TRENDOVI U POSLOVANJU
NAUČNO-STRUČNI ČASOPIS

# SURFOVANJE SA PLIMOM – NEKRETNINE KAO ZAŠTITA OD INFLACIJE
# SURFING WITH THE TIDE: REAL ESTATE AS A HEDGE AGAINST INFLATION3

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## Abstract

*After a multi-year period of low interest rates and monetary expansions following the so-called great moderation, the issue of how to protect capital from value erosion became highly relevant once again. Recent notable increase in inflation re-woke theoretical and practical disagreements about what causes inflation in the first place, in which ways and to what extent inflation is being costly for both households and investors, and in particular how if at all households are able to protect their modest portfolios. Inflation undoubtedly erodes the value of corporate earnings as well as profits of financial intermediaries, thereby impacting virtually all asset classes and all kinds of investors. Nonetheless, it is usually the harshest on the receiving end, since predominantly households are most badly hit by inflation, especially those with fixed- or way too slowly adjusting incomes. Therefore, during a period of accelerated inflationary pressure, it becomes ever more important for all parties to obtain financial instruments that effectively protect capital from value erosion. The question arises of where to invest in order to at least preserve value i.e. keep up with the inflation rate in terms of investment returns. The aim of this research is to measure the correlation between real estate performance and inflation in order to determine whether this type of asset can be a good source of protection against inflation. Also, the aim of the paper is to compare the real estate protective potential against inflation with the performance of stocks, bonds and gold in conserving inherited purchasing power.*

## Sažetak

*Nakon višegodišnjeg perioda niskih kamatnih stopa i monetarne ekspanzije koji su pratili razdoblje takozvane „velike umerenosti", pitanje kako zaštititi kapital od gubitka vrednosti ponovo je postalo veoma relevantno. Skorašnji značajan porast inflacije ponovo je pokrenuo teorijske i praktične nesuglasice o tome šta uzrokuje inflaciju na prvom mestu, na koji način i u kojoj meri inflacija ima troškove kako za domaćinstva, tako i za investitore, a naročito kako i da li domaćinstva mogu zaštititi svoje skromne portfolije. Inflacija nesumnjivo erodira vrednost korporativnih prihoda, kao i profite finansijskih posrednika, time utičući na gotovo sve klase imovine i sve vrste investitora. Ipak, najteže pogođena inflacijom su domaćinstva, posebno ona sa fiksnim ili suviše sporo prilagođavajućim prihodima. Stoga, tokom perioda ubrzanog inflacionog pritiska, postaje sve važnije posedovati finansijske instrumente koji efikasno štite kapital od gubitka vrednosti. Postavlja se pitanje*

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gde investirati kako bi se barem očuvala vrednost, odnosno pratila stopa inflacije u smislu prinosa na investicije. Cilj ovog istraživanja je merenje korelacije između performansi nekretnina i inflacije, kako bi se utvrdilo da li ova vrsta imovine može biti dobar izvor zaštite od inflacije. Takođe, cilj rada je uporediti potencijal zaštite od inflacije nekretnina sa performansama akcija, obveznica i zlata u očuvanju nasleđene kupovne moći.

**Ključne reči:** inflacija, zaštita od inflacije, nekretnine, zlato, akcije, obveznice

**Keywords:** inflation, inflation hedge, real estate, gold, stocks, bonds

### Introduction

The global economy is facing numerous challenges that fully erupted with the recession caused by the COVID-19 pandemic and then the Russian-Ukrainian conflict, however, on a deeper level, the crisis has been around for longer and progressively gained owing to excessive monetary and fiscal expansion, which has relaunched high inflation rates as a once again pressing issue. While the initial, real-economy impact of pandemic caused a global recession in 2020, the year 2021 concluded with a rapid rise of inflation in many countries, including the United States (US) and the European Union (EU). The US experienced an annual Consumer Price Index (CPI) increase of 7%, the highest rate recorded in the last 39 years, primarily due to the rapid increase in energy prices. The EU zone had an annual inflation rate of 5% in 2021. The upsurge of inflation continued, and in many countries, the inflation rate nearly doubled in the first half of 2022 compared to the previous quarter [19].

Moreover, notwithstanding the significant increase in inflation rates, society has also witnessed a non-negligible pretty much continuous rise in real estate prices over the last couple of years. In fact, under inflationary conditions, investors instinctively seek safe havens, and real estate has traditionally been a preferred instrument for protecting investors' purchasing power during periods of high inflation. The real estate has unique characteristics as it can be viewed both as an investment and as a consumer durable good. The demand for real estate is driven by fundamentals such as household wealth, population growth, accessibility to loans, interest rates, and unemployment. Many of these factors can significantly change with shifting economic trends, especially in developing countries and transition economies alike.

The significance of the real estate market is evident in the fact that residential investments account for 5% of the U.S. GDP, and housing services contribute an additional 12%, totalling a whopping 17% share of the overall U.S. GDP. Moreover, at the beginning of the 21st century, the real estate market became increasingly attractive to investment fund managers, with real estate becoming an integral part of their portfolios as part of diversification and risk management strategies. Additionally, the securitization of mortgage loans has significantly increased the liquidity of this market [20]. For households, real estate and stocks are the most significant financial assets, constituting more than half of the total assets on household balance sheets [11]. What's more, in developing countries, investing in the real estate market represents the predominant form of investment. It is expected that both real estate and stock nominal returns move in tandem with inflation, serving as protection against general price shocks. However, Fama and Schwert (1977) [5] found that over time nominal stock returns decline as inflation rises, while nominal returns on real estate keep tracking inflation.

The chief research hypotheses of this paper are formulated with the intention of examining whether residential real estate effectively preserves the value of capital against accelerating inflation or indeed eventually falls prey to the very same medicine it was desperately trying to administer.

Real estate can effectively protect capital from the negative impact of inflation.

Investments in real estate are superior in value preservation compared to government bonds, stocks and gold.

The rest of the article is organised as follows: in section 2, a brief literature review on effectiveness of real estate as a hedge against inflation is laid out; in section 3 authors provide the theoretical basis for hedging against inflation; section 4 explains the data and methodology used; section 5 offers results and discussion thereof, while in section 6 paper is brought to a conclusion.

## Literature Review

Although a larger portion of the population still prefers owning residential real estate as opposed to stocks, limited data availability further contributes to the lack of knowledge regarding the relationship between real estate returns and inflation [14]. Authors found little consensus in the literature on whether and to what extent investing in real estate is a good hedge against inflation. The topic of inflation remains a key debate among economists, calling for additional research.

Bond and Seiler [2] concluded that residential real estate represents a significant hedge against both expected and unexpected inflation, reducing volatility in portfolio returns. Gunasekarage et al. (2008) [10] argued that real estate serves as an effective long-term hedge against inflation, but the same cannot be said for classic financial assets. Parajuli and Chang (2015) analysed which asset serves as a good hedge against inflation and concluded that real assets like real estate, timberland, and farmland are good inflation hedges, while stocks are found to be inferior hedges against inflation[17].

Knoll *et al.* (2017) [13], upon examination of data from 1870 to 2012, concluded that on average, house prices in developed economies have tripled since 1900, equivalent to an average annual real growth rate of just over 1 percent. They noted that this is less than the average annual growth in GDP per capita of around 1.8 percent for the sampled average. In other words, house prices have considerably risen over the observed 140 years relative to consumer durables prices but have lagged behind income growth in most countries. Similarly, Jordà *et al.* (2019) [11], after analysing annual real estate returns from 1870 to 2015, observed that returns on residential real estate and stocks exhibit very similar and indeed high real gains, averaging around 7% annually. They noted that real estate returns are akin to stock returns but much less volatile. Similarly, Shiller (2000) [18] maintained that long-term capital gains from real estate are relatively low, around 1% annually in real terms, and significantly lower than capital gains in the stock market. However, the rental component is usually much higher and more stable than stock dividends, yielding the overall returns of approximately the same magnitude.

Fehrle (2023) [7] investigated data on real estate and equity for 16 countries in the period from 1870 to 2020. His analysis indicates that real estate provides a certain level of protection against inflation over time-spans of 1, 5, and 10 years. He particularly observed that the relationship between nominal yields and inflation is more pronounced in the post-war period. Over the long term, real estate delivers a partial protective effect against inflation, and in the post-war period, it is even considered to be a perfect hedge. On the other hand, equity yields generally decline along with inflation during the post-war period. All in all, the conclusion of his research is that real estate is at least partially superior to shares in protecting against inflation over a longer time horizon.

Wolski (2023) [21][22], on the contrary, concluded that although investors often believe that real estate is an effective hedge against the negative effects of accelerating inflation, research conducted in other markets suggests that this is not always the case. Some researchers even argue that real estate may not only fail to protect against rising prices but could also be a contributing factor to those hikes [16]. Upon examination of the real estate market in Taiwan, Fang et al. (2008) concluded that returns on housing have negative correlations with both expected and unexpected inflation, confirming that they are an ineffective hedge against inflation. Real estate is not found to be a satisfactory inflation hedge at all in most countries [6][12].

Dabara *et al.* (2016) [3] argue that there is no consensus on the ability of real estate to hedge against inflation, since some studies seem to prove it performs well, while others demonstrate the opposite.

## *Theoretical Basis for hedging against Inflation*

Given the well-known Fisherian identity, stemming from the fact that the real return factor equals the nominal return factor divided by the inflation factor, the real return rate is approximately equal to the nominal return rate minus the expected inflation rate. [8];[9]

$$i_t \approx i_t - \pi_t^{E} \qquad (1)$$

If an asset's real return is unaffected by the inflation rate, the asset serves as a perfect hedge against inflation. Similarly, the degree to which the real return rate depends on the inflation rate measures the asset's effectiveness in providing protection against inflation. [8];[9]

$$\Delta i_t / \Delta \pi_t^{E} = \Delta i_t / \Delta \pi_t^{E} - 1 \qquad (2)$$

A shift in the nominal return corresponding to a change in inflation *a)* greater than one signifies an excessive hedge, *b)* equal to one implies a perfect hedge, whereas a change *c)* ranging between zero and one represents a partial hedge, absence of shift *d)* indicates no hedge, whereas a change *e)* falling below zero indicates a hazard.

The potential of an asset to provide protection against inflation depends on the type of that asset. For instance, cash has a nominal yield of zero, ensuring that its nominal return remains unchanged with inflationary changes, and therefore, cash does not offer protection against inflation.

## *Data and Methodology*

For the purposes of the research, quarterly data on real estate prices and rents are used for the Republic of Serbia, the United Kingdom, Germany, Turkey, and the Czech Republic. Data on stock price movements are based on stock indices: BELEX 15 for the Republic of Serbia, FTSE 100 for the United Kingdom, DAX 40 for Germany, BIST 100 for Turkey, and PX for the Czech Republic. The data on bond yields include annual data of five-year government bonds yields of the observed countries. The price of gold is presented quarterly in national currencies: euro, British pound, Serbian dinar, Czech koruna, and Turkish lira. Data for the United Kingdom and Germany are used for the period from Q1 2002 to Q2 2023, for Turkey from Q1 2010 to Q2 2023, for the Czech Republic from Q1 2008 to Q2 2023. For the Republic of Serbia, for housing prices period from Q1 2002 to Q2 2023 is used and for stocks, bonds and gold period from Q1 2010 to Q2 2023 is used. The Consumer Price Index (CPI) is used to measure inflation. The United Kingdom and Germany are chosen as countries with mild inflation, Serbia and the Czech Republic as countries with moderate inflation, and Turkey as an extreme case with hyperinflationary pressures, as can be seen in Figure 1. An index with the base year 2015 (2015=100) has been calculated for all data series. All the necessary data has been collected from the databases of the World Bank, the Organization for Economic Cooperation and Development (OECD), the Bank for International Settlements (BIS), Eurostat, national statistical institutes, and central banks.
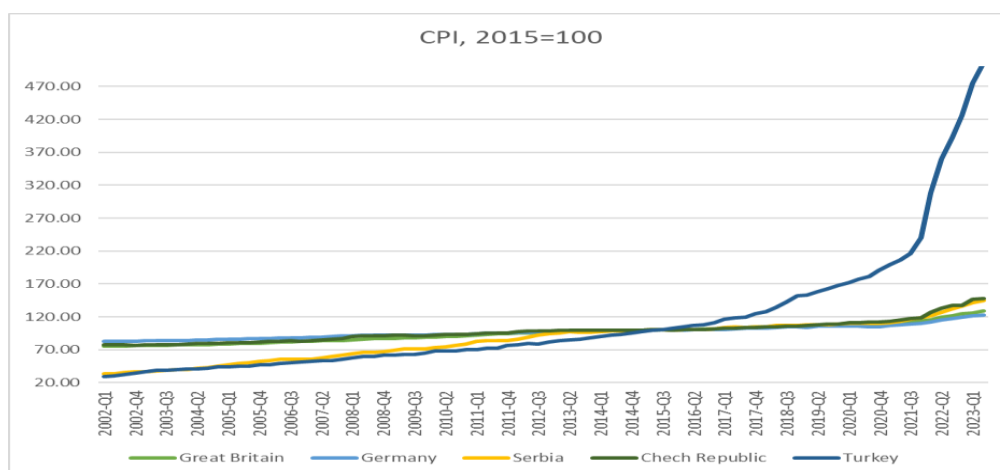
*Figure 1: Inflation rate index (2015=100)*

*Source: Authors' Calculation*

However, it is empirically relevant to presume that real estate prices are not only influenced by CPI inflation but that rapidly rising real estate prices in turn additionally affect the inflation rate through time. Further still, Adam and Woodford (2020) [1] have showcased how -if monetary authority is concerned with element of irrationality in private sector inflation expectations- central bank's objective function and the optimal target criterion must depend on housing prices too. In order to explore whether there exists an underlying long-term relationship between inflation and real estate prices, cointegration analysis was conducted using the Engel-Granger test [4]. The variables employed were the Consumer Price Index (CPI) and the nominal housing price index (NHI) for each observed country individually. The base year chosen was 2015. The testing process involves two steps. In the first step, the variables are tested for their order of integration, and they need to be of the same integration order. In the second step, the Engel and Granger Cointegration test is performed. This test is a residual-based test for cointegration, applying a unit root test to series residuals. The null hypothesis is that the series are not cointegrated. Rejecting this null hypothesis implied the presence of cointegration among the series. Confirmation of cointegration demanded the non-rejection of the null hypothesis for each variable, whereas for residuals, the null hypothesis had to be rejected in favor of the alternative hypothesis.

If there is no cointegration between variables, it indicates that the variables are not connected in the long run and do not share a common stochastic trend. Essentially, the variables do not exhibit synchronized movement over the long term and are not influenced by each other's fluctuations. Additionally, forecasting future values using non-cointegrated variables may lead to less accurate predictions.

## Results and Discussion

First, the authors would like to emphasize some limitations of the research. An ideal real estate price index would contain the value of a standard, unaltered home. However, houses are heterogeneous assets whose characteristics change over time. Moreover, properties are rarely sold, making it difficult to observe their prices over time. All factors influencing real estate cash flow must be considered, including transaction costs, equity participation, insurance, maintenance costs, property tax, mortgages, tax savings, and potential income if the property is sold at some point. The authors calculated all costs related to the tax and maintenance of the property as 35% of the rental price. These costs can vary significantly from country to country and over time, thereby influencing the results.

The authors tested the hypothesis that investments in real estate are superior in value preservation compared to government bonds, stocks, and gold. Cryptocurrencies, primarily bitcoin, were not considered in this paper due to their high volatility and relatively short existence. Some views and predictions of bitcoin performance can be found in the work of Lazovic et al (2023) [15]. To determine which form of investment best protects against inflation, the authors calculated the return on investments in real estate, gold, the national stock market index, and government bonds for each country individually. The results are presented below in Table 1.

*Table 1: Asset returns*

| Country | Asset | Cumulative return in % | Standard deviation | Averrage return |
|---|---|---|---|---|
| Czech Republic/Nominal Q1 2008 to Q2 2023 | Real estate | 116.03 | 1.99 | 1.29 |
| | Gold | 176.09 | 8.06 | 2.00 |
| | Stocks (PX) | -8.11 | 9.41 | -0.13 |
| | Bonds | 31.26 | 1.45 | 1.84 |
| Czech Republic/Real Q1 2008 to Q2 2023 | Real estate-capital gain | 40.11 | 2.10 | 0.58 |
| | Real estate-capital gain+rent | 90.49 | | |
| | Gold | 68.43 | 8.07 | 1.18 |
| | Stocks (PX) | -43.94 | 9.20 | -0.71 |
| | Bonds | -17.90 | 3.29 | -1.25 |
| Turkey/Nominal Q1 2010 to Q2 2023 | Real estate | 1803.38 | 8.04 | 5.98 |
| | Gold | 2857.18 | 11.36 | 7.15 |
| | Stocks (BIST 100) | 744.99 | 13.62 | 13.80 |
| | Bonds | 298.84 | 4.17 | 11.30 |
| Turkey/Real Q1 2010 to Q2 2023 | Real estate-capital gain | 135.70 | 3.99 | 1.70 |
| | Real estate-capital gain+rent | 179.57 | | |
| | Gold | 295.27 | 10.38 | 3.12 |
| | Stocks (PX) | 12.95 | 12.03 | 0.24 |
| | Bonds | -52.69 | 13.82 | -4.28 |
| Serbia/Nominal Q1 2010 to Q2 2023 | Real estate | 112.48 | 2.72 | 1.49 |
| | Gold | 147.91 | 8.02 | 2.04 |
| | Stocks (Belex 15) | 33.29 | 8.33 | 0.89 |
| | Bonds | 121.74 | 3.32 | 6.36 |
| Serbia/Real Q1 2010 to Q2 2023 | Real estate-capital gain | 6.87 | 3.06 | 0.20 |
| | Real estate-capital gain+rent | 35.75 | | |
| | Gold | 24.86 | 8.06 | 0.74 |
| | Stocks (PX) | -32.87 | 8.25 | -0.41 |
| | Bonds | 21.65 | 5.05 | 1.63 |
| Germany/Nominal Q1 2002 to Q2 2023 | Real estate | 80.06 | 1.53 | 0.71 |
| | Gold | 411.94 | 7.08 | 2.19 |
| | Stocks (DAX 40) | 209.37 | 11.61 | 2.02 |
| | Bonds | 36.13 | 1.77 | 1.49 |
| Germany/Real Q1 2002 to Q2 2023 | Real estate-capital gain | 23.68 | 1.71 | 0.26 |
| | Real estate-capital gain+rent | 93.55 | | |
| | Gold | 243.61 | 7.12 | 1.71 |
| | Stocks (PX) | 107.64 | 11.59 | 1.55 |
| | Bonds | -4.92 | 2.34 | -0.21 |
| Great Britain/Nominal Q1 2002 to Q2 2023 | Real estate | 177.18 | 1.90 | 1.22 |
| | Gold | 612.25 | 7.33 | 2.60 |
| | Stocks (FTSE 100) | 49.07 | 6.25 | 0.67 |
| | Bonds | 63.18 | 1.76 | 2.41 |
| Great Britain/Real Q1 2002 to Q2 2023 | Real estate-capital gain | 71.33 | 2.05 | 0.66 |
| | Real estate-capital gain+rent | 141.21 | | |
| | Gold | 314.42 | 7.41 | 1.96 |
| | Stocks (PX) | -13.26 | 6.15 | -0.15 |
| | Bonds | 0.51 | 2.40 | 0.05 |

*Source: Authors' Calculation*

Nominal cumulative return primarily indicates the performance of an individual asset compared to holding cash. As it is known, cash has a nominal yield of zero and provides no protection against inflation. Real cumulative return takes into account the inflation rate and provides information on whether a certain asset has preserved wealth during the observed period, i.e., whether it is a good hedge against inflation. Standard deviation indicates how volatile a particular asset is. Greater volatility represents higher risk, which should also entail a higher potential profit.



*Figure 2: Nominal and real cumulative returns – Czech Republic*
*Source: Authors*

In the market of the Czech Republic during the period from Q1 2008 to Q2 2023, it can be noticed that only investing in the real estate market and gold has preserved and even increased their real value over the observed period (Figure 2). Investing in the stock market of the Czech Republic would be a real hazard, as even the nominal return is negative (-8.11%), so even holding cash is a better option. During a period of elevated inflation, investing money in government bonds did not preserve its value. Investing in gold during the given period would increase the real value by 68.43%, while the capital value of real estate has increased by 40.11% in real terms. If rental income is also considered, investing in real estate represents the most profitable investment in the Czech Republic during the observed period.
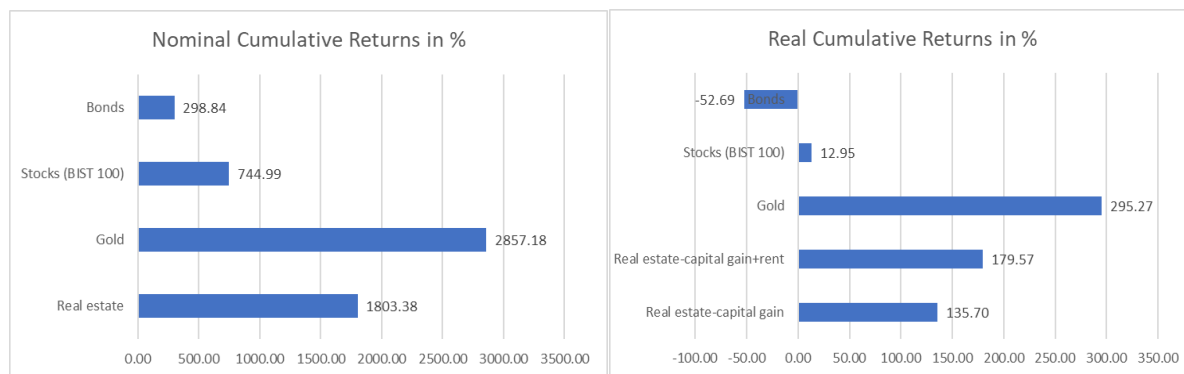


*Figure 3: Nominal and real cumulative returns – Turkey*
*Source: Authors*

The Turkish economy is facing a long-standing problem of high inflation. During the observed period, cumulative inflation has exceeded 600%. Additionally, the national currency is losing its value even more rapidly. In such conditions, getting rid of cash is the only logical choice, and it can be seen that investments in the stock market, real estate, and gold have preserved their value in the period from Q1 2010 to Q2 2023 (Figure 3). Investing in government bonds, as expected, did not contribute to value preservation. The highest returns would be achieved by investing in gold, a remarkable 295.27% in real terms, followed by real estate market investments at 179.67% in real terms, and finally, investments in the national stock market at 12.96% in real terms. In favor of such results is the fact that gold is a global asset, while the Turkish lira has been unstoppable in losing value compared to the strongest world currencies.
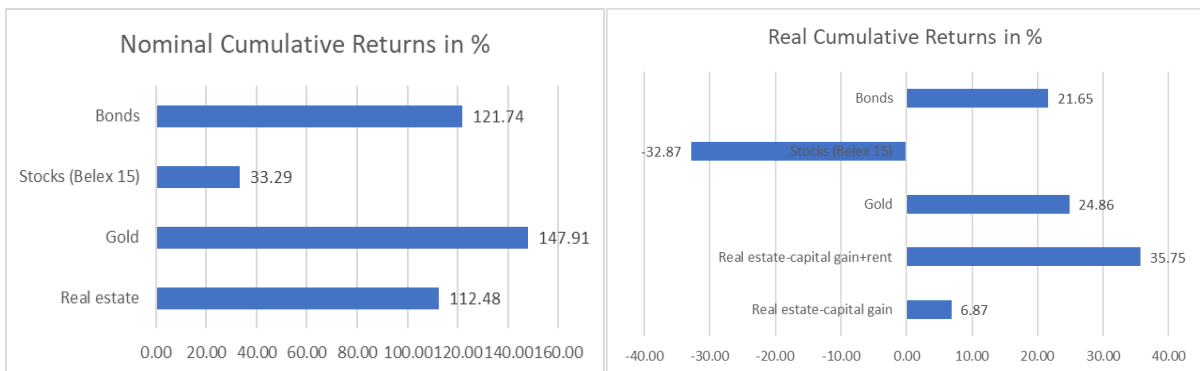
*Figure 4: Nominal and real cumulative returns – Serbia*
*Source: Authors*

In the Serbian market during the period Q1 2010 – Q2 2023, it can be observed that only investment in the national stock market resulted in a negative real return of -32.87% (Figure 4). The highest return comes from investing in the real estate market, with a real gain of 35.75%, followed by gold at 24.86% in real terms. Although the Czech Republic belongs to the group of developed countries, and the Republic of Serbia to the group of developing countries, the authors noticed a certain similarity in the economies of these two nations. The stock market is poorly developed, inflation is moderate, and despite a slightly higher inflation rate compared to the Eurozone countries, national currencies maintain relative stability against the euro over a longer period. Such conditions evidently favor the expansion and speculative growth of the real estate market.
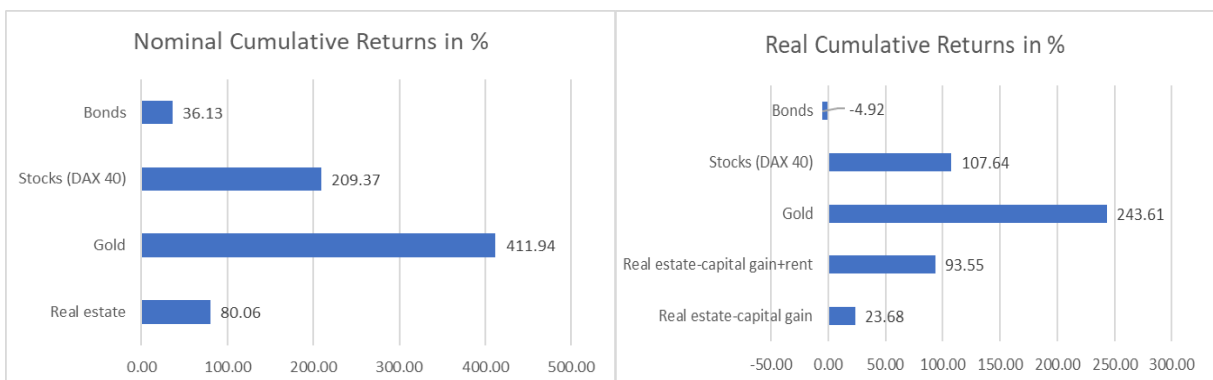


*Figure 5: Nominal and real cumulative returns – Germany*
*Source: Authors*

The German market was observed during the period Q1 2002 – Q2 2023 (Figure 5). The only investment that would have preserved real value is investing in government bonds. The highest return would be achieved by investing in gold, with a real gain of 243.61%, followed by the securities market at 107.64% in real terms, and finally, the real estate market at 93.55% in real terms. The great development of the stock market provides investors with better opportunities for diversification.
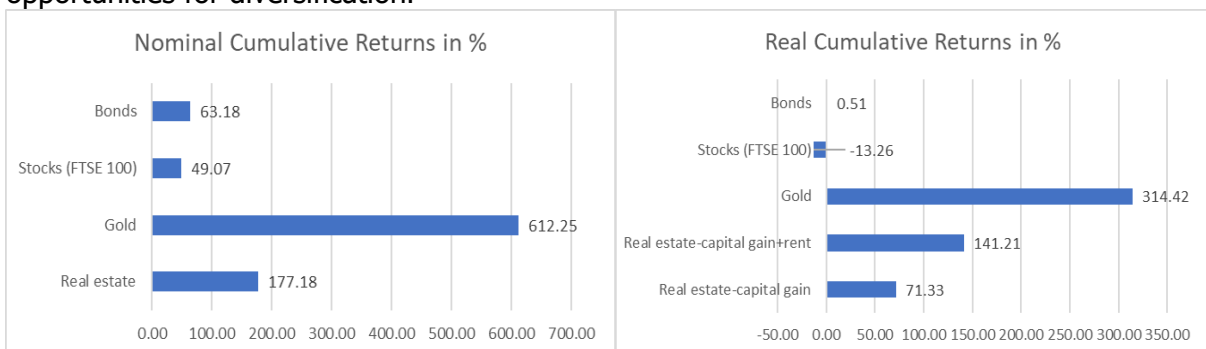


*Figure 6: Nominal and real cumulative returns – Great Britain*
*Source: Authors*

Investing in gold would provide the best return in the United Kingdom during the period Q1 2002 – Q2 2023, with a real return of 314.42% (Figure 6). Excellent returns would also come from real estate investment, with a real return of 141.21%. Investing in government securities would preserve real value with a return of 0.51%, while investing in the stock market would not preserve value with a real return of -13.26. It seems that inefficiencies in the stock market in the United Kingdom lead to higher investments in the real estate market.

Based on the obtained results, it can be concluded that the highest return comes from investing in gold, and among the observed assets, gold represents the best hedge against inflation. The real estate market also provides a positive real return in all observed countries, with an emphasis that if the rental yield is included, this form of investment offers the highest return in the Republic of Serbia and the Czech Republic. Interestingly, the highest real return from investing in the real estate market was achieved in Turkey during hyperinflation. There remains a justified concern that, under those conditions, such speculative growth may not be sustainable in the long term. In other words, investing in government securities over an extended period proverbially leads to real losses.

Investing in the national stock market gave a positive return only in Germany. Considering that volatility in this market is the highest, the achieved returns are not satisfactory, especially in less developed economies.To further explore the relationship between real estate prices and inflation indices, the authors opted for cointegration analysis. Cointegration analysis was conducted based on the belief that cointegration of index values and property prices with inflation implies that returns follow the inflation rate. Cointegration analysis was performed using the Engle-Granger test. Cointegration tests were conducted between nominal housing price index (NHI) and the Consumer Price Index (CPI). Quarterly data were used for the analysis. The results are presented in Table 2.

*Table 2: Cointegration Test*

| Cointegration Test - Engle-Granger<br>Null hypothesis: Series are not cointegrated<br>Automatic lag specification based on Schwarz Info Criterion | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Great Britain | | Germany | | Serbia | | Turkey | | Czech Republic | |
| | Value | Prob.* | Value | Prob.* | Value | Prob.* | Value | Prob.* | Value | Prob.* |
| Engle-Granger tau-statistic | -2.5314 | 0.274773 | -2.26817 | 0.394969 | -0.8346 | 0.928067 | -2.2964 | 0.385275 | -1.45654 | 0.779979 |
| Engle-Granger z-statistic | -14.1106 | 0.153814 | -16.226 | 0.097622 | -2.28822 | 0.917748 | 16.51716 | 1 | -6.30828 | 0.608665 |
| | | | | | | | | | | |
| *MacKinnon (1996) p-values. | | | | | | | | | | |

*Source: Authors' Calculation*

To confirm the existence of cointegration, the condition is that the null hypothesis is not rejected for each variable, while for the residuals, the null hypothesis is rejected in favor of the alternative hypothesis. The null hypothesis for residuals states: Series are not cointegrated. As can be seen, the p-value is greater than 0.05 in all cases, so it can be concluded that there is not enough evidence against the null hypothesis, meaning that the existence of cointegration cannot be proven.

Therefore, the authors conclude that in the conducted study it was not possible to confirm the presence of cointegration between the inflation rate and the movement of real estate prices. The absence of cointegration between variables indicates that the variables do not exhibit synchronized movement in the long run and are not mutually affected by fluctuations. This means that it cannot be reliably claimed that the increase in property prices will follow the increase in inflation over an extended period of time. Although the previous part of the study showed that investing in real estate during the observed period serves as an excessive hedge against inflation, there is no guarantee that investing in the real estate market at this moment will provide protection against inflation in the future. The real estate market is prone to speculative growth, and the effectiveness of inflation protection largely depends on the investment timing.

## Conclusion

To address the questions of whether real estate can effectively protect capital from the negative impact of inflation and whether real estate investments are superior in value preservation compared to government bonds, stocks, and gold, the research based on quarterly data in the markets of Serbia, the Czech Republic, Turkey, Germany, and the Great Britain was conducted.

First, the nominal and real returns of gold, real estate, bonds, and national stock markets were calculated during the observed period. Then, using cointegration tests, it was determined whether there is a robust long-term relationship between the inflation rate and real estate prices. The following conclusions were drawn.

Based on the results obtained, the highest returns come from investing in gold, with gold being the best hedge against inflation among the observed assets. The real estate market also shows positive real returns in all observed countries, particularly noteworthy is that, when considering rental yield, this form of investment offers the highest return in the Republic of Serbia and the Czech Republic. Notably, Turkey achieved the highest real return in the real estate market during hyperinflation, although concerns arise about the sustainability of such speculative growth in the long term under these conditions. Investing in government securities over an extended period results in real losses. Positive returns from investing in the national stock market were observed only in Germany. Given the highest volatility in this market, the achieved returns are deemed unsatisfactory, especially in less developed economies.

The cointegration test revealed that it is not possible to confirm the presence of cointegration between the inflation rate and the movement of real estate prices. The absence of cointegration suggests that these variables do not exhibit synchronized movement in the long run and are not mutually affected by fluctuations. Therefore, it cannot be reliably asserted that an increase in property prices will consistently follow an increase in inflation over an extended period.

While the earlier part of the study indicated that investing in real estate during the observed period served as a robust hedge against inflation, there is no guarantee that investing in the real estate market at this moment will offer protection against inflation in the future. The real estate market is susceptible to speculative growth, and the efficacy of inflation protection largely hinges on the timing of the investment.

In general, it can be concluded that investing in the real estate market provides at least partial protection against inflation over time, and that there is no perfect protection against inflation in the long term applicable for all countries, regardless of other conditions.

Future research could encompass a longer observation period, a greater number of countries, and testing using different methods, as it is evident in the literature that different methodologies can yield different results when it comes to the topic of hedging against inflation.

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