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Housing Loan Trends in Bulgaria and Croatia: An Analysis of Some Important Indicators (2011-2022)

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Abstract: - This article aims to analyse the residential real estate market in Bulgaria and Croatia, focusing on the period from 2011 to 2022. The study examines the main indicators for this market and especially for the financing of transactions with residential properties – interest rate on housing loans and volumes of granted housing loans for the respective years. Data on the housing price index as well as its relationship with other indicators were also examined. A comparison with the levels of interest rates on housing loans in the Euro Area and the European Union was also made. The aim is to identify basic trends in the considered 12-year period, as well as factors affecting the mortgage credit market in Bulgaria through the analysis of these and other indicators and comparing it with the last country admitted to the Euro Area – Croatia. The article contributes to the overall understanding of the dynamics of the real estate market in the country, outlining the factors that have shaped its evolution, as well as outlining future trends related to the residential real estate trade.

Keywords: Bulgaria, Croatia, housing loans, interest rates, real estate market.

I. INTRODUCTION

With housing loans considered as one of the vital financial tools for households worldwide, the real estate market is one of the most dynamic in any economy. It affects both the macroeconomic stability of the country and the financial well-being of individuals. Mortgage lending plays an essential role for individual consumers helping them to satisfy their need for stability and a home, but it also affects consumption patterns, individual and private investment and financial stability in general.

The Global Financial Crisis of 2008 managed to expose the vulnerability of real estate markets by highlighting the role of interest rates and different types of lending in shaping economic performance. In the following years the European mortgage markets, including those in Bulgaria and Croatia, underwent significant transformations because of changes in economic conditions and consumer behaviour in the market. Indicators such as the interest rate on housing loans, their volume and the housing price index serve as the main indicators of the general condition and trends of the housing market. These indicators not only reflect the economic condition of a given country or region, but also shape implications for monetary policies and financial stability in the respective country or community.

Bulgaria and in particular the real estate market in the country represent an interesting object of study due to its transition from central government to a market-oriented economy. The period since 2007 includes important economic events for the country such as its accession to the European Union in 2007, the impact of the Global Financial Crisis in 2008, the subsequent phases of recovery, and finally the Covid-19 pandemic, the invasion of Russian forces in Ukraine and their impact on the country's economy.

The cited events inevitably affected the real estate market, and particularly the interest rates, the volume of housing loans granted and the prices of residential real estate. The present study focuses on a comparative analysis of these important indicators in Bulgaria and in Croatia as a country close to ours in historical and geographical aspect, and both countries are one of the new members of the European Union. Given that Bulgaria is in the "waiting room" for admission to the Euro Area, its comparison with Croatia becomes even more meaningful since, as of January 1st, 2023, Croatia is the last country (as of the writing of this article) to have the euro as its currency and gained membership in the Euro Area. Adopting the euro as the main currency has its advantages – eliminating currency risk, reducing the cost of debt and reducing the overall risk of banking crises, but it is also accompanied by challenges such as inflation because of conversion costs, additional costs of joining the euro system and providing mandatory financial support to struggling Euro Area members [1].

The object of this article is the real estate market in Bulgaria and Croatia, and the subject of the study is the influence of interest rates on housing loans on the trade in residential real estate and, accordingly, their price. The main goal of the authors is to fill the gaps on the subject through a detailed analysis of the main indicators that shape the real estate market, as well as to draw basic conclusions and expectations for its development in the context of

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Bulgaria's future accession to the Euro Area. Through the analysis main trends will be identified, the results of which are important for all participants in the real estate market, as well as for financial institutions and researchers who focus on the development of the sector in emerging European markets.

The authors put several limitations on the scope and interpretation of the relevant results in the process of work. The first limitation is time – the period 2011-2022 will be considered. The reason for choosing this period is the authors' goal to examine the real estate market in a relatively balanced state. For this reason, data involving the Global Financial Crisis, which strongly affected the property market and had an impact on the indicators related to it, is deliberately not included. The second limitation is related to the geographical scope of the study, which focuses on Bulgaria and Croatia as two post-socialist countries with a close geographical location and membership in the European Union. Finally, the study focuses on interest rates on housing loans, because the authors evaluate this indicator as one of the significant and influential ones on the real estate market after the literature review. Their relationship with housing loan volumes and the House Price Index is examined, all other indicators are outside the scope of this analysis.

The present paper will have a standard structure: following the current introduction, a literature review of significant empirical studies related to the topic will be carried out. In the following section, the methodological elements of the study (basic concepts, data sources, used tools and other methodological notes) will be described in detail. The results section will present in-depth analysis of the data under consideration, followed by a discussion outlining conclusions from the research conducted and directions for future research will be set. In conclusion, key insights will be summarized.

II. Literature Review

The real estate market, by its very nature, represents "a complex system of economic and legal relations between various participants in the purchase and sale of real estate, their rental and trust management" [2]. This system is influenced by various factors such as population growth, household income, interest rates and credit availability. They can lead to boom-and-bust periods and have a serious impact on market dynamics, as happened in the 2008 Global Financial Crisis.

In Europe, and especially in the Euro Area, the dynamics of the residential real estate market is strongly influenced by the monetary policies of the European Central Bank, having an impact on the cost of loans, their volume and inevitably on the demand for residential real estate. Other developed economies, such as China's, draw a link even between the stock market and the real estate market [3]. Meanwhile, in countries such as Bulgaria and Croatia, the post-socialist transition and subsequent integration into the European Union have led to unique market conditions and different trends in residential property prices.

The subject of the real estate market, and more specifically interest rates and volumes of housing loans granted, as well as the housing price index, has been widely studied in the economic literature given their key role in shaping the behaviour of participants in the real estate market. They have an impact both on this market and on the economy in general. Housing is not only a core element of individual household wealth, but also a key driver of macroeconomic stability. As such, understanding how monetary policies, especially interest rates, interact with housing finance and market prices is essential.

Interest rates on housing loans are considered one of the main factors influencing the demand and affordability of residential properties. According to classical theories, a change in interest rates leads to a change in the cost of credit, which in turn affects people's ability to buy homes. This theory is supported by various studies in the field, proving that lower interest rates reduce credit costs, increase the demand for residential properties, which leads to an increase in their price [4]. The European Central Bank's low interest rate policies following the 2008 financial crisis and during the Covid-19 pandemic encouraged consumers in most European countries to search for and purchase residential property as low rates encouraged them to reach for cheaper credits. Interest rates set by banks are a critical driver of consumer behaviour, especially in the housing market. Khan and colleagues [5] examined how changes in them affect important financial decisions, such as buying a home. Low interest rates can fuel market "bubbles", while persistently high interest rates can lead to a prolonged lull in the housing market.

However, for economies in transition, such as those of Bulgaria and Croatia, the relationship between interest rates and housing markets is more complex. A study by Egert and Mihaljek [6], which focuses on Central and Eastern Europe, shows that while interest rates have a decisive role, other factors such as economic transition, institutional reforms, labour migration and foreign capital inflows also have a strong influence on the residential property market. The same study also emphasizes that the expanded availability of housing loans (credit booms) in post-socialist countries can lead to "bubbles" in real estate markets. The different economic conditions in these

countries require a broader understanding of how monetary policies interact with other factors and indicators in shaping housing finance. The findings of Suryawanshi and colleagues [7] provide a relevant context for understanding how increased financial inclusion can positively impact housing markets in developing economies such as Bulgaria and Croatia. With better access to financial services, low-income households can access housing loans, leading to greater participation in housing markets and stimulating demand in these regions.

The volume of housing loans granted is another indicator that affects the dynamics of the housing market. A well-developed financial sector usually facilitates access to credits, which increases activity in this market. The difference in credit volumes in the regions reflects the differences in financial development, banking frameworks and the frameworks in which the market functions. Countries with a more developed financial system tend to generate higher volumes of housing loans, but this is often accompanied by an increase in housing prices.

The House Price Index is widely used to track changes in the market values of residential properties. Housing prices are influenced both by the levels of interest rates and the availability of housing loans, as well as by other economic trends such as growth in the level of the gross domestic product (GDP) and the increase in employment in the given region or country. A study by Radonjic and colleagues [8] examines the impact of key economic indicators such as GDP, inflation, mortgage interest rates, household income, unemployment, etc. The authors find that GDP is among the most influential factors in explaining trends in real estate prices, along with other significant indicators such as net wages, unemployment rates and housing loan indicators.

In Bulgaria and Croatia, changes in housing prices are also influenced by factors such as foreign investment and tourism development. Demographic factors, such as total population, rate of natural increase, rate of mechanical increase, number of marriages, live births and number of populations with higher education also influence the level of residential property prices [9].

Various studies looking at the real estate market in the Euro Area and the European Union provide insight into the multi-layered reactions of different markets to monetary policies and credit conditions. For example, a study by Cochrane and Piazzesi [10] examines the relationship between monetary policy and housing markets in Euro Area countries, showing that changes in interest rates affect house prices faster in more developed economies than in those, whose economies were in transition, such as Bulgaria and Croatia. In-depth regional analyses [11] reveal that individual regions in the respective countries are also affected differently and at different pace by changes in the real estate market.

In summary, the reviewed literature highlights the importance of interest rates, housing loan volumes and the House Price Index as interconnected drivers of real estate market dynamics, especially residential real estate. The Euro Area as more mature financial system shows different development patterns compared to the economies of countries such as Bulgaria and Croatia, where external factors, such as integration into the European Union, also play a key role. The literature review reveals some gaps in research, especially regarding the comparative analysis of these factors in different regions within the European Union, highlighting the need for studies such as the present one that examine these relationships in a more region-specific context.

III. Methodology

This section aims to describe the sources that were used in the collection of the necessary empirical data, the essence of the indicators that will be analysed, as well as the analytical tools used in this study to investigate these indicators in Bulgaria and Croatia, and for the comparative analysis – in the Euro Area and the European Union as well.

Regarding the data under consideration, the authors rely on reliable secondary sources of information from reputable institutions and databases. The main data sources for housing loan interest rates, housing loan volumes and the House Price Index are as follows:

- European Central Bank: The European Central Bank is the main source of information on interest rates for different types of loans and deposits, including housing loans, which are the focus of this article; the same source provides data on the amount of housing loans – both newly granted and accumulated for a given period.

- Eurostat: In its role as the statistical office of the European Union, Eurostat is the main source of information on the House Price Index in the European Union, including Bulgaria and Croatia; the same database provides information on the considered indicator at the Euro Area level as well.

The data analysed in this study covers the period from 2011 to 2022. This time frame was chosen to capture real estate market trends following the shocks of the 2008 Global Financial Crisis, also before and after the Covid-19 pandemic, offering a more comprehensive view of the dynamics of the residential real estate market. The period covers significant economic phenomena both in the European Union and in Bulgaria and Croatia.

For the purposes of this study, three main indicators were considered – interest rate on housing loans, volume of housing loans (new business and outstanding) and housing price index. According to European Central Bank [12] "bank interest rate statistics refer to the interest rates that are individually agreed between a bank and its customers. They can therefore be different from the advertised rates, as households and non-financial corporations may be able to negotiate better terms and conditions than those advertised". When the term "interest rates" is used, it means interest rates that are "weighted averages, respectively, with the volumes of new business during the reporting period or with the outstanding amounts of the loans at the end of the reporting period. All interest payments on loans are covered, without including the other costs related to them" [13].

The statistical data provided by the central banks of the individual countries and the European Central Bank itself includes information both on the interest rates themselves and on the volumes of the respective loans and deposits. In the context of housing loans, the focus falls on two metrics – newly granted housing loans ("new business") for the relevant month/year and outstanding amounts on already granted housing loans. "New business" means "any new agreement between a client and a bank. New agreements are all contracts that for the first time determine the interest rate, terms and conditions of the newly granted credit. A new agreement is also any renegotiation of the interest rate, term and/or conditions under an already existing contract, when the possibility of such renegotiation is not included in it" [13]. Interest rates on bad credit and debt restructuring loans granted at below-market rates are excluded from these statistics. "Outstanding amounts" are defined as the availability of all loans granted by banks to their customers. The Bulgarian National Bank specifies that "these volumes do not include non-performing or restructured loans with measures that directly or indirectly lead to a reduction of the interest rate below the market level for the relevant market segment" [13].

The last indicator that is in the focus of this study is the housing price index. According to Eurostat this index "measures the changes in the transaction prices of residential properties, both newly built and existing, purchased by households" [14]. The House Price Index is published by most statistical agencies (national and European) with a reference year of 2015=100. The European Union Regulation 2016/792 on Harmonized Indices of Consumer Prices and the House Price Index provides the legal basis for total reference year 2015=100 and its future updates.

Various statistical tools were used in the present study to effectively analyse the interest rates on housing loans, the volumes on these loans and the housing price index as key indicators for the real estate market in Bulgaria and Croatia. They are selected to provide a comprehensive understanding of the data, to reveal the relationship between the indicators under consideration and to correctly identify possible conclusions and trends.

Correlation analysis is used to study the relationship between individual indicators. The strength and direction of the relationship between the variables "interest rates on housing loans" and "house price index" and between the variables "interest rates on housing loans" and "volume of new housing loans" was assessed using a correlation coefficient of Pearson [15]. All three variables have a quantitative nature, which allows its application. It varies from -1 to +1. The closer it is to ±1, the stronger the relationship between the variables is. Respectively, the closer it is to 0, the weaker their relationship is. The strength of the connection can be conventionally represented in the following limits:

- at $|R| \leqslant 0{,}3$ a weak dependence is established;
- at $0{,}3 < |R| \leqslant 0{,}7$ a medium dependence is established;
- at $|R| > 0{,}7$ a strong dependence is established.

The direction of the relationship depends on the value of the coefficient. When its value is positive (+R), then there is a directly proportional relationship between the variables – when one variable increases, the other increases as well. When its value is negative (-R), then there is an inverse relationship between the variables – as one variable increases, the other decreases.

To assess the effect of interest rates on housing loans on the remaining two variables, a regression analysis of the type was used [15]:

$$Y = a + b.X \quad (1)$$

where:

Y – dependent variable;

X – independent variable;

a – constant in the equation;

b – coefficient showing the effect of X on Y.

The regression model was tested for adequacy using a specific version of the F-test, and the coefficient "b" showing the effect of X on Y was tested for statistical significance using the Student's test (t-test). Both tests were performed at a risk of error of 5% (α=0,05).

For the better visualization and determination of the different trends of the two real estate markets in Bulgaria and Croatia, various graphs and charts are included in the analysis. In the context of the membership of the two countries in the European Union and their different status in the Euro Area, the graphic analysis includes data for both communities as well. This visual approach improves the accessibility of the findings and facilitates the communication of relationships between the indicators under consideration.

IV. Results

The first indicator that is examined in the study is the total volume of housing loans granted and outstanding by commercial banks in the respective country at the end of each year. The data are presented in Figures 1 and 2, respectively for Bulgaria and Croatia on one, and for the Euro Area (EA 19) and the European Union (EU 27) on the second.

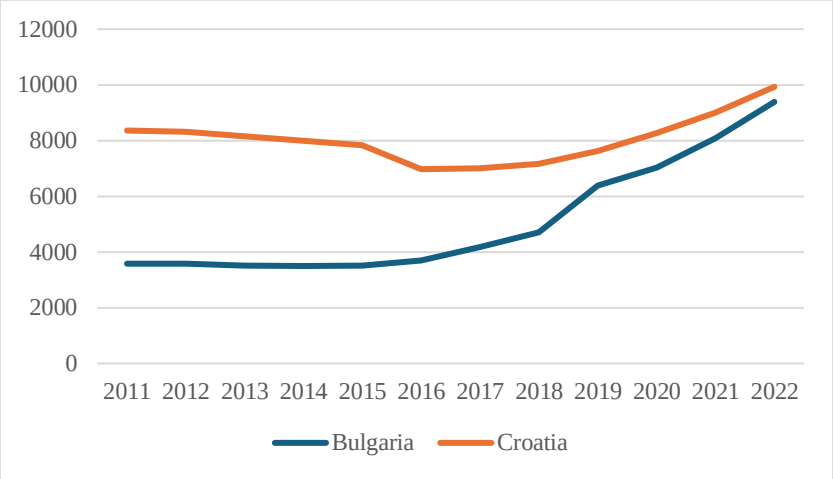

Fig. 1 Total Outstanding Housing Loans Bulgaria/Croatia (end of the year, EUR million)
Source: European Central Bank

As can be seen from Figure 1, the volume of housing loans in Bulgaria has grown more than 2,5 times over the last 12 years, with the strongest growth since 2018. Since then, this indicator has grown by nearly 25% on average annually, which speaks of a rapid development of mortgage lending and suggests an increased interest in real estate investments in this market. Although much less pronounced, a similar revival is also observed in Croatia. After a period of stagnation during the first 8 years of the researched period, after 2018 there is a stage of increased lending with their total volume growing by nearly 10% per year.

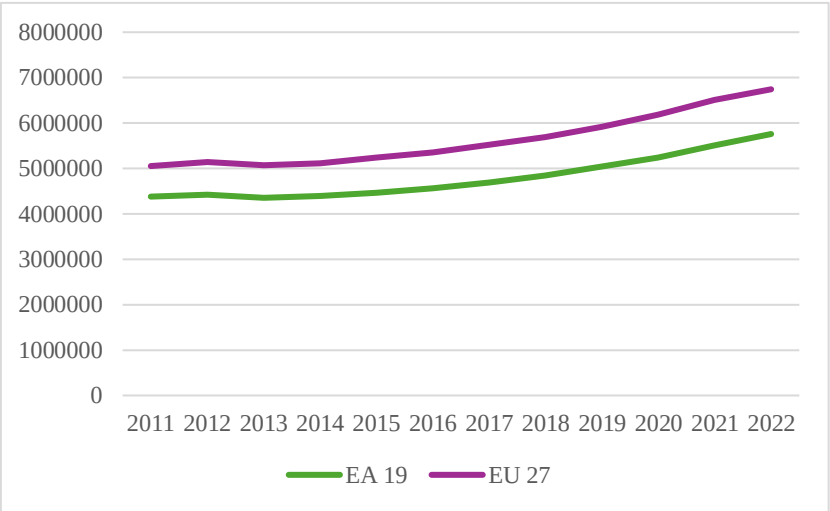

Fig. 2 Total Outstanding Housing Loans EA 19/EU 27 (end of the year, EUR million)
Source: European Central Bank

The mortgage market in the countries of the Euro Area and the European Union follows the same trend of smooth growth in both communities at roughly the same rates, expanding by about 32-33% or about 3% on average per year for the entire period under study. The high activity of commercial banks in Bulgaria and Croatia cannot be reflected at the European level since the mortgage markets as a volume of each of these two countries are still too insignificant as a share of the total – below 0,15%.

We see more clearly the already described trends in the two compared countries when the change in the total volume of granted housing loans by year is analysed, measured as the difference between newly granted loans and the principals paid in instalments of already concluded mortgages. The last 12 years can be conditionally divided into two sub-periods – a period of stagnation (between 2011 and 2017) and a period of revival (growth) of the mortgage market (after 2017). (Figure 3)

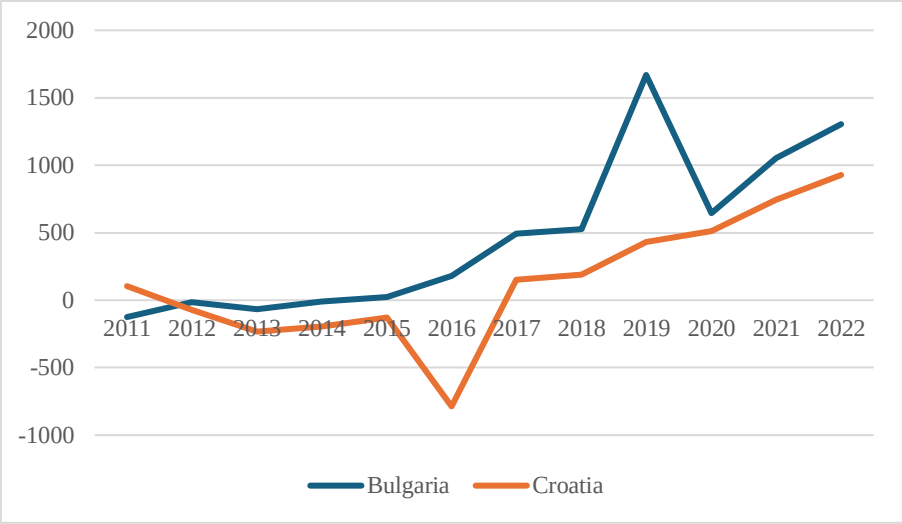

Fig. 3 Change in Outstanding Housing Loans Bulgaria/Croatia (end of the year, EUR million)
Source: Authors' calculations based on European Central Bank

The peak year during the research period for Bulgaria was 2019 with a positive balance of nearly 1,7 billion euros in the volume of loans. For Croatia, the peak is the last year 2022 with a positive balance of just over 900 million euros – precisely the year before the country's admission to the Euro Area.

The dynamics of the mortgage market is most evident in the presentation of data on the volume of newly granted housing loans by year (Figure 4). If during the first years of the considered period commercial banks in Bulgaria granted about 700 million euros in loans, then in the last two years this amount was 2800 and 3400 million respectively, or 4 and 5 times larger. The credit market in the country has been expanding for 11 consecutive years and in each of the last three the growth has been over 25%. These data undoubtedly speak of a serious credit expansion in the country and of the fact that more and more Bulgarians accept a housing loan as a natural step to finance the purchase of a residential property without worrying about possible difficulties in servicing it.

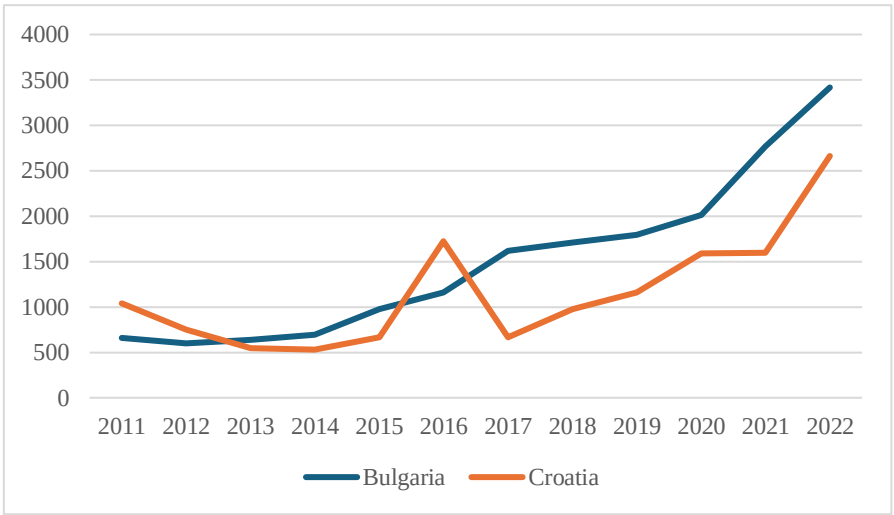

Fig. 4 Housing Loans – new business – Bulgaria/Croatia (EUR million)
Source: European Central Bank

Similar changes are observed in the mortgage market in Croatia. There has been a more pronounced growth in this country for the last 5 years and only in 2022 (the year before the adoption of the euro as an official currency) was a reported growth of 67% in the volume of granted new housing loans on an annual basis.

When the same measure at the community level is analysed (Figure 5), the growth trend in recent years is also present, although much more moderate. Between 2014 and 2021, a sustained growth in lending is observed, both in the Euro Area and the European Union. For 2021, newly granted housing loans are about twice as many as at the beginning of the period. In the last year 2022, a certain decrease of about 5% in the values of the indicator was reported, but whether this is a momentary correction of the market, like that of 2018, or whether it is the beginning of a longer reversal of the trend, we have yet to find out.

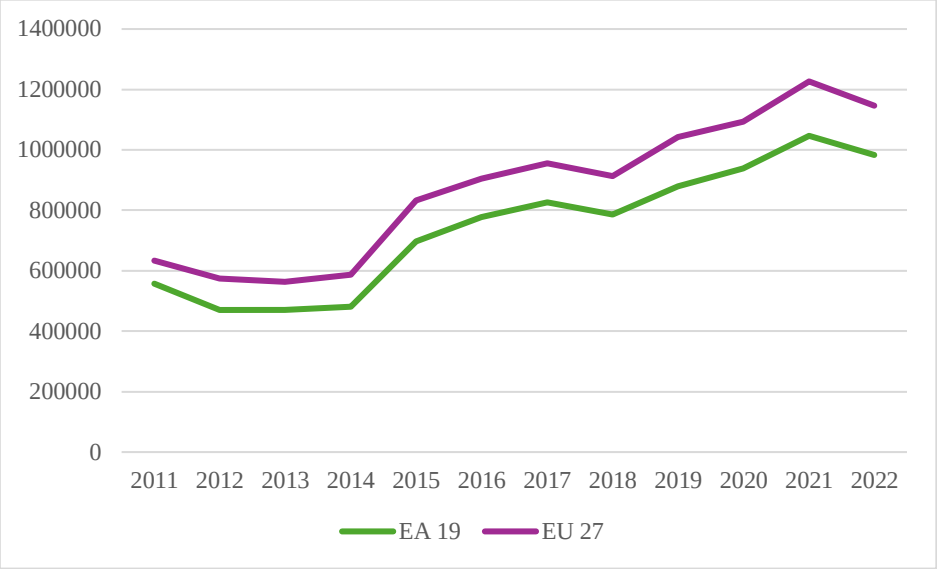

Fig. 5 Housing Loans – new business – EA 19/EU 27 (EUR million)
Source: European Central Bank

Figures 6 and 7 present the average amount in euros of the total volume of granted housing loans per head of the adult population, respectively, for the two compared countries and for the two communities (EA 19 and EU 27). Due to the large differences in the values of the indicator, the data are presented on separate graphs to visualize the differences in volumes better and more clearly. This metric to a certain extent eliminates the influence of the number of the population and its difference in the individual countries under consideration. Regarding Bulgaria, the growth in the outstanding amounts of granted loans is combined with a decrease in the population, which leads to an even faster growth of the indicator. The total volume of housing loans per capita has grown 3 times in 12 years – from 581 to 1662 euros. For Croatia, this growth is much more moderate and amounts to only 30%. (Figure 6)

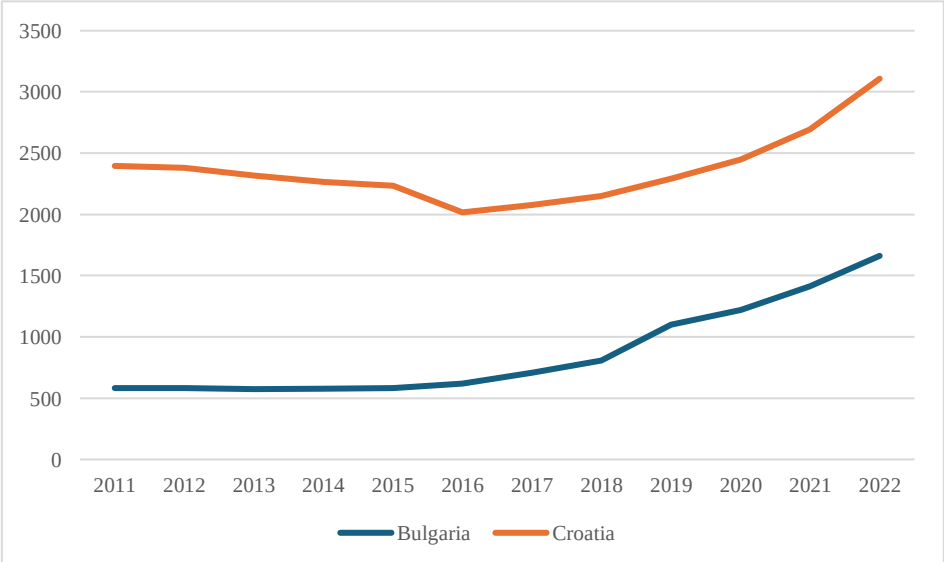

Fig. 6 Total Outstanding Housing Loans per Capita – Bulgaria/Croatia (population over 18 years, EUR)
Source: Authors' calculations based on European Central Bank and Eurostat

Approximately the same growth of about 30% marks the indicator for both studied communities for the period under consideration. It is noteworthy that the mortgage markets of the two former socialist countries are very far in terms of volume from the European one. By the end of 2022, the average adult European owes more than 18000 euros in housing loans to commercial banks, and in the countries of the Euro Area this measure is even higher – more than 20000 euros (Figure 7). The indicator is 6 times lower in Croatia, and for Bulgaria – 11 times. Among the main reasons for this huge difference are the insufficiently developed capital markets in both countries, the low financial literacy of the population, the fear of credit as an element of the people's psychology of the former socialist countries, as well as the high proportion of the population who live in their own housing without property burdens (this indicator will be the subject of analysis in the subsequent exposition).

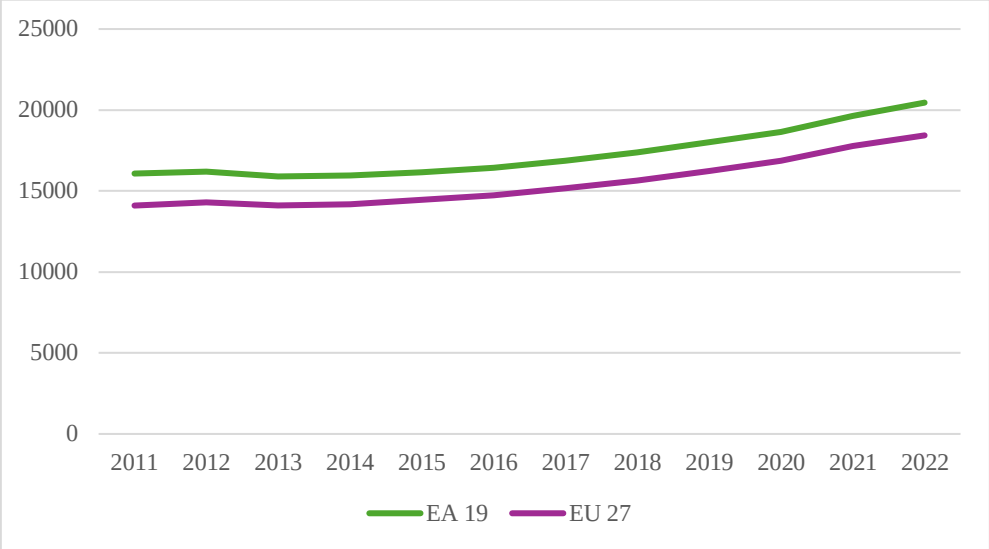

Fig. 7 Total Outstanding Housing Loans per Capita – EA19 / EU27 (population over 18 years, EUR)
Source: Authors' calculations based on European Central Bank and Eurostat

When we examine the outstanding amount of granted housing loans by country, not as an absolute but as a relative value, the trends are not at all the same as those described so far. Figure 8 shows that this volume as a share of the GDP of the country, respectively of the community. During the period 2011-2022, mortgage indebtedness as a share of GDP did not increase in the Euro Area and the European Union but on the contrary – decreased by 3-4%, reaching 42-43% at the end of the period. This shows that the gross product is growing faster than the growth in lending and the indebtedness of the population is slightly decreasing overall in relative terms.

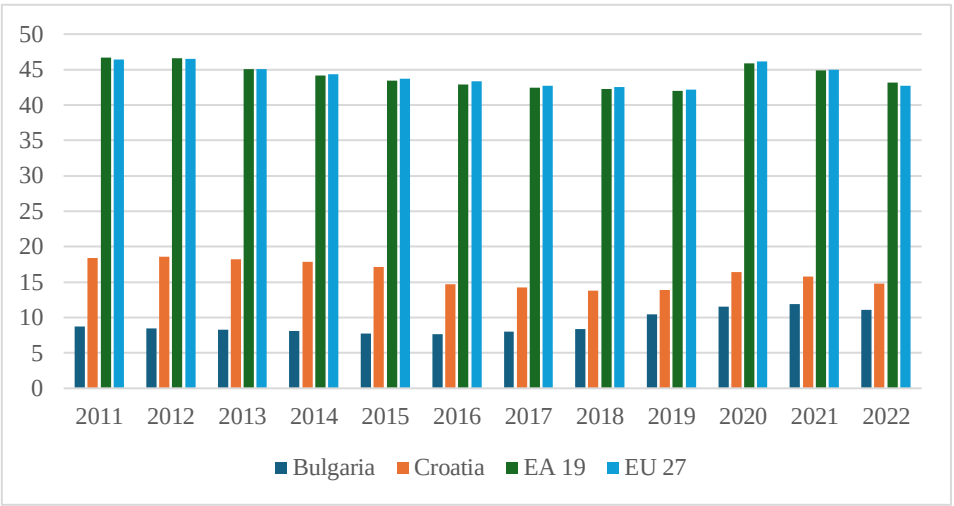

Fig. 8 Total Outstanding Housing Loans to GDP Ratio (%)
Source: Authors' calculations based on European Central Bank and Eurostat

We see the same tendency of a slight decrease in Croatia. The indicator drops at the end of the period from over 18% to below 15%. Only in Bulgaria the relative indebtedness has been growing for the last 4 years, when it jumped to over 10%. However, this indicator remains at a rather low level compared to the average European values of the indicator, and its increase is to some extent due to the low base from which we start in 2011.

The second indicator that the study focuses on is the interest rate on newly granted housing loans in the two compared countries and the Euro Area. The data presented in Figure 9 shows that, with few exceptions, throughout the period studied, housing interest rates have been decreasing. It is noteworthy that in the countries that adopted the single European currency, interest rates were lower throughout the entire period, reaching record low values below 2% per year for 6 years (2016-2021). Although slightly higher, interest rates in Croatia and Bulgaria also declined throughout the analysed period, which explains to some extent the active lending explored above. It was only in 2022 that the European Central Bank began to raise key interest rates, and this led to a bend in the curve, and for the first time the interest rates in the countries of the Euro Area overtook those in Croatia and approached the values in Bulgaria. (Figure 9)

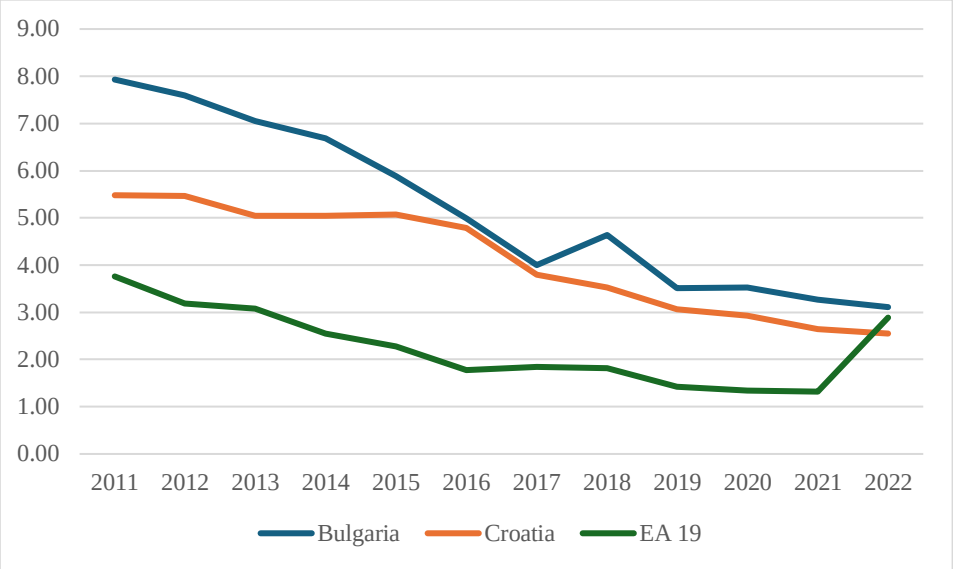

Fig. 9 Representative Interest Rates on New Housing Loans (%)
Source: European Central Bank

It can be categorically concluded that low interest rates lead to a higher growth of granted loans, and this dependence will be the subject of research in the following lines. The authors are also interested in how these two measures affect the trade in residential real estate and, accordingly, their prices. For this purpose, in Figure 10 it is presented data on the housing price index, weighted on an annual average, with the values for the year 2015 taken as a base (2015=100).

It is apparent that the housing market is in a period of 10 consecutive years of price growth since 2013. This growth is greater in Bulgaria (70% compared to the base) and Croatia (60% compared to the base), but also distinct throughout the European Union (just under 50%). In other words, we are observing similar trends as we encountered earlier, related to the increased mortgage lending of commercial banks and the increase in the availability of credits.

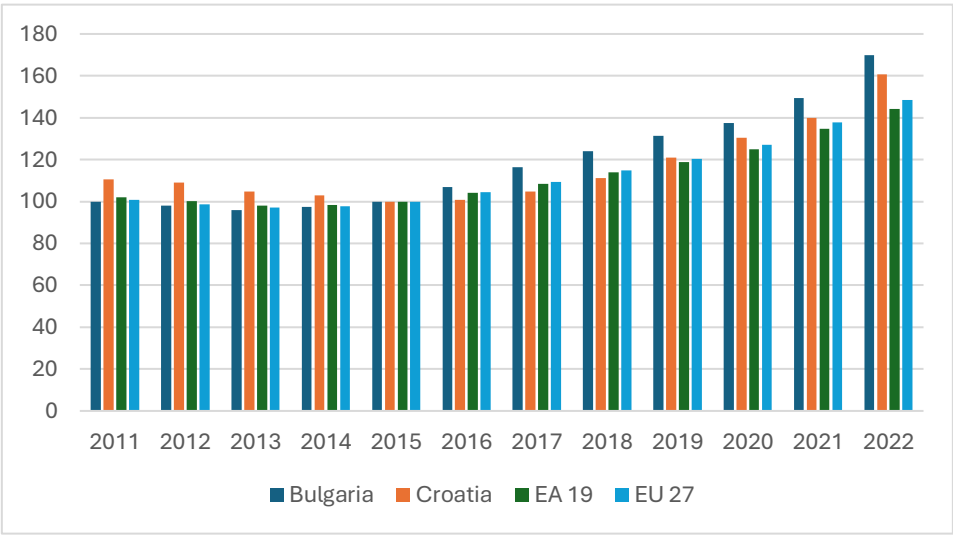

Fig. 10 House Price Index (annual average, 2015=100)
Source: Eurostat

After the presentation of the data for the three studied indicators of the housing market in Bulgaria and Croatia, the authors try to find a connection between the changes in them. All three variables are quantitative, making it possible to measure the correlation between them using the Pearson coefficient.

First, it is examined how the dynamics of interest rates on newly granted housing loans from commercial banks affect housing prices. The correlation coefficient between these variables in Bulgaria amounts to -0,859 (Table 1). Its significance level (α) is less than 0,01, which indicates that it is statistically significant with an error of 1% and can be interpreted. The sign in front of the coefficient is negative and exceeds the absolute value |0.7|. This means that there is an inverse and strong dependence between the phenomena.

The same correlation coefficient between the two variables in Croatia amounts to -0,795. Its significance level (α) is less than 0,01 again indicating that it is statistically significant with a 1% error and can be interpreted. The sign in front of the coefficient is negative, and its value exceeds the absolute value |0.7|. And here we conclude that there is an inverse and strong dependence between the phenomena. It should be noted that the correlation coefficient for Bulgaria is slightly higher than that of Croatia, indicating that the relationship between the interest rate and prices is slightly stronger there.

Table 1 Correlations between Interest Rates and House Price Index

		House Price Index
Interest Rates on New Housing Loans BULGARIA	Pearson Correlation	-,859**
	Sig. (2-tailed)	,000
	N	12
Interest Rates on New Housing Loans CROATIA	Pearson Correlation	-,795**
	Sig. (2-tailed)	,002
	N	12

** Correlation is significant at the 0,01 level (2-tailed)

Source: Authors' calculations

Secondly, the correlation between interest rates on housing loans and the volume of newly granted housing loans is examined, i.e. how the change in the cost of financing affects its volume. This coefficient amounts to -0,882 for Bulgaria (Table 2). Its significance level (α) is less than 0,01, which indicates that it can be interpreted, and its value means that there is an inverse and strong dependence between the phenomena.

Regarding Croatia, the same correlation coefficient amounts to -0,653. Its level of significance (α) is less than 0,05, which indicates that it is statistically significant with an error of 5% and can be interpreted. The sign in front of the coefficient is negative and is within limits between absolute value |0.3| and |0.7|. This means that there is an inverse and medium dependence between the phenomena.

Table 2 Correlations between Interest Rates and New Housing Loans

		New Housing Loans
Interest Rates on New Housing Loans BULGARIA	Pearson Correlation	-,882**
	Sig. (2-tailed)	,000
	N	12
Interest Rates on New Housing Loans CROATIA	Pearson Correlation	-,653*
	Sig. (2-tailed)	,021
	N	12

** Correlation is significant at the 0,01 level (2-tailed)

* Correlation is significant at the 0,05 level (2-tailed)

Source: Authors' calculations

In addition to the direction and strength of the dependence between the variables, regression analysis is used to measure the effect of changes in interest rates on house prices and the volume of new housing loans.

First, the effect of a change in interest rates on property prices is tested (Table 3). When applying the model in both countries (Bulgaria and Croatia) the level of significance of the coefficient "b" before the factor interest rates on housing loans is less than 0,01 which indicates that it is statistically significant with an error of 1% and can be interpreted. The value of the coefficient amounts to -11,59 for Bulgaria, which means that with a decrease in interest rates by 1 percentage point, the housing price index increases by 11,59 percentage points. For Croatia its value is -12,99, which means that when interest rates decrease by 1 percentage point, the housing price index there increases by 12,99 percents. In general, we can conclude that despite the stronger reported dependence between interest rates and prices in Bulgaria, the very effect of the change in interest rates is more pronounced in Croatia.

Table 3 Coefficients between Interest Rates and House Price Index

Coefficients[a]

Model		B	t	Sig.
BULGARIA	(Constant)	178,97	15,02	,000
	Interest Rates on New Housing Loans	-11,59	-5,31	,000
CROATIA	(Constant)	169,80	12,74	,000
	Interest Rates on New Housing Loans	-12,99	-4,15	,002

a. Dependent Variable: House Price Index

Source: Authors' calculations

Secondly, the effect of the change in the level of interest rates on new housing loans on their volume is measured (Table 4). The application of the model for Bulgaria shows that the significance level of the coefficient "b" before the interest rate factor is less than 0,01, it is statistically significant and can be interpreted. The value of the coefficient amounts to -448,08, which means that with a decrease in interest rates by 1 percentage point, the volume of new housing loans increases by 448 million euros.

The significance level of the coefficient "b" for Croatia is less than 0,05 indicating that it is statistically significant with an error of 5% and can be interpreted. The value of the coefficient amounts to -363,10, which means that with a decrease in interest rates by 1 percentage point, the volume of new housing loans increases by 363 million euros. In other words, interest rate dynamics have a greater effect on the volume of new housing loans in Bulgaria.

Table 4. Coefficients between Interest Rates and New Housing Loans

Coefficients[a]

Model		B	t	Sig.
BULGARIA	(Constant)	3825,15	9,25	,000
	Interest Rates on New Housing Loans	-448,08	-5,91	,000
CRATIA	(Constant)	2653,69	4,68	,001
	Interest Rates on New Housing Loans	-363,10	-2,73	,021

a. Dependent Variable: New Housing Loans

Source: Authors' calculations

V. Discussion

Some of the questions that deserve attention and discussion in the context of the topic set and the data presented are related to how far the described trends in the mortgage and housing market in the two compared countries will continue to develop and under the influence of what leading factors it will happen. It is appropriate to first explain the reasons for the trends described above to comment on what the development of the market will be in the coming years.

First, the two countries compared were part of the former socialist bloc until the 1990s. In most countries of this community, bank credit was considered a sign of poverty, and the banking system was monopolized by the state. And although almost 35 years have passed since the beginning of the transition, still a part of the population (the

older one) is not inclined to resort to the use of foreign capital to finance their investment intentions. This largely explains the lower indebtedness in these countries compared to the European Union and the Euro Area.

Secondly, it is appropriate to point out that Bulgaria and Croatia were and still are among the EU countries with the highest share of the population living in their own home without a mortgage for similar reasons (Figure 11). This share is around 90% with under 70% for the European Union and around 65% for the Euro Area. The strong connection of the family with the residential property and the belief that "my home is my fortress" remained in the folk psychology of the societies of the former socialist bloc. This is a significant reason for the less developed housing and mortgage market in these countries compared to other EU members and, accordingly, a prerequisite for its more rapid development in recent and future years due to the lower starting point.

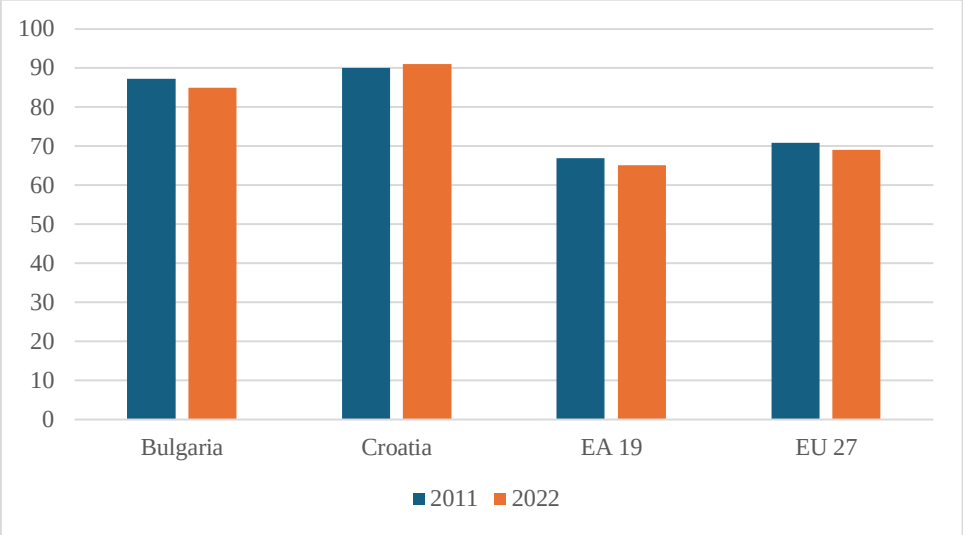

Fig. 11 Owner Occupation Rate (%)
Source: Eurostat

In authors' opinion, the other factors that have the strongest influence on mortgage lending and the demand for residential properties in Bulgaria (as a candidate member of the Euro Area) are:

- the poorly developed capital market and, accordingly, the lack of many other investment opportunities for small investors makes them invest their savings in residential properties;
- the rapid growth of the population's income ahead of inflation leads to an increase in savings and an increase in the affordability of residential properties;
- low interest rates and the liberal attitude of banks in crediting transactions for the purchase of residential properties (low required share of self-participation) lead to increased demand; how healthy this is for the banking system and what risks it poses for borrowers remains to be examined;
- continued urbanization in the country – the strong concentration of the population in large cities and especially in the capital create prerequisites for high demand for residential properties and large-scale construction;
- the effects of the pandemic and the war in Ukraine also contributed to an increased demand for residential properties after 2021 in line with the increased tendency to work from home, inflation in construction materials (some of which are imported from Ukraine and Russia), uncertainty about citizens' savings, etc.

These and other factors will continue to influence the housing and mortgage markets in Bulgaria and Croatia in the coming years and should be the subject of increased interest by researchers in this field of science.

VI. Conclusions

In conclusion from the analysis of empirical data for the mortgage and housing market in Bulgaria and Croatia, the following main conclusions can be drawn:

1. The number and volume of housing loans granted in both countries have grown rapidly over the past 6 years. After a stage of relative calm during the first 6 years of the research period (2011-2016 including), a stage of turbulent lending followed, which led to an increase in the total volume of housing loans by 25% on average annually in Bulgaria and 10% in Croatia.

2. Despite the mentioned growth, in both post-socialist countries the average amount of housing loans granted per capita is far lower than that in the European Union and the Euro Area – for Croatia about 6 times, and for Bulgaria 11 times lower.
3. The insufficient development of the mortgage market in the two countries compared is also evident from the share of granted loans in relation to the country's GDP. This share is around 10-11% for Bulgaria, around 15% for Croatia, and for European Union and the Euro Area it ranges between 40 and 45%.
4. One of the reasons for the active development of mortgage lending in recent years throughout the European community is the decreasing interest rates during the period under review, which reached record low levels. The studied correlation dependence between the two indicators is strong and negative - the lowering of interest rates leads to an increase in the volume of loans granted.
5. Accessible bank financing stimulates the demand for residential properties and logically leads to an increase in the Housing Price Index – strongest in Bulgaria (with 70% since 2015), but also in Croatia (60%) and on average for the European Union (about 50%). The correlation between interest rates on housing loans and prices is strong and negative – with a decrease in interest rates by 1 percentage point, the Housing Price Index increases by 11,59 percentage points for Bulgaria and 12,99 for Croatia.
6. The authors' expectations are that the prices of residential properties in Bulgaria will continue to rise at least until the country's acceptance into the Euro Area under the influence of various factors, among which are the rapid growth of the population's income, the lack of other investment alternatives, the ongoing internal migration to the biggest cities, low interest rates and high inflation.

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