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INFLUENCE OF INFLATION AND INTEREST RATES ON THE VALUE OF REAL ESTATE

Movements at the property market are an important indicator of movements in total economy. In the last two years prominent changes were realized due to some established circumstances. The study is aimed to represent how the movement of inflation and interest rates influence the purchase of real estate and their interdependence. By the multiannual simultaneous monitoring of quoted parameters a detailed model could be designed. The aim of the study is to define quoted factors which have to be considered for analytical prediction of trend of prices movement and selling of real estate in the future. It was established that the treated group of economic influential factors works differently at the property market. The sense of some factors at the property market is essential, some of them do not influence it.

Keywords: property market; real estate; inflation; interest rates.

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ВПЛИВ ІНФЛЯЦІЇ І ПРОЦЕНТНИХ СТАВОК НА ВАРТІСТЬ НЕРУХОМОСТІ

У статті показано, що рух на ринку нерухомості є важливим індикатором руху в економіці в цілому. У останні два роки істотні зміни відбулися у зв'язку з деякими новими обставинами. Продемонстровано, як рух інфляції і процентних ставок впливає на придбання нерухомості та їх взаємозалежність. Детальна модель може бути розроблена на основі багаторічного одночасного моніторингу котирувальних параметрів. Визначено котирувальні чинники, які мають бути розглянуто для аналітичного прогнозування тенденцій руху цін і продажу нерухомості в майбутньому. Встановлено, що дана група економічних впливових чинників спрацьовує по-іншому на ринку нерухомості. СENS деяких чинників на ринку нерухомості має важливе значення, деякі з них не впливають на ринок нерухомості.

Ключові слова: ринок нерухомості; нерухомість; інфляція; процентні ставки.

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В статье показано, что движение на рынке недвижимости является важным индикатором движения в экономике в целом. В последние два года существенные изменения произошли в связи с некоторыми открывшимся обстоятельствами. Продемонстрировано, как движение инфляции и процентных ставок влияет на приобретение недвижимости и их взаимозависимость. Подробная модель может быть разработана на основе многолетнего одновременного мониторинга котируемых параметров. Определены котируемые факторы, которые должны быть рассмотрены для аналитического прогнозирования тенденций движения цен и продажи недвижимости в будущем. Установлено, что рассматриваемая группа экономических влиятельных

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факторов срабатывает по-другому на рынке недвижимости. Смысл некоторых факторов на рынке недвижимости имеет важное значение, некоторые из них не влияют на рынок недвижимости.

Ключевые слова: рынок недвижимости; недвижимость; инфляция; процентные ставки.

1. Introduction. Monitoring of situation at the property market since 2007 brings hesitations of already written legalities, thus we decided to investigate two main economic factors (interest rates and inflation) and their influence on the property market movement in Slovenia.

The reason for this study is the global financial crisis which can cause an additional deadlock at the property market by non-compliance of research parameters. We think that the monitoring of interdependence of some economical factors is a key for further development of property market.

The offer of real estate and global financial crisis have great influence on functioning of property market. Thus Costello, Fraser and Groenewold (2010) quote that in the period of global financial crisis (2007-2010) reporting and analyzing of housing market are the dominant issues inside the academic community and popular press. Here arise interesting questions, namely "if the proceeded factors influence the determination of prices and sale of real estate and how".

The extent of interest's sensibility depends of how many changes of investment projects (nominal cash flow) will happen in the expected inflation. Hewers et al. (1998a, b) investigated the sensibility of inflation's growth caused by changes of interest rates and ascertained that the growth is generally less sensible to interest rates than to property.

The inflation has a great influence on successfulness and profit of companies. As the level of expected inflation influences the actual costs of debts, it means that higher inflation will decrease real value of future debt payments. Thus inflation reduces real interest rates, and yet inflation impetus means that nominal interest rate will conform, as quoted by Ewing and Payne (2005) and Lennert (2008).

The fact that inflation reduces investments, economic growth and future yields was also ascertained by Clark (1993). Huizinga (1993), Zion, Spiegel and Yagil (1993) claimed that inflation leads to lower stabilities of relative prices which causes higher uncertainty of investments. Feldstein and Summers (1997) also ascertained that higher inflation leads to higher income taxes of artificial persons.

Recent growth of apartment prices refers to different mechanisms, as for example "extravagant expectation" of future rise of prices which extend over social epidemic (Shiller, 2007) or price assignment at transactions in connection with combination of inflation and monetary illusion (Brunnenmeier and Julliard, 2008). In this study we want to represent what do we have to be careful about to reject the quoted mechanisms.

Existing lawfulness which should be valuable for stable operation of property market has the mastery because fast and uncontrolled rise of real estate prices become impossible. Concern about possibilities of harmful effects in international economy was expressed by Shiller (2003, 2005) before the global crisis because of extensive spectrum of apartments prices. He also claimed that the USA with regard to price behaviour of residential property since 1997 did not have precedents while OECD

had complete overview on apartment prices for the period from 1970 to 2005 with ascertainment that numerous elements of prices in the period of 1995 to 2005 were without comparison.

Beltratti and Morana (2010) quoted that in the framework of general advantageous macroeconomical circumstances from late '90 the apartment prices in G-7 countries, except in Japan, increased very fast. Housing market became negative in the beginning of 2007. The real prices started to decrease. There arises the question about the existence of common international factors which have the influence on apartment prices because of macroeconomical movements.

Empirical data proves important connections among real estate prices and local and world GDP component parts as ascertained (Case et al., 1999). This shows that general international prices of apartments can be partially explained with common exposure to global economic cycles. Similarly, Ahearne et al. (2005), Otrok and Terrones (2005) were drawn to global dynamics of real interest rate as the factor for international alignment of real estate prices. It can be seen that the connection between real apartment prices and macroeconomical movements is two-way.

By the reason of quotations above, the politics on real estate prices response should be treated with special attention.

The study made for the period from 1998 to 2005 by Wheaton and Nechayev (2008) involves inflation and real estate prices in that period. For solving the case they treated the growth of request, population and income growth and reduction of interest rate through benchmarking. Similar study was made in 2006 by Shiller, who compared the growth of real estate prices with actual interest rates. All of them ascertained that the depreciation of prices was exorbitant. They wrote that the local level, changes of income, employment and national interest rates have influence on real estate prices. In so far as the market starts to decrease the financial injection will be too high for investors thus they will have to move out of apartments.

Lipej (2008) quoted that financial crisis can bring additional deadlock and increase of risk on the capital markets which will have influence on operating of real estate systems. He also claimed that property market needs the access to basic data and information, especially on the market and time trends.

It can be seen that the purchasing power of inhabitants was reduced, uncertainty forces people to save money instead of spending it, credits became more expensive because most of them are obliged to the market, banks predict taking away the real estates in the case of disorderly payment of credit instalments (Chamber of Commerce of Slovenia, Real Estate Services, 2008).

Instead of prediction of existence and development of property market owners are concerned with reduction of prices in the future.

The role, meaning and use of treated parameters at the property market are important for efficient operation. Interest for change and ascertainment of causes of treated parameters was risen. The field of treatment is very extensive in the theoretical and practical senses, thus we have limited our study only to residential property (residential buildings, houses and lands meant for building of apartments). On this specific real estate field the lack of literature and practical knowledge can be seen.

In the past researchers did not pay much attention to the problems which we treat. A few studies were made but none of them treated the sense of economic fac-

tors as are realized by important participants at the property market. Thus we decided to study and represent the influences of treated factors and their interdependence at the property market.

In so far made studies we miss concrete specification, definition and determination of general economic factors at the property market and their interdependence. There exist representations of quoted factors but not in the way that their interdependence and dependence on other economic and political factors could be seen.

2. Methods. We have made the analysis with the help of descriptive and analytic research methods, structural questionnaire, composed of closed type questions, correlation analysis, data from the Statistical Office of the Republic of Slovenia (SURs), Surveying and Mapping Authority of the Republic of Slovenia (GURS), portal of Slovene real estate SLONEP.net, real estate agencies, investors or potential purchasers, Slovene building companies and banks.

Investors, purchasers, real estate owners, building rights owners, real estate users, real estate directors, real estate renters, real estate agencies or companies, architectural or building companies and others of different ages, with different period of working experiences and different education from all over Slovenia were included in the study. Included participants were classified in two groups, namely the group of sellers and the group of purchasers of real estate.

Descriptive, non-experimental and experimental methods were assisting in the study. By descriptive method we have described and investigated the current movement of influent factors at the property market in Slovenia.

Non-experimental method was assistant at looking for answers on the questions with empirical checking of subordinate relations among individual factors. Experimental method was the one by the help of which we have intentionally entered one or more factors which have influence on the condition of property market in Slovenia and ascertained their real influence on the property market.

The research included 150 people from all over Slovenia by the non-chance pattern. Quantitative and qualitative research techniques were used for checking of the hypotheses.

By the help of a questionnaire composed of closed type questions we have used structural standardized interview for acquisition of quantitative data, data of standardized techniques and data appropriate for statistic treatment and induction. Points of view of the respondents were measured by the 5-level Likert scale. Data were checked and analyzed with the help of statistical computer programme.

We have used non-structural monitoring and analysis of documents for acquisition of qualitative data, data of non-standardized techniques, which instruments bring qualitative data, data appropriate for qualitative treatment. Data were treated qualitatively and quantitatively. Data have been quantitatively treated with regard to aspiration for generalization by the help of descriptive statistics and inferential statistics and with regard to number of variable numbers by the help of univariety and bivariety analysis.

The questioned people at the Slovene property market were named participants. By the help of specific descriptive and explicative questions we meant to investigate the following predictions:

1) Participants realize the purchase of real estate as protection from inflation, which is a better protection than financial investment in proprietorial securities or any other investments.

2) Gender, age, city where participants are from, their education and period of working experience have influence on quoted opinion that "the purchase of real estate represents protection from inflation".

3) Participants realize positive interdependence between the statements "decrease of interest rates has influence on trade increase of real estate" and "decrease of interest rates has influence on prices increase of real estate".

4) Participants realize that decrease of interest rates and increase of inflation have influence on real estate trade growth.

Individual predictions were checked as follows:

The first prediction was checked on the basis of viewpoints of all the respondents. The viewpoints were measured on the 5-level Likert scale. We have investigated the following various numbers: "the purchase of real estate as protection from inflation" and "real estate as the best financial long-term investment". "The purchase of real estate as protection from inflation" = 1 means that the purchase of real estate does not represent the protection from inflation, = 5 means that it represents complete protection. "Real estate as the best financial long-term investment" = 1 means that long-term real estate is not a better financial investment as proprietorial securities, = 5 means it is. The first prediction has been checked by correlation analysis and accepted if the correlation coefficient was positive and typical distinctive from zero.

For checking the second prediction we have classified the people in two groups by gender. We have calculated the average value of various number "protection from inflation" for both groups. The characteristics of distinctions between average values of this various number have been checked by t-test for independent patterns. The prediction has been accepted at the level of characteristic 0,005. Similarly, the characteristics of distinctions among average values of this various number by education, period of working experiences, age and city where participants were from have been checked with the help of ANOVA.

The third prediction has been checked on the basis of viewpoints of all the respondents. Viewpoints have been measured on the 5-level Likert scale. We have investigated two various numbers: "the influence of interest rates on real estate trade" and "influence of interest rates on real estate prices". For the first various number 1 means that dependence between decrease of interest rates and increase of trade does not exist, 5 means that dependence between decrease of interest rates and increase of trade does exist. For the second various number 1 means that dependence between decrease of interest rates and higher prices of real estate does not exist, 5 means that dependence between decrease of interest rates and higher prices of real estate does exist. The prediction has been checked by correlation analysis and accepted if the correlation coefficient was positive and typical distinctive from zero.

For checking of the fourth prediction the viewpoints on influence of interest rates and inflation growth on increase of real estate trade have been measured on the 5-level Likert scale. The following various numbers have been investigated: "interest rates have influence on real estate trade" and "inflation growth has influence on increase of real estate trade". For the first various number 1 means that the dependence between decrease of interest rates and increase of real estate trade does not exist; 5 means that the dependence between decrease of interest rates and increase of real estate trade does exist. For the second various number 1 means that the dependence

between inflation growth and increase of real estate trade does not exist; 5 means that there exists a strong dependence between inflation growth and increase of real estate trade. The prediction has been accepted if at least 50% of the respondents have chosen answer 4 or 5 at both various numbers and if the correlation coefficient between these two various numbers was typical distinctive from zero.

3. Results. Data have been checked and analyzed with the help of statistical computer programme SPSS.

At the first prediction the following various number have been investigated: "the purchase of real estate as protection from inflation" and "real estate as the best financial long-term investment".

The viewpoints of the respondents were measured on the 5-level Likert scale. At various number "the purchase of real estate as protection from inflation" 1 means that the purchase of real estate does not represent the protection from inflation, 5 means that it represents complete protection. At various number "real estate as the best financial long-term investment" 1 means that long-term real estate is not a better financial investment as proprietorial securities, 5 means it is.

The first prediction has been checked by correlation analysis and accepted if the correlation coefficient was positive and typical distinctive from zero.

From the results of correlation analysis we have ascertained that correlation coefficient between various numbers "the purchase of real estate as protection from inflation" and "real estate as the best financial long-term investment" is 0,041 and it is not typical distinctive from zero at the level of characteristic 0,05 ($p=0,617$) which means that the data do not confirm interdependence between these two various numbers. The first prediction is not accepted.

That means that participants do not realize the purchase of real estate as protection from inflation which is the better protection than financial investment in the proprietorial securities or any other investments.

At the second prediction the following various numbers have been investigated: "the purchase of real estate as protection from inflation" and "gender, age, city where the participants are from, their education and the period of working experiences".

Demographical data for various numbers "age of participants" and "the period of working experiences" and viewpoints of participants for various number "the purchase of real estate as protection from inflation" have been measured on the 5-level Likert scale. At various number "gender of participants" the possible answers have been male and female. At various number "the age of participants" the possible answers have been the following age groups: 20 to 30, 31 to 40, 41 to 50, 51 to 60 and more than 61 years. At various number "the city where participants are from" the possible answers have been Ljubljana, Maribor, Celje, Novo Mesto, Koper, Murska Sobota, Nova Gorica, Kranj, Slovenj Gradec and Postojna. At various number "the period of working experiences" the possible answers have been: up to 5 years, 5 to 10, 10 to 20 years, 20 to 30, more than 30 years. At various number "the purchase of real estate as protection from inflation" 1 meant that the purchase of real estate does not represent the protection from inflation; 5 meant that it does represent the complete protection.

The influence of gender on the viewpoint "the purchase of real estate as protection from inflation" has been investigated by t-test for two independent patterns, the influence of participants' age, their education and period of working experiences have

been investigated by analysis of variant (ANOVA). Both analysis have been done by SPSS.

For checking the second prediction we have classified the respondents in two groups by gender. We have calculated the average value of various number "protection from inflation" for both groups. The characteristic of distinctions between average values of this various number has been checked by t-test for independent patterns. The prediction has been accepted at the level of characteristic 0,005. Similar has been checked the characteristic of distinctions among average values of this various number regarding to education, period of working experiences, age and city where participants were from by the help of ANOVA.

It has been ascertained that $p < 0,05$. Thus there follows the conclusion that the distinctions are typical and that gender, age and city where participants are from, their education and period of working experiences do not influence the statement that purchase of real estate represents protection from inflation. The prediction is totally accepted.

At checking the third prediction the following various numbers have been investigated: "decrease of interest rates has influence on increase on real estate trade" and "decrease of interest rates has influence on increase of real estate prices".

The viewpoints have been measured on the 5-level Likert scale. For the various number "decrease of interest rates has influence on increase of real estate trade" 1 means that the dependence between decrease of interest rates and increase of real estate trade does not exist; 5 means that the dependence between decrease of interest rates and increase of real estate trade does exist. For various number "decrease of interest rates has influence on increase of real estate prices" 1 means that dependence between decrease of interest rates and higher prices of real estate does not exist; 5 means that dependence between decrease of interest rates and higher prices of real estate does exist.

The prediction has been checked by correlation analysis and accepted if the correlation coefficient was positive and typical distinctive from zero.

From the results of correlation analysis it has been ascertained that correlation coefficient between various numbers "decrease of interest rates has influence on increase of real estate trade" and "decrease of interest rates has influence on increase of real estate prices" is 0,427 and is typically distinctive from zero at the level of characteristics 0,05 ($p=0,000$) which means that data completely confirm dependence between these two various numbers. The third prediction has been accepted.

The confirmation of third prediction allows the conclusion that participants realize that decrease of interest rates has influence on real estate trade and on increase of real estate prices.

At checking the fourth prediction the following various numbers have been investigated "interest rates have influence on real estate trade" and "the inflation growth has influence on increase of real estate trade".

The viewpoints have been measured on the 5-level Likert scale.

For various number "interest rates has the influence on real estate trade" 1 means that dependence between decrease of interest rates and increase of trade does not exist; 5 means that dependence between decrease of interest rates and increase of

trade does exist. For the various number "the growth of inflation has influence on increase of real estate trade" 1 means that dependence between increase of inflation and increase of real estate trade does not exist, 5 means that dependence between increase of inflation and increase of real estate trade does exist.

For the various number "the growth of inflation has influence on real estate trade" 1 means that dependence between the growth of inflation and increase of real estate trade does not exist; 5 means that dependence between the growth of inflation and increase of real estate trade does exist.

The prediction has been accepted if at least 50% of the respondents have chosen answer 4 or 5 at both various numbers and if the correlation coefficient between these two various numbers was typical distinctive from zero.

From the results of correlation analysis it has been ascertained that correlation coefficient between various numbers "interest rates have influence on real estate trade" and "the growth of inflation has influence on increase of real estate trade" is 0,234 (**) and it is typically distinctive from zero at the level of characteristic 0,05 ($p=0,004$), which means that data completely confirm dependence between these two various numbers.

The results of frequent division for various number "interest rates have influence on real estate trade" show that 31.3% of the participants have chosen estimation 4 and 33.3% of them have chosen estimation 5. Total 64.6% of the participants have chosen estimations 4 and 5 on the Likert scale. For the various number "the growth of inflation has influence on increase of real estate trade" the results show that 26% of the participants have chosen estimation 4 and 18.7% of them have chosen the answer 5. Total 44.7% of the participants have chosen estimations 4 and 5 on the Likert scale.

The fourth prediction has been partially accepted. That means that more than 50% of participants realize that decrease of interest rates has influence on real estate trade and less than 50% of participants realize that the growth of inflation has influence on increase of real estate trade.

4. Discussion. Studies which ascertain the influence of economic factors on the property market and their interdependence are very few. Because of fast and essential changes at the property market there arise questions to which there has not been paid attention in the past. The prices of real estate have constantly grown for the last 18 years.

On the basis of predictions and analysis we have ascertained what are the considerations of the participants and how they realize the influences of economic factors on the real estate value.

The results show that the participants do not realize the purchase of real estate as protection from inflation which is a better protection than financial investment in the proprietorial securities or any other investments.

The ascertainment shows that gender, age and city where the participants are from, their education and period of working experiences have influence on realizing the statement that the purchase of real estate represents protection from inflation.

The participants also realize that decrease of interest rates has influence on increase of real estate trade and on increase of real estate prices.

The prediction that "interest rates have influence on real estate trade" and "the growth of inflation has influence on decrease of real estate trade" has been partially

confirmed. That means that more than 50% of the participants realize that decrease of interest rates has influence on real estate trade and less than 50% of participants realize that the growth of inflation has influence on real estate trade.

The ascertainments show that:

- purchase of real estate does not represent protection from inflation;
- purchase of real estate is a better protection than financial investment in proprietary securities or any other investments;
- inflation does not have influence on the property market;
- gender, age and city where the participants are from, their education and period of working experiences have influence on realizing of statement that the purchase of real estate has protection from inflation;
- decrease of interest rates has influence on increase of real estate trade;
- decrease of interest rates has influence on increase of real estate prices;
- inflation growth does not have influence on decrease of real estate trade.

5. Conclusion. Trends at property markets have been changed distinctively in the past years. Two years ago the main characteristics of property markets were surpluses of demand above the offer, fast sale of apartments and "non-particular" purchasers; all together accompanied by increase of real estate prices which has not stopped for almost two decades. In the last two years the circumstances have been distinctively changed: there are few transactions, the offer exceeds the demand, the prices for apartments decrease.

Until the price of money will grow because of global financial crisis, the increase of interest rates and difficult accessibility to loans are expected. Consequently the buying power will decrease. For successful operation of the market it is necessary to ensure and simultaneously supervise the key factors which have influence on movements of real estate market.

Statistical office of the Republic of Slovenia quotes that the index of apartment prices includes rents, their part is less than 2%. Thus we raised question if the real estate prices have influence on inflation and opposite. The ascertainments show that the property market does not have influence on inflation and inflation does not have influence on operation of the property market.

We have ascertained that current movement of some economic factors has a great influence on movement of property market and some of them do not have.

By the study we tried to achieve or to prevent different predictions of operating of property market in the future. Movements of real estate prices increasing or decreasing in the future are very hard to predict without any provable results of influent factors indices and their interdependence.

Such technical factors as location, area, processing, energy efficiency and others have a great influence on purchase of real estate and have to be considered at predicting movements of property market in the future.

For stabilization of real estate trade the current study has been very important. This study represents in a simple way how we can influence the monitoring, decrease or increase of real estate prices.

Current time, which reduces interest rates because of global financial crisis, is absolutely favourable for the ones who already have raised the loan. The same for the ones who think about a loan, however, there is a problem how to arrange the approval of this loan.

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