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The Causal Relationship between Individual's Choice Behavior and Self-Reported Satisfaction: the Case of Residential Mobility in the EU

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Abstract

One of the most persistent and lasting debates in economic research refers to whether the answers to subjective questions can be used to explain individuals' economic behavior. Using panel data for twelve EU countries, in the present study we analyze the causal relationship between self-reported housing satisfaction and residential mobility. Our results indicate that: i) households unsatisfied with their current housing situation are more likely to move; ii) housing satisfaction raises after a move, and; iii) housing satisfaction increases with the transition from being a renter to becoming a homeowner. Some interesting cross-country differences are observed. Our findings provide evidence in favor of use of subjective indicators of satisfaction with certain life domains in the analysis of individuals' economic conduct.

Keywords: Housing satisfaction, residential mobility, homeownership, individual's choice behavior.

JEL classification: D1, R0, J0.

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1. Introduction

One of the most persistent and lasting debates in economic research refers to whether the answers to subjective questions can be used to explain individuals' economic behavior. In contrast with the view of the psychologists, many economists consider that variables containing information provided by subjective measures as self-reported satisfaction cannot be used as indicators of individuals' economic behavior.[1] This debate is crucial, since subjective-well being indicators, such as overall life satisfaction or satisfaction with certain life domains, are very often the unique proxy of utility that economists can use.

In his seminal paper, Freeman (1978) studied, for the first time, the behavioral consequences of job satisfaction. He concludes that although job satisfaction has traditionally been seen with distrust by economists, it not only contains useful information for modeling and understanding economic behavior, but also helps to explain complex dimensions related to individuals' psychological states. Is this feature of satisfaction variables what economists dislike? After Freeman's study, there has been a growing literature studying the determinants of job satisfaction (e.g. Clark and Oswald, 1996; Clark, 1997; or Bryson, Capellari and Lucifora, 2004). However, in what way job satisfaction affects individual labor market choices is a topic that remains to be researched. As far as we are aware, Clark et al. (1998), Clark (2001), and Frijters (2000) are the only empirical works that explicitly test the effect of self-reported satisfaction on individuals' choices. Using data from different European countries (Germany, Russia and the UK), all three studies estimate the causal relationship between job satisfaction and the worker's decision to quit, and find that the propensity to quit one's job increases

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[1] Veenhoven (1996) and Van Praag and Frijters (1999) offer a discussion on the meaning of self-reported satisfaction and its measurement.

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with the level of dissatisfaction. Besides job satisfaction, Frijters (2000) also carries out explicit tests on the behavioral consequences of self-reported satisfaction with different domains of life, such as family and housing. The author studies the effect of satisfaction on the intentions to change and on the actual changes in the areas of dissatisfaction. He finds that in Germany and Russia individuals intend to change those aspects of their lives they feel unsatisfied with, however, the effect of satisfaction on observed changes is weaker. The main conclusion of the paper is that the combined results provide only limited support to the hypothesis that individuals try to maximize self-reported levels of satisfaction.

Our study extends the previously described line of research by analyzing the link between individuals' current satisfaction with a specific life domain and individuals' future choices regarding that domain. More specifically, we estimate the causal relationship between housing satisfaction and residential mobility. We focus on this domain because the residential mobility decisions are among the most important economic choices that households face throughout their life-course. Owning one's dwelling is not only one of the most important ways of wealth accumulation, but also one of the most relevant signals of personal success. In addition, housing satisfaction significantly affects individual's subjective well-being (Varady and Carrozza, 2000; Van Praag, Frijters and Ferrer-i-Carbonell, 2003).

In the late 80s and the early 90s, the interest of many researchers from various scientific areas, including psychology, geography and demography, has been focused on the analysis of the determinants of housing satisfaction. The concerns about the behavioral consequences of housing satisfaction are quite recent. Barcus (2004) uses US data to study the determinants of the changes in residential satisfaction of urban-rural

migrants.[2] Lu (2002) analyzes the residential consequences of migration within the US, and finds that individuals that moved from one place to another, also tended to report higher levels of residential satisfaction. Joong-Hwan (2003) aims to reveal the combined effect of social bonds and residential satisfaction on the mobility intentions of elderly residents in Chicago. The author shows that social bonds exert a significant positive effect on residential satisfaction, which in turn reduces the intention to move. Kearns and Parkes (2003) find a significant and negative relationship between residential satisfaction and housing mobility intentions in poor neighborhoods in the UK. All these studies analyze the relationship between residential satisfaction and housing mobility, but none of them explicitly tests the behavioral consequences of housing satisfaction on mobility choices. Barcus (2004) and Lu (2002) analyze housing satisfaction after a move, while Joong-Hwan (2003) and Kearns and Parkes (2003) explain the impact of residential satisfaction on the intention to move. The main limitation of the latter two studies is the use of as dependent variable the one capturing mobility intentions, and not the observed mobility.

Drawbacks of the existing literature regarding housing satisfaction and mobility are that; firstly, empirical studies are based on cross-section data, and; secondly, they only focus on a very limited number of countries. In our study, we use panel data from twelve EU countries, which allows us to carry out cross-country estimates of the determinants of the observed dwelling transitions of EU households during the period 1994-2001. The remainder of the paper is structured as follows. In section 2, we

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[2] Barcus (2004) uses a multinomial logit model where the dependent variable reflects changes in the level of residential satisfaction for a sample of individuals that moved during the twelve months previous to the survey. However, the study do not establish an explicit link between housing mobility and housing satisfaction, but study the determinants of the changes in residential satisfaction for the sample of movers.

describe the data. Section 3 presents the econometric framework. The empirical results are discussed in section 4. And, section 5 summarizes and concludes.

2. Data and definition of variables

The data used in this paper comes from the European Community Household Panel (ECHP). This is a yearly panel of the EU-15 countries covering the period 1994-2001.[3] We use all the waves of the ECHP for twelve countries. In ten countries (Denmark, the Netherlands, Belgium, France, UK, Ireland, Italy, Spain, Greece and Portugal) the data covers the period 1994-2001. And for Austria and Finland the available files only cover the period 1995-2001 and 1996-2001, respectively. We omit from the analysis Germany, Luxembourg and Sweden. For Germany and Luxembourg the ECHP files only cover the period 1994-1996, while the Swedish data does not include the questions on satisfaction. The main advantage of the ECHP is that the questionnaires are standardized, which allows for valid international comparisons to be done.

The ECHP contains information about households and multiple individual characteristics such as age, sex, education, health status, migration patterns, labor situation and income. Besides, the ECHP includes variables related to the level of satisfaction with different aspects of individuals' life. Among others, respondents are asked to report on a six-point scale how satisfied they are with their housing situation. The possible categories are numbered from 1 to 6, where "not satisfied at all" corresponds to level 1, whereas level 6 stands for "completely satisfied".

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[3] EU-15 refers to the fifteen member states of the European Union before the May 1st 2004 enlargement..

3. Empirical framework

As we mentioned above, one of the most interesting features of our analysis is the use of panel data. It allows us to study the observed mobility, rather than the intentions to move. Moreover, the panel data reveals any changes that occur in individuals' housing satisfaction. This means that we can observe (and can account for in the estimation procedures) housing satisfaction in the period previous to the move and in the period right after the move.

3.1. Determinants of housing mobility: can housing satisfaction predict the household's moving propensies?

Lets us define the moving decision as an observed binary variable, y_{it}, that takes the value one if the household i experience residential mobility between periods t-1 and t, and zero otherwise. It is important to remark that the endogenous variable equals one only during the period the household moves and that it equals zero during the periods before and after the move. This definition of the endogenous variable is very appropriate if we want to observe the effect of the covariates in the precise moment the household moves from one dwelling to another. In this context, y_{it} is the realization of the unobserved propensity to move for household i at period t, y_{it}^{*}. Hence, the econometric specification can be written as:

$$y_{it} = I(y_{it}^{*} > 0) = I(W_{it}^{'}\gamma + \delta_i + e_{it} > 0) \qquad (i=1,...,N; t=1,...,T), \qquad (1)$$

where W_{it} is a matrix containing the observable determinants of housing mobility, δ_i is a household specific component, which is time-invariant and normally distributed with

zero-mean and variance σ_δ^2, and e_{it} is a time-varying white noise error term, which is independent of both δ_i and X_{it}. If we define $W_{it}=[Z_{it}, HO_{it-1}, HS_{it-1}]$, then equation (1) becomes:

$$y_{it} = I(y_{it}^* > 0) = I(Z_{it}'\Pi + HS_{it-1}'\lambda_1 + HO_{it-1}'\lambda_2 + \delta_i + e_{it} > 0),\qquad(2)$$

where Z_{it} refers to individual characteristics of the household head (age, gender, and marital status), household characteristics (household income, number of household members[4], duration of residence in the current dwelling), and shocks that affects the size and composition of the household. Regarding this latter group of variables, we account for changes in the family than imply a reduction or an enlargement of the family size.[5] HS_{it-1} is a dummy variable that takes the value 1 if the household was a home owner the year before the move, and HS_{it-1} is the household's head self-reported housing satisfaction before moving. In the context of our research controlling for households' heterogeneity, picked up by the term δ_i, is very important. The main hypothesis to be tested is whether low housing satisfaction triggers housing mobility, which implies that $\lambda_1<0$ in equation (2). In addition, we can also test whether homeowners are less likely to move, i.e. $\lambda_2<0$.

3.2. Does mobility lead to an increase in housing satisfaction?

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[4] Chung and Haurin (2002) use family size as a stochastic variable when households make their tenure and housing consumption decisions.
[5] Events that imply a reduction of the family size are divorce/separation, widowing or sons/daughters leaving the parental household, while enlargements of the family are due to marriages or births.

To study the contribution of residential mobility to changes in individuals' housing satisfaction, we depart from the following basic specification of the determinants of housing satisfaction:

$$HS_{it} = X_{it}\beta + u_i + \varepsilon_{it} \tag{3}$$

where HS_{it} is self-reported housing satisfaction of the household head i at period t, X_{it} is a matrix containing the determinants of housing satisfaction, u_i is a time constant-household effect, and ε_{it} is a white noise time varying error term. The matrix X_{it} refers to household characteristics and includes the following variables: years living in current the dwelling (T_{it}), log of household income (LI_{it}), number of household members (MH_{it}), a dummy for homeownership (HO_{it}), and a dummy variable that takes value one if the current dwelling is a house (H_{it}) and zero if it is a flat. To reflect the changes in housing satisfaction between period $t\text{-}1$ and t as a function of the variations in household characteristics, we rewrite equation (3) in the following way:

$$HS_{it} - HS_{it-1} = (X_{it} - X_{it-1})\beta + (\varepsilon_{it} - \varepsilon_{it-1}) \tag{4}$$

After including a set of individual (household head) characteristics, equation (4) becomes:

$$\Delta HS_{it} = \alpha + \beta_1\Delta T_{it} + \beta_2 HS_{it-1} + \beta_3\Delta HO_{it} + \beta_4\Delta MH_{it} + \beta_5 MH_{it-1} + \beta_{6it}\Delta LI_{it} + \tag{5}$$
$$+\beta_7 LI_{it-1} + \beta_8\Delta H_{it} + \beta_9 Age_{it} + \beta_{10}Age_{it}^2 + \beta_{11}Woman_{it} + \beta_{11}MS_{it} + \gamma_i + \upsilon_{it}$$

where MS_{it} are dummies collecting the marital status of the head of household i in period t, and $\upsilon_{it}=\Delta\varepsilon_{it}$ is the error term. The inclusion of a set of variables in levels leads

us to consider an individual time constant effect, γ_i, though we think this effect should be hardly noticeable.

Among the determinants of household's (dis)satisfaction variation expressed in equation (5), we think that the significance and the signs of three parameters (β_1, β_2 and β_3) deserve special attention. The variable ΔT_{it} allows us to study the effect of residential mobility on housing satisfaction changes (ΔHS_{it}). Since T_{it} refers to the number of years living in the current dwelling, ΔT_{it} will take the value 1 if there is no residential mobility between *t-1* and *t*, and a non-constant negative value if the household moves during that period. The definition of the variable ΔT_{it} as described is considered more appropriate (as compared to the inclusion of a dummy indicator of mobility), since it allows to analyze not only the impact of mobility on the change in satisfaction, but also the effect of time residing in the previous dwelling. If residential mobility improves housing satisfaction, then we should get $\beta_1 < 0$. We also control for the effect of the level of satisfaction in satisfaction variation by including HS_{it-1}. One would expect that the higher the satisfaction level the lower is the probability of experiencing an increase in housing satisfaction in the next period, i.e. $\beta_2 < 0$. The variable ΔHO_{it} is included to capture the variations in household's satisfaction with their home due to changes in the tenure status. It takes the value 1 if household becomes homeowner between *t-1* and *t*, the value 0 if there is no change in the tenure status, and -1 if the household becomes a renter. If households report higher levels of satisfaction after becoming homeowners, we expect $\beta_3 > 0$.

4. Empirical results

4.1. The determinants of housing satisfaction

Table 1 contains the descriptive statistics of the variables used in the analysis. Between 20 and 30 percent of the European households experienced residential mobility over the studied period. The lowest levels of mobility (19.9%) are those of Greece and Portugal, while more than one third of the Finish households (32.1%) changed their homes. Central and North-European households tend to report higher satisfaction with their dwellings (average housing satisfaction level is above 5) compared to their South-European counterparts. In Greece and Portugal people declare housing satisfaction levels below 4, Spain and Italy score just above 4. Another characteristic, common in the Mediterranean countries, is that dwellers tend to experience longer tenures between housing transitions compared to the other EU countries. During the reference period, between 23 and 28 percent of the households have experienced a shock that have reduced the household size. In contrast, shocks enlarging the size of the household are much less frequent, between 3 and 6 percent.

[Insert table 1, about here]

The results of the random effects probit estimation of equation (2) are shown in table 2. In general, the results are quite similar across the European countries. Our main hypothesis, i.e. households that report lower housing satisfaction are more likely to move, cannot be rejected in any case. The coefficient associated to self-reported housing satisfaction in the period before the move is negative and highly significant in all countries. This result suggests that, as expected, individuals tend to change those

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aspects of their life they are unsatisfied with. It also provides additional evidence (to the one reported by Clark et al., 1998; Clark, 2001; Frijters, 2000) in favor of the use of self-reported satisfaction indicators in the study of individuals' economic behavior. Another interesting result we get is the finding that homeowners are less likely to move compared to the renters. In the Southern European countries the "homeownership" effect tends to dominate over the "satisfaction" effect, while the opposite holds in the rest of Europe.

As we expected, income exerts a significant positive effect on residential mobility in all the countries included in the analysis. The results regarding the shocks affecting household size are quite revealing and allow us to define two groups of countries. The households belonging to the first group, formed by the Southern European countries and Ireland, tend to move after a positive shock on the size of the household (e.g. after marriage or child birth), but do not change their homes as a result of a family-size reduction (e.g. after sons leaving the parents' dwelling or widowing). Differently, the households from the second group, including the remaining European countries in our sample, show higher propensities to move after a shock that affects the size of the household. This result is not affected by the nature of the shock (positive or negative). Finally, we find that residential mobility is U-shaped with the age of the household head, but not significantly affected by gender.

[Insert table 2, about here]

In table 3 we report the estimated probability of moving in each country broken by tenure status and by the level of housing satisfaction in the period previous to the

move. We observe that the probability of moving strongly decreases with housing satisfaction for both homeowners and renters. However, there are important differences between countries. Households who are completely unsatisfied with their housing situation have much higher probability to move if they reside in Denmark, the Netherlands, Belgium, France and Finland, compared to those living in the Southern European countries, the UK and Ireland. We also observe quite marked differences regarding the rate at which the moving probabilities decrease with housing satisfaction. For instance, in the Netherlands the probability of moving for a non-satisfied household is almost eleven times higher than for a fully satisfied household, whereas in Spain this probability is just one and a half times larger. This result holds for both homeowners and renters. These findings point to the different "housing" cultures throughout Europe, which may also be used to explain variations in labor mobility.

[Insert table 3, about here]

4.2. The determinants of housing satisfaction variation

Table 4 reports the estimates of equation (5). In most of the cases, the results regarding the variables reflecting mobility and changes in the household are significant and behave as expected. Housing mobility (ΔT_{it}) is found to be statistically significant and positively correlated with the variation in housing satisfaction in all countries, i.e. residential mobility increases self-reported housing satisfaction. The initial level of housing satisfaction (HS_{t-1}) also exerts a significant and negative effect in all countries. This means that the higher the initial level of housing satisfaction, the lower the probability to report higher satisfaction in the following period. The level of and

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changes in household income (ΔLI_{it} and LI_{it-1}) are also significant and positively related to the growth of housing satisfaction in all countries. On the contrary, an increase in the number of the household members (ΔHM_{it}) exerts a negative effect on the change in the level of satisfaction. Another interesting result concerns the variables reflecting the characteristics of the new residential situation. The transition from being a renter to becoming a home owner (ΔHO_{it}) augments the satisfaction with one's housing situation in all countries. Similar result is observed when the move a flat to a house (ΔH_{it}) is considered. Only in Belgium, the variable coefficient is not statistically significant, although has the expected sign.

The results regarding the characteristics of the household head are more heterogeneous across countries. Changes in self-reported housing satisfaction are inverted U-shaped with age in Denmark, the Netherlands, France, Italy, Spain, Portugal and Austria, while the effect of age is positive in UK, Belgium and Finland, and negative in Ireland and Greece. The probability to observe higher levels of housing satisfaction over time is greater for women who are household heads in the Netherlands, Spain and Finland, for men who are household heads in Ireland and Portugal and is non-significantly affected by the gender of the household head in the remaining countries. Finally, married individuals are more prone to report positive variations in the housing satisfaction over time compared to those not married (singles, widowed, divorced or separated).

[Insert table 4, about here]

5. Conclusions

In this paper we have investigated the causal relationship between the level of and the variations in residential mobility and housing satisfaction. Our study differs from the previous literature in that instead of using variables measuring intentions to move, we employ indicators of the observed mobility. The panel structure of our data permits to observe the variations in the determinants when mobility occurs. The data also allow us to pick up changes in the household and inter-temporal variations in the level of self-reported housing satisfaction. Our results determine that housing satisfaction not only triggers housing mobility, but also that movers indeed experience a rise in housing satisfaction after the move in all analyzed countries. This result indicates that questions about how people feel toward their residential situation are meaningful and convey useful information about individuals' behavior regarding housing that should not be ignored. In a more general context, this paper provides empirical evidence that contributes to the debate about whether satisfaction variables are valid instruments for analyzing individuals' economic decisions.

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Table 1: Descriptive statistics

	Denmark		Netherlands		Belgium		France		UK		Ireland	
	Mean	*S.D.*	*Mean*	*S.D.*	*Mean*	*S.D.*	*Mean*	*S.D.*	*Mean*	*S.D.*	*Mean*	*S.D.*
Mover	0,282	0,450	0,242	0,428	0,226	0,418	0,244	0,430	0,219	0,413	0,220	0,414
log(income) (-1)	12,207	0,617	10,736	0,636	13,737	0,740	11,856	0,727	9,576	0,764	9,652	0,726
Household size	2,249	1,252	2,499	1,317	2,605	1,383	2,573	1,384	2,494	1,319	3,420	1,837
Household enlargement	0,060	0,238	0,043	0,203	0,039	0,194	0,043	0,203	0,060	0,238	0,048	0,213
Household reduction	0,272	0,445	0,243	0,429	0,231	0,422	0,249	0,432	0,230	0,421	0,285	0,451
Separated	0,017	0,131			0,032	0,177	0,009	0,096	0,027	0,162	0,036	0,186
Divorced	0,117	0,322	0,097	0,296	0,100	0,300	0,086	0,281	0,110	0,313	0,005	0,069
Widowed	0,118	0,323	0,096	0,294	0,136	0,342	0,120	0,325	0,130	0,337	0,133	0,339
Never married	0,294	0,456	0,215	0,411	0,146	0,353	0,219	0,414	0,213	0,410	0,145	0,352
Age	48,606	17,830	48,532	16,486	51,140	16,732	50,293	17,193	49,243	18,108	52,507	16,100
Woman	0,423	0,494	0,360	0,480	0,319	0,466	0,272	0,445	0,469	0,499	0,267	0,443
Dwelling tenure (-1)	9,148	7,119	10,198	6,961	11,136	7,035	10,576	7,624	9,395	7,161	13,161	6,258
Housing satisfaction (-1)	5,113	1,092	5,002	0,985	4,842	1,165	4,684	0,986	5,174	1,184	4,972	1,235
Homeowner (-1)	0,651	0,477	0,553	0,497	0,719	0,449	0,620	0,485	0,725	0,447	0,875	0,330

Notes: The term (-1) indicates that the variable is lagged one period

Table 1 (Continuation)

	Italy		Greece		Spain		Portugal		Austria		Finland	
	Mean	*S.D.*	*Mean*	*S.D.*	*Mean*	*S.D.*	*Mean*	*S.D.*	*Mean*	*S.D.*	*Mean*	*S.D.*
Mover	0,207	0,405	0,199	0,399	0,240	0,427	0,199	0,399	0,242	0,429	0,321	0,467
log(income) (-1)	17,227	0,753	14,981	0,842	14,591	0,813	14,276	0,892	12,745	0,674	11,789	0,687
Household size	3,002	1,363	2,924	1,403	3,086	1,484	2,980	1,515	2,823	1,566	2,565	1,402
Household enlargement	0,033	0,178	0,034	0,180	0,035	0,183	0,035	0,183	0,032	0,176	0,047	0,211
Household reduction	0,239	0,426	0,234	0,424	0,272	0,445	0,240	0,427	0,274	0,446	0,308	0,462
Separated	0,022	0,147	0,008	0,092	0,024	0,152	0,018	0,134	0,010	0,098	0,007	0,085
Divorced	0,012	0,111	0,024	0,152	0,013	0,115	0,028	0,164	0,084	0,277	0,098	0,298
Widowed	0,144	0,351	0,147	0,354	0,159	0,366	0,184	0,388	0,142	0,349	0,065	0,246
Never married	0,083	0,276	0,103	0,304	0,093	0,290	0,057	0,232	0,149	0,356	0,302	0,459
Age	54,136	15,681	53,492	16,479	54,518	16,456	55,922	16,158	52,136	16,423	45,266	16,350
Woman	0,229	0,420	0,250	0,433	0,241	0,428	0,273	0,446	0,348	0,476	0,480	0,500
Dwelling tenure (-1)	13,094	6,646	13,027	6,504	12,692	6,465	13,992	6,282	13,903	6,703	9,841	7,624
Housing satisfaction (-1)	4,201	1,272	3,929	1,243	4,440	1,204	3,998	1,098	5,182	1,044	4,802	1,078
Homeowner (-1)	0,808	0,393	0,848	0,359	0,880	0,325	0,790	0,407	0,658	0,474	0,732	0,443

Notes: The term (-1) indicates that the variable is lagged one period

Table 2: Random-effects probit estimates of the moving decisions, equation (2).

	Denmark		Netherlands		Belgium		France		UK		Ireland	
	Coeff.	z-value	Coeff.	z-value	Coeff.	z-value	Coeff.	z-value	Coeff.	z-value	Coeff.	z-value
Constant	0,335	0,78	0,136	0,46	-1,359	-2,57	-0,886	-3,17	-0,523	-1,51	-1,231	-2,15
log(income) (T-1)	0,075	2,08	0,121	4,63	0,137	3,83	0,170	7,63	0,130	4,13	0,174	3,29
Household size	-0,067	-3,51	-0,094	-5,90	-0,035	-1,80	-0,068	-5,60	-0,071	-3,66	-0,051	-2,35
Household enlargement	0,670	13,55	0,602	13,12	0,596	9,38	0,549	13,61	0,569	9,24	0,344	3,93
Household reduction	0,447	7,87	0,393	7,22	0,057	0,63	0,374	8,01	0,441	7,05	0,107	1,01
Separated	0,514	4,77			0,232	2,36	-0,346	-2,18	0,290	2,66	-0,056	-0,39
Divorced	0,164	2,81	0,045	0,84	0,063	0,89	0,049	1,02	0,108	1,62	-0,037	-0,11
Widowed	0,109	1,41	-0,090	-1,29	0,078	0,86	-0,164	-2,53	0,182	2,02	-0,006	-0,04
Never married	0,029	0,56	-0,045	-0,96	0,014	0,22	-0,082	-2,14	-0,014	-0,23	-0,140	-1,48
Age	-0,064	-9,42	-0,077	-12,08	-0,027	-2,95	-0,051	-9,07	-0,053	-6,60	-0,033	-2,25
Age squared	0,000	7,29	0,001	9,82	0,000	1,75	0,000	6,14	0,000	4,66	0,000	1,30
Woman	0,038	1,14	0,021	0,65	0,063	1,30	0,090	2,75	-0,018	-0,44	0,049	0,66
Dwelling tenure (T-1)	0,015	5,10	0,013	5,50	0,005	1,38	0,005	2,54	0,006	1,84	-0,017	-2,85
Housing satisfaction (T-1)	-0,213	-15,91	-0,297	-23,87	-0,227	-15,10	-0,228	-20,34	-0,160	10,84	-0,153	-7,36
Homeowner (T-1)	-0,234	-5,95	-0,224	-6,69	-0,825	-17,00	-0,681	-20,29	-0,151	-3,13	-0,387	-4,77
$\rho^{(1)}$	0,033	0,004	0,037	0,004	0,037	0,005	0,036	0,003	0,039	0,01	0,041	0,008
Log-likelihood	-3.964		-5.018		-2.485		-6.214		-2.530		-1.049	
N	16.781		31.518		17.998		36.278		13.359		15.625	

Notes: The term (T-1) indicates that the variable is lagged one period; (1) the cell corresponding to the column z-value corresponding to ρ contains correspond the estimated standard error.

Table 2 (continuation)

	Italy		Greece		Spain		Portugal		Austria		Finland	
	Coeff.	z-value	Coeff.	z-value	Coeff.	z-value	Coeff.	z-value	Coeff.	z-value	Coeff.	z-value
Constant	-1,369	-2,89	-3,098	-5,79	-1,383	-3,69	-1,543	-3,30	-1,177	-1,57	-1,168	-3,19
log(income) (T-1)	0,047	1,83	0,154	4,37	0,089	3,73	0,112	3,65	0,150	2,57	0,210	6,64
Household size	-0,009	-0,56	-0,016	-0,73	0,010	0,77	-0,009	-0,54	-0,079	-2,69	-0,111	-6,40
Household enlargement	0,463	7,81	0,281	3,54	0,645	12,08	0,553	7,75	0,582	5,93	0,670	12,25
Household reduction	0,077	1,02	0,138	1,64	0,059	0,88	0,128	1,57	0,018	0,13	0,765	14,43
Separated	0,082	0,83	0,076	0,41	0,266	2,89	0,034	0,23	-0,102	-0,37	0,216	1,26
Divorced	0,368	3,11	-0,133	-0,93	0,153	1,21	0,156	1,39	0,113	1,04	0,111	1,91
Widowed	0,033	0,42	-0,137	-1,30	0,220	3,25	0,220	2,58	-0,145	-0,92	0,110	1,26
Never married	-0,025	-0,35	-0,264	-3,11	0,094	1,56	-0,059	-0,59	-0,032	-0,34	-0,109	-2,14
Age	-0,021	-2,53	-0,022	-2,23	-0,041	-5,46	-0,026	-2,79	-0,041	-3,03	-0,045	-6,57
Age squared	0,000	1,06	0,000	1,26	0,000	3,92	0,000	1,43	0,000	1,70	0,000	4,00
Woman	-0,044	-0,82	0,016	0,24	-0,096	-1,93	-0,178	-2,81	0,025	0,36	0,017	0,51
Dwelling tenure (T-1)	0,000	0,03	-0,002	-0,43	0,003	1,01	-0,010	-2,69	-0,010	-2,03	0,005	1,74
Housing satisfaction (T-1)	-0,131	-9,51	-0,059	-3,26	-0,101	-7,79	-0,177	-8,97	-0,244	-11,15	-0,214	-14,86
Homeowner (T-1)	-0,636	-16,49	-0,963	-18,04	-0,670	-16,71	-0,468	-10,00	-0,892	-9,76	-0,456	-10,35
$\rho^{(1)}$	0,043	0,007	0,041	0,006	0,040	0,006	0,041	0,007	0,042	0,009	0,034	0,004
Log-likelihood	-3.039		-1.967		-3.449		-2.053		-1.029		-3.746	
N	38.955		2.886		33.425		27.284		14.734		15.330	

Notes: The term (T-1) indicates that the variable is lagged one period; (1) the cell corresponding to the column z-value corresponding to ρ contains the estimated standard error.

Table 3: Estimated probability of moving according to the level of housing satisfaction and tenure status in the period previous to the move

		Denmark		Netherlands		Belgium		France		UK		Ireland	
		Renter	Owner	Renter	Owner	Renter	Owner	Renter	Owner	Renter	Owner	Renter	Owner
Not satisfied	1	0,348	0,214	0,336	0,192	0,286	0,087	0,284	0,073	0,182	0,131	0,105	0,030
	2	0,279	0,190	0,239	0,175	0,228	0,049	0,220	0,058	0,178	0,113	0,091	0,024
	3	0,220	0,143	0,152	0,093	0,165	0,034	0,162	0,040	0,138	0,093	0,063	0,018
	4	0,162	0,092	0,086	0,054	0,117	0,021	0,114	0,025	0,099	0,065	0,052	0,013
	5	0,107	0,057	0,046	0,029	0,076	0,011	0,075	0,015	0,077	0,051	0,034	0,009
Fully satisfied	6	0,056	0,030	0,020	0,015	0,039	0,005	0,053	0,009	0,043	0,029	0,022	0,005

Note: Estimates based on equation (12)

Table 3 (Continuation)

		Italy		Greece		Spain		Portugal		Austria		Finland	
		Renter	Owner	Renter	Owner	Renter	Owner	Renter	Owner	Renter	Owner	Renter	Owner
Not satisfied	1	0,084	0,019	0,084	0,006	0,126	0,032	0,072	0,029	0,185	0,040	0,372	0,206
	2	0,067	0,014	0,072	0,006	0,106	0,025	0,057	0,014	0,127	0,024	0,335	0,152
	3	0,054	0,012	0,072	0,006	0,095	0,020	0,049	0,012	0,091	0,015	0,258	0,116
	4	0,045	0,009	0,068	0,006	0,079	0,016	0,036	0,008	0,055	0,008	0,194	0,068
	5	0,035	0,007	0,065	0,005	0,066	0,013	0,027	0,007	0,029	0,004	0,146	0,046
Fully satisfied	6	0,026	0,005	0,059	0,005	0,053	0,011	0,024	0,004	0,017	0,003	0,092	0,026

Table 4: Random-effects linear regression estimates of housing satisfaction growth, equation (5)

	Denmark		Netherlands		Belgium		France		UK		Ireland	
	Coeff.	z-value	Coeff.	z-value	Coeff.	z-value	Coeff.	z-value	Coeff.	z-value	Coeff.	z-value
Constant	0,664	3,03	1,164	9,83	0,487	2,23	0,551	4,87	1,576	6,58	0,685	3,49
Housing satisfaction (T-1)	-0,566	-81,85	-0,565	111,00	-0,565	-83,53	-0,587	125,13	-0,642	-61,91	-0,643	-86,22
Tenure (D-1)	-0,037	-15,11	-0,037	-19,33	-0,036	-11,01	-0,032	-18,55	-0,012	-2,94	-0,020	-3,79
Log(Income) (D-1)	0,087	4,48	0,046	4,15	0,060	3,68	0,090	9,01	0,086	3,05	0,091	4,31
Log(Income) (T-1)	0,132	7,05	0,103	9,91	0,121	8,26	0,149	16,70	0,176	8,05	0,199	11,44
Household size (D-1)	-0,055	-3,60	-0,020	-1,58	-0,048	-2,46	-0,060	-5,60	-0,064	-2,76	-0,027	-1,57
Household size (T-1)	-0,041	-4,66	-0,014	-2,50	-0,040	-4,86	-0,043	-9,18	-0,053	-4,28	-0,065	-8,75
Homeowner (D-1)	0,445	13,34	0,656	22,94	0,713	15,37	0,522	19,89	0,366	5,83	0,205	3,64
House (D-1)	0,468	12,73	0,297	8,69	0,054	1,02	0,190	6,74	0,240	3,39	0,499	5,37
Age	0,018	5,93	0,020	8,70	0,014	3,91	0,015	7,58	-0,001	-0,18	0,025	5,58
Age squared	-0,000	-2,29	0,000	-6,05	-0,000	-1,27	-0,000	-5,37	0,000	1,95	-0,000	-3,65
Woman	0,019	1,16	0,058	4,56	0,012	0,55	0,002	0,11	-0,017	-0,62	-0,050	-1,86
Separated	-0,277	-4,62			-0,239	-4,88	-0,189	-3,65	-0,245	-2,96	-0,400	-7,41
Divorced	-0,165	-6,14	-0,168	-8,32	-0,242	-7,57	-0,160	-8,21	-0,197	-4,63	-0,409	-3,15
Widowed	-0,027	-0,87	-0,036	-1,54	-0,045	-1,34	-0,067	-3,29	-0,018	-0,36	-0,070	-1,84
Never married	-0,157	-6,25	-0,166	-9,05	-0,145	-4,82	-0,098	-5,99	-0,170	-4,16	-0,297	-8,70
$\rho^{(1)}$	0,069		0,064		0,074		0,063		0,257		0,140	
R^2 (overall)	0,300		0,296		0,274		0,299		0,250		0,274	
N	16.630		31.353		17.639		36.036		8.710		14.649	

Notes: The term (T-1) indicates that the variable is lagged one period; (D-1) indicates a first difference.

Table 4 (continuation)

	Italy		Greece		Spain		Portugal		Austria		Finland	
	Coeff.	z-value	Coeff.	z-value	Coeff.	z-value	Coeff.	z-value	Coeff.	z-value	Coeff.	z-value
Constant	-0,141	-1,25	-2,140	-12,67	-0,138	-0,91	-0,178	-1,43	0,573	2,84	1,051	5,32
Housing satisfaction (T-1)	-0,514	119,23	-0,649	122,38	-0,669	130,87	-0,448	-90,72	-0,553	-76,30	-0,578	-78,95
Tenure (D-1)	-0,022	-7,75	-0,024	-5,66	-0,035	-11,43	-0,042	-14,85	-0,057	-12,80	-0,034	-13,98
Log(Income) (D-1)	0,152	14,74	0,247	20,64	0,108	10,67	0,104	9,67	0,101	5,98	0,069	3,18
Log(Income) (T-1)	0,199	21,37	0,341	31,26	0,198	20,53	0,137	17,56	0,147	9,56	0,123	7,11
Household size (D-1)	-0,040	-2,95	-0,063	-4,19	-0,068	-4,97	-0,050	-4,63	-0,039	-2,24	-0,043	-2,61
Household size (T-1)	-0,046	-8,80	-0,073	-10,91	-0,067	-12,28	-0,048	-10,39	-0,035	-5,22	-0,007	-0,86
Homeowner (D-1)	0,283	7,96	0,281	6,04	0,217	5,74	0,431	10,38	0,168	3,41	0,538	14,46
House (D-1)	0,128	2,17	0,129	1,73	0,137	2,16	-0,140	-2,34	0,098	1,10	0,271	7,10
Age	0,019	7,58	-0,003	-1,13	0,014	5,17	0,010	4,10	0,018	5,14	0,003	0,81
Age squared	-0,000	-7,93	0,000	0,06	0,000	-4,63	0,000	-4,77	0,000	-3,91	0,000	1,82
Woman	0,010	0,56	0,022	1,03	0,055	2,63	-0,041	-2,34	0,001	0,04	0,062	3,68
Separated	-0,196	-5,08	-0,052	-0,70	-0,246	-5,64	-0,223	-5,34	-0,057	-0,72	-0,003	-0,03
Divorced	-0,145	-2,92	-0,256	-5,47	-0,263	-4,73	-0,165	-4,81	-0,168	-5,07	-0,066	-2,25
Widowed	-0,068	-2,97	-0,070	-2,60	-0,131	-5,15	-0,051	-2,44	0,002	0,06	0,019	0,51
Never married	-0,129	-5,42	-0,236	-8,63	-0,180	-6,97	-0,131	-4,94	-0,124	-4,23	-0,056	-2,18
ρ	0,035		0,075		0,020		0,059		0,131		0,098	
R^2 (overall)	0,254		0,315		0,338		0,215		0,240		0,293	
N	38.559		27.469		32.812		27.109		14.689		14.827	

Notes: The term (T-1) indicates that the variable is lagged one period; (D-1) indicates a first difference.

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