Are Homeowners Happier than Tenants?

Empirical Evidence for Switzerland

incomplete and preliminary

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Abstract

Many people have a strong preference to own the house or apartment they are living in. Among other factors, homeownership is expected to affect the subjective well-being of individuals. Our paper analyzes the impact of homeownership on subjective well-being in Switzerland. Based on the data from the Swiss Houshehold Panel (SHP) over the time period from 2000 to 2014, we use an ordered logit model to explain life satisfaction by a set of relevant factors including homeownership. Our results, which have been tested for robustness within several specifications, provide strong empirical evidence for the fact that homeowners are happier than tenants. This effect seems to be robust over the years considered as well as for different specifications of our model. In order to control for a potential reverse causality effect, we separately analyze the subsample of households that had change in the homeownership but no changes with respect to other characteristics except age. The generated odds ratios confirm that homeownership has a positive impact on people's happiness.

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Key Words: Homeownership; Subjective Well-Being; Ordered logit models

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1 Introduction

Homeownership is a dream of many people, and this also holds for Switzerland. However, only 37.4% of the permanent residential populations of Switzerland live in their own house or apartment (BFS 2016). In an international context, this figure is rather small. According to Eurostat (2014), the homeownership rate, defined as the share of households living in their own house or apartment, amounts to 78.8% in Spain, 84.4% in Norway, 68.8% in Ireland, 73.1% in Italy, 65% in France, 57.2% in Austria and 52.5% in Germany.

In Switzerland, a large share of tenants would like to become homeowners. Their preferences are well reflected in the political debate over the last ten years, and it has been repeatedly discussed whether and how the state should promote homeownership. Several political initiatives were launched (e.g. Bausparinitative, sicheres Wohnen im Alter), but they found no majority by the voting population. Also, the Swiss Federal Constitution foresees the facilitation of homeownership. According to its article 108, the Swiss State is legally obligated to promote homeownership.

Homeownership may have several implications. Existing work on benefits of homeownership suggest that homeowners are more active and involved citizens (e.g. DiPasquale and Glaeser, 1999). Other studies claim that homeownership leads to better child outcomes (e.g. Green and White, 1997; Boehm and Schlottmann, 1999; Haurin et al. 2002b and 2002c). Another important outcome of homeownership refers to a higher life satisfaction. There exits an increasing number of studies that investigate this issue, but they also lead to mixed results. For instance, Rohe and Stegman (1994), Rohe and Basalo (1997) and Rossi and Weber (1996) all provide empirical evidence of homeowners being more satisfied with life than tenants. However, as outlined by, e.g. Galster (1987), Rohe et al. (2002) and Buchianieri (2011), the relationship between homeownership and life satisfaction might be related to model misspecifications and omitted variables, respectively. There also exist some methodological challenges with this type of data, which need to be addressed properly in order to obtain consistent estimation results.

The main goal of our paper is to empirically investigate whether homeowners in Switzerland have a higher life satisfaction than tenants, while taking into accounts the limitations in former studies. So far, there exists no study that systematically investigates this claim for Switzerland. Switzerland seems to be a particularly interesting case for this analysis, given that Switzerland has still a relatively low homeownership share in the international context, but that it has increased significantly over the last 10 years.

The new aspects of our study are as follows. It is the first empirical study that investigates the impact of homeownership on life satisfaction in Switzerland, while controlling for other factors that are expected to affect subjective well-being. So far, the majority of studies focuses on the US only. Given that the US housing market differs in some important aspects from the Swiss housing market, which has, in addition, some unique features, our results provide new insights in this matter. In addition, we include additional explanatory factors that affect the life satisfaction of households as well as their living situation, and those factors have not been considered before. In particular, we also include factors related to the social

environment such as whether the respondents live with a partner and together with children. Finally, we use the appropriate estimation method for the data on subjective well-being. In contrast to existing studies, e.g. Bucchianeri (2011), we apply an improved estimation methodology which is suitable for this type of data. In concrete, we use a generalized ordered logistic model for our estimations and eliminate the problem of heterogeneity in the residuals and potentially biased estimates.

Our main results show that homeownership has a positive and significant effect on the life satisfaction of households. This result holds even after having controlled for person- and integration-specific aspects as well as other characteristics related to the living situation, factors that are all expected to affect subjective well-being. We also show that the positive effect of homeownership on life satisfaction is stable over time and for different model specification including different set of controls. Finally, we carry out some additional analysis to show that this effect is not driven by a reverse causality issue, i.e., it is homeownership that affects life satisfaction, and not life satisfaction that makes it more likely that someone is a homeowner. Our results are interesting from an academic point of view, but they may also provide some inputs to the discussion on housing policy in Switzerland, where several attempts to increase homeownership on a national level have failed over the last ten years.

The paper is structured as follows: Section 2 contains an overview of the literature. Section 3 outlines the empirical model and section 4 describes the data. The results can be found in section 5, and section 6 concludes.

2 Overview of the literature

2.1 Literature on homeownership and happiness

To be included.

2.2 Literature on homeownership in Switzerland

The majority of the existing literature on Swiss homeownership focuses primarily on descriptive statistics of the available data and on the formulation of qualitative hypothesis regarding the causes of the internationally low homeownership rates in Switzerland. In a publication by the Federal Office of Housing (Bundesamt für Wohnungswesen BWO, 2005), for example, several reasons are listed which could explain the relatively low homeownership rates compared to those in other Western countries. Firstly, condominiums were not allowed in Switzerland before 1965, with the only exception being the canton Valais. Secondly, the relatively liberal market for rented flats is very attractive for investors like real estate companies, and this fact favors, therefore, the supply of rented apartments. Moreover, the existing competition between suppliers improves the average price-quality ratio of the rented apartments. Thirdly, it is postulated that the relatively high percentage of foreign residents has a negative effect on Swiss homeownership rates.

Similarly, a broader study focusing on the overall housing situation in Switzerland by Gerheuser (2004) describes the development of the homeownership rates between 1990 and 2000 using census data for the

year. He found that the homeownership rate increased from 31% to 35% over the period considered, and he attributes this increase to the doubling of the ownership rate of condominiums (from 4% in 1990 to 8% in 2000). Besides emphasing the high rate of foreign residents and the role of real estate companies in the market for rented flats, he hypothesizes that the main driver behind the low Swiss homeownership rate is the fact that rented units clearly dominated the market in the decades up to 1970 due to the mentioned restrictions in the market for condominiums.

Hornung et al. (1997) qualitatively analyses if the institutional framework of the Swiss housing sector could be held responsible for the low homeownership rates. He came to the conclusion that it plays only a minor role since in countries with a higher homeownership rates, like France, Holland and Italy, the institutional restrictions are even tighter than in Switzerland. Roelli (1981) categorizes a broad range of variables related to demand and supply factors affecting the homeownership rates. Based on statistic analyses he found some evidence that the price-income relationship is a major factor influencing the tenure choice of the households.

Schulz et al. (2005) is one of the few studies which describe the spatial differences in the homeownership rates across Switzerland. The authors use building census[1] data of the year 2000 and found that urban municipalities are clearly dominated by tenants, while there are more owners than tenants in rural and peri-urban municipalities. The analysis of the socio-demographic characteristics of the households living in the properties shows that families are the most frequent household type within owner occupiers, while single-person households are the most common within tenants. Moreover, they found that the higher the socio-professional category is, the higher is the homeownership rate, and that the share of foreign residents is lower in owner occupied units than in rented units.

While the papers mentioned above concentrate on qualitative and descriptive investigations of the Swiss homeownership rates, comprehensive empirical work focusing on the factors influencing it are rare. In a very recent paper, Bourassa and Hoesli (2007) use household survey data for five Swiss cantons (Zurich, Berne, Vaud and Geneva) to analyze why Switzerland has the lowest home ownership rate in Western Europe. The authors use a tenure choice model in order to assess the impact of a number of key variables on the ownership rate. In particular, they focus on the relative costs of owning versus renting and on the borrowing constraints faced by house buyers. The main result of the analysis attributes the low Swiss home ownership rate to the fact that housing prices are very high relative to rents as well as relative to what households can afford based on their income and wealth. A house price and price-rent ratio drop by 10% combined with a relaxation of both income and wealth constraints by 40% and 14%, respectively, would raise the Swiss homeownership rate by about 10.8%. Based on data from a sample of 1563 households participating in an inquiry about tenure choice conducted in 1996, Thalmann et al. (2002) found that the probability of being an owner is a function of the households' preferences for ownership,

[1] Gebaeude- und Wohnungserhebung 2000

age, marital status, nationality, professional status (self-employed vs. employed), parent's homeownership, preference for single-family home, income and wealth. Finally, Delbiaggio and Wanzenried (2012) analyze homeownership rates across Swiss cantons over the time period from 1970 to 2000. Based on the Swiss population census data from 1970, 1980, 1990 and 2000, they use logit and OLS regressions to identify the main determinants of equilibrium housing tenure outcomes both at the household as well at the municipality level within a differentiated spatial analysis framework.

2.3 International literature on homeownership

The homeownership rates differ significantly across European countries, ranging from about 45 percent in Germany to more than 90 percent in Hungary (National Board of Housing, 2005). There are many studies on the determinants of individual housing tenure choice focusing on a set of market and household-specific variables (e.g. Gabriel and Rosenthal, 2005; Coulson 1999). However, these disparities in homeownership rates across countries or regions have been largely ignored. One of the first papers attempting to identify the reasons for these differences in homeownership rates across European countries is Hilber (2007). The author uses data of the European Consumer Household Panel between 1994 and 2001 and applies fixed effects-specifications to analyze within a cost-benefit and supply-demand framework the equilibrium tenure choice outcomes both at the individual and regional level. He finds that at the individual level the accommodation type has the strongest impact on the homeownership choice, while at the regional level the housing stock composition and the share of public rental housing are the main identifiable causes of the homeownership differentials across countries. Moreover, the estimation results cannot support the hypothesis that taxation policies have had a major impact on homeownership rates. In a study focusing on the United States, Coulson (2002) examines the regional and state disparities in homeownership rates within a standard probit model of the individual homeownership decision, where the micro-level observations are aggregated to the regional level. Factors which play a significant role at the individual level are evaluated for their ability to replicate the regional homeownership rates. In a second step, the marginal impact of these factors on the predicted homeownership rates is used to estimate their contribution to regional disparities in homeownership rates. He found that market-based characteristics like price, density and centrality of the location are most important in explaining regional differences. In contrast, demographic differences across regions do not have much explanatory power except for those describing variation in immigrant population. The approach used to assess regional disparities in homeownership is very useful. However, as Hilber (2007) notes, the inclusion of endogenous variables like market prices, which are the result of the relative demand and supply of homeownership, in the reduced form equation can cause biased estimates.

3 Empirical model and estimation method

We use an ordered logit model to explain life satisfaction by a set of relevant factors which determine an indivdual's well-being. Subjective well-being measures are typically ordinal variables and, therefore, not so easy to interpret. However, they are increasingly accepted as a satisfactory empirical approximation to individual utility (Frey and Stutzer (2002).

Our dependent variable y_i^* is an ordinal variable and refers to satisfaction with life in general. It takes possible values between 0 and 10, with meanings 0=not satisfied at all, and 10=fully satisfied.

The independent variables consist of four sets of factors. The main variable of interest is whether the household is an owner or a tenant. We include the dummy variable $owner_i$, which takes to value 1 in case household *i* is a homeowner and the value 0 else. We then consider three sets of control variables, which are all expected to affect life satisfaction of individuals and which we include sequentially into the model. In model (1), we include a vector of person-specific factors P_i, which captures person-specific characteristics of the household head such as age, gender, nationality, household income, health status and work situation. In model (2), we additionally include a vector of integration-specific variables I_i, which reflect the social integration of the household head, namely whether he is living with a spouse or partner and whether there are children living in the household. Finally, in model (3) we add the third set of control variables described by the vector H_i referring to aspects related to the housing situation, such as the housing costs relative to household income and the quality of housing.

The econometric model is given by equations (1) to (3).

$$\Pr(y_i^*) = \alpha_0 + \alpha_1 Owner_i + \varepsilon_i \quad (1)$$

$$\Pr(y_i^*) = \alpha_0 + \alpha_1 Owner_i + \alpha_{2j} P_{ij} + \alpha_{3j} I_{ij} + \varepsilon_i \quad (2)$$

$$\Pr(y_i^*) = \alpha_0 + \alpha_1 Owner_i + \alpha_{2j} P_{ij} + \alpha_{3j} I_{ij} + \alpha_{4j} H_{ij} + \varepsilon_i \quad (3)$$

A detailed description of the regression variables can be found in Table 1.

We estimate our equations by a ordinal generalized linear model. When a binary or ordinal regression model incorrectly assumes that error variances are the same for all cases, the standard errors are wrong and (unlike ordinary least squares regression) the parameter estimates are biased (Yatchew and Griliches 1985). Such models explicitly specify the determinants of heteroskedasticity in an attempt to correct for it. In our robustness tests, we re-estimate the model with a regular ordered logit model.

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4 Data description

Our analysis is based the Swiss Household Panel (SHP) data. According to its website, the principal aim of the SHP is to observe social change, in particular the dynamics of changing living conditions and representations in the populations of Switzerland (see also http://forscenter.ch/en/our-surveys/swiss-household-panel/). The SHP is run by FORS, the Swiss Centre of Expertise in Social Sciences. Data are collected annually using computer-assisted telephone interviewing (CATI). The SHP data are available free of charge for the scientific community.

Our sample includes a total of 52'761 observations over the years 2000 to 2014. For our main regression results, we use the most recent data for the year 2014, which includes a total of 6'152 households. For each household we keep the household head only (ref to paper which does the same), and we exclude students and all other persons following a full-time educational training our sample. The definitions of all the variables used in our regression analysis at the household level can be found in Table 1.

Table 1: Definition of variables

Variables	Description
Dependent	
y_i^*	Satisfaction with life in general of individual *i*; ordinal variable with 10 possible values {0, 1, …, 10}, where 0=not satisfied at all, 10=fully satisfied
Independent	
Homeowner	Dummy: One if household owns the home, zero else
Control variables I: Person-specific factors (P_i)	
Male	Gender. Dummy variable: is one if household head is male, and zero else
Age	Age of household head in years
Swiss	Nationality. Dummy variable: is one if household head is Swiss, and zero else
Household income	Yearly net household income
Good health	Health status. Dummy variable: is one if household head has good self-reported health, and zero else
Unemployed	Employment status. Dummy variable: is one if household head is unemployed, and zero else
Not in work process	Working status. Dummy variable: Dummy variable: is one if household head is not in work process, and zero else
Control variables II: Integration-specific factors (I_i)	
Living with partner	Cohabitation status. Dummy variable: is one if household head is living with partner, zero else
Children in household	Offspring. Dummy variable: is one if there is at least one child living in household, and zero else.
Control variables III: Living situation (L_i)	
Good housing quality	Quality of current housing. Dummy variable: is one if quality of housing is reported as good, and zero else.
Relative housing costs	Housing costs relative to the net household income in %

This table contains the definitions of the regression variables. The data source is the Swiss Household Panel provided by FORS.

Table 2 reports descriptive statistics of our regression variables for the newest available year 2014. As to our explained variable satisfaction with life, we observe a mean value of 7.93 and a median of 8, which means that 50% of households in our sample report a life satisfaction level in the top 20% of the possible values. The share of homeownership amounts to 50% % in our sample for the most recent year. Note the Federal Office of Statistics reports a homeownership rate of 37.4% in Switzerland for the year 2014. The higher share in our sample might have to do with the fact that homeowners are, compared to tenants, more likely to have a telephone line, and the data for this survey were collected by telephone interviews

Therefore, we have slight overrepresentation of homeowners in our sample. 43.7% of the household heads are men, and on average, the household head is 54 years old, and 89.5% of the household heads are Swiss . According to the Federal Office of Statistics, the share of foreigners amounted to 23.8% in 2014. Hence, our sample includes another bias towards a higher share of Swiss, which may well be related to the availability of telephone line as well. The yearly net household income amounts to CHF 111,111 on average, and the median income is CHF 98,000. Given the unequal distribution, we include the natural logarithm of income in our regression model. 84% of the respondents report a good health status, and the unemployment rate in our sample amounts to 1.4%. Furthermore, 31.3% of the household heads are not in the work process anymore. As to the integration-specific variables, almost 66% of the respondents live together with a partner, and 72% of the observations are households with children. Finally, about 97% of the households report to live in a housing with good quality, and the average living costs relative to the household income amount to 22%, on average for the year 2014.

Table 3 reports the descriptive statistics over the entire time period from 2000 to 2014. We observe similar values for most variables. Figure 1 shows the development of the homeownership rate and the level of life satisfaction over the entire time period considered. We observe an U-shaped curve for the life satisfaction variable, with decreasing values over the years 2000 to 2006, when the lowest value is reached, and a moderately increasing average value from then on, with temporary decreases, and a sharp increase in 2012 and 2013. As to the homeownership share, it has steadily increased over the time period considered, from roughly 38% in 2000 to about 50% in 2014.

Table 2: Descriptive statistics of the regression variables for the year 2014

Variable	Mean	p25	Median	p75	Std.Dev.	Min	Max
Satisfaction with life in general	8.108	8.000	8.000	9.000	1.448	0.000	10.000
Homeowner	0.505	0.000	1.000	1.000	0.500	0.000	1.000
Male	0.437	0.000	0.000	1.000	0.496	0.000	1.000
Age	54.078	43.000	54.000	66.000	15.550	17.000	99.000
Swiss	0.895	1.000	1.000	1.000	0.306	0.000	1.000
Household income	111,000	65,000	98,000	139,050	78,383	25,00	2,620,000
Good health	0.841	1.000	1.000	1.000	0.366	0.000	1.000
Unemployed	0.014	0.000	0.000	0.000	0.119	0.000	1.000
Not in work process	0.313	0.000	0.000	1.000	0.464	0.000	1.000
Living with partner	0.659	0.000	1.000	1.000	0.474	0.000	1.000
Children in household	0.720	0.000	1.000	1.000	0.449	0.000	1.000
Good housing quality	0.969	1.000	1.000	1.000	0.173	0.000	1.000
Relative housing costs	0.219	0.130	0.185	0.256	0.328	0.000	16.667

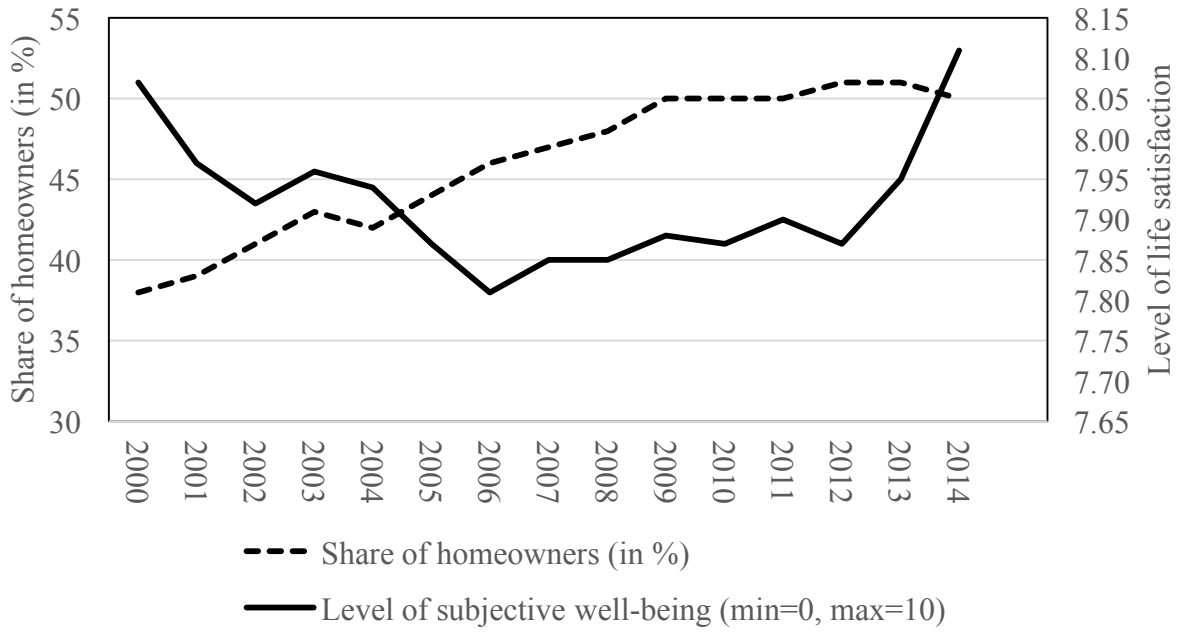
This table reports descriptive statistics of the regression variables for the year 2014. The number of observations is 6,152. The data source is the Swiss Household Panel provided by FORS.

Table 3: Descriptive statistics of the regression variables for the 2000 to 2014 (averaged)

Variable	Mean	p25	Median	p75	Std.Dev.	Min	Max
Satisfaction with life in general	7.931	7.000	8.000	9.000	1.506	0.000	10.000
Homeowner	0.465	0.000	0.000	1.000	0.499	0.000	1.000
Male	0.384	0.000	0.000	0.000	0.486	0.000	1.000
Age	51.337	40.000	50.000	63.000	15.280	-2.000	99.000
Swiss	0.902	1.000	1.000	1.000	0.298	0.000	1.000
Household income							
Good health	0.831	1.000	1.000	1.000	0.375	0.000	1.000
Unemployed	0.014	0.000	0.000	0.000	0.119	0.000	1.000
Not in work process	0.296	0.000	0.000	1.000	0.456	0.000	1.000
Living with partner	0.652	0.000	1.000	1.000	0.476	0.000	1.000
Children in household	0.712	0.000	1.000	1.000	0.453	0.000	1.000
Good housing quality	0.968	1.000	1.000	1.000	0.177	0.000	1.000
Relative housing costs	0.230	0.139	0.196	0.267	0.325	0.000	30.600

This table reports descriptive statistics of the regression variables for the year 2000 to 2014. The total number of observations is 52,761. The data source is the Swiss Household Panel provided by FORS. The definition of the variables are given in Table 1.

Figure 1: Homeownership and life satisfaction over time



The graph reports the development of the average life satisfaction level and the homeownership share over the time period from 2000 to 2012. The total number of observations is 52,761. The data source is the Swiss Household Panel provided by FORS. The definition of the variables are given in Table 1.

5 Analysis and results

Our analysis proceeds in three steps. First, we estimate our models with data of the year 2014. In a second step, we repeat our analysis by looking at the data of over all the years available, namely from 2000 to 2014 in order to see whether the results are robust over time. In a third step, we use a subset of our sample and only consider the households which changed ownership status over time, i.e., which either were a tenant and became a home owner, or which moved from being a home owner to be a tenant. This last part of the analysis is to control for the reverse causality problem.

5.1 Estimation results for the year 2014

Table 4 reports the regression results for the year 2014. We sequentially include the three sets of control variables in order to see the effects of the different determinants. Most importantly, the coefficient of our main explanatory variable Homeowner is positive and statistically significant for all three model specifications. Accordingly, the satisfaction with life in general of household heads is significantly higher for households who own their house or apartment they are living in compared to households who are renting their accommodation. This effect becomes weaker with the inclusion of additional control variables, but it remains strong and statistically significant.

Looking at the other determinants of satisfaction with life, namely the person-specific factors, we observe that men in our sample a report a lower level of happiness compared to women. Also, satisfaction with life seems to decrease with age, but the effect becomes weaker increasing age. Household heads with the Swiss nationality are significantly happier than foreigners in our sample. Also, a higher household income contributes positively to the satisfaction with life of the household head, and so does a good health status. Furthermore, unemployed persons are less satisfied with their life in general, which matcches our expectations. The fact whether the household head is in the work process or not does not matter in our data, i.e., the work status is probably already picked up by age and the unemployment status. These results confirm findings from former studies such as …

When considering our second set of control variables, which refer to the socio-economic integration of the household head, we observe that persons who are living together with their partner are significantly more satisfied in life compared to singles. Interestingly, the fact of having children in the household reduces the life satisfaction. This finding might have to do with the additional work and costs children are causing, which overcompensates the joy of having children. Finally, the inclusion of the third set of factors referring to the living situation point out to the fact that the quality of the accommodation has a positive and significant effect on the individual well-being of the household head, but the the housing costs relative to the household income does not seem to matter.

In a second step, we estimate our models separately for each year as well as over the entire time period considered. The results can be found in Table 5.

Table 4: Determinants of satisfaction with life in general for the year 2014

Dependent variable: Satisfaction with life in general	Year=2014		
	Model I	**Model II**	**Model III**
Homeowner	0.30***	0.233***	0.213***
	(0.052)	(0.0531)	(0.0535)
Male	-0.17***	-0.217***	-0.218***
	(0.047)	(0.0478)	(0.0479)
Age	-0.08***	-0.0720***	-0.0703***
	(0.011)	(0.0108)	(0.0108)
Age squared	0.00***	0.000832***	0.000813***
	(0.000)	(0.000104)	(0.000104)
Swiss	0.18**	0.198**	0.190**
	(0.083)	(0.0842)	(0.0842)
Log (Household income)	0.54***	0.404***	0.385***
	(0.050)	(0.0544)	(0.0558)
Good health	1.33***	1.335***	1.327***
	(0.078)	(0.0774)	(0.0776)
Unemployed	-0.94***	-0.997***	-0.988***
	(0.235)	(0.237)	(0.234)
Not in work process	0.02	-0.0665	-0.0617
	(0.079)	(0.0786)	(0.0786)
Living with partner		0.735***	0.728***
		(0.103)	(0.103)
Children in household		-0.383***	-0.371***
		(0.108)	(0.108)
Good housing quality			0.549***
			(0.148)
Relative housing costs			-0.0370
			(0.0551)
Wald Chi^2	633.90***	716.61***	732.09***
Observations	6,152	6,152	6,152

This table reports results for the year 2014 from heteroskedastic ordinal regressions of the effects of person- and integration- and housing-specific characteristics on satisfaction with life in general of the household head. The definition of the variables are given in Table 1. Robust standard errors in brackets. Coefficients that are significantly different from zero at the 1%, 5%, and 10% level are marked with ***, **, and * respectively.

5.2 Estimation results for the entire time period

In order to see whether our results are not only valid for the particular year considered, namely 2014, we re-estimate the models for all the years for which the relevant data are available. The results can be found in Table 4. Most importantly, the coefficient of the homeownership variable is positive and strongly significant in all years except in 2003 and 2011. We interpret this finding as clear empirical evidence for our claim that homeowners have, in general, a higher life satisfaction than tenants, while controlling for other known factors that affect life satisfaction. Also, we assume this positive impact on life satisfaction being directly related to homeownership, even though we need to explore this issue further in the next chapter.

As to the control variables included in our regression analyses, we observe robust results for most variables over the years considered. Worth to mention is that the negative effect of children in the household is not significant in all, but in the majority of years in our sample. Also, the effect of relative housing costs is unclear, i.e. insignificant in most years, but positive and significant in four years, and negative and significant in one year.

Table 5: Determinants of satisfaction with life in general for the years 2000 to 2007

Dependent variable: Satisfaction with life	2000	2001	2002	2003	2004	2005	2006	2007
Homeowner	0.275***	0.303***	0.142*	0.112	0.275***	0.256***	0.223***	0.198***
	(0.076)	(0.077)	(0.080)	(0.081)	(0.076)	(0.073)	(0.071)	(0.072)
Male	-0.355***	-0.359***	-0.317***	-0.253***	-0.355***	-0.211***	-0.135**	-0.257***
	(0.071)	(0.069)	(0.073)	(0.078)	(0.071)	(0.065)	(0.067)	(0.067)
Age	-0.050***	-0.117***	-0.098***	-0.098***	-0.050***	-0.096***	-0.064***	-0.088***
	(0.018)	(0.017)	(0.016)	(0.018)	(0.018)	(0.016)	(0.016)	(0.017)
Age squared	0.001***	0.001***	0.001***	0.001***	0.001***	0.001***	0.001***	0.001***
	(0.000)	(0.000)	(0.000)	(0.000)	0	(0.000)	(0.000)	(0.000)
Swiss	0.519***	0.434***	0.427***	0.453***	0.519***	0.307***	0.272**	0.340***
	(0.115)	(0.120)	(0.122)	(0.126)	(0.115)	(0.110)	(0.113)	(0.118)
Log (Household income)	0.322***	0.344***	0.480***	0.331***	0.322***	0.541***	0.538***	0.461***
	(0.089)	(0.089)	(0.092)	(0.100)	(0.089)	(0.083)	(0.086)	(0.073)
Good health	1.220***	1.109***	1.162***	1.372***	1.220***	1.197***	1.326***	1.344***
	(0.107)	(0.106)	(0.114)	(0.114)	(0.107)	(0.098)	(0.099)	(0.098)
Unemployed	-1.372***	-0.714**	-1.056***	-1.382***	-1.372***	-1.444***	-0.931***	-1.116***
	(0.361)	(0.330)	(0.298)	(0.280)	(0.361)	(0.308)	(0.345)	(0.325)
Not in work process	0.313***	0.011	0.043	0.138	0.313***	0.059	-0.076	-0.045
	(0.097)	(0.099)	(0.102)	(0.111)	(0.097)	(0.099)	(0.100)	(0.100)
Living with partner	0.911***	0.491***	0.452***	0.700***	0.911***	0.650***	0.860***	0.644***
	(0.151)	(0.160)	(0.175)	(0.163)	(0.151)	(0.150)	(0.146)	(0.146)
Children in household	-0.660***	-0.178	-0.286	-0.541***	-0.660***	-0.593***	-0.708***	-0.345**
	(0.158)	(0.166)	(0.182)	(0.170)	(0.158)	(0.154)	(0.148)	(0.147)
Good housing quality	0.553***	1.034***	0.808***	0.604***	0.553***	0.370*	0.421**	0.363**
	(0.201)	(0.213)	(0.221)	(0.215)	(0.201)	(0.205)	(0.189)	(0.182)
Relative housing costs	-0.142	-0.181	0.220	-0.479	-0.142	0.130**	0.401*	-0.051
	(0.340)	(0.264)	(0.135)	(0.481)	(0.34)	(0.066)	(0.235)	(0.051)
Wald Chi^2	387.98***	350.55***	309.47***	338.16***	436.14***	406.55***	436.32***	451.21***
Observations	3,122	3,047	2,746	2,586	3,864	3,261	3,291	3,352

cont. 5 Determinants of satisfaction with life in general for the years 2008 to 2014

Dependent variable: Satisfaction with life	2008	2009	2010	2011	2012	2013	2014	All years
Homeowner	0.267***	0.269***	0.175***	0.031	0.120*	0.263***	0.213***	0.197***
	(0.069)	(0.068)	(0.068)	(0.069)	(0.068)	(0.072)	(0.053)	(0.018)
Male	-0.207***	-0.255***	-0.311***	-0.086	-0.210***	-0.240***	-0.218***	-0.232***
	(0.066)	(0.064)	(0.063)	(0.064)	(0.064)	(0.067)	(0.048)	(0.017)
Age	-0.053***	-0.088***	-0.076***	-0.061***	-0.043***	-0.084***	-0.070***	-0.074***
	(0.016)	(0.015)	(0.014)	(0.015)	(0.014)	(0.015)	(0.011)	(0.004)
Age squared	0.001***	0.001***	0.001***	0.001***	0.001***	0.001***	0.001***	0.001***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Swiss	0.310***	0.292***	0.207*	0.563***	0.384***	0.496***	0.190**	0.332***
	(0.119)	(0.109)	(0.113)	(0.122)	(0.112)	(0.122)	(0.084)	(0.029)
Log (Household income)	0.358***	0.550***	0.350***	0.496***	0.322***	0.348***	0.385***	0.405***
	(0.088)	(0.074)	(0.086)	(0.076)	(0.077)	(0.083)	(0.056)	(0.020)
Good health	1.418***	1.531***	1.467***	1.595***	1.562***	1.463***	1.327***	1.358***
	(0.096)	(0.095)	(0.089)	(0.099)	(0.090)	(0.095)	(0.078)	(0.025)
Unemployed	-1.262***	-0.952***	-1.101***	-1.223***	-0.763*	-0.900**	-0.988***	-1.048***
	(0.296)	(0.283)	(0.297)	(0.279)	(0.444)	(0.374)	(0.234)	(0.078)
Not in work process	0.107	0.114	-0.087	0.141	-0.081	-0.028	-0.062	0.056**
	(0.101)	(0.101)	(0.098)	(0.101)	(0.103)	(0.106)	(0.079)	(0.025)
Living with partner	0.763***	0.755***	0.723***	0.773***	0.635***	0.752***	0.728***	0.712***
	(0.148)	(0.138)	(0.146)	(0.133)	(0.147)	(0.149)	(0.103)	(0.037)
Children in household	-0.601***	-0.543***	-0.447***	-0.536***	-0.222	-0.480***	-0.371***	-0.461***
	(0.152)	(0.144)	(0.155)	(0.141)	(0.155)	(0.159)	(0.108)	(0.038)
Good housing quality	0.634***	0.504***	0.566***	0.491**	0.381	0.581**	0.549***	0.563***
	(0.176)	(0.195)	(0.190)	(0.194)	(0.248)	(0.247)	(0.148)	(0.051)
Relative housing costs	-0.195	0.109***	-0.375*	0.116**	0.036	-0.086	-0.037	0.007
	(0.260)	(0.033)	(0.214)	(0.054)	(0.096)	(0.136)	(0.055)	(0.037)
Wald Chi^2	460.03***	595.60***	492.62***	542.91***	495.30***	488.87***	731.87***	6,849.02***
Observations	3,376	3,615	3,646	3,638	3,629	3,436	6,152	52,761

This table reports results for all the years from heteroskedastic ordinal regressions of the effects of person- and integration- and housing-specific characteristics on satisfaction with life in general of the household head. The definition of the variables are given in Table 1. Robust standard errors in brackets. Coefficients that are significantly different from zero at the 1%, 5%, and 10% level are marked with ***, **, and * respectively.

5.3 Reverse causality problem: Consideration of households with change in ownership

Our results outlined above provide strong empirical evidence for the claim that homeowners are happier than tenants. Given that we control for a range of other factors that are expected to have an impact on an individual's well-being, it is less likely that this effect is driven by some other unobservable factors, which are not included in our model.

Our claim is based on the underlying assumption that homeownership causes happiness. However, one could argue that homeowners are per se happier than tenants, because they have, for instance, a more positive attitude towards life in general, and due to this state of mind they are more likely to buy a house or an apartment. This positive attitude would also help to explain why they have in general a higher income, or are more educated, and are therefore happier than tenants. As a consequence, the causality would run in the other direction, i.e., certain people are homeowners because they are characterized by certain specific characteristics including a higher life satisfaction, which makes it more likely that they become a home owner.

We try to control for this potential reverse causality effect by analyzing only households with a change in ownership over the time period considered and no changes in the other control variables expect changes in age (and age squared) and changes in income within a given narrow range. For the control variable "income" we specify a tolerance range of plus/ minus ten percent around last year's income, and we treat income as constant within this range. Accordingly, we only keep the household heads in our sample who either moved from being a tenant to a homeowner, or from being a homeowner to a tenant over the time period from 2000 to 2014 and for whom the following control variables (as specified in model II) do not change: gender, nationality, household income (within the tolerance range), health status, occupation, partner, child in household.

Table 5: Overview of the numbers of households in the sample from 2000 to 2014

Variable	Total	Owner	Tenant
number of households	53'300	24'762	28'538
out of them			
numer of household, who change the owner status	1'498	456	1'042
out of them			
number of household with no change in control variable	396	107	289
out of them			
number of household with change of satisfaction	213	56	157

Table 5 gives an overview of the sample. In total there are 53'300 heads of households where 24'762 are homeowners and 28'538 are tenants. 1'498 households change the owner status: 456 homeowners become tenants and 1'042 tenants become homeowners over the time period considered. Keeping only those observations with no changes in the control variables in our sample, we are left with 107 homeowners becoming tenants and 289 tenants becoming homeowners. Out of them, 56 of the homeowners, who

become tenants and 157 tenants, who become homeowner also have a change in their satisfaction of life. For these 213 observations the descriptive statistics of the control variables are given in Table 6. Compared to the descriptive statistics of the total sample for the year 2014 in table 2, the subsample is not very different according to the control variable.

Table 6: Descriptive statistics of control variables for households with change in ownership status and satisfaction but no change in the control variable

Variable	Mean	p25	Median	p75	Std.Dev.	Min	Max
Satisfaction with life in general	8.124	8	8	9	1.379	1	10
Homeowner	0.730	0	1	1	0.445	0	1
Male	0.412	0	0	1	0.493	0	1
Age	49.735	37	45	62	16.086	24	91
Swiss	0.912	1	1	1	0.284	0	1
Log (Household income)	11.450	11.125	11.513	11.818	0.524	9.980	12.885
Good health	0.914	1	1	1	0.281	0	1
Unemployed	0	0	0	0	0	0	0
Not in work process	0.270	0	0	1	0.445	0	1
Living with partner	0.758	1	1	1	0.429	0	1
Children in household	0.785	1	1	1	0.411	0	1

This table reports descriptive statistics of the regression variables for the subsample with households with a change in ownership over the years 2000 to 2014. The data source is the Swiss Household Panel provided by FORS. The definition of the variables are given in Table 1.

To address the question whether our assumption that homeownership causes happiness is correct and whether the potential reverse causality is true, we divided each of the two groups, i.e. homeowners who become tenants and tenants become homeowners, in those who become happier and those, who become less happy. We then calculate the odds ratio to quantitatively describe the association between the happiness of the two groups according to the following formula:

$$\text{odds ratio}=odds\ rato = \frac{a/c}{b/d} = \frac{a \times d}{b \times d} \quad (4)$$

whereas

a: tenants becoming homeowners and getting happier

b: homeowners becoming tenants and getting happier

c: tenants becoming homeowners and getting less happy

d: homeowners becoming tenants and getting less happy

An odds ratio of 1 indicates that there is no difference between the happiness of the two groups. An odds ratio greater than 1 indicates that the chance to be happy in the group of tenants who become homeowners is more likely to occur than in the group of homeowners who become tenants. Correspondingly, an odds ratio less than 1 indicates that the chance that tenants who become homeowners are happy is less likely to occur than of homeowners who become tenants. An odds ratio greater than 1 would therefore support our claim of assumption that homeownership causes happiness. If the reverse causality would be true, we expect an odds ratio of 1.

The results can be found in Table 6. Overall, from the 157 households in our sample that moved from being a tenant into homeownership, 84 become happier and 73 become less happy, while from the 56 households sold their home and became a tenant, become 24 happier and 32 less happy. The generated odds ratio is roughly 1.5. The chance to be happier is in the group of tenants who become homeowners 1.5 times higher than in the group with homeowners who became tenants. This supports our assumption that homeownership makes people happier. If homeowners were per se happier than tenants, we would expect an odds ratio of 1 and therefore no difference between the two groups.

Table 6: households with change in ownership for the years 2000 to 2014: Odds Ratio

	tenants becoming homeowners	homeowners becoming tenants	observations
more happy	84	24	108
less happy	73	32	105
observations	157	56	**213**
Odds ratio			**1.534**

6. Conclusions

The goal of this paper is to analyze the impact of homeownership in Switzerland on subjective life satisfaction. Based on a data set from the Swiss Household Panel for the years 2000 to 2014, we used a generalized ordered logistic model to analyze whether homeownership has a statistical significant impact on satisfaction with life. Because the subjective well-being is not only influenced by homeownership, we include in our empirical model also household-, accommodation- and location-specific factors that are expected to affect subjective satisfaction with life. In contrast to the existing literature, we additionally consider social factors as partnership, child in households as well as occupation, which are also factors which might have effects of satisfaction. Moreover, using generalized ordered logistic model for our estimations we eliminate the problem of heterogeneity in the residuals and, therefore, a potential bias in the parameter estimates.

Our main results show that homeownership has a statistical positive effect on subjective life satisfaction. To analyze the robustness of this result, we estimate three different models with different control variables and over different years. These robustness tests show that the results are not sensitive to these modifications and all support the effect of homeownership on satisfaction. However, it can be argued that people, who are homeowners, may have, in general, a positive attitude towards life and are, therefore, in general happier. In order to control for this potential reverse causality effect, we analyze only those households that had a change in the homeownership status, but no changes with respect to other characteristics except age. In concrete terms, we build two groups: tenants who become homeowners and homeowners who become tenants. To quantitatively describe the impact of homeownership on the satisfaction of live, we calculate the odds ratio of the two groups. An odds ratio of 1.5 supports the hypothesis that homeownership has an impact on satisfaction and not vice versa.

Even though our analyses provide new insights regarding the impacts of homeownership and specific characteristics of the housing situation on the life satisfaction of households, additional work is necessary to better understand the underlying mechanisms. Similar to Bucchianieri (2011), it might be insightful to consider different measures of well-being, which take into account the different dimensions of a person's happiness, instead of focusing on a single life satisfaction indicator. Also, taking into account residential mobility decisions may add further insights. For instance, it will be necessary to further investigate the relative importance of factors that have led to an increase in homeownership rates in certain areas. Also, it might be useful to include certain macroeconomic characteristics and their impact on housing tenure decisions. Finally, additional region-specific analyses might be helpful to derive some useful policy advice for an effective housing policy in Switzerland. Some of these issues will be addressed in future research.

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