



INFLUENCE OF ECONOMICAL FACTORS ON PRICE BUBBLE FORMATION IN LITHUANIA RESIDENTIAL REAL ESTATE MARKET

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Abstract

Real estate was often considered as a reliable investment, which constitutes a major part of person's property and satisfies one of the most fundamental individual needs. In the Baltic States, including Lithuania, the increase in housing prices was particularly rapid and of a great extent: in the last nine years real estate prices had increased more than four times some market segments. Increase of real estate prices in the new European Union member states have noticeably exceeded the increase of housing prices in European Union old-timers. The phenomenon of rapidly increasing real estate prices has evoked talks about the formed price bubble in real estate market.

In the article it is sought to ascertain, whether the growth of macroeconomic factors could possibly have a crucial influence on such a sudden and rapid increase in real estate prices.

This paper analyses the theoretical background of real estate price bubble: the understanding of real estate price bubble and reasons influencing real estate price bubble formation. The investigations of factors, influencing real estate price bubble, conducted by various scientists are analyzed.

This paper also analyses residential real estate market tendencies in Lithuania during the years of 2000-2008. The analysis lets to identify the start of real estate price bubble and the period of real estate price decrease.

Two researches are made in this article. According to the statements of the theoretical part about factors influencing real estate market, seven economical indicators are chosen: GDP, average salary, interest rates, inflation, number of new apartments, the number of issued building permits, and investment to residential buildings. These economical factors evaluate internal and external real estate surroundings. Firstly, correlation between economical factors and home price changes is evaluated. Secondly, regression analysis lets to identify the economical indicators, which exactly reflect housing prices, assess the accuracy of the chosen regression model. Correlation and regression analysis allows precisely and objectively to evaluate the influence of internal and external macroeconomic indicators on the increase in real estate prices and determine the macroeconomic factors, which influence the tendencies of increasing real estate prices most precisely.

KEYWORDS: real estate price bubble, residential real estate market, correlation and regression analysis.

Introduction

In 2003, Lithuanian economy was growing most rapidly in Europe, since then the inexperienced increase in real estate prices has started. With the growing economy and a wage increased a need to purchase one's own housing. The increased need to purchase real estate has promoted the lending services market of financial institutions, which have an influence on the whole financial system. Many experts explained increasing real estate prices as a tendentious rising in parallel with growing country's economy. Others stated that increase in real estate prices is too sudden and it cannot be based upon the growth of country's economy. According to them, the greatest influence on the sudden increase in real estate prices had psychological reasons. The real estate experts' opinions and exhortations to take notice and not to succumb to the euphoria did not equal to the growth of economical and psychological factors, which caused the tendencies of increasing prices. There occurred some evidences, which allowed to state reasonably about the bubble formation in the real estate market and a possible threat to country's economy.

The aim of study is - to evaluate the influence on economic factors on the formation of price bubble in residential real estate market of Lithuania.

The object of study - the prices in residential real estate market.

The study tasks:

To analyze the assumptions of price bubble;

To analyze Lithuanian residential real estate market from year 2000 to 2008;

To determine a link between macroeconomic indicator and the real estate prices;

To determine macroeconomic factors, which influence the tendencies of real estate prices most precisely.

The research methods - the comparative analysis of scientific literature and statistical data. The aim of scientific literature analysis - to analyze and summarize a price bubble conception, characteristics and theories. The aim of statistical data analysis - to analyze a change in the economical indicators and real estate prices. In the study the correlation and regression analysis is done, which aim is to reflect phenomena in the formalized indicators. Analyzed and systemized data are processed with statistical analysis software SPSS 15.0.

Assumptions of price bubble formation

Economists, real estate analysts and experts often disagree about when growing real estate prices transform into real estate price "bubble", which is formidable to the national economy. Real estate price bubble is difficult to identify when it is developing, that is why it is usually estimated retrospectively. In most cases, the price

"bubble" is identified, then it bursts and real estate prices decrease rapidly (Goodhart; Hoffman 2006).

Real estate bubble is a type of economic bubble that occurs periodically in local or global real estate markets. It is characterized by rapid increases in valuations of real property, such as housing, until it reaches unsustainable levels compared to incomes and other economic factors. Real estate price "bubble" is the housing price increase in ongoing process, where the initial price increase creates a further increase in expectations and attracts new buyers, primarily profiteers who care about the profits from apartments trading, not the opportunity to generate rental income (Kuodis 2008).

In recent years when real estate prices were increasing rapidly, many academics have made some researches in order to find out what determined such a sudden increase in real estate prices and a formation of price bubble. One of the ultimate attitudes towards price bubble was developed by American economist Eugene F. Fama (1970) called "the efficient market hypothesis". In concordance with E. F. Fama's theory, the bubbles and their explosions are meaningless concepts in the world of rational expectations and efficient markets, and real estate prices just reflect volatile and often inconsistent information about the main economical factors influencing the prices. French economist Olivier Blanchard has explicated so-called theory of rational bubbles. According to the rational expectations model, the bubbles can occur when the date of explosion is not exactly known - it is useful for the market players to increase together with a bubble and at the same time to increase their asset, having a possibility to access the information sources and, in accordance with fundamental factors, to evaluate the existing situation. The determining factors for the formation of price bubbles were analyzed by Jonathan McCarth and Richard W. Peach (2004). Having accomplished a research in American real estate market, they determined that a sudden change in housing prices mostly depends on the number of housings, household income, the expenditure of building companies and investment into real estate. A research done by Irene de Greef and Ralph T. de Haas (2000) in Netherlands real estate market has showed that real estate prices as well as the occurrence of price bubble directly depend on the main country's economic indicators and the sizes of home loans. S. Stevenson (2005), having done a research in Irish real estate market, states that a major influence on the increase of real estate prices has a value of speculative element. The real estate market speculation problem has been also discussed by Case and Shiller (1989), Levin and Wright (1997), Muellbauer and Murphy (1997), Riddel (1999), Chan, Lee and Woo (2001) and others.

Other academics had accomplished the researches in order to find out what impact real estate bubbles could have on country's economic development. Kostas Tsatsaronis and Zhu (2004) applied a structural vector autoregression (VAR) model, based on the industrial countries data in 1970-2003. The authors studied the interaction between housing prices and the fundamental macroeconomic factors. This study showed that the most important factors influencing the growth of housing prices are inflation, bank credit, and short-term interest

rate. The authors evaluated that income was not a significant factor in housing prices growth (Leika; Valentinitė 2007).

R. Kuodis analyzed factors and outcomes, which influenced the real estate price bubble in Lithuania. Belinskaja (2007) accomplished researches have shown that the real estate bubble could be determined both by fundamental and psychological reasons. The crisis caused by these factors can have a complex and hardly predictable impact on important economic processes (Belinskaja 2007). The logistic capital control theory created by S. Girdzijauskas (2006) describes the limits and reasons for economic growth, which cause the occurrence of price bubbles. According to this theory improved by Girdzijauskas (2008) and Streimikienė (2008), the occurrence of price bubble is explained by the exhaustion of financial growth resources.

Summarizing different opinions of scientists, it can be stated, that the formation of real estate price bubble may be influenced by dual reasons: subjective and objective. The objective reasons, which can influence the formation of price bubble, are fundamental factors, which are easy to predict. Subjective reasons are usually psychological factors, which are difficult or impossible to predict.

Objective reasons:

- The decrease of resources of growth. The investment capacity is limited and with increasing investment coverage, the growth resources are diminishing. Therefore, investment capacity limits the growth of investments. When investments are approaching the capacity limits, the economic bubble starts to burst. Therefore, the bubble is formed when Investment Coverage increases in the fixed Investment Capacity and thus Resources of Growth decrease. In this situation efficiency of investments, or logistic internal rate of return, increases very sharply. Such behavior of the system causes the formation of the bubble effect.

- The growth of national economy. The gross domestic product growth reflects the economic growth in the country (Jasinskas; Simanavičienė 2008). The rapid growth of gross domestic product may influence the rapid property price growth and the formation of real estate price bubble.

- Income growth. The growth of income and unemployment decrease may lead to an objective need for purchase of apartment. Legitimate remittances made by emigrants can contribute to population income (Čekanavičius; Kasnauskienė 2009). Emigration increase noticed then Lithuania joined the European Union, emigration was influenced by the possibility of legal and better payment in the old European Union member states (Bagdonavicius; Juodkonienė 2009). Brain circulation is also one of the most important factors influencing countries economy growth (Daugeliene; Marcinkeviciene 2009).

- Readily available sources of funding: very favorable credit conditions. Very low interest rate and easy loans even for persons receiving low income.

Subjective reasons:

- Psychological factors, caused by fear that the property may be difficult to obtain due to future rise in prices. Euphorical purchase of real estate can also be stated as an impulsive buying. Impulsive buying does not

correspond to rational decision taking model of a consumer (Virvilaite; Saladiene; Bagdonaite 2009).

- Better living expectations. Consumers' expectations for the better subsistence and revenues growth in the future, so the repayment for the acquired apartment will not be difficult.

- The strong influence of banks. One of the most important factors influencing the economic development of any state is effective performance and reliability of the banks (Ginevicius; Podvesko 2008). Commercial Bank is an institution, in which personal contact with the consumer (client) is very important, and the service provided must be qualitative and rendered effectively (Žukauskas; Neverauskas 2008). At the end of 2006, the market share of the five largest banks accounted for 84 % of assets, more than 86 % of loans (Deltuvaite; Vaškelaitis; Prancėvičiūtė 2007). As there is a competition between banks, the consumer is impressed by announced discounts, promotions and special offers made by banks.

- Shaped motive that in the future real estate prices will increase.

Analysis of Lithuanian residential real estate market

Authors Ivanauskas, Eidukevičius, Marčinskas, Galinienė (2008) affirm that the development of the real estate market in Lithuania can be characterized by several stages. The first (1992 - 2002) was related to a more active commercial real estate market. The second stage (2002 - 2005) was characterized by a growth in demand in residential real estate. Real estate market analysts identify this as the period when the real estate market 'overheated' – the observed rise in costs was too rapid and unfounded, especially in 2004 - 2005. By the third stage (2005 - 2006), the housing market had reached its summit. The fourth stage (2007 - 2008) was seen as a period of stabilization in the real estate market (Ivanauskas; Eidukevičius; Marčinskas; Galinienė 2008).

The analysis made in this article let to identify stages of residential real estate market in Lithuania. The faster increase of residential real estate market prices started in the year of 2003. The observed price increase during this year was 20 percent in Lithuania and 30 percent in capital Vilnius. The increase of residential prices in the year of 2004 was about 40 percent in all Lithuanian towns. A noticeable price increase was observed in old apartment section. The year of 2004 can be considered as the start of price bubble, because during this period residential real estate market price increase was too rapid and unfounded by fundamental factors. In the year of 2005, the growth of the real estate residential market prices in Lithuania had reached a record high. Average increase in the costs of apartments in the country's larger cities had grown 50 percent and as high as 120 percent in certain segments in one year.

The analysis of Lithuanian real estate market let evaluate 30 percent residential real estate market price increase in the year of 2006 and 25 percent price increase in the year of 2007. In the first quarter of 2008, the peak of residential real estate market price was reached and

during the second and the third quarter of this year residential real estate market price fell down. Comparing real estate price in the first quarter of 2008 and in the first quarter of 2009, a noticeable 20 percent decrease is seen (Figure 1).

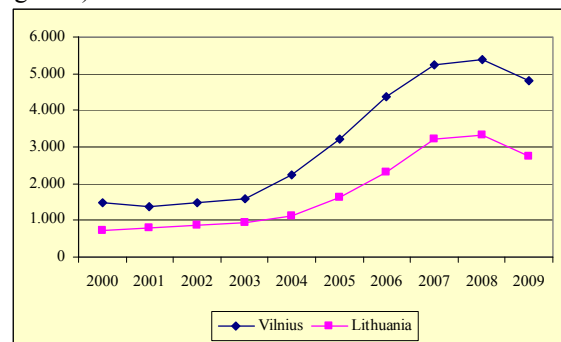


Figure 1. Average 1 m² apartment price in Lithuania and capital Vilnius in 2000-2009

Analysis of the real estate market activity shows that the most, even 37435 sale and purchase transactions were made in Lithuania in the year of 2005. The most active real estate market in Vilnius was observed in the year of 2007, at that time 10837 sale and purchase transactions were made. In the year of 2008 the number of sale and purchase transactions significantly decreased (Figure 2).

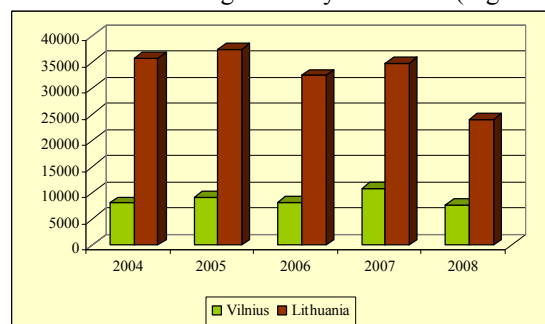


Figure 2. The number of apartment sale and purchase transactions made in Lithuania and capital Vilnius from year 2004 to 2008.

During the second half of 2008 and the first quarter of 2009 significant decrease of old apartments' demand was noticed. At that period, the number of profiteers decreased and this was due to the increase of supply. In previous periods, profiteers' activity was significantly reducing the real potential buyers to choose the appropriate accommodation for the real price. The real estate price decrease and the decrease of sale and purchase transactions could be also influenced by the increase of supply. At the highest demand of real estate, in the year of 2005, only 5933 apartments were built. As a response to the growing real estate demand, the number of building permits increased notably. Newly issued building permits accelerated new real estate projects. New projects increased the possibility for buyers to pay greater attention to the quality of housing purchased.

The methodology of research

By the research, it is sought to evaluate the influence of economic factors on the formation of price bubble in Lithuanian real estate market. In accordance with the

statements given in the theoretical part concerning the factors having a crucial influence on real estate market, 7 economic indicators were chosen: gross domestic product, average salary, interest-rate, inflation, the number of built apartments, the number of issued building certifications. These economical factors evaluate internal and external real estate environment.

The object of research - Lithuanian real estate market segments. General segment - an average price of all the apartments in Lithuania according to data given by the SE Centre of Registers. The segment of new apartments - an average price of all new-built apartments in Lithuania according to data given by the centre of registers. The segment of old apartments- an average price of all old apartments in Lithuania according to data given by the centre of registers.

The object of correlation and regression analysis - all the three real estate market segments in Lithuania. Such an object is chosen for this research purposefully in order to evaluate a sudden increase in real estate prices in each segment. Having evaluated the price change of each segment, it would be easier to compare and evaluate on which segment the change of economical indicators had the greatest influence. Data from general segment and segments of new and old apartments are systemized in accordance with exact data given by the SE Centre of Registers. The analysis of change in the segments in quarters of a year will allow evaluating the general tendencies in Lithuanian real estate market properly from year 2000 to 2008.

The subject of research - the macroeconomic factors influencing the formation of price bubble in real estate market.

The aim of research - to evaluate a link of each macroeconomic indicator with real estate prices and determine macroeconomic factors, which evaluate the tendencies of increasing real estate prices the most precisely.

In order to realize the aim of research the main **research tasks** were formulated:

To evaluate the correlation between macroeconomic indicators and prices of segments;

To choose a relevant regression model in order predict the apartment prices in the segments;

To evaluate the relevance of chosen regression model for the prediction of prices for each segment by making a regression equation;

To evaluate an accuracy of a chosen model.

By the research, it is sought to evaluate the change in internal and external economic indicators and the change in real estate prices in all segments every other quarter of a year from 2000 to 2008. In order to evaluate a changeability of economic indicators properly, the analysis of nine-year statistical data of economic indicators will be done. There are seven economic indicators chosen in the research (gross domestic product, average salary, interest rate, inflation, the number of built apartments, and the number of issued building permits) which are analyzed over a nine-year period dividing it into quarters.

The analyzed data are systemized and processed with statistical analysis software SPSS 15.0. The processed data are used to evaluate the correlation of macroeconomic indicators with the apartment prices from the separate segments. In order to realize the aim of research the correlation analysis is done – it is a method of analysis, which allows finding a correlation matrix, which is constituted by the correlation coefficients between separate parameters. The correlation defines a correlation between the variables (Williams; Monge 2006).

It is also sought to determine the macroeconomic indicators, which evaluate the tendencies of increasing real estate prices most precisely. In order to realize the aim of research a regression analysis is done. Regression analysis - is a statistical method, for the determination of mathematical expression (regression equation) of dependencies between random variables and the analysis of its parameters. Regression analysis is used when predicting, knowing what is the link of variable x with a variable y and having the values of variable x to predict particular values of variable y (Williams; Monge 2006). During the research process, it is sought to choose a relevant regression model, to evaluate the relevance of a chosen model to each segment by making a regression equation and to evaluate the accuracy of chosen model. When doing the research it is sought to predict the apartment prices in the separate segments according to precise data of macroeconomic indicators and to compare the estimated prices with the precise apartment prices in these segments given by the SE Centre of Registers.

Correlation and regression analysis allows precisely and objectively evaluating the influence of internal and external macroeconomic indicators on the increase in real estate prices and determining the macroeconomic factors, which evaluate the tendencies of increasing real estate prices most precisely.

The evaluation of influence of macroeconomic factors on the real estate prices in separate market segments

In this part of study, it is sought to determine the link of each macroeconomic indicator with real estate prices and the macroeconomic factors evaluating the tendencies of increasing real estate prices most precisely.

In order to determine the link of each macroeconomic indicator with real estate factors, need to evaluate a correlation link of macroeconomic indicators with each other and with the apartment prices in separate segments. The correlation analysis will help to evaluate the intensity of correlation link properly. A correlation matrix is obtained, in which, when a row crosses with a column, a correlation coefficient is obtained (Table 1). The correlation coefficient shows the elasticity of link and its sign - a nature and direction of the link. The values, which are close to 1 or -1, show that there exists strong dependency between two variables.

Table 1. Correlation matrix

	Average salary	Building permits	Number of new apartments	GDP	Inflation	Interest rate	
Old apartment lt/m ²	,968*	,881*	,789*	,958*	,707*	-,260	,937*
New apartment lt/m ²	,961*	,887*	,801*	,958*	,671*	-,266	,926
All apartment lt/m ²	,969*	,882*	,794*	,960*	,698*	-,280	Investment to residential buildings *

Correlation is significant at the 0.01 level (2-tailed)

Analyzing the correlation of old apartment prices with separate macroeconomic indicators according to the correlation matrix given in table 1, it is seen that both old and new apartment prices most strongly correlate with a salary, GDP allocated to one person and the investments into housing. The correlation coefficient of these indicators is bigger than 0.9, what means that correlation between these indicators is very strong. In addition, it can be stated that the apartment prices in all the segments strongly correlate with the number of issued building certifications and the number of new-built apartments. According to the correlation matrix, it is seen that a weakest correlation is between the apartment price in segments and interest rate.

In general, it can be stated that analyzed macroeconomic indicators are related to the increase in real estate prices.

Having determined the correlation of macroeconomic factors with the apartment prices in separate segments, it is purposeful to ascertain the macroeconomic factors evaluating the tendencies of increasing real estate prices most precisely: It needs to choose the most relevant model, to evaluate the relevance of chosen regression model to predicate the prices for each segment by making a regression equation, and evaluate the accurateness of chosen model.

Firstly, it needs to choose a regression model properly, which most precisely could tell the dependencies of segment prices on economical indicators, a correlation coefficient found in each regression model (linear, logarithmic, inverse, compound, power, S, growth, exponential and logistic) in the separate segments.

Further Table 2 is given, in which the correlation of seven macroeconomic indicators (gross domestic product, average salary, interest-rate, inflation, the number of built apartments, and the number of issued building certifications) with the apartment prices dependently on regression model is shown.

Table 2. The coefficient averages of correlation between the macroeconomic indicators and apartment prices

Model	Average of correlation coefficients			
	All apartment	Old apartment	New apartment	Overall average
Linear	0,673	0,671	0,664	0,669
Logarithmic	0,578	0,570	0,579	0,576
Inverse	0,500	0,490	0,502	0,497
Compound	0,669	0,671	0,664	0,668
Power	0,606	0,601	0,597	0,601
S	0,547	0,537	0,531	0,539
Growth	0,669	0,671	0,664	0,668
Exponential	0,669	0,671	0,664	0,668
Logistic	0,669	0,671	0,664	0,668

Data given in Table 2 show the correlation coefficients of internal and external macroeconomic indicators and the apartment prices in all the segments. To determine the correlation coefficient, in SPSS program each economical indicator was compared with real estate prices in separate market segment, applying different regression models. Having evaluated the correlation coefficient between each market segment and separate economical indicators, an average of correlation coefficients was estimated.

The overall average of correlation coefficients for all segments was greatest under the linear model. This model shows that one variable is dependent from other variable linearly that is when increases one variable another variable increases proportionally. The overall average of correlation coefficient under the linear model is the greatest (0,669). This means that estimating in accordance with linear model the estimated values will be most accurate.

Having chosen the linear regression model, the relevance of this model for each segment to predict prices is evaluated by making a regression equation. To determine the relevance of model, it is searched for the dependency between each analyzed real estate market segment and all seven macroeconomic indicators. A separate analyzed segment is chosen as a dependent unit and independent - all the macroeconomic indicators (gross domestic product, average salary, interest-rate, inflation, the number of built apartments, and the number of issued building certifications). Using SPSS program, the possible interdependency between all the macroeconomic indicators, and influence on the prices in separate segments as well as interaction is analyzed and the indicators having greatest influence on the prices in a segment are selected. At the same time, theoretical prices in a segment are estimated (according to the estimated coefficients by SPSS program) automatically. According to the estimated coefficients by SPSS program, a linear regression equation is made.

Table 3. The linear regression equations of separate segments

Segments	Equation
All apartment	$-1419,666 + 1,938 \times AI + 0,156 \times BP + 94,822 \times I$
Old apartment	$-1240,276 + 1,746 \times AI + 0,137 \times BP + 99,526 \times I$
New apartment	$-556,488 + 2,051 \times AI + 0,218 \times BP$

Where:

AI-average income

BP- the number of issued building permits

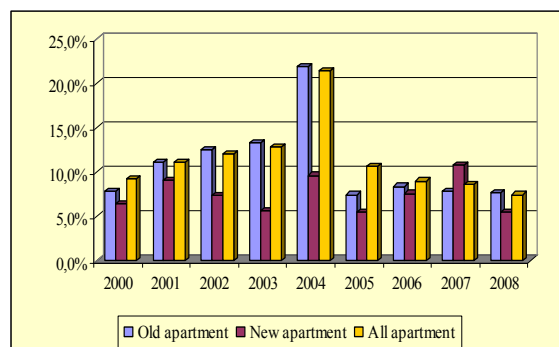
I- inflation

The linear regression equations are made for the separate segments of apartments and show which macroeconomic factors best reflect the apartment prices in a particular segment.

From data given in Table 3 according to the linear regression equations, it is seen that the salary, the number of issued building certifications and inflation, precisely reflects all the prices both of old and new-built apartments in Lithuania. The salary and the number of issued building permits best reflect the prices of new-built apartments. The implication could be made that the increase in prices of new-built apartments is closely related to the number of issued building certifications, because when demand for real estate and housing prices was growing, it was issued more building certificates for the new apartments so that the supply would match the demand.

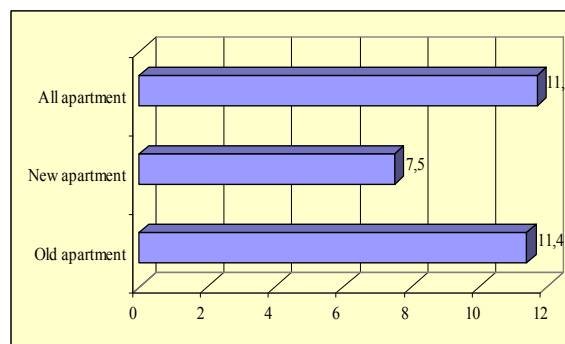
As correlation analysis has shown, the influence of other macroeconomic indicators on the apartment prices in analyzed segments cannot be denied, even though they are not included in the linear regression equation variables. Making the linear regression equation, the possibilities of SPSS program were chosen, which allow including separate macroeconomic indicators gradually, evaluating their interaction and selecting the macroeconomic indicators having a bare mistake possibility into the linear regression equation.

During the further process of research it is sought to evaluate how precisely are predicted the apartment prices in the separate segments according to the linear regression equations in Table 3 and at the same time how precisely these prices are dependent on these macroeconomic indicators which constitute the variables in a linear regression equation. To evaluate the preciseness, the apartment prices in separate segments given by the centre of registers and prices predicted (estimated) according to the linear regression equations (Table 3) were compared, using statistical analysis software SPSS. The bias is evaluated in percentage (Fig. 3).


Figure 3. The bias (%) between the apartment prices given by the centre of registers and prices predicted according to the linear regression equations from year 2000 to 2008.

The implication could be made that influence on the accuracy of bias could have psychological factors. It is seen in the year 2004, when predicted prices for the new apartments in accordance with linear regression equation had a similar bias as in all analyzed years, and the old apartment prices and the precise prices of all Lithuanian apartments given by the centre of registers had differed more than 20% from predicted prices in accordance with the linear regression model. Namely, many real estate experts describe year 2004 as an evident beginning of price bubble in real estate market, what is also proved by the observed tendency in Figure 3.

Further given data show general reliability of General linear regression model in accordance with the segments over the whole analyzed period (Fig. 4).


Figure 4. The bias (%) between the apartment prices given by the centre of registers and prices predicted according to the linear regression equations

According to data given by Figure 4, it is seen that least bias is when comparing the apartment prices agreeably to data and prices from the centre of registers, predicted in accordance with linear regression equation (Table 3). The bias of all apartments and old apartments in Lithuania is bigger, thus it could be stated that the apartment prices in these segments were less dependent on macroeconomic indicators constituting their linear regression equation (Table 3). Price bubble in real estate market is seen most clearly when analyzing the increase in old apartment prices, so a bigger bias in the market of old apartments and all apartments in Lithuania indicates that the influence on price bubble in real estate market could have not only the growth of economical factors, but also psychological factors.

According to theory, the formation of price bubble in real estate market is most clearly seen when analyzing old-built apartments, because the influence on the increase of apartment prices in this segment namely could have psychological factors. The value of newly built object is based more objectively upon existent economical situation and resources. The price of long ago built apartment in normal conditions (if this is not an object of cultural inheritance or a specific architectural building) decreases, evaluating its esthetical and constructional deterioration. Thus, in this case, when economy grows, the apartment prices in this segment should increase marginally. In the case of price bubble in real estate market, the apartment prices in latter segment has increased especially rapidly, often exceeding the increase in new apartment prices.

Summarizing the researches described in this paper it can be stated that the formation of real estate price bubble in Lithuania was affected by the investigated macroeconomic factors, but the growth of real estate price bubble was due to psychological factors.

Conclusions

The statistical analysis made in this article let to identify the stages of residential real estate market in Lithuania. The first (1992 - 2002) was related to a more active commercial real estate market. The second stage (2002 - 2005) was characterized by a growth in demand in residential real estate. Faster increase of residential real estate market prices started in the year of 2003. The increase of residential real estate prices was about 40 percent in the year of 2004. By the third stage (2005 - 2006), the housing market had reached its summit. In the year of 2005, the growth of the real estate residential market prices in Lithuania reached a record high of more than 50 percent. The analysis of Lithuanian real estate market let to evaluate 30 percent residential real estate market price increase in 2006 and 25 percent price increase in 2007. The fourth stage (2007 - 2008) was seen as a period of stabilization in the real estate market. In the first quarter of 2008, the peak of residential real estate market price was reached and a noticeable 20 percent decrease of prices was seen in the first quarter of 2009.

Correlation analysis showed that both the growth of old and new apartment prices most strongly correlate with a salary, GDP allocated to one person and the investments into housing. In addition, the apartment prices in all the segments strongly correlate with the number of issued building permits and the number of new-built apartments.

The linear regression equations are made for the separate segments of apartments and show which macroeconomic factors affect the apartment prices in a particular segment the most.

According to the linear regression equations, it is seen that the salary, the number of issued building certifications and inflation, precisely affects all the prices both of old and new - built apartments in Lithuania. The salary and the number of issued building permits best reflect the prices of new-built apartments. Further analysis let to identify how precisely these prices are dependent on these macroeconomic indicators, which

constitute the variables in a linear regression equation. To evaluate the preciseness, the apartment prices in separate segments given by the centre of registers and prices predicted (estimated) according to the linear regression equations were compared. An increase of bias in 2004 let to identify the influence of psychological factors.

Both research methods described in this paper indicate that the formation of real estate price bubble in Lithuania was affected by the investigated macroeconomic factors, but the growth of real estate price bubble due to psychological factors.

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EKONOMINIŲ VEIKSNIŲ ĮTAKA LIETUVOS NEKILNOJAMOJO TURTO KAINŲ BURBULO SUSIFORMAVIMUI

Santrauka

Per pastarąjį dešimtmetį nekilnojamojo turto kainos daugelyje pasaulio šalių paaugo nuo keliasdešimties iki kelių šimtų procentų. Baltijos šalyse, tame tarpe ir Lietuvoje, būsto kainų augimas buvo ypatingai spartus: nekilnojamojo turto kainos per devynerius metus atskiruose rinkos segmentuose paaugo daugiau nei keturis kartus. Sparčiai augusių nekilnojamojo turto kainų kilimo fenomenas sukėlė kalbas apie nekilnojamojo turto rinkoje susiformavusį kainų „burbulą“.

Straipsnyje siekiama išsiaiškinti, ar makroekonominių veiksnių augimas galėjo turėti lemiamą įtaką tokiam staigiam ir sparčiam nekilnojamojo turto kainų kilimui.

Straipsnyje atlikta mokslinė literatūros analizė leidžia apibendrinti įvairių mokslininkų nuomones ir išskirti nekilnojamojo turto kainų burbulo atsiradimą lemiančias priežastis: subjektyvias ir objektyvias priežastis. Objektyvioms priežastims, sukėjusioms kainų burbulo atsiradimą, gali būti priskiriami veiksniai, kuriuos lengva prognozuoti ir galima numatyti, subjektyvios priežastys - tai priežastys, kurias

numatyti sunku arba neįmanoma.

Objektyvios priežastys-tai kapitalo nišos sumažėjimas, ribota būsto pasiūla, ekonomikos augimas, gyventojų pajamų augimas, lengvai prieinami finansavimo šaltiniai.

Subjektyvios priežastys-tai psichologiniai veiksniai, sąlygojami baiminimusi, kad vėliau nekilnojamojo turto gali būti sunku išgyti dėl ateityje išaugusių kainų, geresnio pragyvenimo lūkesčiai, stipri finansinių institucijų įtaka, taip pat suformuotas motyvas, kad nekilnojamojo turto kainos ateityje turės kilti.

Statistinių duomenų analizė leidžia įvertinti pagrindinius Lietuvos nekilnojamojo turto gyvenamojo sektoriaus etapus.

Straipsnyje atliktu tyrimu siekiama įvertinti ekonominių veiksnių įtaką Lietuvos nekilnojamojo turto kainų „burbulo“ susiformavimui. Remiantis teorinėje dalyje išdėstytais teiginiais dėl veiksnių, turinčių įtakos nekilnojamojo turto rinkai, buvo pasirinkti 7 ekonominiai rodikliai: bendrasis vidaus produktas, vidutinis darbo užmokestis, palūkanų normos, infliacija, pastatytų butų skaičius, išduotų statybos leidimų skaičius. Pasirinkti makroekonominiai rodikliai lyginti su atskirų segmentų butų kainomis. Tyrimo objektas – Lietuvos nekilnojamojo turto rinkos segmentai. Bendras segmentas – visų Lietuvos butų kainos vidurkis pagal V.I.Registrų centro duomenis. Naujų butų segmentas – visų naujai pastatytų Lietuvos butų kainų vidurkis pagal V.I.Registrų centro duomenis. Senų butų segmentas – visų senos statybos Lietuvos butų kainos vidurkis pagal V.I.Registrų centro duomenis.

Straipsnyje atlikta koreliacinė ir regresinė analizė leidžia tiksliai ir objektyviai įvertinti vidinių ir išorinių makroekonominių rodiklių įtaką nekilnojamojo turto kainų augimui bei nustatyti makroekonominius veiksniai, tiksliausiai įvertinančius nekilnojamojo turto kainų kilimo tendencijas.

Atlikta koreliacinė analizė parodė, kad visų, senų ir naujų butų kainos stipriausiai koreliuoja su darbo užmokesčiu, BVP vienam gyventojui ir investicijomis į gyvenamąjį būstą.

Pasirinkus tiesinį regresinį modelį, įvertinimas šio modelio tinkamumas kiekvienam segmentui prognozuoti kainas, sudarant regresijos lygtį. Tiesinės regresinės lygtys, sudarytos atskiriems butų segmentams, parodo, kokie makroekonominiai veiksniai geriausiai atspindi atitinkamo segmento butų kainas.

Prognostines kainas lyginant su tikslėmis V.I. Registrų centro pateiktomis kainomis, gaunama paklaida procentais. Analizuotais metais paklaidos dydis buvo panašus, išskyrus 2004 metus. 2004-iais metais naujų butų prognozuotos kainos pagal tiesinės regresijos lygtį turėjo panašią paklaidą kaip ir visais analizuotais metais, o senų ir visų Lietuvos

butų kainų paklaida ženkliai padidėjo. Galima daryti prielaidą, kad paklaidos tikslumui įtakos galėjo turėti psichologiniai veiksniai. Būtent 2004–ius metus daugelis nekilnojamojo turto ekspertų įvardina kaip nekilnojamojo turto „burbulo“ pradžią, ką pagrindžia ir atliktas tyrimas.

Apibendrinant atliktus tyrimus galima teigti, kad analizuotų makroekonominių veiksnių augimas turėjo įtakos nekilnojamojo turto kainų burbulo susiformavimui, tačiau nekilnojamojo turto kainų burbulo augimas priklausė nuo psichologinių veiksnių.

PAGRINDINIAI ŽODŽIAI: nekilnojamojo turto kainų burbulas, gyvenamojo sektoriaus nekilnojamojo turto rinka, koreliacinė ir regresinė analizė.

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