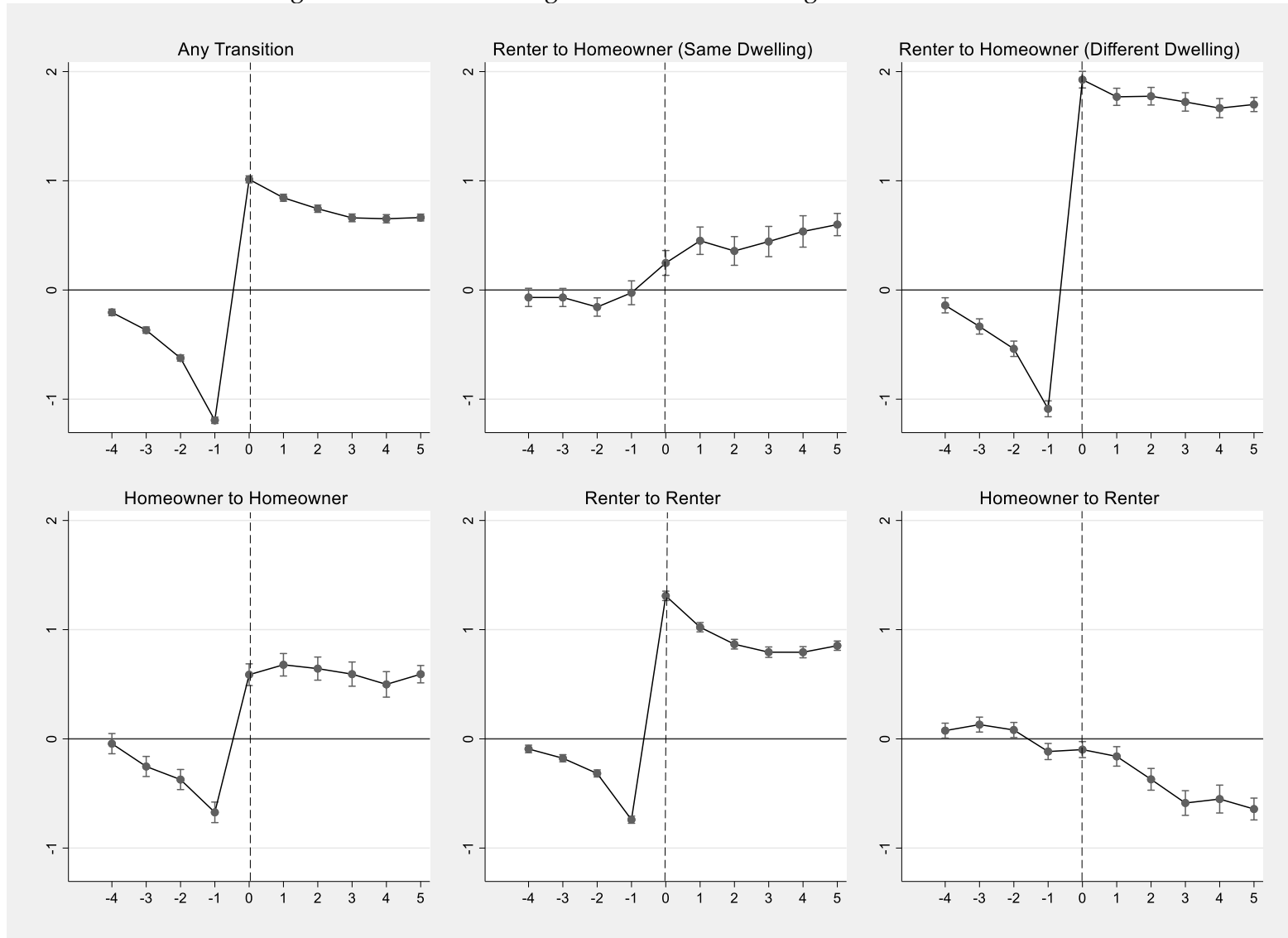
Figure A1
Lags and Leads of Housing Transitions on Life Satisfaction
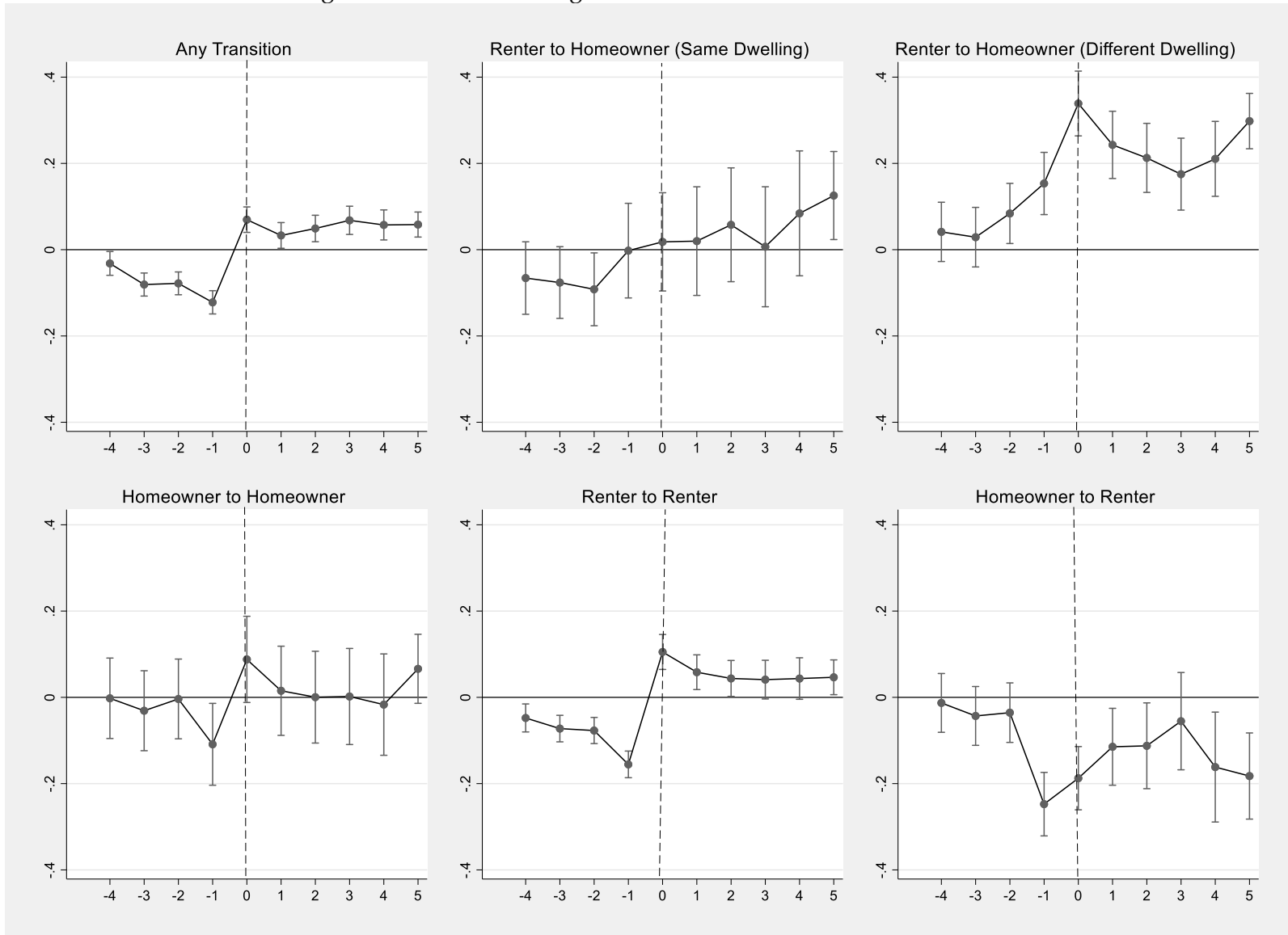
Note: The estimated coefficients here do not control for marital status, labour-force status, income or the number of children.

Figure A2
Lags and Leads of Housing Transitions on Housing Satisfaction

Note: The estimated coefficients here do not control for marital status, labour-force status, income or the number of children.