Unemployment and Regional Structure of Housing Market

Nezaměstnanost a regionální struktura trhu s byty

Ing. David Slavata, Ph.D.

Katedra veřejné ekonomiky	*Department of Public Economy*
Fakulta ekonomická	*Faculty of Economics*
VŠB-TU Ostrava	*VŠB-TU Ostrava*
✉ *Sokolská 33, 70121 Ostrava, Czech Republic*	
E-mail: david.slavata@vsb.cz	

Annotation

The paper tries to explain the relationship between the regional level of unemployment and regional structure of supply of housing market. There are investigated three segments of housing market, which is the rental, home ownership and cooperative segments. The data were collected from temporary real estate advertising in the years 2015, 2016 and 2017. The data were investigated by using OLS model. As main result there was find out relationship between the regional level of unemployment and cooperative housing. The main likely reasons for the relationship can be explained as legal and financial barriers and concentration of elderly generation in cooperative housing sector.

Key words

unemployment, home ownership, rental housing, cooperative housing

Anotace

Příspěvek je zaměřen na analýzu vztahu mezi regionální úrovní nezaměstnanosti a regionální strukturou nabídky trhu s byty. V příspěvku jsou analyzovány tři hlavní segmenty trhu s byty. Jedná se o segmenty nájemních bytů, bytů do osobního vlastnictví a družstevních bytů. Údaje, které jsou předmětem výzkumu byly získány z běžné realitní inzerce v letech 2015, 2016 a 2017. Veškeré údaje jsou analyzovány za použití metody regresní statistiky. Jako hlavní výsledek byla analýzou dat zjištěna závislost mezi regionální úrovni nezaměstnanosti a regionálním podílem segmentu družstevních bytů. Nejpravděpodobnější vysvětlení této závislosti jsou právní a finanční bariéry a koncentrace starší generace v družstevních bytech.

Klíčová slova

nezaměstnanost, osobní vlastnictví, nájemní bydlení, družstevní bydlení

1. Introduction

There have been plenty of researches in the field of the structure of real estate market and the unemployment issued. The topic seems to be very important from macroeconomic point of view. The changes in structure of real estate supply can indicate the changes in landlords and tenants behavior caused by their expectations. There are many of reasons for such behavior. The most listed reasons are such as increase of prices, wages, unemployment, demographic development or political changes. By inspecting of the supply structure changes there can be some recommendations provided as well. As I could analyzed the theoretical materials describing similar topic, there have not been inspected the situation in Czech Republic, using the real dynamic data yet. From that point of view the paper seems to be discovering.

The most cited Oswald (1999) tries to argue that the main problem of European unemployment is caused by the structural (un)balance of the housing market. The home ownership increases unemployment rate. The reason for his argumentation is the costs and risks involved in owning a home compare to renting.

The less mobility of home owners cause the higher unemployment. He recommends to revive private rental housing as treatment for reducing of unemployment. His surveys show that unemployment rates had risen most quickly in the nations with the fastest growth in home ownership. In his paper he compares the statistical data from 1990s and 1960s to confirm his arguments. He presented his results by analyzing the regional level of unemployment of Switzerland and structure of home ownership in the same regions. The modified point of view present Ionnides and Zabel (2014). They try to search relation between vacant houses and the labor market. They develop the dynamic model of job and housing vacancy rates. In their model they used the data from the US census. As result of their research by using the developed model, they present the negative significant impact on job vacancies in case of the shocks to the owner and rental vacancies.

The advanced literature in the field of housing and labor market is oriented to the using of the housing vacancies as main searching category. It mostly introduces the changing in housing vacancy rates as base for measure the key events. The changes in housing vacancy rates are presented as reaction of landlords on the changing economic situation. The models based on the concept of vacancy rate are widely accepted in the academic and professional real estate community. The concept of structural vacancy rate is developing by the Rosen and Smith (1983) for instance. The level of structural vacant rate depends on the landlord and tenant search processes the literature presents as well (Wheaton and Torto, 1988, Sivitanides, 1997).

The main results of theoretical bibliography explains, that in case of high rate of unemployment (or expecting rise of unemployment) the housing supply structure should be changed. The rate of home ownership in supply structure should be higher relatively comparing to private rental sector. In accordance of this assumption I would like to try to make the research of the regional supply housing market structure. In the paper there will be the relationship between the present regional supply of housing market structure and the rate of unemployment analyzed.

The real estate data will be analyzed on the sample of Czech Republic particularly the regional data will be observed and compared. In the Czech Republic there are basically three different sectors of housing. The ownership housing, the cooperative housing and the rental housing.

The aim of paper is to confirm next research questions. According to the theory and to my previous research I would express two research questions:
1. Is there any relationship between unemployment and regional supply structure of housing market within Czech Republic?
2. If there will be any relationship indicated, what is likely reason for explanation of indicated relationship?

To confirm or refuse research questions the analysis of regional data, describing real estate supply structure will be used.

2. Data sources and methods
To analyse the situation from the point of regional housing supply structure the valuable data will be used. It was decided as main source of housing data the S-Reality server will be used. The S-Reality server (http://www.sreality.cz/) is one of the most popular servers which is used for dealing of property in Czech Republic. It provides qualitative data for the objective research. The structure of web pages allows to sort the ads in accordance of the research requirements. The data will be collect from the regional point of view.

The research has started in year 2015. Because of it there are achievable the data from the years 2015, 2016 and 2017. The data were collected in selected weeks (for the past 7 days) of mentioned years with exception of the year 2015 where data were collected as annual. In selected years the data will be in their average used to avoid the fluctuations.

The information concerning of the unemployment from the portal of the Ministry of Labour and Social Affairs of the Czech Republic   (http://portal.mpsv.cz/sz/local) will be taken. It allows to sort the

information in accordance of regional level to be comparable with the similar ones describing the housing structure of the market. Some data from the Czech Statistical Office (2015, 2016, 2017, www.czso.cz) will be used as well.

In the paper there will be the similar procedures used as I was used together with my university colleagues in the latest monography as well as in the latest paper published in Ostrava (Slavata, 2015). In my latest paper I was comparing the database describing the regional housing markets of Czech Republic with the regional rates of unemployment. The main information describing the present situation of the housing market is summarised in the next table 1.

Tab. 1: The shares of main housing indicators in 2015, 2016, 2017

Indicator	Average rate of unemployment in %			Average share of rental housing			Average rate of home ownership			Average rate of coopertaive housing		
Year	15	16	17	15	16	17	15	16	17	15	16	17
Praha, hl. m. Praha	4.6	4.07	3.3	0.460	0,59	0.467	0.481	0.354	0.467	0.058	0.118	0.118
Středočeský kraj	5.6	5.16	4.4	0.208	0.373	0.352	0.698	0.553	0.572	0.092	0.067	0.067
Jihočeský kraj	4.8	4.99	4.6	0.202	0.438	0.472	0.613	0.427	0.462	0.183	0.121	0.065
Plzeňský kraj	4.6	4.35	3.7	0.285	0.459	0.407	0.669	0.506	0.549	0.044	0.029	0.038
Karlovarský kraj	7.2	6.82	5.5	0.077	0.195	0.291	0.877	0.738	0.643	0.044	0.045	0.05
Ústecký kraj	9.7	8.99	7.9	0.184	0.347	0.381	0.478	0.348	0.403	0.337	0.285	0.198
Liberecký kraj	6.7	6.14	5.3	0.293	0.492	0.383	0.518	0.392	0.468	0.187	0.113	0.148
Královéhradecký kraj	5.0	4.60	3.8	0.161	0.423	0.362	0.723	0.447	0.541	0.115	0.115	0.096
Pardubický kraj	4.8	4.97	4.2	0.212	0.422	0.449	0.670	0.495	0.47	0.116	0.081	0.08
Kraj Vysočina	5.8	5.88	5.3	0.125	0.334	0.224	0.701	0.799	0.666	0.173	0.104	0.108
Jihomoravský kraj	7.0	6.81	6.2	0.461	0.586	0.555	0.472	0.344	0.395	0.066	0.048	0.045
Olomoucký kraj	7.2	6.70	6.1	0.234	0.45	0.375	0.600	0.431	0.491	0.165	0.101	0.125
Zlínský kraj	6.1	5.70	5.1	0.240	0.424	0.471	0.638	0.494	0.454	0.120	0.076	0.074
Moravskoslezský kraj	8.8	8.25	7.5	0.338	0.51	0.46	0.292	0.229	0.28	0.369	0.258	0.254

Source: S-Reality, 30.5.2015, 03-05/2016, 02-03/2017, Ministry of Labour and Social Affairs, own processing

There will be the recorded data with respect to the research questions investigated. The steps in accordance of theoretical literature (Albright, Winston, 2015) will be done.

The steps:

1. Identification of the main relationship of variables.
2. The estimation of data by the ordinary least squares (OLS)

For the second step of analysis and according of many researches the Pearson correlation coefficient is the suitable to estimate the basic relationship. I do expect the linear relationship between the selected variables, which is the main limitation of the form of relationship. In this step the relationship between the segments of real estate market structure and unemployment will be searched. The formula for r (Pearson correlation) is given by equation (1) . It is a sum of products in the numerator, divided by the product $s_x s_y$ of the sample standard deviations of X and Y. This requires a considerable amount of computation, so correlations are almost always computed by the software. In this case the Excel software will be used. The mathematic formulation is:

$$r = \frac{\sum\limits_{i=1}^{n} (x_i - \overline{x})(y_i - \overline{y})}{\sqrt{\sum\limits_{i=1}^{n} (x_i - \overline{x})^2 \sum\limits_{i=1}^{n} (y_i - \overline{y})^2}}$$
(1)

The third, the statistical significance of the collecting data further the analysis of variance (ANOVA) will be in order to analyse the differences between group means and their associated procedures used. The data will be by OLS model estimated. The model of simple linear regression will be used to predict the possible situation. The basic formula can be written as:

$$Y = a + bX$$
(2)

where Y is predicted value from value X. In this sample the Y represents the share of real estate market segment. X represents the unemployment in its percentage form. The b is the slope of the predicted line. The b means the change in Y when X increases by one unit.

$$b = \frac{\sum (X_i - \overline{X})(Y_i - \overline{Y})}{(X_i - \overline{X})^2}$$
(3)

From the formula (3), you can see that it is closely related to the correlation between X and Y. Specifically, if the standard deviations of X and Y are kept constant, the slope b of the least squares line varies directly with the correlations between the two variables.

$$a = \overline{Y} - b\overline{X}$$
(4)

The effect of formula a (4) is not quite as interesting. It simply forces the least squares line to go through the point of sample mean. For the estimation of data the excel software will be used. The results will be in the next chapter of this paper presented.

3. Results and discussion

The results of the survey are indicated in the next table 2. It confirms my previous research results from year 2015. In comparison to the other researches (Osvald, 1999) the analysis of used Czech Republic regional data does not confirm the relationship between homeownership and unemployment. There is no significant relationship shown (-0.261), while in accordance of the researches on the similar topic the typical bibliography show the clear confirmation of positive correlation between the rate of unemployment and the rate of home ownership sector in the housing market supply structure. The Pearson coefficient shows the significant correlation between unemployment and cooperative share of housing supply (0.68).

Tab. 2: The Pearson correlation coefficient

	Unemployment	Cooperative	Home ownership	Rental
Unemployment	1			
Cooperative	0.685275804	1		
Homeownership	-0.261785879	-0.419492905	1	
Rental	-0.179330463	-0.165210721	-0.783180795	1

Source: own processing

As the step 2, the data were estimated by OLS model. The main results of OLS model are in next table 3 shown. Using of OLS estimation you can see the confirmation of previous results in table 2 shown. The relationship between unemployment and share of cooperative sector is statistically significant at the level of 1%. R- Square explains variance to the total variance of the dependent variable, which is in this sample 46%. The relationship between unemployment and other depended variables is not statistically significant.

Tab. 3: OLS estimation results

Dep. variables	Unemployment	Constant	R-Square	F-stat

Rental	-2.12	6.58	0.03	1.32
Homeownership	-2.73	7.24	0.06	2.94
Cooperative	12.793	4.26***	0.46	35.41***

Source: own processing
*Notes: ***, ** and * symbols imply statistically significance at the level of 1%, 5% and 10% respectively.*

The figure 1 presents the graphical variation of rate of unemployment and the share of cooperative ownership sector in the housing market supply structure, where each dot is a region of the Czech Republic in years 2015, 2016, 2017. All together 42 dots are shown.

Fig. 1: The relationship between rate of unemployment and share of cooperative housing.
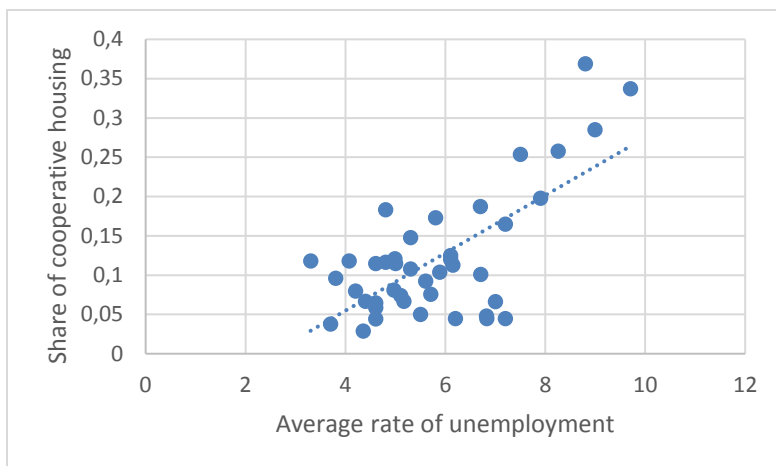
Source: own processing

According to the research questions set in second chapter of paper I would express the answers. The results show relationship between unemployment and share of cooperative ownership sector in the housing market supply structure. The results do not confirm relationship between unemployment and home ownership within the condition of Czech Republic. The likely reasons for the explanation of pronounced statement follows in next subhead.

3.1 The specifics of cooperative housing

It seems the main reasons for relationship between cooperative sector and unemployment comes generally from legal status of the cooperatives in comparison with home ownership. The legal status of cooperatives limits the households living in cooperative dwellings in their decisions. The limitations of households living in cooperative dwellings affect labor market.

The main limitations and specifics follows:
- legal barriers
- financial barriers
- concentration of elderly generation

3.1.1 Legal barriers
According to the Act number 90/2012 the owner of cooperative dwelling is not occupant, but the cooperative. The occupants of cooperative dwellings are not the real owners. According of the law the authorised occupant of the cooperative dwelling is in the position of the "better" tenant to say honestly. Authorization (tenant rights) for usage of cooperative dwelling gives to its occupant the ownership share of the cooperative. To be a shareholder of cooperative which is the real owner of the house where the dwelling is situated means, that the shareholder must respect the cooperative authorities.

Second main reason for the difference between home owners and cooperatives is the rental possibility. To rent a dwelling in ownership is easier than to rent a cooperative dwelling. The right of owner provides the freedom in decision. It is up to him (her) to whom it is rented.

To rent a cooperative dwelling is not so easy. Because the cooperative member is not the owner of flat, he (she) must respect the decision of cooperative authority. The procedure of renting the cooperative dwelling in accordance of the law is, that the cooperative member must ask the cooperative authority for certification to whom can be the dwelling rented.

The decisions how to use the dwelling belongs primary to the authorities of the cooperative. It is subjected to the decision of cooperative authorities or administrative whether or to whom the dwelling will be sublet. The full tenant rights can be transferred only with the cooperative share. There is no possibility to use the dwelling as deposit and get the loan in case the owner needs funds, or even there is nearly no chance to finance the purchase of the dwelling by the getting of loan.

3.1.2 Financial barriers

The way how to finance the purchase of cooperative dwelling is quite different in comparison to home ownership. To finance the cooperative dwelling, the typical way how to do it is to get the consumer credit, while to finance the home ownership, you can get the mortgage. At the moment there is the difference in the interest. While the interests of mortgages is at about 2.0% at the present, the consumer credit it is possible to get from let say 7.0%, which is three times more at least. This difference comes from the legal status of the two housing sector. It is not possible to give the pledge in case of cooperative dwelling, because the cooperative dwelling is own by the cooperative, not by the cooperative member.

Despite the fact that the cooperative dwellings are in average cheaper than dwellings in home ownership (20% in average), the sum of year interest payment would be in the case of cooperative dwelling even higher (they have to finance it by consumer loan). The reason for this difference is the mentioned legal status of the two housing sectors. It is not possible to give the pledge in case of cooperative flat, because the cooperative flat is own by the cooperative, not by the cooperative member. Because of it the banks provide logically higher level of interest (higher risk of financial transaction) than in case of financing the dwelling in home ownership.

3.1.3 Concentration of elderly generation

For the young households and their ability to be mobile because of their employment the cooperative dwellings are not attractive. It seems it is not the whole story of relationship between the unemployment and dwellings in cooperative ownership. I assume the concentration of older generation households in cooperative dwellings rather than in home ownership dwellings.

It is generally known that the unemployment of elderly generation is more difficult than the young one. The elderly generation is not so adaptable for new working conditions. The generation is more conservative even in making the decisions in case of changing the place of living where they already grassed their roots.

4. Conclusion

The main results of the paper confirm the relationship between cooperative housing and rate of unemployment. There were find out the significant correlations and relationships which have never been described yet. As the source for constructing the OLS model, there were the data from daily newspapers used.

The ignored element in explaining of the relationship between rate of housing ownership (cooperative ownership) and rate of unemployment seems to be the implementation of tenure neutrality principals (legal and financial barriers) together with demographic aspects (concentration of elderly generation),

which is in my opinion the key to comprehend the function how to explain correlation between the share of cooperative (and home) ownership and rate of unemployment.

The main findings of my research are:

1.   I find out the positive correlation between the share of cooperative housing sector in the housing market supply structure and regional level of unemployment rate,

2.   there are the financial barriers between the cooperative segment of housing and the rest segments (rental, home ownership),

3.   the barriers can cause the rise of concentration of elderly generation in cooperative segment,

The study even confirmed, that the published adverts have its own logical structure reflect the real situation on the real estate market, despite the first view, that there is no logical structure. The research even find the new challenges for next research. Many of interesting sources of data still wait for analysis. It can be by econometrical model use. It looks like the unknown universe with billions of stars still wait for new discoveries.

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