Does Rent Deregulation Influence Housing Tenure Choice? The Case of the Czech Republic

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Abstract

The choice between buying and renting house is usually referred to as tenure choice. Existing literature defines several typical factors (patterns) which influence this key decision every household has to make. In our analysis we propose one more factor which might be of interest. Based on the data covering last phase of the rent deregulation process in the Czech Republic (CR) in 2005 – 2011 we assess to what extent rent deregulation in the CR has influenced the tenure choice patterns. Our analysis using logit model did prove that regulated rents were an important factor affecting tenure choice. After deregulation households living in apartments with regulated rent preferred to buy house rather than stay in rental sector. The results show that also in the CR was tenure choice influenced by household income, education, marital status. By contrast, gender, age, number of children or retired persons in the household turned out to be insignificant.

Keywords: *housing, tenure, choice, factors, logistic regression*

JEL Classification: D12, P36, R21

1. Introduction

The choice between owning and renting house, which is one of the key decisions made by any household, is usually referred to as tenure choice. This issue has been drawing attention of researchers for many years. They focus mostly on identifying the determinants which are relevant to the decision of households to own or rent their housing as well as on establishing the degree of their impact. A host of authors view tenure choice as an independent decision. Nevertheless, a more common opinion has it that the choice of home type is only one part of all the other decisions that households have to make in relation to consumption

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and investment (Turner and O'Neal, 1986). Thus tenure choice is typically ana-
lysed in connection with household mobility (Boehm, 1981; Krumm, 1984)
housing attributes (dwelling characteristics – Boehm, 1982; Andersen, 2009), as
an element of consumption and investment decisions (Artle and Varaiya, 1978;
Henderson and Ioannidis, 1983) or with respect to household attributes (Burgess,
1982; Coolen, Boelhouwer and Driel, 2002; Bazyl, 2009).

Tenure choice is probably most frequently examined in connection with house-
hold attributes. A wide range of these characteristics can be categorized into two
basic groups, namely socio-economic and demographic ones. Burgess (1982)
identified impact of individual characteristics of the household head on tenure
choice. According to Burgess, the probability of living in one's owned house is
significantly influenced by the head's age, household size and current income in
both types of households (male headed/female headed). A statistically significant
but negative impact was confirmed in case of welfare income and living in the
city centre. Second income and employment status had no influence.

Bazyl (2009) was also involved in analysing an impact of the above factors
on tenure choice. She labelled them socio-demographic characteristics of house-
holds and compared their importance across several European countries. Per-
formed analyses led her to a conclusion that marriage proved to be an important
factor influencing the decision to buy a home in all analysed countries without
exception. In most countries the fact that the household head is a citizen of that
country (i.e. they are not foreigners) can be even more significant than the mar-
riage itself. In most countries the odds of homeownership grows with higher age
of the household head and his/her income. Bazyl gradually expanded her basic
model – in one of them she investigated only recent migrants. This last case
demonstrated that the impact of income on tenure choice is many times greater
than the model involving all households.

An alternative approach is developed by Coolen, Boelhouwer and Driel
(2002). In their paper they deal with the impact of life goals and values of
households on their preferences for the given housing type. Using the means-end
model they proved that about 91% of decisions made about a type of housing are
influenced by particular household characteristics, such as age, income, house-
hold composition etc.

Ulker (2008) claimed that surprisingly little attention had been given to the
impact of individual characteristics on a household's housing expenditures, although
a host of authors studied a mutual relationship of these characteristics and the
decisions of households about consumption and investment. Ulker proved that
home ownership is more likely to be chosen by a household headed by a married
white man in his fifties with higher education. In his view, housing expenditures

for homeowners are relatively less significant in proportion to the total budget of the household if the number of its working members goes up. Alternatively, renters (who have lower mobility costs) can be more flexible in adapting housing to their needs. As a result, their expenditures on housing and on other goods are proportionally allocated. Despite many differences all the researchers studying tenure choice in connection with household attributes agree that the level of income has the most profound impact on the outcome of household decisions.

Tenure choice is mostly analysed from the microeconomic perspective, since it examines individual decision-making of households depending on various factors shown above. Nevertheless, the mutual proportions of homeownership and renting are also influenced by other factors such as inflation, taxes, unemployment rate, interest rates or credit availability. Influence of these macroeconomic determinants was studied e.g. by Fischer and Jaffe (2003). According to their analyses GDP has a positive but statistically insignificant effect on homeownership rate. The effect of inflation remains unproven. They did not restrict their research to the above factors only. Their ambition was to *"seek to evaluate the potential impacts of social, political, legal, cultural and other variables"* in order to understand *"homeownership as an international phenomenon"*. They concluded that they had found some factors associated with homeownership rates but they failed to develop „*a single equation model with the comprehensive explanatory power of homeownership as a global pattern*"(Fischer and Jaffe, 2003, p. 37).

The issues of tenure choice were touched on by Czech authors as well. While Špalková and Špalek (2014) connected the choice of tenure with the housing expenditures, Lux and Sunega (2012) assessed the influence of the form of ownership (i.e. only tenure) on mobility. Using family accounts statistics, Tsharakyan and Zemčík (2011) studied whether the rent deregulation had an impact on households renting behaviour or their ownership status (renters vs. owners). None of the above papers is devoted to the analysis of tenure choice itself.

Our analysis is oriented onto the selected factors of the tenure choice in line with the above theoretical models and their empirical results. We have enhanced this kind of analysis with introducing one more factor. On basis of the data covering the last phase of the rent deregulation process in the Czech Republic we try to capture the relative importance of the process on forming the tenure choice pattern of the Czech households.

Rent control is integral part of housing policy in many countries (for survey of various systems of the rent control see Arnott, 1995 or Lind, 2001). Haffner, Elsinga and Hoekstra (2008) characterize particular forms of these systems in several countries and discuss reasons for the rent control policy. This is topical in the Central and Eastern European (CEE) countries as the transformation period

was accompanied by the re-definition of the housing policy with large privatisation of the housing stock followed by discussions on the rent control abolishment. Still there is no agreement on the unique housing policy concept, but as pointed Hegedüse and Tosics (1998), integral part of every system should be rental sector based on at least cost-covering rents. Lux and Sunega (2010) summarize the development of the private rental sector in the Czech Republic (CR) after 1990. Proposal of the state support of the social rental housing in the CEE countries can be found in Sunega et al. (2011).

Our paper has combined two of the above mentioned approaches towards the exploration of tenure choice. Based on the results of the econometric model, we have defined the factors that affect tenure choice of Czech households over the period 2005 – 2011. Using the acquired factors we have further quantified their impact on the selected samples of migrants and renters. The aim is to assess, whether and to what extent has rent deregulation in the CR influenced the tenure choice patterns. We will verify if the same factors as in other countries affect tenure choice as well as to find out whether the ongoing deregulation affected tenure choice.

2. Material and Methods

As shown above, our approach relies on the quantitative analysis of sampled data. In order to analyse tenure choice we have applied an econometric model in accordance with the most frequent approaches. The model relies on a form of a regression logit model (e.g. Bazyl, 2009; Ulker, 2008). This approach allows us (using the so-called odds ratios) to capture the individual influences of each set of potential factors that may affect tenure choice. The model enables to calculate the conditional probability of the choice of a particular type of housing depending on a given factor, provided that the values of other factors are constant. In this paper we have used a logit model, which has the following formula (Wooldridge, 2006):

$$\log \frac{\pi}{1-\pi} = \beta_0 + \beta_1 X_1 + ... + \beta_k X_k \tag{1}$$

where

π – probability of homeownership for a given value of x and takes the form of normal cumulative distribution function:

$$\pi = \Phi(z) = \int_{-\infty}^{z} \frac{1}{\sqrt{2\pi}} e^{-\frac{u^2}{2}} du$$

x_k – explanatory variables (see below),

β_k – coefficients estimated by the logit model.

The values of the coefficients β_k express the effect of each factor on the tenure choice and at the same time show its direction. We refer to homeownership as the default choice, because the values of the coefficients β_k are related to this option. Positive values of the coefficient β_k therefore indicate that higher values of factor x_k increase the likelihood of choosing home ownership. On the other hand, negative values indicate that there is a greater likelihood of choosing rental in case of high values of factor x_k. Then for those factors with a dichotomous nature (Yes = 1/No = 0), lower values of the factor mean 'No' and its higher values 'Yes'.

The analyses included in this paper are based on the data pertaining to Czech households collected by the CSO (The Czech Statistical Office). The data were collected under sample surveys of income and living conditions of households between 2005 and 2011, under the Living Conditions Programme (called hereinafter the EU-SILC). This data set contains information on the social structure of households, their incomes and expenditures. The dates relate to the date of the investigation, i.e. the defined date in the spring of that year, only incomes are listed for the previous year. The sample selected is considered to be a minimally distorted representative sample of Czech households (e.g., a total 8,866 households were examined in SILC 2011). To make this subsample of households applicable for the entire country, a new PKOEF coefficient showing the weight of each household examined was constructed. For the purpose of our analysis (described in more detail in the sections 3.2 and 3.3) we developed pseudo-panel data sample. The household investigated by EU-SILC survey usually stays four years in the panel and up to one third of the panel is annually renewed. This enabled us to analyse changes of households' characteristics between two (or more) years.

In the data sets, households are divided into five groups according to the form of ownership. For the purposes of our analysis, however, the relevant division is the category of home ownership or that of rented housing. Homeownership comprises of three different forms – living in an owned house, in an apartment in personal ownership, and an apartment in cooperative ownership. Lease and rental of the whole apartment fall into the category of rented housing.

After calculations for the entire population of the CR it was ascertained that the percentage of homeownership significantly exceeds the percentage of rented housing and keeps increasing over time. The ownership percentage grew from 73.6% in 2005 to 80.6% in 2011 (see Table 1). If we de-compose the percentage of migrants, we found that majority of migrants come from rental sector (90%). The structure according to this indicator (after calculations for the entire population of the CR) is as follows:

T a b l e 1

Household by Tenure Status (%)

	2005	2006	2007	2008	2009	2010	2011
Owner-occupied	73.6	74.1	74.9	76.0	76.8	79.1	80.6
Tenant	26.4	25.9	25.1	24.0	23.2	20.9	19.4
- market rent	5.5	5.5	5.4	5.7	6.2	5.5	14.4
- regulated rent	20.9	20.4	19.7	18.3	17.0	15.4	4.9
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0
- migrants	–	–	–	6.4	7.9	5.0	

Source: Authors, SILC database 2005 – 2011.

This development was the logical result of gradual privatisation of the housing stock in the past. Privatisation, however, is slowly becoming a thing of the past, and so a question emerges: What factors have caused this development in recent years? To what extent have demographic and socioeconomic characteristics affected household's choice of the type of housing? Which of these characteristics has been statistically the most significant? Has the structure of the households in both sectors changed in any way?

The hypothesis of our research analysis is as follows: "Home ownership is preferred in households where the household head has a higher than basic education and is married. Rented housing is preferred by lower-income households that are 'incomplete', specifically, divorced persons with children." (H)

The rent paid for an apartment is one of the most significant items of household expenditure related to housing. Attention is paid to it, not only because of its high ratio in household expenses, but also because it has a substantial impact on the quality of housing (and hence life) of individual households. In the Czech Republic there were changes in the rent control. Low and regulated rent was not able to cover the necessary costs associated with the operation and maintenance of housing. Efforts to increase the rents to a market level (after 1989) have long been unsuccessful (Jahoda and Špalková, 2012). Finally, the deregulation act (Act No. 107/2006 Coll.) has brought a unilateral increase of the level of rents. Four-year process of deregulating rents was begun in January of 2007, intended to lead to a convergence of regulated and market rents. The process covers more than 750 thousands of rental apartments (80% of the rental sector). The beginning of the deregulation process was also tied to the introduction (redefinition) of social benefits intended to ameliorate its impact on households. The deregulation process took form of the gradual (annual) increase of the regulated rent based on average local real estate prices. Target level of the annual rent was set to 5% of the house/apartment price (Jahoda and Špalková, 2009). By 2011, rent control was therefore to be completely eliminated, with rent prices exclusively determined by the market. In 2009, however, the law was amended, primarily

because of fears concerning the social situation of families living in rental housing. These fears resulted in adjustment of the rate of deregulation deriving from the rise in real property prices. The amended act allowed for the end of deregulation to be pushed to the end of 2012 in selected cities and localities (larger cities including Prague). This amendment act applied to about 40% of rent-controlled apartments. Rent control in Czech Republic was finally abolished by the end of 2012.

3. Results and Discussion

In respect to the above hypothesis, we divided our analysis into three steps. First, the factors affecting tenure choice of the complete sample of Czech households are derived on the tenure choice model (section 3.1). Second, the robustness of the results is tested by the application of the same model onto the subsample of Czech households. Only those households that moved their house during the selected period (and had to really choose their tenure) were subject to the analysis (section 3.2). Third, the effects of the rent deregulation onto the tenure choice are tested via second subsample. We selected only households living in the rental sector (both regulated and market rents – section 3.3). We presume that these types of households are those which might have been influenced by the deregulation process most. The process might force the households to move their house and to doubt the changing of the tenure. The households living in the time $t – 1$ in the rental sector could move in the time t to the owner sector or to stay in rental one.

In line with the above hypothesis, we focused on the examination of the impact of the demographic and socio-economic characteristics of the households on tenure choice. To some extent, the range of potential factors is determined by the used data source. Potential factors mostly comprise characteristics monitored within SILC survey (i.e. our source of data), or variables that can be derived from monitored characteristics.[1] In accordance with the proposed hypothesis we have concentrated on the household heads – their age, gender and marital status and also on the household from the perspective of its economic status, disposable income or number and age of children.

3.1. Housing Tenure Choice – Complete Czech Households Sample

First our attention is paid to the complete sample of Czech households in our data set. As noted above, this sample comprises 8,866 Czech households.

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[1] Definitions of individual factors are based on survey methodology and can be found in Commission Regulation (EC) No. 1983/2003.

In examining the factors influencing tenure choice we use the vector of variables shown in Table 2. The table also provides average values of individual factors in households living in their own home (apartment or house) and households living in rented housing in 2011. The variables with greatest differences can be seen as potential factors influencing tenure choice.

T a b l e 2
Summary Statistics by Tenure Status (explanatory variables), 2011

Type of ownership	Owners		Renters		Total	
	Mean	SD	Mean	SD	Mean	SD
Household size (number of persons)	2.567	1.222	2.301	1.295	2.515	1.241
Number of economically active persons	1.153	0.970	0.987	0.888	1.121	0.957
Number of self-employed	0.204	0.470	0.154	0.411	0.195	0.459
Age of household head	53.194	15.525	48.256	17.377	52.238	16.020
Gender of household head (0 = F;1 = M)	0.792	0.406	0.648	0.465	0.771	0.420
Education in the household						
(1 = both primary school, 0-higher)	0.065	0.247	0.113	0.317	0.075	0.263
Household head is single*	0.126	0.332	0.267	0.442	0.153	0.360
Household head is married*	0.615	0.487	0.388	0.487	0.571	0.495
Household head is divorced*	0.142	0.349	0.222	0.416	0.157	0.364
Household with children*	0.353	0.478	0.333	0.471	0.349	0.477
Children under two years*	0.079	0.270	0.090	0.287	0.081	0.273
Fully employed household	0.030	0.170	0.072	0.258	0.038	0.191
At least one retiree	0.276	0.447	0.233	0.423	0.267	0.443
Household head works in public sector*	0.026	0.160	0.021	0.145	0.025	0.157
Household resides in Prague*	0.107	0.309	0.258	0.438	0.136	0.343
Total floor area per person	38.889	22.751	31.571	17.206	37.473	21.979
Household income (disposable)	12.659	0.592	12.440	0.625	12.617	0.605

* Dichotomous variables take values 1 (Yes) / 0 (No). SD – standard deviation.
Source: Authors.

As seen from the table, larger households (according to the number of its members) preferred homeownership to rented housing. At the same time these households were characterized by a higher number of economically active members or a higher number of the self-employed. As a rule, household head living in their own house or apartment was a married male, average age around 53 with higher than basic education. Typically, home ownership was related to a larger total floor area per person but it must be noted that it ranged from 14 m^2 (150.69 ft^2) to 60 m^2 (645.83 ft^2) per person. Households having at least one retired person tended to live in the homeownership sector. In contrast, households living in rented housing were headed by a woman with lower education and lower age (about 48 years). The woman was more often single or divorced than married. Households with no economically active member (and at least one unemployed) were more frequently found in rented housing. These households had considerably lower income in comparison with the households in the homeownership sector. However, there was no marked difference between home owners and renters as far as children are concerned (or babies up to two years of age). Virtually no impact on tenure choice was observed whether the household head was working in the public sector or not.

The above characteristic of households, based on average values of investigated factors, must be taken as tentative. There could be a correlation between the analysed factors. In other words, differences in average values between rented and ownership housing can be caused by multiple factors, or an impact of other, latent variable. In order to distinguish a real impact of investigated factors on tenure choice it is necessary to use the econometric model, based on the logit estimation.

Results of the regression analysis examining tenure choice determinants are summarized in Table 3. Marginal effect β_k is computed not only for the year 2011 but they also cover a seven-year time span (2005 – 2011). This enables to assess trends of development of these effects.

T a b l e 3

Logit Estimation Results for Housing Tenure Choice (1 = owner)

Factor (x_k)	Marginal effect (β_k)**						
	2005	2006	2007	2008	2009	2010	2011
Constant	5.744	4.846	4.174	4.365	5.521	5.484	5.550
Household size (number of persons)	0.134	0.186	0.190	0.235	0.190	0.151	0.143
Number of economically active persons	0.186	0.051	0.012	0.014	0.020	0.007	0.022
Number of self employed	0.082	0.160	0.171	0.131	0.086	0.059	0.030
Age of household head	0.020	0.017	0.014	0.013	0.018	0.015	0.014
Gender of household head (0 = F;1 = M)	0.020	–0.046	–0.067	–0.001	0.025	–0.021	0.017
Education in the household (1 = both primary school, 0-higher)	–0.258	–0.283	–0.239	–0.278	–0.320	–0.235	–0.299
Household head is single*	0.364	0.176	0.107	0.211	0.196	0.092	0.165
Household head is married*	0.519	0.470	0.455	0.479	0.469	0.369	0.454
Household head is divorced*	0.177	0.059	–0.041	–0.024	0.045	–0.009	0.079
Household with children*	0.161	–0.010	–0.054	–0.036	–0.053	0.120	0.174
Children under two years*	0.099	0.096	0.137	0.037	0.200	0.013	–0.078
Fully unemployed household*	0.183	–0.045	–0.320	–0.289	–0.195	–0.096	0.038
At least one retiree*	0.134	–0.092	–0.090	0.033	–0.070	0.001	0.108
Household head works in public sector*	0.184	0.236	0.196	0.151	0.084	0.043	0.158
Region							
Prague*	–0.927	–0.792	–0.740	–0.745	–0.663	–0.527	–0.641
Moravia-Silesia*	–0.686	–0.525	–0.475	–0.589	–0.427	–0.219	–0.261
South Moravia*	–0.164	–0.281	–0.349	–0.430	–0.280	–0.052	–0.023
Ústí nad Labem*	–0.186	–0.069	–0.135	–0.203	–0.200	–0.122	–0.158
Central Bohemia*	–0.005	0.296	0.261	0.174	0.186	0.276	0.255
Zlín*	0.116	0.343	0.299	0.270	0.220	0.401	0.362
Olomouc*	–0.333	–0.060	–0.133	–0.252	–0.160	0.216	0.309
Karlovy Vary*	–0.122	0.064	–0.131	–0.101	–0.042	0.047	0.235
Plzeň*	–0.249	–0.085	–0.083	–0.181	–0.222	0.101	0.142
South Bohemia*	–0.211	–0.095	–0.121	–0.174	–0.286	–0.084	–0.079
Vysočina*	0.340	0.243	0.152	0.030	0.190	0.232	0.326
Hradec Králové*	–0.083	–0.067	0.029	–0.091	–0.064	0.083	–0.036
Liberec*	–0.790	–0.351	–0.316	–0.416	–0.293	–0.004	–0.144
Total floor area per person	0.025	0.026	0.026	0.026	0.025	0.023	0.022
Household income (disposable)	0.314	0.261	0.228	0.238	0.314	0.333	0.338
N	4 161	7 185	9 273	10 787	9 502	8 756	8 504
Nagelkerke R^2	0.277	0.275	0.258	0.254	0.243	0.212	0.277

* Dichotomous variables take values 1 (Yes) / 0 (No). ** All values are statistical significant at 99% level (t-statistics are upon request by authors).

Source: Authors.

As expected, one of the most significant factors affecting the choice of type of housing in 2011 (as in other years) was the marital status of the household head ($\beta^{2011} = 0.454$). If the household head was married, the odds of choosing homeownership increased. The analogous assumption, i.e. that single or divorced persons would more likely prefer rented housing, was not confirmed. On the contrary, the singles were more likely to choose homeownership even if the strength of this factor was far weaker. The other strong factor was the net disposable income of households ($\beta^{2011} = 0.338$). Higher-income households tend to prefer homeownership to renting. The importance of this factor was growing over the covered period. Among other strong (and statistically significant) factor, affecting tenure choice in 2011, was education of household members ($\beta^{2011} = -0.299$). Our findings showed that households with lowest level of education (both primary education maximally) was more likely to choose rented housing. The most significant factor affecting tenure choice was residence in Prague ($\beta^{2011} = -0.641$). This can be linked with a high proportion of rented flats as compared with privately owned flats (or houses) in the capital city and so renting is a much faster and simpler way to acquire a new home there. Prague is also a university city, where many students and mainly graduates obviously prefer renting. At the beginning of the analysed period the same situation was in five other regions (South Bohemia, South Moravia, Moravia-Silesia, Ústí nad Labem and Liberec). With the deregulation process the probabilities β decrease and become less important. On the other hand, three Czech regions (Central Bohemia, Zlín and Vysočina) are typical of large owner occupied sector. This might be caused, beside other factors, by high proportion of the newly constructed houses (compared to the rest of the country).

Others factors affecting tenure choice can be found. Rented housing was chosen with high probability by the households with a lower number of persons ($\beta^{2011} = 0.143$). So the results corroborate the assumption that homeownership is affordable only for higher-income households, which usually corresponds to higher education. This housing type is preferred by families (not individuals), i.e. a higher number of persons per household, and also by households, whose members work, since it is necessary to make regular mortgage payments (i.e. the past significance of the number of economically active persons grew much weaker in 2011). For the second time children within a household became significant towards choosing homeownership in 2011 ($\beta^{2011} = 0.174$). The influence of other factors, i.e. the number of self-employed, age or gender of the household head and the total floor area per person was not established.

By contrast, a sharp decline in the significance of economically active persons per household as a determining factor for tenure choice was observed

throughout the period. While in 2005 a higher number of economically active persons markedly increased the odds of homeownership choice, ($\beta^{2005} = 0.186$), by 2011 this factor nearly lost its significance ($\beta^{2011} = 0.022$). An impact of the number of the self-employed per household, single or divorced persons, children, retired persons or fully unemployed persons is rather variable and hence uncertain over the long term.

Table 3 also indicates the development trends of the individual factors in tenure choice over the period 2005 – 2011. Throughout this period the following factors had a decisive effect on tenure choice: income of the household; education of its members; whether the head of the household was married or not. If the head of the household was married, the members of the household had a higher than basic education and a higher income, it implies the choice of homeownership. Our results in this respect correspond to the results of similar foreign studies. Ulker (2008) in his article showed that there was a highly significant influence of socio-economic characteristics, such as income and education on the tenure choice of households in the USA. Both Ulker (2008) and Bazyl (2009) confirmed a decisive impact of marriage on tenure choice of households throughout all monitored European countries.

3.2. Housing Tenure Choice – Subsample of Migrants

Tenure choice model was applied also to the subsample consisted of the households that have moved during the period 2008 – 2011. The subsample comprises 1,142 Czech households (equals 426,806 households in the whole population).[2] Results show that also for such households (that had to decide on the choice of the tenure) there are the same four key factors that influence the decision: marital status of the household head (married), the net disposable income of households, education of households' members and residence in Prague. Compared to the complete sample there are differences in the relative strength of the factors (see Table 4).

The most important factor that influences the tenure choice decision for moving households is again the residence in Prague ($\beta^{2010-2011} = -0.432$). If the moving household is from Prague and at the same time household members have lower education ($\beta^{2010-2011} = -0.210$), there is high probability that the household will move to the rental sector. The second strongest factor was the marital status of the household head – marriage ($\beta^{2010-2011} = 0.339$). The same applies for the net disposable income ($\beta^{2010-2011} = 0.247$) while the influence of both factors is somewhat weaker compared to the complete sample.

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[2] The method how the households that moved have been recognized in our sample is upon request from the authors.

T a b l e 4

Logit Estimation Results for Housing Tenure Choice (1 = owner) for Migrants

Factor (x_k)	Marginal effect (β_k)[**]		
	2008 – 2009	2009 – 2010	2010 – 2011
Constant	2.837	4.246	4.047
Household size (number of persons)	0.146	0.135	0.120
Number of economically active persons	0.026	0.039	0.061
Number of self-employed	0.074	0.004[n]	0.119
Age of household head	0.011	0.014	0.010
Gender of household head (0 = F;1 = M)	–0.053	–0.001[n]	0.014
Education in the household (1 = both primary school, 0-higher)	–0.287	–0.198	–0.210
Household head is single*	0.133	0.108	0.079
Household head is married*	0.369	0.269	0.339
Household head is divorced*	–0.025	–0.022	–0.007
Household with children*	–0.045	0.108	0.130[n]
Children under two years*	0.034	0.086	0.012
Fully unemployed household	–0.429	–0.236	0.027
At least one retiree	0.015	–0.071	0.115
Household head works in public sector*	0.076	–0.081	0.033
Region			
Prague*	–0.629	–0.491	–0.432
Moravia-Silesia*	–0.485	–0.230	–0.229
South Moravia*	–0.332	–0.007	0.076
Ústí nad Labem*	–0.140	–0.142	–0.067
Central Bohemia*	0.137	0.263	0.302
Zlín*	0.170	0.412	0.367
Olomouc*	–0.227	0.176	0.383
Karlovy Vary*	–0.031	0.063	0.250
Plzeň*	–0.227	0.084	0.217
South Bohemia*	–0.273	–0.060	–0.059
Vysočina*	0.086	0.248	0.464
Hradec Králové*	–0.033	0.082	0.122
Liberec*	–0.381	0.037	–0.160
Total floor area per person	0.019	0.020	0.020
Household income (disposable)	0.167	0.253	0.247
N	459	397	286
Nagelkerke R^2	0.181	0.166	0.171

* Dichotomous variables take values 1 (Yes) / 0 (No). ** All values are statistical significant at 99% level (t-statistics are upon request by authors) excluded the coefficient market [n].

Source: Authors.

Besides the four key factors other factors that influence the behaviour of moving households can be found. Interesting is the development of the influence of the rate of economic activity in the household. While in the complete sample the factor is of low importance, moving households with self-employed household head are more likely to choose ownership of the house or apartment ($\beta^{2010\text{-}2011} = 0.119$). Mixed results can be found for fully unemployed households. While in the beginning of the period analysed it was more likely for fully unemployed household to move to the rent ($\beta^{2008\text{-}2009} = –0.429$) in the end it was opposite ($\beta^{2010\text{-}2011} = 0.027$). Again, the influence of the deregulation process on the tenure choice patterns can be illustrated by the regional dummy variables. As the deregulation moved further, the propensities to choose owner occupied housing increase in large part of the regions (or the propensities to choose rental decrease).

3.3. Influence of Rent Control on the Housing Tenure Choice –
Subsample of Renters

One of the principal aims of our analysis is to assess potential influence exerted by rent deregulation (and its phasing out in the CR) on the spectrum of factors influencing tenure choice. Therefore our attention is focused on the households in rented housing only (whether with market or controlled rents). We thus explored behaviour of almost a fifth of population (19.4%) in 2011. We chose only the households really affected by the deregulation process and could face the decision whether to remain in deregulated rented housing or to leave for the ownership sector. At the period $t – 1$ these households lived in the rental sector while in the period t they could choose between rental and owner. In order to simulate hypothetical decision-making on (not) moving a house,[3] we deduced their household tenure choice from their housing type in the following year.

The results of regression analysis exploring the tenure choice determinants are summarized in Table 5.

Borderline effects of individual factors β_k are calculated not only for the base year 2010 (and related housing type in 2011) but also include the entire period of the last deregulation stage in the CR, i.e. from 2007 to 2011. In such a manner we can evaluate potential development trends in this field.

Compared with the results shown above (3.1 and 3.2), the established factors and their impacts differ considerably. The influence of household income is also observed but in contrast with previous results it is mixed. While in early stages of deregulation the influence was fairly "standard" and higher-income households were more probable to prefer owning to renting, after deregulation the trend was completely reversed. After the year 2010 – 2011 a decreasing income had a tendency towards increasing homeownership probability ($\beta^{2010\text{-}2011} = –0.217$). On the other hand, Prague residents increasingly tended to choose rented housing. Undoubtedly, it was strongly affected by the fact that the sample of rented apartments continuously diminished and households in Prague, where the rental sector is traditionally most strongly represented, played more and more important role.

The deregulation process also changed the behaviour of households with children, which more often bought their own housing, particularly towards the end of deregulation (in 2007 it was exactly the opposite). A gradual drop in the households living in rent-controlled apartments during that period resulted in gradual weakening of the deregulation factor (variable *regulated rent*) and its

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[3] Even the decision "not to move" from an apartment following rent deregulation is relevant to our analysis.

influence on tenure choice. Its direction, however, remained the same throughout the entire period – households living in rent-controlled apartments were more likely to choose home ownership rather than renting.

Household head status as well as their education played a very uncertain role in our sample of households in rented housing. The results failed to confirm the formerly established trend – which married household heads with higher education chose to own their housing. Again influence of regional factor (Prague excluded due to the persisting rent control) is becoming less favourable for rental sector.

T a b l e 5

Logit Estimation Results for Housing Tenure Choice for Renters

Factor (x_k)	Marginal effect (β_k)**			
	2007 – 2008	2008 – 2009	2009 – 2010	2010 – 2011
Constant	4.466	2.836	–0.058	–0.627
Household size (number of persons)	0.142	–0.075	–0.065	–0.008
Number of economically active persons	–0.002^n	–0.044	0.224	0.330
Number of self-employed	–0.327	–0.135	–0.344	0.074
Age of household head	0.000^n	0.013	0.006	0.003
Gender of household head (0 = F;1 = M)	0.125	0.047	0.004^n	0.011^n
Education in the household (1 = both primary school, 0-higher)	–0.093	–0.520	–0.125	–0.055
Household head is single*	0.220	0.432	–0.160	–0.136
Household head is married*	0.175	0.190	–0.097	–0.111
Household head is divorced*	0.103	0.195	–0.107	–0.219
Household with children*	–0.208	0.026	0.249	0.133
Children under two years*	–0.325	0.212	0.005^n	0.178
Fully unemployed household	–0.265	–0.080	–0.278	0.389
At least one retiree	0.072	–0.244	0.145	0.588
Household head works in public sector*	–0.581	0.372	0.043	0.181
Region				
Prague*	–0.374	–0.634	–1.405	–0.976
Moravia-Silesia*	–0.587	0.130	–0.053	0.140
South Moravia*	–0.826	0.174	0.199	0.444
Ústí nad Labem*	–0.289	–0.080	–0.295	0.465
Central Bohemia*	0.107	–0.028^n	0.180	0.550
Zlín*	–0.045	–0.243	0.085	0.684
Olomouc*	–0.033^n	0.057	0.423	0.691
Karlovy Vary*	–0.057	0.002^n	–0.120	0.923
Plzeň*	–0.301	–0.213	0.356	0.444
South Bohemia*	–0.434	0.057	–0.084	0.428
Vysočina*	–0.323	0.250	–0.278	1.054
Hradec Králové*	–0.027^n	0.373	0.186	0.288
Liberec*	–0.097	0.017^n	0.091	0.167
Total floor area per person	0.007	0.001	0.005	0.001
Household income (disposable)	0.180	0.067	–0.119	–0.217
Regulated rent	0.295	0.256	0.080	0.162
N	1 916	1 637	1 400	1 221
Nagelkerke R^2	0.076	0.082	0.161	0.153

* Dichotomous variables take values 1 (Yes) / 0 (No). ** All values are statistical significant at 99% level (t-statistics are upon request by authors) excluded the coefficient market ^{n}.

Source: Authors.

Conclusion

As in other countries, many factors influence the decisions of Czech households to live in rented housing or in their own home. Although the motive of homeownership as a long-term investment cannot be neglected, most studies report that the greatest influence is exercised by demographic and socio-economic composition of household. Our results corroborate this assumption to a considerable degree. During 2005 – 2011 tenure choice in the Czech Republic was particularly influenced by household income, education of its members, marital status of the household head (married, single or divorced), residence in Prague or elsewhere. By contrast, gender or age of the household head, children or retired persons living in the household proved to be insignificant. The results greatly support our hypothesis proposed at the beginning of our research. We have succeeded in confirming the hypothesis that higher education of household members (including the household head) and marriage of the household head are more likely to lead to homeownership. However, the second part of our hypothesis has only partly been supported. It has been confirmed that the lower the income of a household indicates that the household prefers rented housing. On the other hand, incomplete households (e.g. divorced persons with children) have not been proved to prefer renting.

The robustness of the results has been tested via application the model to subsample of households who really decided on the type of tenure (moved their house during the period). The overall results (i.e. factors that influence the tenure choice) are similar to ones for the complete sample. On this basis we suggest that the logit model used for analysing of the tenure choice can be considered appropriate to such kind of analysis.

The households in apartments, whose rent was gradually deregulated, more often tried to resolve the question whether to stay in the rental sector (paying higher market rents) or to opt for buying their own home. And the analysis using the econometric (logit) model did prove that regulated rents were really an important factor affecting tenure choice. Households living in rent regulated flats preferred to move to the ownership sector rather than stay in the market rental sector. Along with the progressive deregulation the impact of this factor was diminishing and other factors such as income, education, economic activity, or marital status of the household head outweighed it.

We are aware of the existence of some other factors that can influence tenure choice in the selected period. One of them is housing stock privatisation which in the Czech Republic took form of the transfer of the state owned apartments to the municipalities followed by selling it to the renters. By the end of 2004 more than 75% of municipal housing stock was privatised (UUR, 2011). Our analysis

though covers the period when less than 25% (130 thousands apartments) of municipal housing stock could be privatised.

Of course, our interpretation of the submitted results must be treated with caution. The EU-SILC is a sample survey, in which 8,866 households were examined out of the total of 4,018,288 in the year 2011. The source data are only statistical estimates, which are burdened with an unspecific error. We believe, however, that despite these limitations the results presented are relevant and pertinent conclusions can be drawn from them.

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