

Will, Sebastian; Renz, Timon

Working Paper

In debt but still happy? Examining the relationship between homeownership and life satisfaction

SOEPpapers on Multidisciplinary Panel Data Research, No. 1164

Provided in Cooperation with:

German Institute for Economic Research (DIW Berlin)

Suggested Citation: Will, Sebastian; Renz, Timon (2022) : In debt but still happy? Examining the relationship between homeownership and life satisfaction, SOEPpapers on Multidisciplinary Panel Data Research, No. 1164, Deutsches Institut für Wirtschaftsforschung (DIW), Berlin

This Version is available at:

<https://hdl.handle.net/10419/251792>

Standard-Nutzungsbedingungen:

Die Dokumente auf EconStor dürfen zu eigenen wissenschaftlichen Zwecken und zum Privatgebrauch gespeichert und kopiert werden.

Sie dürfen die Dokumente nicht für öffentliche oder kommerzielle Zwecke vervielfältigen, öffentlich ausstellen, öffentlich zugänglich machen, vertreiben oder anderweitig nutzen.

Sofern die Verfasser die Dokumente unter Open-Content-Lizenzen (insbesondere CC-Lizenzen) zur Verfügung gestellt haben sollten, gelten abweichend von diesen Nutzungsbedingungen die in der dort genannten Lizenz gewährten Nutzungsrechte.

Terms of use:

Documents in EconStor may be saved and copied for your personal and scholarly purposes.

You are not to copy documents for public or commercial purposes, to exhibit the documents publicly, to make them publicly available on the internet, or to distribute or otherwise use the documents in public.

If the documents have been made available under an Open Content Licence (especially Creative Commons Licences), you may exercise further usage rights as specified in the indicated licence.

1164²⁰²²

SOEP papers
on Multidisciplinary Panel Data Research

In Debt but Still Happy? – Examining the Relationship Between Homeownership and Life Satisfaction

Sebastian Will and Timon Renz

SOEPPapers on Multidisciplinary Panel Data Research at DIW Berlin

This series presents research findings based either directly on data from the German Socio-Economic Panel (SOEP) or using SOEP data as part of an internationally comparable data set (e.g. CNEF, ECHP, LIS, LWS, CHER/PACO). SOEP is a truly multidisciplinary household panel study covering a wide range of social and behavioral sciences: economics, sociology, psychology, survey methodology, econometrics and applied statistics, educational science, political science, public health, behavioral genetics, demography, geography, and sport science.

The decision to publish a submission in SOEPPapers is made by a board of editors chosen by the DIW Berlin to represent the wide range of disciplines covered by SOEP. There is no external referee process and papers are either accepted or rejected without revision. Papers appear in this series as works in progress and may also appear elsewhere. They often represent preliminary studies and are circulated to encourage discussion. Citation of such a paper should account for its provisional character. A revised version may be requested from the author directly.

Any opinions expressed in this series are those of the author(s) and not those of DIW Berlin. Research disseminated by DIW Berlin may include views on public policy issues, but the institute itself takes no institutional policy positions.

The SOEPPapers are available at <http://www.diw.de/soeppapers>

Editors:

Jan **Goebel** (Spatial Economics)

Stefan **Liebig** (Sociology)

David **Richter** (Psychology)

Carsten **Schröder** (Public Economics)

Jürgen **Schupp** (Sociology)

Sabine **Zinn** (Statistics)

Conchita **D'Ambrosio** (Public Economics, DIW Research Fellow)

Denis **Gerstorff** (Psychology, DIW Research Fellow)

Katharina **Wrohlich** (Gender Economics)

Martin **Kroh** (Political Science, Survey Methodology)

Jörg-Peter **Schräpler** (Survey Methodology, DIW Research Fellow)

Thomas **Siedler** (Empirical Economics, DIW Research Fellow)

C. Katharina **Spieß** (Education and Family Economics)

Gert G. **Wagner** (Social Sciences)

ISSN: 1864-6689 (online)

German Socio-Economic Panel (SOEP)

DIW Berlin

Mohrenstrasse 58

10117 Berlin, Germany

Contact: soeppapers@diw.de



In Debt but Still Happy?

Examining the Relationship Between Homeownership and Life Satisfaction

Sebastian Will and Timon Renz¹

Abstract

We investigate the relationship between homeownership and life as well as housing satisfaction. Using panel data from Germany, we find that compared to renting, owning a home positively impacts housing satisfaction. Contrarily, we find no significant effects on life satisfaction in the long-term. Analysing short-term effects in an event-study design, we show that both life and housing satisfaction anticipate the event and adapt shortly after. Debt-free buyers, however, do not experience anticipation or adaptation effects at all. Comparing outright homebuyers to debt-financing owners, we show that having a real estate loan impacts homeowners' life satisfaction negatively. Paying off a loan does not differently affect the housing satisfaction of both types of buyers. We conclude that the negative effect of loan payments on life satisfaction offsets the positive impact of homeownership.

JEL Classification: D15, I31, R20

Keywords: subjective well-being, homeownership, household finances, financial burden, adaptation, housing satisfaction

Declaration of interest: none

¹ University of Freiburg, Institute of Public Finance and Social Policy, Freiburg, Germany.
Corresponding author's e-mail address: sebastian.will@vwl.uni-freiburg.de

1. Introduction

Many positive qualities are attributed to owning a self-occupied home. Homeownership impacts households' wealth, its social capital but also the urban environment and land use (Rossi and Weber, 1996; DiPasquale and Glaeser, 1999; Dietz and Haurin, 2003; Engelhardt et al., 2010). On top of that, homeownership has effects on individual behaviour like fertility, engagement in neighbourhood activities and subjective wellbeing (SWB) (Rohe and Stegman, 1994; Mulder and Billari, 2010). SWB is a meaningful measure to evaluate policy interventions and has become a popular concept in housing research (Kahneman and Krueger, 2006; Clapham et al., 2018). Hence, the relationship between homeownership and individuals' SWB has been an important aspect in the literature about homeownership.

On the one hand, homeownership is found to be correlated with SWB as the perception of the home increases when it is owned, not rented (Stotz, 2019). Moreover, owning a home may lead to higher self-esteem, pride of ownership, a feeling of security, and a self-perception of having successfully entered the "next level" in the life cycle. Further, owning a home increases one's satisfaction with the occupied dwelling (Diaz-Serrano, 2009). All these factors may explain why ownership has a positive impact on SWB. Recent literature, however, has shown that SWB anticipates certain life cycle events as marriage, unemployment, or home purchase and adapts to a lower level shortly after events (Clark et al., 2008; Clark and Georgellis, 2013; Qari, 2014; Clark and Diaz-Serrano, 2021). Hence, a long longitudinal dataset seems to be necessary to accurately measure the impact of tenure status on SWB.

On the other hand, homeownership could be a heavy financial burden which in turn may affect SWB negatively (van Praag et al., 2003). As housing prices increase in almost every developed country, the financing amount and hence the financial burden increases. In addition to the monthly annuities for the real estate loans, the financial obligations include maintenance and repair costs, costs for outdoor amenities. Thus, the decision to purchase a home is associated with high and rising financial obligations which could counteract the positive influence of homeownership on SWB.

These two opposing effects raise the question of whether the commonly diagnosed positive relationship still holds considering indebted and outright homebuyers in an event-study design. Using data from the German Socio-Economic Panel (SOEP) from 1984 to 2019, the present article examines (i) the relationship between owning a home and life as well as housing satisfaction, (ii) the effect of a debt-financed home purchase on both mentioned satisfaction domains, and (iii) finally the temporal effects of both, (i) and (ii), in an event-study design.

Our contribution is threefold: First, unlike existing research, we explicitly take the financial burden of a mortgage into account while simultaneously analysing the temporal effects. Sec-

ond, aiming for statistical power, we analyse the relationships between homeownership, mortgage and SWB using one of the longest available panel datasets. Third, we make use of recent econometric developments and provide an explanation of the different outcomes of past studies. Hereby, we provide a starting point for future research in this area.

We find no significant long-term effect of being a homeowner on life satisfaction but do find a strong positive impact on housing satisfaction. Considering the temporal effects of the home purchase, we find significantly lower but increasing levels of life satisfaction before the purchase that culminate to the highest life satisfaction level in the year within the purchase. After the change to being an owner, life satisfaction adapts again to a lower level and ends up more than six years after the purchase at approximately the same level as it has been more than 5 years before the tenure change. Regarding housing satisfaction, we estimate anticipation effects which anticipate the lowest level of housing satisfaction in the year before the purchase. After the purchase, housing satisfaction increases by more than 10 percentage points and adapts to a certain, lower level. Even more than six years after the transition to an owner, the satisfaction level is still significantly above the level of five or more years before.

Further, we provide evidence that the financing method, either credit-financed or outright, matters. Having a mortgage decreases life but increases housing satisfaction. Similarly, we estimate positive effects on housing satisfaction, the higher the loan payments relative to the household's income. Vice versa, life satisfaction is decreasing with higher loan payments.

Outright buyers do not experience any change in life satisfaction due to the tenure change nor any anticipation or adaptation effects. Regarding housing satisfaction, outright buyers do not anticipate the home purchase but experience a significant increase of approximately 5 percentage points in the years following the purchase. Hence, we conclude that debt-free buyers do not adapt their housing satisfaction and consistently gain from being a homeowner. Debt-financed buyers anticipate and adapt their housing satisfaction and experience a higher increase in housing satisfaction than outright buyers in the long-term. We conclude that the positive effects of owning a self-occupied home are outweighed by the financial burden.

The remainder of the article is structured as follows. We derive hypotheses from a literature review on the relationship between homeownership and financial burden with life and housing satisfaction, respectively. In the third chapter, we describe the data and elaborate on our empirical strategy to test our hypotheses. We then discuss our results before we draw our conclusions in the end.

2. Literature Review and Hypotheses

We broadly follow three branches of literature. From each, we derive hypotheses about the relationships between (indebted) homeownership and life and housing satisfaction. In the following, we present the literature and propose our hypotheses.

Homeownership and life satisfaction

Previous empirical literature showed mostly positive impacts of homeownership on life satisfaction. Earlier studies analysing cross-sectional or small longitudinal datasets find significant but small positive effects (Rohe and Stegman, 1994; Rossi and Weber, 1996; Rohe and Basolo, 1997). Contrarily, using more recent econometric methods, Bucchianeri (2009) does not find any significant effect of homeownership either on life satisfaction or emotional well-being. Although the sample is of high quality and the author includes many covariates, the analysis still lacks a temporal aspect and has a relatively small sample size.

More recent studies, like Zumbro (2014) or Seiler Zimmermann and Wanzenried (2019), use longer panel datasets from Germany and Switzerland, respectively. Both find significant positive effects of homeownership on life satisfaction. Latif (2021) provides evidence from Canada that owning a home does not lead to significantly higher levels of life satisfaction. In contrast, he even shows that homeownership negatively impacts the life satisfaction of individuals with low income. In a cross-country comparison, Ruprah (2010) finds evidence for a positive effect of ownership on life satisfaction in most Latin American countries. Using data from the Chinese Household Finance Survey from 2011, Zhang and Zhang (2019) show that the positive impact of owning a home is mostly driven by an increase in wealth. Using the cross-country dataset of SHARE which surveys adults over 50 years in several European countries, Herbers and Mulder (2017) show for the year 2012 that older tenants have a significantly lower SWB than homeowners.

While most of the studies find positive effects, the quality of the studies in terms of the observational period of the data or the methodological strategy leaves room for further investigations. One main reason why the findings are fuzzy could lie in the fact of different attitudes on being a renter or an owner in different countries. The cultural embeddedness of homeownership seems to be a large factor in how life satisfaction is influenced by tenure status (Kemeny, 2001; Fong et al., 2021). In countries with a well-developed rental sector and tenant protections, renting seems to be as opportune as owning a home (Voigtländer, 2009). Compared to renter-societies, homeownership in homeownership-societies seems to have a larger impact on life (Elsinga and Hoekstra, 2005). Apart from the geographically spread cultural embeddedness of homeownership, we see at least three other reasons why homeownership might not substantially impact life satisfaction:

According to the livability theory (Veenhoven and Ehrhardt, 1995; Veenhoven, 2010), an individual's life satisfaction depends on their need gratification which again depends on external living conditions (and their inner abilities to use them). If an individual perceives homeownership as a basic need, he or she should expect a high gain in life satisfaction. The actual increase in well-being might be small as the change from being a renter to an owner might be influenced by the law of diminishing returns. While the basic needs are satisfied ("having a roof over one's head"), the additional utility of owning a home might be small. The perceived discrepancies between the actual utility gains and the expected ones influence subjective well-being negatively (Michalos, 1985, 2008). One reason for this could be that individuals overestimate the future emotional gains of the "achievement" of homeownership – that is, they overweight the benefits from extrinsic or materialistic goods (such as homeownership) (Odermatt and Stutzer; Ronald, 2008; Reid, 2013). By investigating tenants who buy their dwellings, Diaz-Serrano (2009) provides evidence for the relevance of unfulfilled expectations regarding homeownership.

The second reason why subjective well-being might not be affected by homeownership comes from the Social Comparison Theory. Diener et al. (1993) find that the SWB gains from a higher income do not depend on the absolute height of the income but rather on the relative income of the observed region. Having bought a home lead to a perceived step upwards in social status. The Social Comparison Theory states that individuals assess their SWB according to their peer group. Homeownership can thus initially mean socioeconomic or (perceived) sociometric advancement, as one either gains a material advantage within one's social group ("local-ladder effect") or catches up with existing wealth within the group (all others already have homeownership) (Anderson et al., 2012). However, this is a zero-sum game: If on the one hand one is the first to be a homeowner within one's circle of friends, one causes negative externalities. On the other hand, if one is behind the others, obtaining homeownership is simply catching up with others. In line with this, Clark (2003) and Powdthavee (2005) show that negative impacts as unemployment or crime do affect one's well-being less when peers experience the same negative impact. A new homeowner compares themselves to other homeowners and not to other renters anymore. As these two groups are different in many aspects (see table 1), homeowners have on average a higher socioeconomic status. Hence, new homeowners might not experience large gains in SWB

The third and – at least in the intersection between the real estate and SWB literature – most prevalent theory is the baseline hypothesis which states that the SWB anticipates important events in life, e.g. unemployment, marriage, divorce, or the birth of a child. Similarly, the SWB adapts after the event back to the baseline level (Lucas, 2007; Clark et al., 2008; Clark and Georgellis, 2013; Qari, 2014).

Based on the theoretical approaches - Livability Theory, Social Comparison Theory, and the Anticipation and Adaptation Phenomena - we assume that homeownership will not have a durable effect on overall life satisfaction in the long run. Most of the mentioned studies that investigate homeownership on SWB do not apply their estimation approach to a long panel dataset and are not able to exploit within variations of an individual. According to the baseline hypothesis, we assume that there are no significant long-term effects of homeownership on life satisfaction as the short-term gains will adapt to its lower baseline level. Hence, our hypotheses are:

Hypothesis 1a: Being a homeowner does not affect life satisfaction in the long-term.

Hypothesis 1b: The becoming homeowner anticipates the purchase and adapts to the past level of life satisfaction.

Homeownership and housing satisfaction

Considering housing satisfaction, the theoretical and empirical evidence is unambiguous. Being a homeowner leads to significant gains in housing satisfaction in at least two ways. First, a home purchase is usually associated with high attention towards the new home in the following periods after the purchase. This positive attention effect decreases over time (Kahneman and Thaler, 2006). Stotz (2019) empirically shows that the positive effect for owners decreases in the long run but remains positive compared to renters. In a recent study, Clark and Diaz-Serrano (2021) find that the gain in housing satisfaction is three times larger for renters who buy and move to a new home compared to renters who buy the dwelling in which they already live. This finding might foster the evidence for the attention hypothesis.

Secondly, homeownership itself is a housing satisfaction driver. After all, Clark and Diaz-Serrano (2021) and Stotz (2019) find a significant effect of tenure status on housing satisfaction. Diaz-Serrano (2009) concludes that housing satisfaction of renters who become homeowners increases regardless of the housing context and whether they geographically move or not. Elsinga and Hoekstra (2005) examine the European Community Household Panel and find in almost all considered European countries a significant positive relationship between ownership and housing satisfaction. A major limitation of the study is that it does not take the panel structure of the dataset into account and estimate their coefficients only based on the year 2001. These findings support Saunders (1990), who argues that there is a preference in human nature for a defined area of one's own. Thus, this second effect can simply be referred to as the "ownership effect".

Summing up the existing literature, we propose the following two hypotheses regarding housing satisfaction:

Hypothesis 2a: Being a homeowner increases housing satisfaction in the long-term.

Hypothesis 2b: The becoming homeowner anticipates the purchase and adapts to the past level of housing satisfaction.

Financial burden and SWB

Tharp et al. (2020) find a positive relationship between homeownership and the satisfaction of one's financial situation. On an 11-point Likert scale, they estimate a significant increase of 0.41 points due to the tenure change. At the same time, having a mortgage negatively impacts financial satisfaction (-0.18 points). As financial satisfaction is an important explanatory domain of life satisfaction (van Praag et al., 2003), the conclusion that having a mortgage might negatively impact life satisfaction seems evident. A mortgage seems to be a financial stressor that negatively impacts financial and life satisfaction (Smith et al., 2017). On the other hand, a mortgage is usually a necessity to buy a home. Therefore, having a mortgage enables the individual to experience a positive impact on housing satisfaction which in turn positively affects life satisfaction (Diener et al., 2017).

Examining data from the Health and Retirement Study from the USA, Loibl et al. (2022) find support for both views. Investigating individuals aged 62 and older, they show that unsecured financial debts lead to more financial stress. Contrarily, mortgage debt does not impact financial stress even though it restricts financial opportunities. Herbers and Mulder (2017) provide evidence for a strong negative association between elderly mortgage holders and their life satisfaction. Loibl et al. (2018) investigate the impact of reverse mortgages on housing and life satisfaction. They show that the access to the liquidity which initially was tied in the property leads to a higher level of life satisfaction. As the reverse mortgage sets liquidity free, contrarily to a common mortgage, their work supports the view of a negative impact of a mortgage on life satisfaction. Hence, we assume that the negative impact of a mortgage debt outweighs the potential positive effects of housing satisfaction on life satisfaction. Accordingly, individuals who can buy their home outright should experience a larger gain in life satisfaction than debt-financing buyers. For both types, we should see anticipation and adaptation effects which lead us to:

Hypothesis 1c: Life satisfaction anticipates the debt-financed home purchase and adapts after. The long-term gain in life satisfaction of debt-financing buyers is lower than for outright buyers.

Contrarily, debt-financing buyers should experience the same effect as outright buyers since there is no reason why the financing type directly has an impact on housing satisfaction.

Hypothesis 2c: Housing satisfaction anticipates the debt-financed home purchase and adapts after. The long-term gain in housing satisfaction of debt-financing buyers is the same for outright buyers.

The more individuals spend on their homes, the higher is the aspiration and commitment to the home that could lead to higher housing satisfaction. At the same time, the financial burden is higher which should negatively affect life satisfaction. So, we state:

Hypothesis 3: The higher the loan, the higher is the negative impact on life satisfaction. Vice versa for HSF.

3. Data and Empirical Strategy

3.1. Data description

For our analysis, we rely on the German Socio-Economic Panel (SOEP) (Goebel et al., 2019). The SOEP is an annual survey that is representative of the German population and conducted since 1984. On average 12.000 households with 25.000 individuals are surveyed each year. The SOEP contains among others a wide range of (socio-)demographic, economic, and psychological variables. For our sample, we use all the 35 waves from 1984 to 2018.

Our variables of main interest *life satisfaction* and *housing satisfaction* are obtained using the following questions: "In conclusion, we would like to ask you about your satisfaction with your life in general. How satisfied are you with your life, all things considered?", given possible answers ranging from 0 ("completely dissatisfied") to 10 ("completely satisfied"). This measure is commonly used and found to be a good proxy for SWB. Housing satisfaction was surveyed by the question "How satisfied are you with your dwelling?" with the same answer possibilities as above.

We assume that households' heads and their partners experience the most (dis-)utility of becoming a homeowner or a debtor. The responsibilities associated with homeownership, e.g. maintaining the house or serving the credit, are mostly borne by them. For that reason, we exclude not only children but all other households' members who are not the heads of the households and their partners. We end up with a total sample size of 476,709 observations of

62,886 individuals out of which 38 per cent are owners and 62 per cent are renters.² In the final dataset, we observe 7,056 transitions from being a renter to a first-time owner.

The summary table (table 1) shows the mean and standard deviation of the considered variables for both owners and renters. It additionally displays a student's t-test of the difference between these two groups. The table clearly states that renters and owners are inherently different. Owners are significantly more satisfied with their lives and their homes than renters. Owners are to a less extent full-time employed or unemployed, and more often employed in part-time, and retired. Following, owners are significantly older, have a higher probability of being married (83 per cent), and have on average 0.67 children. 41 per cent of the renters, in contrast, are single and are still in education/do vocational training. The housing characteristics differ as well: Homeowners have a higher probability of having access to a garden, a balcony or terrace, and a basement. Owners occupy on average 128 square meters of residential space while renters only have 79 square meters. In general, the western parts of Germany have a higher ownership rate than the eastern parts.

² The official ownership ratio in Germany amounts to 46.5 per cent in 2018. As the ratio is increasing over the last 20 years and the ratio was under 40 per cent before 1990, the difference of the ratio in the dataset to the official one could be due to the long panel structure of the data.

Table 1: Summary table

	Owner		Renter		Difference	
	Mean	SD	Mean	SD	Mean	t-test
Life satisfaction	7.243	1.704	6.828	1.890	-0.41 ^{***}	(-79.47)
Housing satisfaction	8.356	1.553	7.112	2.202	-1.24 ^{***}	(-226.69)
Person in need of care in the household	0.041	0.198	0.037	0.189	-0.00 ^{***}	(-6.21)
Yearly household's income	31297	23143	20333	14409	-10964 ^{***}	(-186.18)
Home has a garden	0.908	0.289	0.386	0.487	-0.52 ^{***}	(-351.87)
Home has a balcony/terrace	0.884	0.321	0.713	0.452	-0.17 ^{***}	(-117.27)
Home has a basement	0.957	0.204	0.928	0.258	-0.03 ^{***}	(-33.16)
Size of home	127.852	46.159	79.012	30.769	-48.84 ^{***}	(-358.71)
Number of children	0.669	1.012	0.637	0.986	-0.03 ^{***}	(-11.24)
Share of people with a full-time job	0.405	0.491	0.424	0.494	0.02 ^{***}	(13.47)
Share of people with a part-time job	0.155	0.362	0.115	0.319	-0.04 ^{***}	(-39.82)
Share of people in vocational training	0.018	0.133	0.063	0.242	0.04 ^{***}	(79.56)
Share of retired people	0.295	0.456	0.231	0.422	-0.06 ^{***}	(-49.61)
Share of people with other jobs	0.001	0.030	0.001	0.038	0.00 ^{***}	(5.86)
Share of unemployed people	0.126	0.332	0.165	0.371	0.04 ^{***}	(38.32)
Living in west Germany	0.812	0.391	0.780	0.414	-0.03 ^{***}	(-26.73)
Number of years in education	12.240	2.681	11.530	2.614	-0.71 ^{***}	(-91.61)
Share of married couples living together	0.831	0.374	0.570	0.495	-0.26 ^{***}	(-202.57)
Share of married people living apart	0.011	0.102	0.026	0.160	0.02 ^{***}	(40.20)
Share of singles	0.051	0.220	0.217	0.412	0.17 ^{***}	(171.72)
Share of divorced	0.045	0.206	0.111	0.314	0.07 ^{***}	(84.61)
Share of widowed	0.063	0.242	0.077	0.266	0.01 ^{***}	(18.68)
Age	53.050	14.026	46.535	16.487	-6.51 ^{***}	(-147.42)
Observations	220430		256279		476709	

Note: Life and housing satisfactions are scaled between 0 and 10. The yearly household's income is given in Euro, the size of the home in square meters, age in years. The number of children shows the number of children living in the same household. Garden, balcony/terrace, basement, West Germany indicate one when the characteristic is true. The shares are calculated by averaging the indicator variables.

3.2. Empirical strategy

To test our hypotheses, we rely on two estimation approaches. First, we estimate the status effect of being a homeowner with or without a mortgage. Second, we incorporate indicator variables into the model which indicate the timing of the home purchase and up to 6 years before and after the event. For both models, we use an OLS estimator with both, individual and time fixed effects. Therefore, our static estimation model has the following form:

$$Y_{it} = \beta_1 O_{it} + \gamma_1 X'_{it} + \gamma_2 H'_{it} + \mu_i + \delta_t + \epsilon_{it} \quad (1)$$

O_{it} indicates the considered independent variable of interest that is either whether individual i lives in an owner-occupied dwelling, whether she must pay off a property loan for the self-occupied home, or the amount of the monthly loan payments proportional to her income. X_{it} is a matrix containing individual and household characteristics of i in t , while H_{it} depicts a matrix of dwelling related characteristics in which i lives in period t . μ_i and δ_t capture time and individual invariant unobservable characteristics effects, respectively. ϵ_{it} is the idiosyncratic error term. The dependent variable Y_{it} is the regarding satisfaction variable, either life or housing satisfaction.

As the treatment is heterogeneous, i.e. the home purchase varies over time, we include variables that indicate periods before and after the event to examine potential effects that vary depending on time before and after the event. With this approach, we follow e.g. Qari (2014), Stotz (2019), and Clark and Diaz-Serrano (2021) that our event-study analysis is based on the following specification:

$$Y_{it} = \sum_{k=-6}^6 \beta_k T_{it}^k + \gamma_1 X'_{it} + \gamma_2 H'_{it} + \mu_i + \delta_t + \epsilon_{it} \quad (2)$$

Our main independent variables are variables that indicate a change in tenure status, in particular when changing from being a tenant to a homeowner and vice versa. Furthermore, we observe the time each individual remains in this new tenure status and the time until this specific event. We end up with indicator variables that show us the specific amount of time the individual has been a homeowner or tenant after a change in tenure has been observed. In period $k = 0$, the individual stated that the regarding event, e.g. becoming a homeowner, happened for the first time, i.e. the purchase of the housing has happened within the last year. In the next period, $k = 1$, $T_{it}^1 = 1$ if the individual is still homeowner (now for at least one year but less than two years). We code every indicator variable of T_{it}^k like this analogously, six periods before and after the event. Following Clark and Diaz-Serrano (2021), we consider only the first

change in tenure status when there are multiple ones. We think we can exclude habituation effects of individuals who change between being owner and tenant multiple times. Taking out a loan for the self-occupied dwelling is only indicated when the tenure transition is in the same period.

If not stated differently, we include the following variables as covariates into our models: age, family and employment status, number of children, experienced years in school, yearly household income, variables that indicate whether a person in need of care lives in the household, the home has a garden, a balcony, or a basement, the size of the home, the space perception, financial worries, and whether the home is in West or East Germany. For the sake of brevity, we always refer to a property loan for an owner-occupied home when just writing a loan or mortgage.

4. Results

We structure our results as follows. First, we examine the static effect while comparing owners to renters (hypotheses 1a and 2a) before turning to the temporal analysis (hypotheses 1b and 2b). Then, we investigate the impact of a mortgage on the two satisfaction domains, both statically and dynamically (hypotheses 1c, 2c, and 3). We plot the coefficients of the event analyses and their confidence intervals and provide the regression result tables in the appendix.

Examining the status of being an owner compared to being a renter, we estimate equation (1). The results are displayed in table 2. We find an insignificant positive effect of owning a self-occupied house on life satisfaction. Housing satisfaction, in contrast, seems to be significantly affected (+0.55 points) by the tenure choice. Assuming linearity among the Likert scale this translates to an approximately 5 percentage point gain in housing satisfaction associated with the ownership. In summary, we find evidence for hypotheses 1a and 2a. Being a homeowner increases housing satisfaction, while life satisfaction seems to be not affected.

Table 2: Tenants vs. homeowners

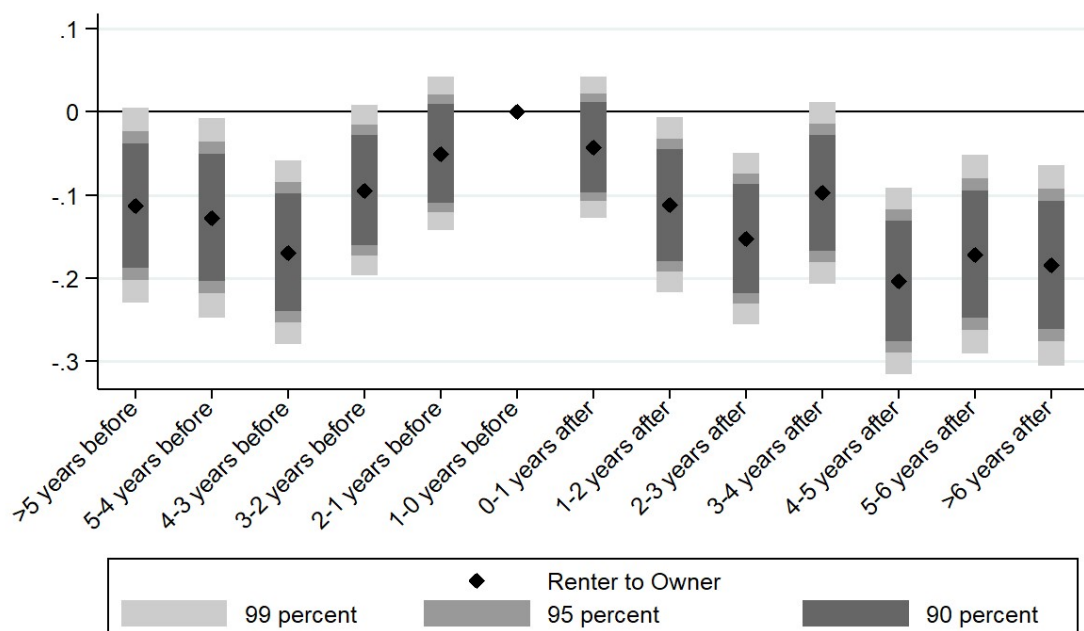
	Life satisfaction	Housing satisfaction
Owner	0.0144 (0.0163)	0.548*** (0.0212)
Fixed effects	Yes	Yes
Controls	Yes	Yes
Observations	247692	247642
Within-R ²	0.0689	0.128

*The regression includes both, individual and year fixed effects and controls for housing and socioeconomic characteristics. On an individual level clustered standard errors are given in paratheses. * p < 0.1, ** p < 0.05, *** p < 0.01*

To test the baseline hypothesis, we proceed with estimating the effects of the event *becoming a homeowner* with equation (2). Figure 1 illustrates how life satisfaction reacts to the transition from being a tenant to an owner up to more than 5 years before and up to six years after the change. The diamond markers depict the coefficients while the confidence intervals in the common ranges are depicted by the shaded bars around the coefficient. The y-axis gives the effect size in life satisfaction points on the 11-point Likert scale. We estimate highly significant estimates in most periods. We choose the year of the home purchase as our reference year which is the year in which the individual has indicated for the last time that she lives in a rented dwelling, i.e. the transition from being a renter to becoming a homeowner will happen within a year. The reference year is the year in which life satisfaction is the highest.

More than five years before the transition, life satisfaction is 1.13 percentage points below the level in the years of the purchase. The lowest level of life satisfaction is reached 4-3 years before the purchase (1.69 percentage points). From that period on, the satisfaction level increases in time until it gets insignificantly different from the year of the event. After the years in which the renter becomes an owner, life satisfaction drops to 1.12 percentage points below 1-2 years after. Afterwards, life satisfaction seems to decrease further and stabilises around 1.85 percentage points below the reference level. Hence, we estimate lower life satisfaction levels in the long-term after the event of becoming a homeowner than more than five years before the homeownership.

Figure 1: The effects of a transition from being a tenant to a homeowner on life satisfaction

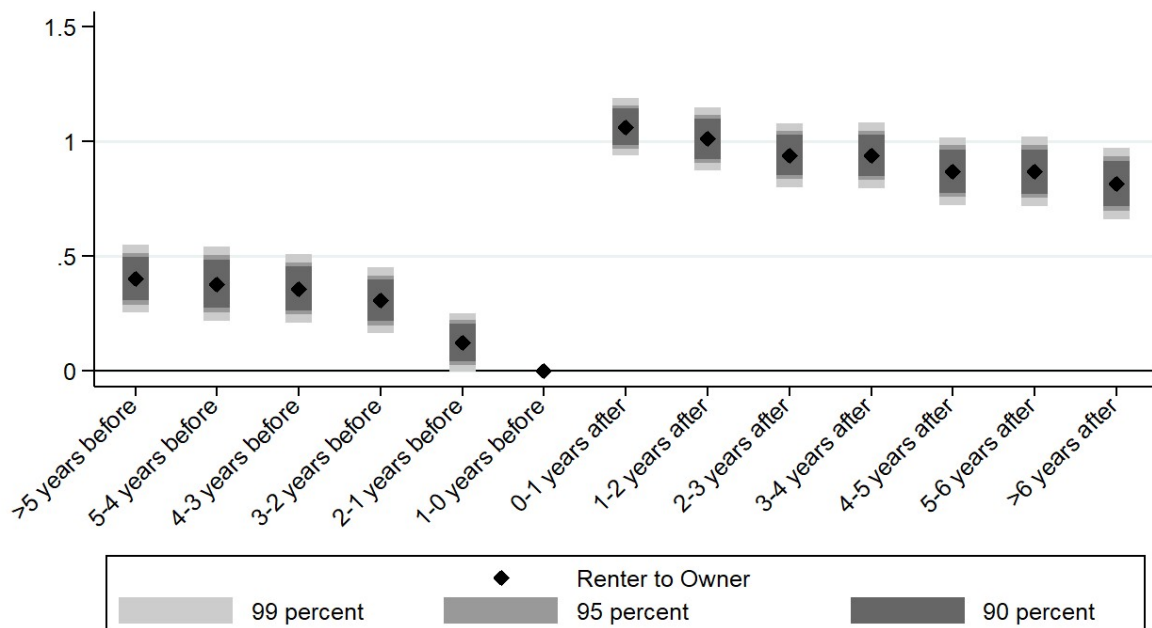


Note: The figure depicts the estimates from a home purchase on life satisfaction with indicators of the year relative to the event. The regression includes both, individual and year fixed effects and controls for housing and socioeconomic characteristics. The standard errors are clustered at an individual level.

In general, we see anticipation effects starting 3 years before the purchase and adaptation effects up to 5 years afterwards. Hence, the results support the baseline hypothesis and therefore our hypothesis 1b. The slightly lower level after 4 or more years compared to more than 5 years before, hints that the transition from being a renter to an owner may even negatively affect life satisfaction in the long-term. Before turning to possible explanations for this finding, we first investigate the baseline hypothesis regarding housing satisfaction.

Figure 2 depicts the coefficients and their confidence intervals of equation (2) with housing satisfaction as the dependent variable. In the reference period, 1-0 years before the transition, the level of housing satisfaction is the lowest. Before becoming a homeowner, we see strong adverse anticipation effects of the event on housing satisfaction. Five or more years before, housing satisfaction lies 4.01 percentage points above the reference year. This level decreases the closer the transition comes. The ownership leads to a heavy increase in height of 10.63 percentage points in housing satisfaction one year after. Afterwards, housing satisfaction decreases again and levels off around 8 percentage points six and more years after becoming a homeowner.

Figure 2: The effects of a transition from being a tenant to a homeowner on housing satisfaction



Note: The figure depicts the estimates from a home purchase on housing satisfaction with indicators of the year relative to the event. The regression includes both, individual and year fixed effects and controls for housing and socioeconomic characteristics. The standard errors are clustered at an individual level.

Regarding housing satisfaction, we do not find evidence to fully support the baseline hypothesis although we do find anticipation and adaptation effects which at most converge to a certain baseline level. The difference of approximately 4 percentage points between more than

five years before and more than six years after the purchase may be too large to support the baseline hypothesis. Hence, we find clear anticipation and adaptation effects but no clear evidence for our hypothesis 2b.

Having investigated the static and dynamic effects of homeownership on life as well as housing satisfaction, we turn to the financial side, analysing the influence of a mortgage on both satisfactions. Table 3 shows that owners paying off a property loan experience a significant reduction in life satisfaction due to the loan compared to owners who buy outright. Housing satisfaction seems to be unaffected by the loan. These results provide evidence that a real estate loan harms life satisfaction and has no effect on housing satisfaction which supports the second parts of hypotheses 1c and 2c. The loan amount per household income has adverse effects on life and housing satisfaction. While life satisfaction decreases by 2,86 percentage points, housing satisfaction gains 2.17 percentage points when the loan-income ratio increases by 1 percentage point. This shows support for hypothesis 3.

Table 3: Debt-financed home purchase

	Life satisfaction	Housing satisfaction	Life satisfaction	Housing satisfaction
Paying off a loan	-0.0437*** (0.0162)	-0.0151 (0.0165)		
Loan amount per income			-0.286*** (0.0942)	0.217** (0.0941)
Fixed effects	Yes	Yes	Yes	Yes
Controls	Yes	Yes	Yes	Yes
Observations	119261	119231	62593	62533
R ²	0.0618	0.0385	0.0632	0.0516

The regression includes both, individual and year fixed effects and controls for housing and socioeconomic characteristics. On an individual level clustered standard errors are given in parentheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

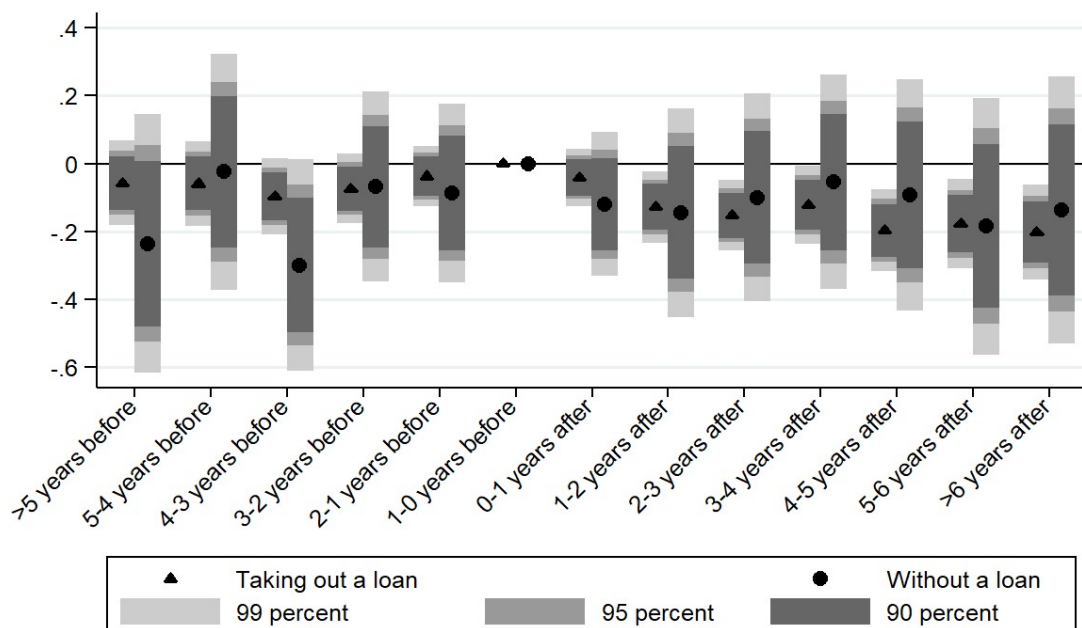
Considering the temporal effects of a mortgage-financed home purchase, we again estimate equation (2) for both satisfactions as dependent variables and the independent variables of an outright and a debt-financed purchase, respectively. The triangle marks the estimates for the time indicators of taking out a loan while the circle depicts the estimates for the time indicators of buying a home outright (figure 3).

Except for the period between three and four years before the tenure change, the estimated effects before the transition are not significantly different from zero for an outright buyer. Moreover, they do not adapt after the event. Similarly, debt-financed buyers do not anticipate the transition. The estimated effects before the transition are with – the exception of the two periods between four and two years before the purchase – insignificantly different from zero. Contrary to outright buyers, debt-financed buyers experience a decrease in life satisfaction after the purchase. Every estimate except for the first after the purchase is significantly below

zero. The estimates converge in the long-term towards a level around 2 percentage points below the reference year. Debt-financing buyers seem to be even worse off after the purchase than before.

Hence, we can confirm hypothesis 1c with the exception that we do not see anticipation effects. The tenure change of outright buyers does not seem to have an impact on life satisfaction at all. A debt-financed home purchase decreases life satisfaction more than an outright purchase.

Figure 3: The effects of an outright and a debt-financed home purchase on life satisfaction

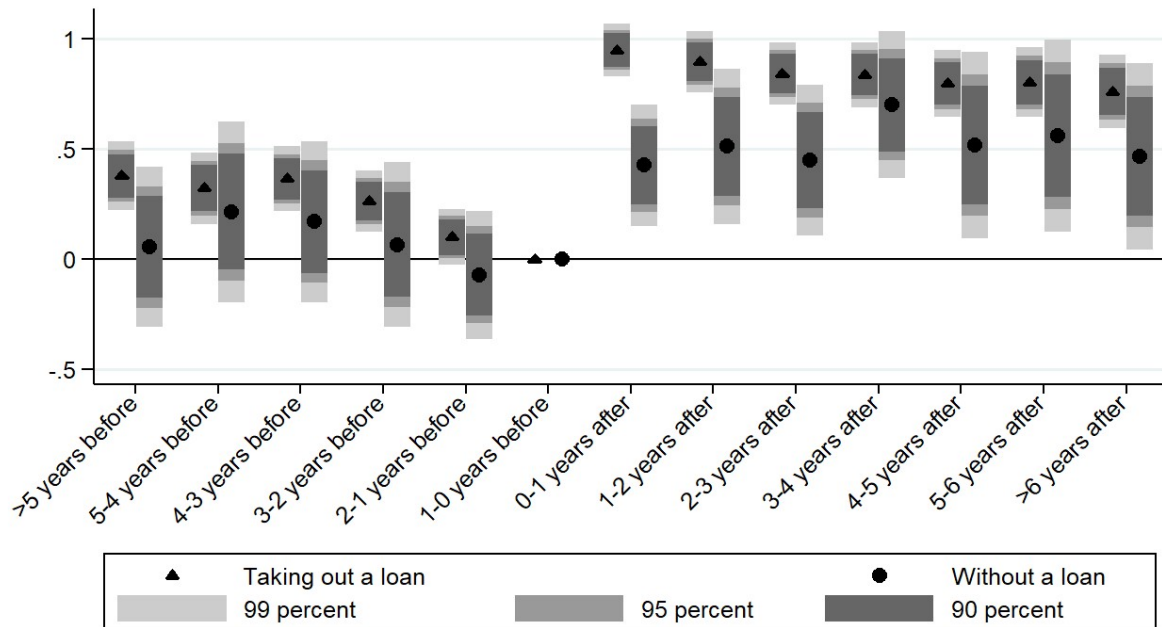


Note: The figure depicts the estimates from debt and non-debt financed home purchase on life satisfaction with indicators of the year relative to the event. The regression includes both, individual and year fixed effects and controls for housing and socioeconomic characteristics. The standard errors are clustered at an individual level.

Figure 4 depicts the estimates of the impact on housing satisfaction of a debt-financed (triangle markers) and an outright (circle markers) purchase. As in the case of life satisfaction, outright buyers are not affected by the transition beforehand. After the event, they experience a significant increase in housing satisfaction which sustains around 5 percentage points even after six and more years. Hence, we do not estimate anticipation nor adaptation effect and cannot support the baseline hypothesis for outright buyers. Differently, debt-financed buyers' housing satisfaction anticipates the transition to being a homeowner in advance and negatively adjust to the lowest point in the year before the purchase. Within the year of the purchase, housing satisfaction increases by 9.47 percentage points which is almost double the increase for outright buyers. In the following periods, the effect decreases to still a 7.59 percentage points increase compared to the year of the purchase. These results affirm hypothesis

2c. Debt-financing buyers experience anticipation and adaptation effects regarding housing satisfaction. Compared to outright buyers, they experience a larger gain in housing satisfaction even though they seem to converge in the long-run.

Figure 4: The effects of an outright and a debt-financed home purchase on housing satisfaction



Note: The figure depicts the estimates from debt and non-debt financed home purchase on housing satisfaction with indicators of the year relative to the event. The regression includes both, individual and year fixed effects and controls for housing and socioeconomic characteristics. The standard errors are clustered at an individual level.

5. Robustness Tests

So far, two models have been dominant in the happiness literature, the linear regression model with (two-way) fixed effects and the ordinal logit model without fixed effects. Both have been used to check each other's plausibility and have been led to similar results (Zumbro, 2014). Only a few authors have dealt with fixed effects ordered logit models like Ferrer-i-Carbonell and Frijters (2004) or Frijters et al. (2004). While most of the mentioned authors concluded that the results of linear and logistic models are similar for the common 5 to 11 points Likert scale, Schröder and Yitzhaki (2017) argue against using cardinal estimation methods for ordinal data. Baetschmann et al. (2015) show that the widely used fixed effects ordered logit estimators are inconsistent. Baetschmann et al. (2020) suggest an alternative, consistent estimator. To check whether the results are still valid interpreting the Likert scale ordinally, we make use of their so-called BUC estimator. The regression results are depicted in tables A4-A6 in the appendix and do not show substantial differences to the estimates of our preferred linear two-way fixed effects model.

A recent critique on event studies using two-way fixed effects as we do comes from Sun and Abraham (2021), Callaway and Sant'Anna (2021), Goodman-Bacon (2021), and Baker et al. (2021) who among others show that the standard two-way fixed effects approach leads to biased results in setups where the absorbing treatment (here the transition from a renter to an owner) appears in different periods. As the treatment (home purchase) varies over time depending on the decision of each individual, this critique might also apply to our estimation strategy. Sun and Abraham (2021) propose an alternative estimator which leads to unbiased lags and leads coefficients. Applying Sun's (2021) estimation approach does not lead to largely changing results (tables A4-A6 in the appendix).

We are aware that we did not include an important determinant of life satisfaction, health condition. This is because health condition was not queried until 1992. We chose to exclude this variable to get a longer dataset which provides us with more observations of the examined events. Including health condition as a control variable does not change the results substantially and are available on request.

Another potential shortcoming of our study is that we do not control for other events that occur in the same life cycle as e.g., marriage or birth of the first child. As these events should not have an impact on housing satisfaction, the analysis of housing satisfaction seems not to be affected by the exclusion of these events. For life satisfaction e.g., Clark et al. (2008) and Clark and Georgellis (2013) show that marriage and the birth of the first child only have a short-term impact on life satisfaction.

6. Conclusion

Having examined the home purchase with an event-study, we show significant anticipation and adaptation effects before and after the tenure change (hypotheses 1b and 2b). Contrarily to life satisfaction, housing satisfaction does not fully adapt back to its past lower level and sustains its higher level in the long-term (hypothesis 2a). The long-term effect on life satisfaction is small and insignificant (hypothesis 1a).

Comparing the effects of outright buyers to debt-financing buyers, we conclude that the type of financing matters. We show that financial burden in the form of a mortgage negatively affects life satisfaction in the long-term which might come from a strong adaptation effect after the purchase. Outright buyers do not experience significant short or long-term effects (hypothesis 1c). Regarding housing satisfaction, we provide evidence that the short-term gains are higher for debt-financing than for outright buyers. Due to a strong adaptation effect of housing satisfaction of debt-financing buyers, the long-term effect on housing satisfaction is not significantly different from each other (hypothesis 2c). On the other hand, when debt-financing a

home, a trade-off between housing and life satisfaction is given via the loan-income ratio. The higher the loan payments proportional to the income, the higher the housing and the lower the life satisfaction (hypothesis 3). The financial burden enables the purchase and hence the following short and long-term increase in housing satisfaction. Supposing housing satisfaction influences life satisfaction positively (Diener et al., 2017), life satisfaction should also increase persistently. Since we do not find a significant positive effect on life satisfaction directly, it fosters the impression that loan payments for a home are a heavy financial burden that dampens life satisfaction to an extent that the positive effect via the gains in housing satisfaction is neutralised.

Further investigations of these relationships might be beneficial to get a deeper understanding of how homeownership affects other domain satisfactions like the financial, neighbourhood, or living standard satisfaction. Concerning the adaptation effects of debt-financing buyers that are not visible for outright buyers, analysing whether disappointments of potentially exaggerated predictions about the gain in happiness are different between the financing type, may be a promising field of research.

From a methodological point of view, it becomes visible that previous studies which find a significant positive relationship between SWB and homeownership, e.g. (Rossi and Weber, 1996; Rohe and Basolo, 1997; Ruprah, 2010; Seiler Zimmermann and Wanzenried, 2019; Zhang and Zhang, 2019), did not use individual or time fixed effects. On the other hand, studies that did use two-way fixed effects, e.g. our present study or Bucchianeri (2009) do not find a significant association. Latif (2021) finds a significant impact on life satisfaction using an ordered logit model while finding no effect including fixed effects.

At least for studies dealing with an 11-point Likert scale of life satisfaction, it seems appropriate to linearly interpret the scale. However, two-way fixed effects should always be in use when estimating the effect of homeownership on SWB. For smaller Likert scales where an ordinal interpretation is a better fit, the BUC estimator of Baetschmann et al. (2015) seems to be a good alternative.

References

- Anderson, C., Kraus, M.W., Galinsky, A.D., Keltner, D., 2012. The Local-Ladder Effect: Social Status and Subjective Well-Being. *Psychological Science* 23, 764–771.
- Baetschmann, G., Ballantyne, A., Staub, K.E., Winkelmann, R., 2020. feologit: A new command for fitting fixed-effects ordered logit models. *The Stata Journal* 20, 253–275.
- Baetschmann, G., Staub, K.E., Winkelmann, R., 2015. Consistent estimation of the fixed effects ordered logit model. *Journal of the Royal Statistical Society. Series A (Statistics in Society)* 178, 685–703.
- Baker, A., Larcker, D.F., Wang, C.C.Y., 2021. How Much Should We Trust Staggered Difference-In-Differences Estimates? European Corporate Governance Institute - Finance Working Paper, 736/2021.
- Bucchianeri, G., 2009. The American dream or the American delusion? The private and external benefits of homeownership for women. The Wharton School of Business Working Paper.
- Callaway, B., Sant'Anna, P.H., 2021. Difference-in-Differences with multiple time periods. *Journal of Econometrics* 225, 200–230.
- Clapham, D., Foye, C., Christian, J., 2018. The Concept of Subjective Well-being in Housing Research. *Housing, Theory and Society* 35, 261–280.
- Clark, A., Diaz-Serrano, L., 2021. The Long-run Effects of Housing on Well-Being. PES working paper, 2021-32, halshs-03230851.
- Clark, A.E., 2003. Unemployment as a Social Norm: Psychological Evidence from Panel Data. *Journal of Labour Economics* 21, 323–351.
- Clark, A.E., Diener, E., Georgellis, Y., Lucas, R.E., 2008. Lags and leads in life satisfaction: A test of the baseline hypothesis. *Economic Journal* 118, 222–243.
- Clark, A.E., Georgellis, Y., 2013. Back to Baseline in Britain: Adaptation in the British Household Panel Survey. *Economica* 80, 496–512.
- Diaz-Serrano, L., 2009. Disentangling the housing satisfaction puzzle: Does homeownership really matter? *Journal of Economic Psychology* 30, 745–755.
- Diener, E., Heintzelman, S.J., Kushlev, K., Tay, L., Wirtz, D., Lutes, L.D., Oishi, S., 2017. Findings all psychologists should know from the new science on subjective well-being. *Canadian Psychology* 58, 87–104.
- Diener, E., Sandvik, E., Seidlitz, L., Diener, M., 1993. The relationship between income and subjective well-being: Relative or absolute? *Social Indicators Research* 28, 195–223.
- Dietz, R.D., Haurin, D.R., 2003. The social and private micro-level consequences of homeownership. *Journal of Urban Economics* 54, 401–450.

- DiPasquale, D., Glaeser, E.L., 1999. Incentives and Social Capital: Are Homeowners Better Citizens? *Journal of Urban Economics* 45, 354–384.
- Elsinga, M., Hoekstra, J., 2005. Homeownership and housing satisfaction. *Journal of Housing and the Built Environment* 20, 401–424.
- Engelhardt, G.V., Eriksen, M.D., Gale, W.G., Mills, G.B., 2010. What are the social benefits of homeownership? Experimental evidence for low-income households. *Journal of Urban Economics* 67, 249–258.
- Ferrer-i-Carbonell, A., Frijters, P., 2004. How important is methodology for the estimates of the determinants of happiness? *Economic Journal* 114, 641–659.
- Fong, E., Yuan, Y., Gan, Y., 2021. Homeownership and happiness in urban China. *Journal of Housing and the Built Environment* 36, 153–170.
- Frijters, P., Haisken-DeNew, J.P., Shields, M.A., 2004. Money does matter! Evidence from increasing real income and life satisfaction in East Germany following reunification. *American Economic Review* 94, 730–740.
- Goebel, J., Grabka, M.M., Liebig, S., Kroh, M., Richter, D., Schröder, C., Schupp, J., 2019. The German Socio-Economic Panel (SOEP). *Journal of Economics and Statistics* 239, 345–360.
- Goodman-Bacon, A., 2021. Difference-in-differences with variation in treatment timing. *Journal of Econometrics* 225, 254–277.
- Herbers, D.J., Mulder, C.H., 2017. Housing and subjective well-being of older adults in Europe. *Journal of Housing and the Built Environment* 32, 533–558.
- Kahneman, D., Krueger, A.B., 2006. Developments in the Measurement of Subjective Well-Being. *Journal of Economic Perspectives* 20, 3–24.
- Kahneman, D., Thaler, R. H., 2006. Anomalies: Utility Maximization and Experienced Utility. *Journal of Economic Perspectives* 20, 221–234.
- Kemeny, J., 2001. Comparative housing and welfare: Theorising the relationship. *Journal of Housing and the Built Environment* 16, 53–70.
- Latif, E., 2021. Homeownership and happiness: evidence from Canada. *Economics Bulletin* 21, 1–17.
- Loibl, C., Haurin, D.R., Brown, J.K., Moulton, S., 2018. The Relationship Between Reverse Mortgage Borrowing, Domain and Life Satisfaction. *The Journals of Gerontology: Series B* 75, 869–878.
- Loibl, C., Moulton, S., Haurin, D., Edmunds, C., 2022. The role of consumer and mortgage debt for financial stress. *Aging & Mental Health* 26, 116–129.
- Lucas, R.E., 2007. Adaptation and the Set-Point Model of Subjective Well-Being: Does Happiness Change After Major Life Events? *Current Directions in Psychological Science* 16, 75–79.

- Michalos, A.C., 1985. Multiple discrepancies theory (MDT). *Social Indicators Research* 16, 347–413.
- Michalos, A.C., 2008. Education, happiness and wellbeing. *Social Indicators Research* 87, 347–366.
- Mulder, C.H., Billari, F.C., 2010. Homeownership Regimes and Low Fertility. *Housing Studies* 25, 527–541.
- Odermatt, R., Stutzer, A., 2020. Does the Dream of Home Ownership Rest Upon Biased Beliefs? A Test Based on Predicted and Realized Life Satisfaction. IZA Discussion Paper Series, 13510.
- Powdthavee, N., 2005. Unhappiness and Crime: Evidence from South Africa. *Economica* 72, 531–547.
- Qari, S., 2014. Marriage, adaptation and happiness: Are there long-lasting gains to marriage? *Journal of Behavioral and Experimental Economics* 50, 29–39.
- Reid, C., 2013. To buy or not to buy? Understanding tenure preferences and the decision-making processes of lower-income households. Joint Center for Housing Studies of Harvard University Working Papers.
- Rohe, W.M., Basolo, V., 1997. Long-Term Effects of Homeownership on the Self-Perceptions and Social Interaction of Low-Income Persons. *Environment and Behavior* 29, 793–819.
- Rohe, W.M., Stegman, M.A., 1994. The Impact of Home Ownership on the Social and Political Involvement of Low-Income People. *Urban Affairs Quarterly* 30, 152–172.
- Ronald, R., 2008. *The Ideology of Home Ownership: Homeowner Societies and the Role of Housing*. New York: Palgrave Macmillan.
- Rossi, P.H., Weber, E., 1996. The social benefits of homeownership: Empirical evidence from national surveys. *Housing Policy Debate* 7, 1–35.
- Ruprah, I.J., 2010. Does Owning Your Home Make You Happier? Impact Evidence from Latin America. IDB Publications Working papers, OVE/WP-02/10.
- Saunders, P., 1990. *A nation of home owners*. London: Routledge.
- Schröder, C., Yitzhaki, S., 2017. Revisiting the evidence for cardinal treatment of ordinal variables. *European Economic Review*, 92, 337–358.
- Seiler Zimmermann, Y., Wanzenried, G., 2019. Are Homeowners Happier than Tenants? Empirical Evidence for Switzerland. In: Brulé, G., Suter, C. (Eds.) *Wealth(s) and Subjective Well-Being*. Springer International Publishing, Cham, pp. 305–321.
- Smith, S.J., Cigdem, M., Ong, R., Wood, G., 2017. Wellbeing at the edges of ownership. *Environment and Planning A: Economy and Space* 49, 1080–1098.
- Socio-Economic Panel (SOEP), 2020. Data for years 1984-2018, SOEP-Core v35, doi: 10.5684/soep.core.v35

- Stotz, O., 2019. The perception of homeownership utility: Short-term and long-term effects. *Journal of Housing Economics* 44, 99–111.
- Sun, L., 2021. EVENTSTUDYINTERACT: Stata module to implement the interaction weighted estimator for an event study. <https://econpapers.repec.org/RePEc:boc:bo-code:s458978>.
- Sun, L., Abraham, S., 2021. Estimating dynamic treatment effects in event studies with heterogeneous treatment effects. *Journal of Econometrics* 225, 175–199.
- Tharp, D.T., Seay, M., Stueve, C., Anderson, S., 2020. Financial Satisfaction and Homeownership. *Journal of Family and Economic Issues* 41, 255–280.
- van Praag, B.M., Frijters, P., Ferrer-i-Carbonell, A., 2003. The anatomy of subjective well-being. *Journal of Economic Behavior & Organization* 51, 29–49.
- Veenhoven, R., 2010. Life is getting better: Societal evolution and fit with human nature. *Social Indicators Research* 97, 105–122.
- Veenhoven, R., Ehrhardt, J., 1995. The cross-national pattern of happiness: Test of predictions implied in three theories of happiness. *Social Indicators Research* 34, 33–68.
- Voigtländer, M., 2009. Why is the German Homeownership Rate so low? *Housing Studies* 24, 355–372.
- Zhang, C., Zhang, F., 2019. Effects of housing wealth on subjective well-being in urban China. *Journal of Housing and the Built Environment* 34, 965–985.
- Zumbro, T., 2014. The Relationship Between Homeownership and Life Satisfaction in Germany. *Housing Studies* 29, 319–338.

Appendix

A 1: The effects of a transition from being a tenant to a homeowner on life and housing satisfaction

	Life satisfaction	Housing satisfaction
<i>Purchase of housing</i>		
more than 5 years before	-0.113** (0.0455)	0.404*** (0.0575)
5-4 years before	-0.127*** (0.0466)	0.382*** (0.0632)
4-3 years before	-0.169*** (0.0430)	0.362*** (0.0577)
3-2 years before	-0.0943** (0.0400)	0.303*** (0.0552)
2-1 years before	-0.0502 (0.0359)	0.121** (0.0497)
0-1 year after	-0.0429 (0.0329)	1.059*** (0.0480)
1-2 years after	-0.112*** (0.0408)	1.012*** (0.0531)
2-3 years after	-0.153*** (0.0399)	0.941*** (0.0539)
3-4 years after	-0.0974** (0.0424)	0.937*** (0.0549)
4-5 years after	-0.204*** (0.0437)	0.865*** (0.0571)
5-6 years after	-0.171*** (0.0464)	0.861*** (0.0587)
more than 6 years after	-0.185*** (0.0468)	0.814*** (0.0600)
Fixed effects	Yes	Yes
Controls	Yes	Yes
Observations	44426	44424
Within-R ²	0.0802	0.242

Note: The table depicts the estimates from a home purchase on life and housing satisfaction with indicators of the year relative to the event. The regression includes both, individual and year fixed effects and controls for housing and socioeconomic characteristics. The standard errors are clustered at an individual level.

A 2: The effects of a debt-financed home purchase on life and housing satisfaction

	Life satisfaction	Housing satisfaction
<i>Taking out a loan</i>		
more than 5 years before	-0.125** (0.0524)	0.508*** (0.0684)
5-4 years before	-0.140*** (0.0525)	0.465*** (0.0719)
4-3 years before	-0.161*** (0.0480)	0.479*** (0.0659)
3-2 years before	-0.0951** (0.0446)	0.397*** (0.0622)
2-1 years before	-0.0587 (0.0396)	0.189*** (0.0569)
0-1 year after	-0.0357 (0.0378)	1.229*** (0.0560)
1-2 years after	-0.121*** (0.0470)	1.181*** (0.0618)
2-3 years after	-0.156*** (0.0460)	1.114*** (0.0635)
3-4 years after	-0.108** (0.0497)	1.091*** (0.0658)
4-5 years after	-0.191*** (0.0522)	1.054*** (0.0676)
5-6 years after	-0.177*** (0.0561)	1.047*** (0.0698)
more than 6 years after	-0.183*** (0.0592)	0.996*** (0.0736)
Fixed effects	Yes	Yes
Controls	Yes	Yes
Observations	31315	31308
Within-R ²	0.0758	0.286

Note: The table depicts the estimates from a debt-financed home purchase on life and housing satisfaction with indicators of the year relative to the event. The regression includes both, individual and year fixed effects and controls for housing and socioeconomic characteristics. The standard errors are clustered at an individual level.

A 3: The effects of an outright home purchase on life and housing satisfaction

	Life satisfaction	Housing satisfaction
<i>Outright purchase</i>		
more than 5 years before	-0.235 (0.148)	0.0559 (0.140)
5-4 years before	-0.0245 (0.135)	0.216 (0.158)
4-3 years before	-0.299** (0.120)	0.170 (0.141)
3-2 years before	-0.0683 (0.108)	0.0667 (0.144)
2-1 years before	-0.0872 (0.102)	-0.0705 (0.112)
0-1 year after	-0.120 (0.0820)	0.426*** (0.107)
1-2 years after	-0.144 (0.119)	0.511*** (0.136)
2-3 years after	-0.100 (0.118)	0.449*** (0.132)
3-4 years after	-0.0546 (0.122)	0.699*** (0.128)
4-5 years after	-0.0922 (0.132)	0.515*** (0.163)
5-6 years after	-0.185 (0.146)	0.559*** (0.169)
more than 6 years after	-0.137 (0.153)	0.465*** (0.164)
Fixed effects	Yes	Yes
Controls	Yes	Yes
Observations	4600	4604
Within-R ²	0.0868	0.152

Note: The table depicts the estimates from an outright home purchase on life and housing satisfaction with indicators of the year relative to the event. The regression includes both, individual and year fixed effects and controls for housing and socioeconomic characteristics. The standard errors are clustered at an individual level.

A 4: The effects of a transition from being a tenant to a homeowner on life and housing satisfaction – BUC and Sun's estimators

	(1) Life satisfac- tion	(2) Life satisfac- tion	(3) Housing sat- isfaction	(4) Housing sat- isfaction
<i>Purchase of housing</i>				
more than 5 years before	-0.216*** (0.0817)	-0.113** (0.0455)	0.572*** (0.0845)	0.404*** (0.0575)
5-4 years before	-0.242*** (0.0854)	-0.127*** (0.0466)	0.536*** (0.0901)	0.382*** (0.0632)
4-3 years before	-0.299*** (0.0782)	-0.169*** (0.0430)	0.483*** (0.0808)	0.362*** (0.0577)
3-2 years before	-0.172** (0.0739)	-0.0943** (0.0400)	0.434*** (0.0766)	0.303*** (0.0552)
2-1 years before	-0.0825 (0.0679)	-0.0502 (0.0359)	0.183*** (0.0690)	0.121** (0.0497)
0-1 year after	-0.0716 (0.0613)	-0.0429 (0.0329)	1.662*** (0.0738)	1.059*** (0.0480)
1-2 years after	-0.185** (0.0774)	-0.112*** (0.0408)	1.609*** (0.0856)	1.012*** (0.0531)
2-3 years after	-0.261*** (0.0753)	-0.153*** (0.0399)	1.430*** (0.0852)	0.941*** (0.0539)
3-4 years after	-0.149* (0.0801)	-0.0974** (0.0424)	1.398*** (0.0869)	0.937*** (0.0549)
4-5 years after	-0.347*** (0.0823)	-0.204*** (0.0437)	1.268*** (0.0907)	0.865*** (0.0571)
5-6 years after	-0.298*** (0.0873)	-0.171*** (0.0464)	1.245*** (0.0942)	0.861*** (0.0587)
more than 6 years after	-0.301*** (0.0865)	-0.185*** (0.0468)	1.131*** (0.0955)	0.814*** (0.0600)
Logistic	Yes		Yes	
Fixed effects	Yes	Yes	Yes	Yes
Controls	Yes	Yes	Yes	Yes
Observations	42462	43762	42637	43763
(Pseudo-/adj. within-) R ²	0.0695	0.0637	0.196	0.213

Note: Baseline variable: 0-1 years after change. At an individual level clustered standard errors are given in parentheses. Odd column numbers present the odds ratios of the ordered logit model (BUC estimator), even numbered columns Sun's robust estimates.

A 5: The effects of a debt-financed home purchase on life and housing satisfaction - BUC and Sun's estimators

	(1) Life satisfac- tion	(2) Life satisfac- tion	(3) Housing sat- isfaction	(4) Housing sat- isfaction
<i>Taking out a loan</i>				
more than 5 years before	-0.250*** (0.0958)	-0.125** (0.0524)	0.732*** (0.101)	0.508*** (0.0684)
5-4 years before	-0.278*** (0.0971)	-0.140** (0.0525)	0.671*** (0.101)	0.465*** (0.0719)
4-3 years before	-0.287*** (0.0884)	-0.161*** (0.0480)	0.666*** (0.0921)	0.479*** (0.0659)
3-2 years before	-0.176** (0.0830)	-0.0951** (0.0446)	0.595*** (0.0861)	0.397*** (0.0622)
2-1 years before	-0.104 (0.0761)	-0.0587 (0.0396)	0.293*** (0.0785)	0.189*** (0.0569)
0-1 year after	-0.0566 (0.0710)	-0.0357 (0.0378)	1.942*** (0.0863)	1.229*** (0.0560)
1-2 years after	-0.207** (0.0894)	-0.121*** (0.0470)	1.886*** (0.0990)	1.181*** (0.0618)
2-3 years after	-0.263*** (0.0871)	-0.156*** (0.0460)	1.715*** (0.101)	1.114*** (0.0635)
3-4 years after	-0.162* (0.0938)	-0.108** (0.0497)	1.622*** (0.105)	1.091*** (0.0658)
4-5 years after	-0.325*** (0.0978)	-0.191*** (0.0522)	1.556*** (0.107)	1.054*** (0.0676)
5-6 years after	-0.313*** (0.105)	-0.177*** (0.0561)	1.521*** (0.112)	1.047*** (0.0698)
more than 6 years after	-0.293*** (0.109)	-0.183*** (0.0592)	1.387*** (0.116)	0.996*** (0.0736)
Logistic	Yes		Yes	
Fixed effects	Yes	Yes	Yes	Yes
Controls	Yes	Yes	Yes	Yes
Observations	29563	30743	29874	30738
(Pseudo-/adj. within-) R ²	0.0678	0.0594	0.240	0.248

Note: Baseline variable: 0-1 years after change. On individual level clustered standard errors are given in parentheses. Odd column numbers present the odds ratios of the ordered logit model (BUC estimator), even numbered columns Sun's robust estimates.

A 6: The effects of an outright home purchase on life and housing satisfaction – BUC and Sun's estimators

	(1) Life satisfac- tion	(2) Life satisfac- tion	(3) Housing sat- isfaction	(4) Housing sat- isfaction
<i>Outright purchase</i>				
more than 5 years before	-0.448* (0.261)	-0.235 (0.148)	0.260 (0.231)	0.0559 (0.140)
5-4 years before	0.0100 (0.236)	-0.0245 (0.135)	0.427* (0.253)	0.216 (0.159)
4-3 years before	-0.574*** (0.210)	-0.299** (0.120)	0.382* (0.229)	0.170 (0.141)
3-2 years before	-0.165 (0.201)	-0.0683 (0.108)	0.242 (0.215)	0.0667 (0.144)
2-1 years before	-0.164 (0.185)	-0.0872 (0.102)	-0.00729 (0.176)	-0.0705 (0.112)
0-1 year after	-0.248* (0.149)	-0.120 (0.0821)	0.704*** (0.177)	0.426*** (0.107)
1-2 years after	-0.245 (0.212)	-0.144 (0.119)	0.800*** (0.234)	0.511*** (0.136)
2-3 years after	-0.205 (0.217)	-0.100 (0.119)	0.721*** (0.221)	0.449*** (0.132)
3-4 years after	-0.127 (0.224)	-0.0546 (0.122)	1.194*** (0.216)	0.699*** (0.128)
4-5 years after	-0.169 (0.243)	-0.0922 (0.132)	0.778*** (0.279)	0.515*** (0.163)
5-6 years after	-0.374 (0.272)	-0.185 (0.146)	0.909*** (0.304)	0.559*** (0.169)
more than 6 years after	-0.299 (0.276)	-0.137 (0.153)	0.668** (0.281)	0.465*** (0.164)
Logistic	Yes		Yes	
Fixed effects	Yes	Yes	Yes	Yes
Controls	Yes	Yes	Yes	Yes
Observations	4191	4416	4198	4421
(Pseudo-/adj. within-) R ²	0.0784	0.0582	0.136	0.116

Note: Baseline variable: 0-1 years after change. On individual level clustered standard errors are given in parentheses. Odd column numbers present the odds ratios of the ordered logit model (BUC estimator), even numbered columns Sun's robust estimates.