

THE COMPARISON OF HOUSING AFFORDABILITY OF CZECH AND POLISH REGIONS

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Abstract

The Czech Republic is a country with one of the highest growth of real estate's prices in Europe. The paper is focused on the analysis if this long-term growth of real estate's prices influences the availability of housing, i.e., if the price growth is in balance with the growth of households income and what is the situation in the Czech Republic and Poland especially. There will be presented inter European data describing housing affordability as well. The housing affordability in Czech and Polish regions will be compared using the basic indicators of housing affordability such as P/I ratio and P/R ratio. The aim of the paper is to find out (with the help of mentioned ratios), if the prices in inspected regions are overvalued or undervalued. To evaluate the results the sum of P/I and P/R ratios will be used. The Czech real estate market is very specific even from the point of new construction. It is famous that the level of new building permits in Czech Republic is not in accordance of the high price of flats. Exactly the level of new constructions is very low. There will be inspected some consequences, using the data from Czech and Polish statistical offices to find what can be the reason of low rate of issued building permits in Czech Republic. According to some of theories will be inspected whether one of the reason why there is the low rate of new construction in Czech Republic depends on the type of ownership.

Keywords

housing, price/income ratio, price/rent ratio, real estate market, ownership.

JEL classification

R30, P50

1 Introduction

The paper focuses on analyse of housing affordability in Czech and polish regions. Many countries in the world have been experiencing boom in house prices for a couple of years, and the European countries are no exception. The house price is one of the highly monitored indicator. To analyse housing prices and housing bubbles is very common topic in literature. The house price analysis has become very common in connection with crisis in 2008. From the time up to now the economists make many of researches to explore potential risk of house price increase. Now in 2018 again many of papers are analysing the potential real estate bubble. Under condition of rising prices of homes and rising amount of mortgages there are some worries of Czech National Bank, that there can be some real estate bubble expected.

This paper is related to the increasing literature, which focuses on the empirical investigation in housing market. The main goal of this paper is to make an analysis of the situation in the housing market in selected European countries. Using the main housing ratios, which are often used as indicators of overvaluation of housing prices, I will examine the reasons of their overvaluation or undervaluation.

To identify the overvaluation or undervaluation of house prices is not so easy. There are many of different view and factors how to identify the real estate bubble. Under the condition of Czech Republic there are several authors who analyse the situation of house prices in Czech Republic. J Cadil (2009) tries to analyse the real estate bubble in Czech Republic using the R/I ratio and regression analysis. He states the price bubble is the expectation of price acceleration of particular asset, which results in higher demand and such increase in demand is pushing prices up. The self – reinforcing mechanism is working until bubble bursts.

There are some other authors who try to analyse the Czech real estate market from the point of real estate bubble. Hlavacek, Komarek (2010) define real estate bubble as residual of housing price growth that cannot be explained by the aforementioned “standard” factors. The main factors for increase of real estate prices in national economy they define as:

1. a process of catching-up with the usual level in developed economies combined with macroeconomic convergence,
2. a correction in relative prices,
3. the development of the Czech housing market and
4. the constantly expanding mortgage market in the Czech Republic.

They analyse the property prices using three alternative approaches – an approach based on simple indicators of housing price sustainability (price-to-income and rental returns) and two simple econometric models (a time series model and panel regression).

Zemcik and Mikhed (2009) in their paper investigate the situation of decreasing of U.S. real estate market after the beginning of the financial crisis. They use the regression analysis to explain the main fluctuations.

Many of sources use for identification of price real estate bubble the simple housing market indicators. There are mainly compared the historical levels of indicators with the current level of indicators. The most typical indicator using by accredited institutions (national and international financial institutions such as Goldman Sachs, Czech National Bank etc.) is P/I ratio. The comparison of P/I can indicate potential real estate bubble.

The main simple real estate indicators can be divided into the four separate groups:

1. housing affordability measures
2. housing debt measures
3. housing ownership and rent indicators
4. housing price indexes

The aim of the paper is to find out, if the prices in inspected Czech and Polish regions are overvalued or undervalued.

2 Material and Methods

To analyse the Czech and Polish real estate market the data from the July 2018 were from online renewed web pages collected and recorded. As the main source of data the internet analytical portal www.trzniceny.cz for recording of data describing Czech real estate market was used. To record the data describing Polish real estate market the portal www.otodom.pl was used. The other needed data were recorded from official national statistical offices www.czso.cz and www.stat.gov.pl. For the inter European analysis the data were from www.numbeo.com and Eurostat recorded.

There were inspected the basic parameters of Czech and Polish real estate markets such as prices of flats in separate regions, rents of flats in separate regions and wages. For the specific purpose of this research there were recorded data describing the kind of flat ownership in regions and number of new issued construction permits. Specifically, because of inter comparison the data were modified. They were transformed to the average values - flat price per m², year payed rent per m² and year gross salaries.

To analyse the housing affordability it was decided the next indicators will be use:

1. PI ratio
2. PR ratio

The price to income ratio (see the formula 2.1) is the basic affordability measure for housing in a given area. It is generally the ratio of average house prices to average familial disposable incomes, expressed as a percentage or as years of income. This ratio, applied to individuals, is a basic component of mortgage lending decisions.

$$\text{PI ratio} = P/I \tag{2.1}$$

where

P..... Average price of flat

I..... Average net personal income

The price to rent ratio express the inverted value of capitalization. It says how many year rents will cover the current price of flat. As lower the P/R ratio is as more convenient to buy the flat. Trulia established the following thresholds for the P/R ratio: less than 15 indicates it is much better to buy than rent; from 15 to 20 indicates it is typically better to rent than buy; and 20 or more indicates it is much better to rent than buy (Investopedia, 2018).

$$\text{PR ratio} = P/R \tag{2.2}$$

where

P..... Average price of flat

R..... Average gross year rent

The separate values of above ratios will be added up into the global indicator. The overvaluation or undervaluation will be counted from the next mathematic formula (2.3.):

$$OU (\%) = ((P/In + P/Rn) - (\text{sum } (P/I + P/R)/U)) / (\text{sum } (P/I + P/R)) * 100 \quad (2.3.)$$

where

P..... Average price of flat

I..... Average gross year rent

R..... Average gross year rent

n..... The particular country (region)

U..... Number of inspected units (countries or regions)

OU..... Over (+) valuation, under (-) valuation of particular country (region)

3 Results and Discussion

The results valid for the particular countries are in percentage shown and valid for centrum areas and outside of centrum areas as well as average value of values for centrum and outside of centrum areas. The rank is assigned to the countries according to their average value. The results are in next Table 1 shown.

Table 1- Overvaluation and undervaluation of flat prices in %, July 2018

Country	Overvaluation, undervaluation in % city center areas	Overvaluation, undervaluation in % outside of center	Average	
			value	rank
Albania	22,75	3,23	12,99	6,00
Austria	13,06	18,96	16,01	5,00
Belgium	-21,53	-10,03	-15,78	26,00
Bulgaria	-16,28	-12,59	-14,44	24,00
Croatia	18,32	25,42	21,87	4,00
Cyprus	-35,57	-30,30	-32,94	30,00
Czech Republic	31,75	32,55	32,15	2,00
Denmark	-12,89	-10,13	-11,51	21,00
Estonia	-2,60	0,84	-0,88	15,00
Finland	2,66	-5,18	-1,26	16,00
France	39,99	33,01	36,50	1,00
Germany	11,88	13,04	12,46	7,00
Greece	-6,24	6,72	0,24	14,00
Hungary	10,75	0,56	5,66	12,00
Ireland	-29,34	-31,82	-30,58	29,00
Italy	12,50	2,88	7,69	11,00
Latvia	-6,87	-10,44	-8,65	20,00
Lithuania	7,60	10,73	9,16	9,00
Luxembourg	7,69	15,13	11,41	8,00
Malta	-16,87	-18,91	-17,89	28,00
Netherlands	-16,77	-17,18	-16,97	27,00
Poland	-9,24	-6,68	-7,96	19,00
Portugal	-6,62	-16,87	-11,75	22,00
Romania	-6,70	0,87	-2,91	17,00
Slovakia	-16,22	-7,92	-12,07	23,00

Slovenia	3,38	13,22	8,30	10,00
Spain	-12,04	-17,54	-14,79	25,00
Sweden	29,71	24,37	27,04	3,00
Ukraine	0,09	-9,68	-4,79	18,00
United Kingdom	3,61	3,74	3,68	13,00

Source: Own calculations, www.numbeo.com, Eurostat 2018, World Bank 2018

The overvaluation and undervaluation is calculated due to the deviation of average values counted from the given parameters. The methodology of calculation is presented in previous chapter.

The results from Table 1 show the overvaluation of flats in Czech Republic. The price overvaluation of flats is 32.15% above the average value for the file of presented countries. The rank assigned to the country is 2. The Czech Republic is the country with one of the most overvalued flats in Europe.

The most overvalued flats in Europe you can find in France with the rank 1, where the level of overvaluation exceeds 36%. The rank number 3 belongs to the Sweden with its overvaluation of 27.04%. The data show undervaluation of flats in Poland. The average undervaluation of flats is 7.96%, which is the 19th position from inspected countries.

On the other hand the most undervalued prices of flats are Cyprus (-32.94%, rank 30), Ireland (-30.58%, rank 29) and Malta (-17.89, rank 28). It is assumed the increase of price flats in the future in these countries.

From the Table 1 it is seen even the difference between overvaluation/undervaluation of flat prices in city centrum areas and overvaluation/undervaluation of flat prices in outside city areas. The difference between overvaluation of city centrum areas and outside of centrum areas is -0,80% in case of Czech Republic. It imply there is nearly no difference between cities and rural areas. The demand covers all the areas equally.

The highest difference is indicated for Albania (+19.52%). While the overvaluation in cities there is indicated at the level of 22.75%, the situation in outside of central areas indicates the overvaluation only +3.23%. The next country with the high difference is Belgium (-11.49%). Undervaluation of central city areas is equal to -21.53% which is more than in outside of city areas (-10.03%). The third position belongs to the Portugal (10.25%). Its city centrum areas are undervalued by -6.62% while the outside city centrum areas are undervalued by -16.87%.

3.1 Czech and Polish regions

In the next table there is the basic overview presented. The most expensive is Praha with the price over 88 thousand Kč per m². The lowest price of flats is in Ustecky Region. Its price is on the level of 14% of the price in Praha region. In Praha there is indicated even the highest level of rent as well as highest salaries.

The most expansive Polish region is Malopolski. The price of flat per m² is more than 50 thousand per m². On the other hand the highest year salary in Polish regions is indicated in Mazowiecki region.

Table 2- The basic data, July 2018

Region	Price per m2 in thousands Kč	Monthly rent per m2 in Kč	Year gross salary in Kč
Praha	88,9	353	461232
Małopolskie	50,7	250	320494
Jihomoravský	46,2	212	352152
Karlovarský	35,7	157	315444
Lubuskie	33,7	163	280594
Středočeský	37,6	185	360828
Královéhradecký	32,4	167	331428
Podkarpackie	30,6	175	276856
Plzeňský	32,7	178	348648
Jihočeský	27,6	146	323292
Pomorskie	41,7	268	338683
Olomoucký	28,7	158	319908
Pardubický	28,8	159	324024
Vysočina	28,1	153	331932
Zlínský	30,3	175	317172

Mazowieckie	49	343	400654
Lubelskie	31,5	208	280306
Liberecký	28,2	163	336120
Świętokrzyskie	24	142	274196
Wielkopolskie	31,5	207	304103
Podlaskie	28,2	193	275993
Zachodniopomorskie	31,9	236	304103
Kujawsko-pomorskie	26,2	192	279084
Warmińsko-mazurskie	24,8	185	263412
Opolskie	21,8	158	294110
Moravskoslezský	19,4	132	325500
Dolnośląskie	28,9	245	331134
Łódzkie	22,3	186	296913
Śląskie	19,2	158	336598
Ústecký	13,2	134	336348

Source: www.trznicey.cz, www.otodom.pl, www.czso.cz, www.stat.gov.pl, own calculations 31.7.2018

The table 3 presents over valuations and undervaluation of flats in searched regions. The most overvalued flats it is seen are in Prague region. In comparison with other regions the flats in Prague are overvalued by 65%. The sum of P/I and P/R ratios is more than 34. From that point of view the housing affordability in Prague is the worst. In Prague you can find the highest value of P/I (13,4) and P/R (20,9) ratios. The analysts would not recommend you in such situation to buy the flat. On the other hand the most undervalued flats the table show you can find in Ustecky region. The undervaluation is 47,5%. The sum of P/I and P/R ratios is 10,9, which is one third of the Prague level.

The most overvalued Polish region seems to be Malopolski. Within the searched regions its overvaluation is 34,2%. The sum of P/R and P/I ratios is 28. The most undervalued Polish region seems to be Slaski. Its undervaluation is 32,2%. The highest value of P/I indicator in Polish regions you can see in Malopolski region. The lowest value of its indicator is in Slaski region. The highest value of P/R ratio you can find in Lubuski region (17,1) , while the lowest value is indicated in Dolnoslaski region (9,8).

Table 3 – Values of indicators

Region	P/I ratio, flat		P/I + P/R	over/under valuation in %
	70m2	P/R ratio		
Praha	13,4	20,9	34,4	65,0
Małopolskie	11,0	16,9	28,0	34,2
Jihomoravský	9,1	18,1	27,3	30,9
Karlovarský	7,9	18,9	26,8	28,6
Lubuskie	8,4	17,1	25,5	22,4
Středočeský	7,2	16,9	24,2	16,0
Královéhradecký	6,8	16,1	23,0	10,1
Podkarpackie	7,7	14,5	22,2	6,5
Plzeňský	6,5	15,3	21,8	4,7
Jihočeský	5,9	15,7	21,7	4,0
Pomorskie	8,6	12,9	21,5	3,2
Olomoucký	6,2	15,1	21,4	2,5
Pardubický	6,2	15,0	21,3	2,0
Vysočina	5,9	15,3	21,2	1,6
Zlínský	6,6	14,4	21,1	1,1
Mazowieckie	8,5	11,9	20,4	-1,8
Lubelskie	7,8	12,6	20,4	-1,8
Liberecký	5,8	14,4	20,2	-2,8

Świętokrzyskie	6,1	14,0	20,2	-3,1
Wielkopolskie	7,2	12,7	19,9	-4,3
Podlaskie	7,1	12,1	19,3	-7,3
Zachodniopomorskie	7,3	11,2	18,5	-10,9
Kujawsko-pomorskie	6,5	11,3	17,9	-14,2
Warmińsko-mazurskie	6,6	11,1	17,7	-15,0
Opolskie	5,2	11,4	16,6	-20,0
Moravskoslezský	4,1	12,2	16,4	-21,3
Dolnośląskie	6,1	9,8	15,9	-23,6
Łódzkie	5,2	9,9	15,2	-26,9
Śląskie	4,0	10,1	14,1	-32,2
Ústecký	2,7	8,2	10,9	-47,5

Source: www.trznicy.cz, www.otodom.pl, www.czso.cz, www.stat.gov.pl, own calculations 31.7.2018

3.2 New Construction Permits and Ownership

According to the housing theories it was investigated whether there is any relationship between ownership structure in regions and future flat construction. The regions were sorted into the 4 groups - the overvalued flat regions, undervalued flat regions and separately Czech and Polish regions. It was assumed, that in overvalued regions will be significant correlation between ownership and new issued housing permits. It was created the OLS model with the parameters which is presented in the next table 4.

Table 4 – OLS Estimation Results

Ownership	State/Municipal	Cooperative	Corporate	Exclusive	Condominium	Other and mix
Overvalued	-0,03	-0,41	-0,06	0,58**	-0,68***	0
Undervalued	0,25	0,16	0,35	-0,04	-0,38	0,31
Czech Regions	-0,38	-0,56**	-0,26	0,8***	-0,42	-0,72***
Polish Regions	-0,35	-0,07	-0,23	0,5**	-0,4	0,08

Source: own processing

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

The OLS estimation results in table 4 show the relationship between the share of issued housing permits and the share of housing ownership. It seems that the main growth engine of new housing construction is the exclusive ownership. The column of exclusive ownership indicate positive and significant correlation in three of four searched groups. The results show the relationship between exclusive ownership and issued housing permits in overvalued regions, Czech regions and Polish regions. The relationship with its R square can be justified from 34%, 64% and 25%.

On the other side the rest of ownership kinds show the negative and significant correlation. Cooperative ownership in Czech Republic with its justification of 32%, condominium kind of ownership in overvalued regions with its justification of 47% and probably the most significant negative relationship – mixed ownership and other with its justification of 51%.

In undervalued regions was not identify any significant relationship.

Clarification of these results provides some explanations. It seems any kind of co – ownership demotivates the bodies to develop an initiative to new flat constructions, even in situation the market is overvalued and according to the standard theories the supply of new constructing flats must increase. In overvalued regions the most significant negative relationship is presented by condominium co-ownership. In Czech Republic it is even the more significant in case of cooperative (co-ownership) and in case of mixed co-ownership.

The likely reasons for this situation consist in high cost of co – ownership in comparison with exclusive ownership. Get an approval to the new housing constructions is too complicated and brings high negotiation costs. This probably

demotivates the participants of co ownership club to negotiate. The next result of the situation can reflex the higher prices of flats in regions with higher share of co-ownership.

4 Conclusion

The results made by simple indicator analysis show the overvaluation of real estates in Czech Republic in comparison with the European countries. The inter region comparison in Czech Republic and Poland certify the general overvaluation of flats in Czech Republic with the special position of Prague where was identified the over valuation of 65%. To compare the situation of the Czech real estate market with the other European countries, the Czech Republic occupies the second position, just behind France and Sweden (see the table 1).

To reduce the overvaluation by increase of new flat construction can be disabled by too complicated ownership relations. The most problematic seems to be any kind of co-ownership (cooperative, condominium, mix of ownership). As the result of the too high rate of flat in co-ownership seems to be the higher flat prices in regions with high rate of co-ownership in comparison with regions with high rate of exclusive ownership, where in general the prices are lower.

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