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Direct and Indirect Real Estate Investment Performance – Data from Bulgaria, the Eurozone, the UK and the US

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Abstract

There is ample research on the similarities and differences between direct and indirect investment in real estate. Some claim that both behave similarly, offer similar investment performance and diversification benefits to investors, while others are in the view that there are differences and the two types of investments in real estate cannot be treated as substitutes. This paper analyses the capital return and risk performance of direct investment in residential properties and indirect investment in real estate on the stock exchange in Bulgaria. The results are compared to other markets in the eurozone, the UK and the US. Overall direct investments in the residential market appear preferable for the risk averse investor compared to indirect investments in REITs especially in adverse economic conditions. The average return in the residential market is greater than the return from REITs in the eurozone and the UK and almost equal to it in Bulgaria and the US. However, the volatility is significantly lower than the volatility of REITs returns in all markets. There is significant improvement in the volatility of REITs in more stable economic conditions but it is not enough to outperform direct investments on risk adjusted basis.

Key words:

Direct Investment; Indirect Investment; Real Estate; Performance.

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1. Introduction

Investment in real estate is defined as purchasing properties which will with reasonable probability provide a source of income and will preserve the value of the invested capital for a certain period of time. It can be direct and indirect based on the relationship between the investor and the acquired property. Direct investment involves the purchase of the property itself and the investor becomes the owner of the real estate. Indirect investment is the purchase of equity shares of an entity, an institutional investor, which invests in real estate (Yovkova 2018). In Bulgaria such entities are special investment purpose joint stock entities (SIPJSE), while in western markets they are known as real estate investment trusts (REITs). These investment companies are regulated and there are strict requirements on their investment policy. They can invest only in real estate or real estate financing (e.g. mortgages). In Bulgaria they can invest in one or the other and it is not allowed for a single entity to invest in both. In other markets such REITs are called hybrid.

Indirect investment copes with some disadvantages of direct investment – the REITs shares are homogeneous and traded in a centralized market place with higher liquidity, greater number of participants and lower transactions costs. Due to these characteristics, there is evidence that prices of REITs shares react faster to changes in the economic environment (Hoesli, Oikarinen, and Serrano 2015). In terms of the comparative performance between the two types of investing in real estate there is a range of opinions. Some argue that both investments offer similar returns and diversification benefits because they are based on the same underlying asset (Oikarinen et al. 2011, Boudry et al. 2012, and Hoesli and Oikarinen 2012). Others consider the two types of investments to perform differently with indirect investments returns resembling more common stocks rather than the underlying real assets performance and offering different degree of diversification benefits to investors (Adair et. al. 2020, Newel and Hsu 2007, Ekemode and Olaleye 2016).

In Bulgaria direct investment in real estate assets by the individual investor is mainly in residential properties. According to real estate agency reports during 2024, so far more than 90% of the search for properties to buy is for residential real estate (Arco Real Estate 2024). In addition, the country ranks 7th in the European Union in terms of homeownership – 85% of the population lives in their own home (Eurostat 2023). Therefore, residential properties will be the subject of analysis for the performance of direct investment in real estate. The house price index (HPI) is the official statistic measure reflecting changes in the prices of residential properties. The BGREIT index on the Bulgarian Stock Exchange represents the performance of share prices of the entities offering opportunities for indirect investment in real estate. Since both indices reflect only the change in prices the performance analysis will be based on capital returns only. For compatibility purposes in the comparison to other markets corresponding indices in each region will be used.

2. Purpose, Data and Methodology

The purpose of this paper is to compare the performance of direct and indirect investments in real estate. The focus is on capital return and risk of residential prices and REITs indices in four markets – Bulgaria, the eurozone, the UK and the US. The period of analysis is the last 20 years from 2005 to first half (H1) of 2024 – this is the period for which there is available data on the HPI for the Bulgarian market. The BGREIT index reflecting the performance of listed SIPJSEs on the Bulgarian Stock Exchange was created in 2007, so the available data for it covers the period from 2007 to H1 2024. This analysis will contribute to further understanding the dynamics of real estate investments in the Bulgarian market which is still developing (IMF 2023) and compare its performance to more developed markets in the eurozone, the UK and the US.

As a proxy for house prices will be used the house price index (HPI) for the four regions. For Bulgaria and the eurozone data is obtained from Eurostat, for the UK – from the HM Land Registry and for the US – from the Federal Housing Finance Agency. Where possible unadjusted HPI data is used to enable better comparability to REITs indices. As proxies for the prices of REITs are used REITs indices for each respective region. In Bulgaria this is the BGREIT index, for the eurozone – NAREIT Eurozone index, for the UK – FTSE 350 REITs index and for the US market – MSCI REITs US index. These indices are mainly composed of equity REITs (those investing in real estate assets rather than financial products). Historical data for all REITs

indices is obtained from Investing.com. Monthly and quarterly data is used. The year-end values are derived by taking the value at December or quarter 4 in each year.

The methodology for calculating the capital return and risk of investment is according to the definitions of Yovkova (2018):

- Capital return:

$$R = \frac{P_t - P_{t-1}}{P_{t-1}} \, x \, 100\% \tag{1}$$

where R is the rate of return in percentage, P_t is the index value at year t, and P_{t-1} is the index value at the end of the previous year t-1.

- Historical risk:

$$\sigma = \sqrt{\frac{\sum_{i=1}^{n}(R_i - \bar{R})^2}{n}} \, x \, 100\% \tag{2}$$

where σ is the standard deviation in percentage, R_i is the rate of return in year i, $\bar{R}$ is the average or mean return for the analyzed period, and n is the number of observations.

The coefficient of variation (CV) will be used to compare the performance of different investments in all markets on a risk adjusted basis. It is calculated as follows and the lower the number the better the risk-return tradeoff (Investopedia 2024):

$$CV = \frac{\sigma}{\bar{R}} \tag{3}$$

where σ is the standard deviation and $\overline{R}$ is the mean return.

Performance analysis will be performed graphically at level and rate of return as well as numerically comparing the results of the above calculations between markets and direct and indirect investments in real estate. To account for the significant impact of the global financial crisis in all markets the calculations will be performed for the whole period and for a subsample period from 2010 onwards.

3. Direct Investment in Residential Real Estate

Figure 1 presents the dynamic of the house price indices in Bulgaria, the eurozone, the UK and the US.

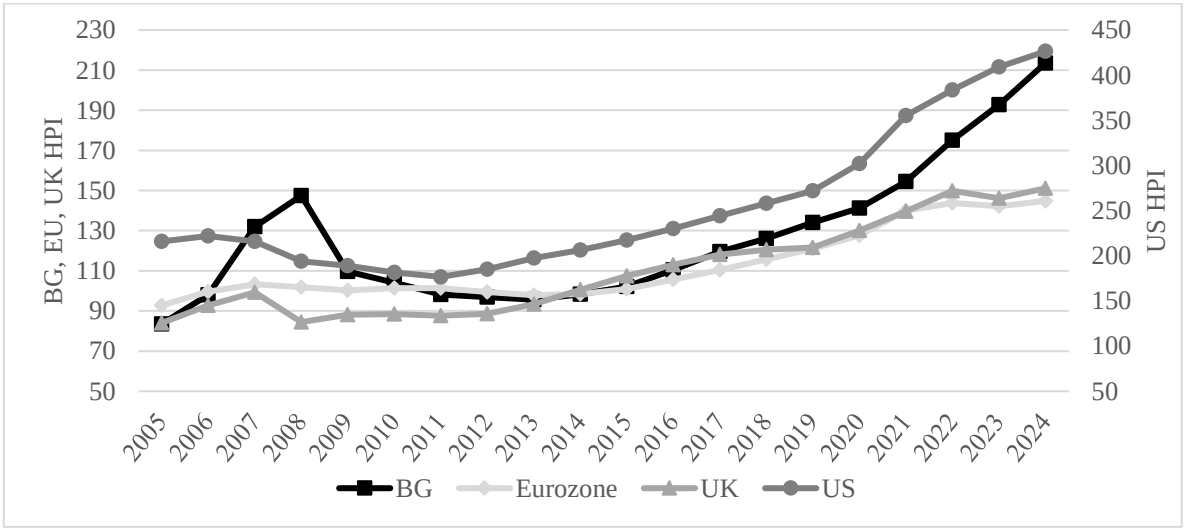


Fig. 1. HPI trends
Source: Eurostat, HMLR, FHFA

During the period of analysis there are two main global events which affected the economy as a whole –

the financial crisis of 2007 and the Covid-19 crisis in the end of 2019 and beginning of 2020. As the global financial crisis started in the US, reasonably the negative effect on the housing market was first recorded there – the HPI started a downward trend in 2007. Its effect spilled over to the markets in eurozone and the UK in the following year – 2008, while in Bulgaria the correction in house prices started in 2009. In the UK and the US housing prices reached the bottom in 2011 while in Bulgaria and the eurozone they were lowest in 2013. Afterwards there is a period of stable recovery up to the start of the Covid-19 crisis in all of the locations. In contrast to the crisis of 2007, the Covid-19 crisis did not have a negative effect on housing prices – the HPI experienced a greater increase compared to the period of recovery up to 2019. At the end of the period can be noticed that prices continued to rise in Bulgaria and the US, while they fell in the eurozone and the UK in 2023 before recovering in the first half of 2024.

This can be seen also in Figure 2 which presents the percentage change in the HPI over the period.

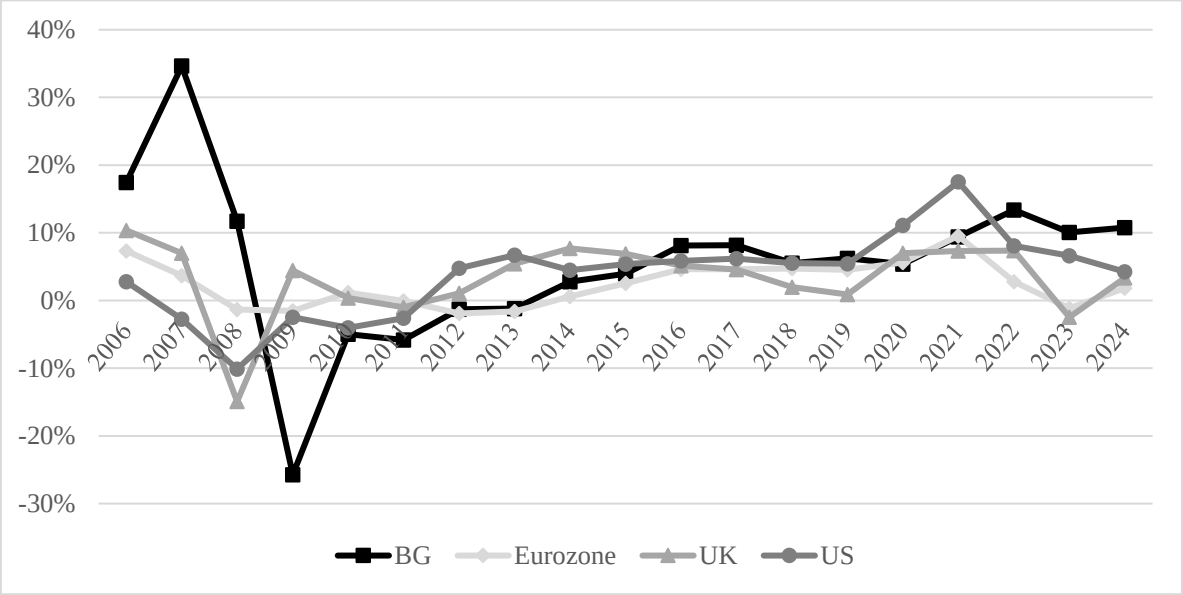


Fig. 2. HPI growth rates
Source: Eurostat, HMLR, FHFA

The Bulgarian housing market experienced the greatest increase in prices in 2007 of 34.6% and the greatest correction of 25.7% in 2009, followed by the UK where prices rose the most in 2006 by 10.4% and reduced by 14.9% in 2008. The housing prices in the eurozone and the US experienced more modest increase before the crisis and smoother correction in 2008 – 1.3% and 10.1% respectively. The worst year for the eurozone market was in 2012 when prices fell by 1.9%. The markets in the UK and the US recovered earlier and from 2011 onwards the growth rate is positive, while it took another two years for the markets in Bulgaria and the eurozone to start their recovery in 2013. The following period of recovery observed positive growth rates between 2% and 8% p.a.

The Covid-19 crisis first impacted the markets in the US and the UK in 2020 resulting in more than double growth rate in that year compared to 2019 - 11.1% in the US and 7% in the UK up from 5.4% and 0.9% respectively. The increase in housing prices in the eurozone and Bulgaria appeared in 2021 with a rise of 9.5% and 9.4% respectively. Housing prices in Bulgaria rose the most in 2022 compared to the other markets by 13.4% and continued to experience the greatest growth rate through to the first half of 2024, while the growth rate in the US housing prices reduced to the pre-pandemic levels from 2022 onwards. On the other hand, the housing prices in the eurozone and the UK experienced a reduction in 2023 before bouncing back in the first half of 2024.

Based on the dynamics in the housing markets, it can be concluded that the Bulgarian market experienced

the greatest shocks (both positive and negative) before and after the global financial crisis in 2007. This is consistent with the results of Chien et. al. (2014) who analysed the housing markets in 33 countries and concluded that in developing markets whit lower personal income house prices are much more susceptible to changes in the economic activity compared to developed markets. It is noticeable that in the post-pandemic period the market in Bulgaria is experiencing better growth rates compared to the other geographies. Even though the Covid-19 pandemic affected the economy it was a health crisis rather than an economic one. The economies and market fundamentals in each region were not so severely impacted as in 2007 which might explain why house prices reacted differently in the regions after the pandemic.

4. Indirect Investment in REITs

Figure 3 presents the trends in the financial markets for the selected REITs indices.

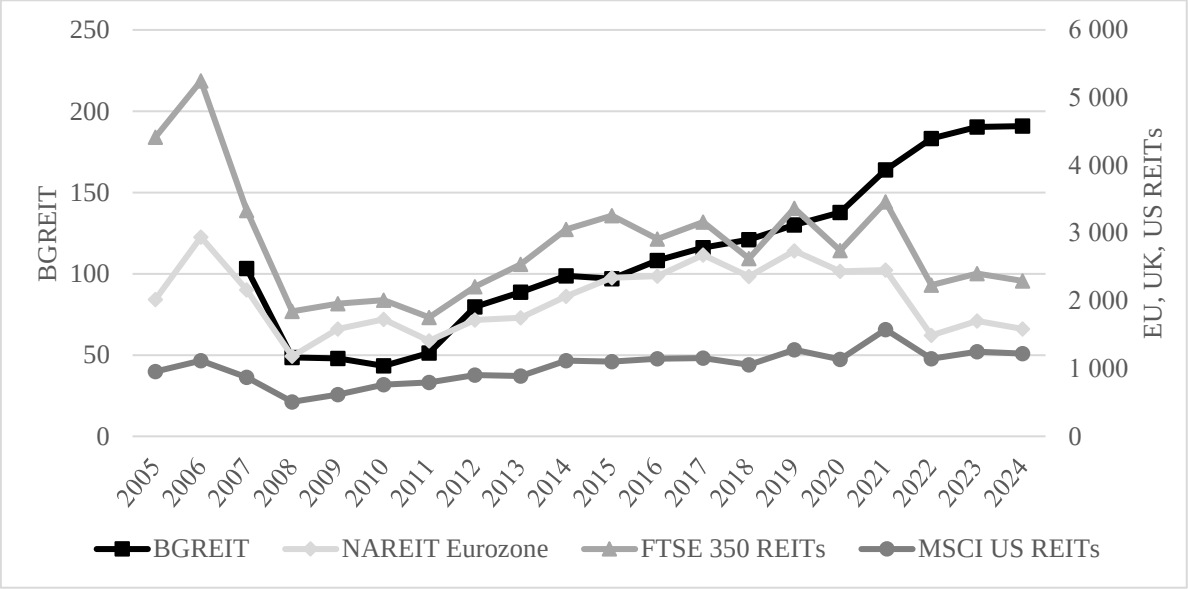


Fig. 3. REITs indices trends
Source: Investing.com

The dynamics resulting from the global financial crisis in 2007 are similar as what is observed in the housing market. All indices rose in 2006 and the crisis caused a correction in 2007 and 2008. With the REITs indices there is no delay in the effect of the crisis which causes simultaneous reduction in share prices across all markets. The US REITs market started a smooth recovery afterwards up until 2021 when it experienced a boost and then dropped again to pre-pandemic level. The other markets had a phase of recovery up until 2011. For the period from 2011 to 2015 they experienced smooth growth which continued afterwards for the Bulgarian REITs market up until the Covid-19 pandemic. It had a positive impact and the BGREIT index was the only one which followed a growth trend in the post-pandemic period. The eurozone and the UK REITs markets entered a more volatile period from 2015 to 2022. The positive effect of the pandemic in 2021 was reversed in 2022 and since then the indices have been stable.

Figure 4 presents the percentage change in the indices. In contrast to the HPI, the BGREIT index correction as a result of the global financial crisis in 2008 was similar to the other REITs indices. The other markets recovered faster in the following years while the BGREIT started rising again in 2011. After 2013 BGREIT has entered into a stable positive growth trend which continues to 2024. All other indices follow a more volatile trend from 2011 onwards – years with positive growth alternate with years of contraction. It is visible that from 2019 onwards the magnitude of change in both directions have increased.

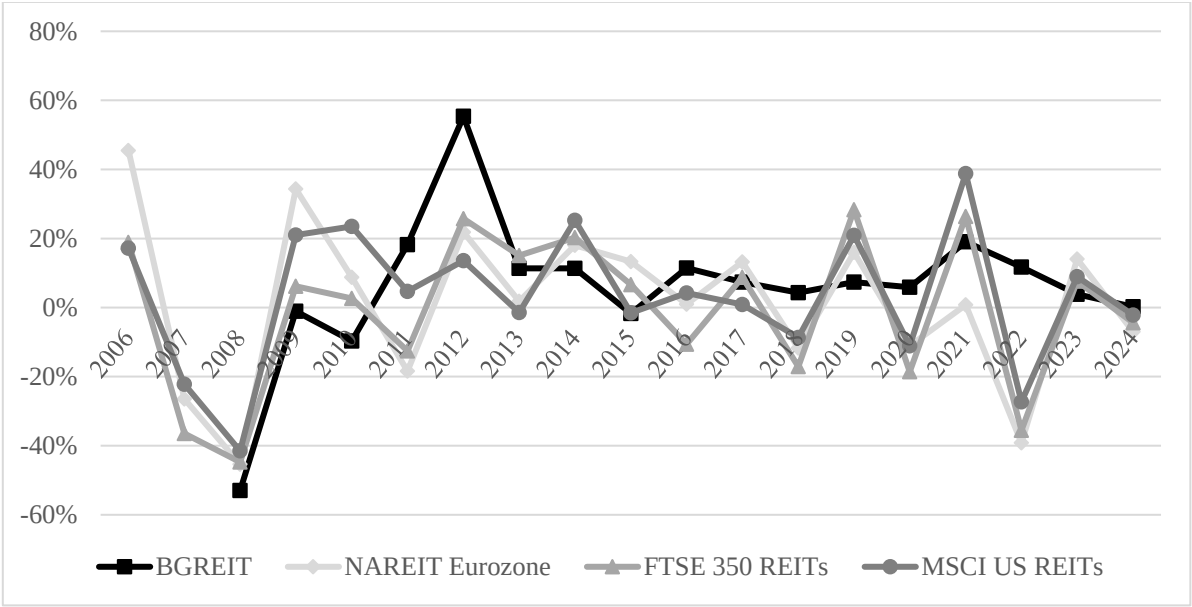


Fig. 4. REITs indices growth rates
Source: Investing.com

Developed financial markets attract more capital, therefore, they are more liquid, which leads to quicker reflection of shocks by the share prices of REITs. The Bulgarian market is a developing one with much smaller volume and value of trades compared to the others. This reduces the liquidity in the market and its effect on the price of the BGREIT index which may explain the smoother trend in the rate of growth.

5. Quantitative Analysis

Table 1 contains the results of the performance analysis of HPIs.

Table 1

Performance analysis of the housing markets across locations 2005 – H1 2024

HPI 2005 – H1 2024	Average return (%/yr)	Volatility (%/yr)	Coefficient of variation	Worst year
BG	5.7%	11.7%	2.06	-25.7%
Eurozone	2.4%	3.3%	1.36	-1.9%
UK	3.3%	5.6%	1.69	-14.9%
US	3.8%	6.1%	1.60	-10.1%

Source: Eurostat, HMLR, FHFA

The analysis reveals that the Bulgarian house market experienced the highest price growth on average for the period of 5.7% pa. The second-best performing market is the US where prices grew by 3.8% pa. Following is the UK market with annual growth of 3.3% and the lowest growth is observed in the eurozone – 2.4% pa. Based on the return alone the Bulgarian market is the top performer, however, after looking at the associated volatility, it is clear that the high return comes at the cost of the highest risk compared to the other markets. The volatility in the Bulgarian house prices is 11.7% – almost double the volatility observed in the US (6.1%)

and more than double the volatility in the UK (5.6%) and the eurozone (3.3%). In order to assess the risk adjusted performance it is necessary to compare the coefficients of volatility (CV) between the markets. Even though the house prices in the eurozone grew the least, they did not vary greatly either, thus producing the lowest CV of 1.36. Following are the markets in the US and the UK with 1.6 and 1.69 respectively and the highest CV is observed in the Bulgarian housing market of 2.06. These results support the assumption that higher returns attract higher risk. Even though the Bulgarian market has outperformed the rest in terms of price growth it attracted the highest level of risk. Based on the risk adjusted assessment it is the least appealing market with the highest CV.

Table 2 below presents the results of the performance analysis of REITs indices.

Table 2

Performance analysis of REITs indices across locations 2005 – H1 2024

REITs 2005 – H1 2024	Average return (%/yr)	Volatility (%/yr)	Coefficient of variation	Worst year
BGREIT	6.0%	20.6%	3.42	-53.0%
NAREIT Eurozone	1.6%	23.4%	15.04	-45.4%
FTSE 350 REITs	-1.8%	22.3%	12.32	-44.7%
MSCI US REITs	4.0%	19.8%	4.95	-41.5%

Source: Investing.com

The market for indirect investments in real estate in Bulgaria represented by the BGREIT index has generated the highest average return of 6% pa. Similar to the housing market it is followed by the US with an annual return of 4% for the MSCI US REITs index. Next is the NAREIT index showing an average return of 1.6% in the eurozone. The worst performer is the FTSE 350 REITs index in the UK, which actually generated a loss on average of 1.8% pa. In contrast to the housing markets there are not significant differences between the levels of volatility of indices' returns – they range from 19.8% (in the US) to 23.4% (in the eurozone). BGREIT has the second lowest volatility of 20.6% whereas the house prices in the country show the greatest volatility. As a result of this the best risk adjusted performer is namely the BGREIT index with the lowest CV of 3.42, followed by the US index with a CV of 4.95. Given the much lower level of returns combined with the similar level of risk, the FTSE 350 REITs and the NAREIT Eurozone indices have a much higher CV of 12.32 (the absolute value has been used because of the negative average return) and 15.04 respectively.

The period being analysed above captures the years before and after the global financial crisis in 2007 when the markets experienced abnormal gains and losses. All but one of the indices suffered their worst year performances in the period up to 2010 with the exception of the eurozone HPI which reduced the most in 2012. The Bulgarian market for both direct and indirect investments in real estate experienced the greatest loss due to the financial crisis. In their worst years the HPI fell by 25.7% and the BGREIT index fell by 53%.

To account for the abnormal behaviour and the shocks caused by the financial crisis, the quantitative analysis will be performed over a subsample period from 2010 onwards. Table 3 presents the results of the performance analysis of house prices. During the subsample period the Bulgarian house prices increased by 4.7% pa on average which is second to the US where prices increased by 5.7% pa. The markets in the UK and the eurozone follow with average increase in prices of 3.7% and 2.7% pa. All market show better returns apart from the Bulgarian market. This is due to the abnormal gains in the Bulgarian market in 2007 of 35% which is visible in Figure 2. The Bulgarian market suffered the greatest correction after the crisis in 2009 and the

exclusion of this volatile period has improved significantly its risk profile – 5.8% compared to 11.7%. The other markets also show improvement in their risk profiles – the worst performing years are within the average volatility for each market (one standard deviation of the average return).

Table 3

Performance analysis of the housing markets across locations 2010 – H1 2024

HPI 2010 – H1 2024	Average return (%/yr)	Volatility (%/yr)	Coefficient of variation	Worst year
BG	4.7%	5.8%	1.23	-5.8%
Eurozone	2.5%	3.2%	1.25	-1.9%
UK	3.7%	3.4%	0.91	-2.5%
US	5.7%	5.0%	0.87	-4.0%

Source: Eurostat, HMLR, FHFA

The Bulgarian market still exhibits the greatest volatility of 5.8% but is much closer to the other markets, particularly the US with volatility of 5%. The UK and the eurozone follow with 3.4% and 3.2% respectively. Looking at the risk adjusted returns the housing market in the US is the best performer with a CV of 0.87, closely followed by the UK market with a CV of 0.91. Third best is the Bulgarian housing market with a CV of 1.23 and last is the eurozone with a CV of 1.25. It is noticeable that the differences in the CV have reduced significantly between the markets. Also the housing market in the eurozone has moved from the top risk return tradeoff position to the last. This is mainly due to the fact that the market suffered the least from the financial crisis which led to a marginal reduction in the average volatility during the subsample period – 3.2% compared to 3.3%.

Table 4 contains the results of the performance analysis of REITs indices for the subsample period from 2010 to H1 2024.

Table 4

Performance analysis of REITs indices across locations 2010 – H1 2024

REITs 2010 – H1 2024	Average return (%/yr)	Volatility (%/yr)	Coefficient of variation	Worst year
BGREIT	10.4%	14.5%	1.39	-9.7%
NAREIT Eurozone	1.4%	16.6%	11.56	-39.2%
FTSE 350 REITs	2.8%	19.0%	6.73	-35.6%
MSCI US REITs	5.9%	16.6%	2.81	-27.3%

Source: Investing.com

The BGREIT index has the highest average annual return of 10.4%, again followed by the MSCI US REITs index with 5.9% pa. The FTSE 350 REITs index and the NAREIT eurozone index have switched places and the FTSE outperforms NAREIT with 2.8% pa compared to 1.4% pa. During the subsample period all indices have higher returns compared to the overall period except the NAREIT index which is 0.2% lower.

The greatest gain is experienced by the BGREIT index – rise of 4.4% from 6% pa to 10.4% pa. The FTSE 350 REITs index has moved into positive returns which indicates the significant impact of the financial crisis to the UK market. Similar to the housing prices the risk profiles of the REITs indices have improved by reducing the volatility for all markets. The BGREIT index has the lowest volatility of 14.5% followed by the MSCI US REITs and the NAREIT eurozone indices with 16.6% and with the highest volatility is the FTSE 350 REITs index (19%). An interesting observation is that the BGREIT index is the only one whose worst year performance is within one standard deviation. This is due to the smooth upward trend of the BGREIT index contrasting with the more volatile trends in the other indices noticed in Figure 3. During the subsample period the BGREIT index also has the lowest CV of 1.39, followed by the MSCI US REITs index with a CV of 2.81. Next is the FTSE 350 REITs index with a CV of 6.73 and the NAREIT eurozone index has the highest CV of 11.56. Therefore, we can conclude that the BGREIT index has the best risk adjusted performance over the subsample period.

6. Comparison Between Direct and Indirect Investments

Not surprisingly there are differences in the performance of the various markets due to differences in the economic environments and specifics of each region. However, in a particular region the economic, political, legislative and other market factors are the same for both direct and indirect investments. A comparison analysis will be implemented to investigate any variances between direct and indirect investments performance in the analyzed markets by region both graphically and referring the results in Tables 1 to 4.

In Bulgaria the BGREIT index reacted much faster to the global financial crises and correction started in 2008 whereas the housing market declined one year later in 2009. The BGREIT index also recovered quicker and started an upward trend in 2011, while the HPI started growing from 2014. BGREIT reached the level of the HPI in 2014 and since then they move in line until the first half of 2024 when they start to diverge (Figure 5). Changes in BGREIT proceed changes in the HPI and are of greater magnitude. Results in Tables 1 and 2 confirm this – BGREIT has an average return of 6% with a volatility of 20.6% while the HPI return is close – 5.7%, its volatility is much lower – 11.7%. On risk adjusted basis direct investment (HPI CV – 2.06) outperforms indirect investments (BGREIT CV – 3.42) for the period from 2005 to H1 2024. However, looking at the subsample period from 2010 to H1 2024 BGREIT average return is 10.4% with volatility of 14.5% while the return on HPI is 4.7% with a volatility of 5.8%. Even though direct investment is still the better performer on risk adjusted basis, BGREIT gained more and is much closer with a CV of 1.39 compared to 1.23 for the HPI (Tables 3 and 4).

Figure 5 presents the dynamic of the HPI and REITs indices in each market. In the other markets a similar trend can be noticed - the REITs indices have gained more before the 2007 crisis and suffered a greater loss as a result of it while the effects on the HPIs were more subtle. A noticeable difference between the Bulgarian market and the others is that the REITs indices continue to be volatile even after they recover from the financial crisis. Despite the common upward trend in HPIs across all markets, the REITs indices do not follow the same trend as in the Bulgarian market. Another difference in the trends of the indices can be noticed after the Covid-19 pandemic when they start a downward trend.

For the period from 2005 to H1 2024 the average return in the housing market is higher or almost equal (in the US) to what is achieved by the REITs indices at a much lower risk level (refer to Tables 1 and 2). Therefore, in volatile periods direct investment outperforms indirect investment in nominal returns. The difference is even more significant when looking at the results on risk adjusted returns bases – the CVs of REITs indices are much higher compared to the CVs of HPIs – 15.04 vs 1.36 in the eurozone, 12.31 vs 1.69 in the UK and 4.95 vs 1.60 in the US respectively.

Excluding the effect of the global financial crisis and comparing the performance over the period from 2010 onwards there are better returns at lower risk levels across all markets (except the eurozone REITs where the average return dropped from 1.6% to 1.4% during the subsample period). Even so house prices average return is again higher or almost equal (in the US) to the returns of the REITs indices at a lower risk level (refer

to Tables 3 and 4). Therefore, in a more stable economic environment there is significant improvement in the risk profile of indirect investment but it is not enough to outperform direct investment on a risk adjusted basis – the CVs of REITs are still higher than CVs of HPIs – 11.56 vs 1.25 in the eurozone, 6.73 vs 0.91 in the UK and 2.81 vs 0.87 in the US.

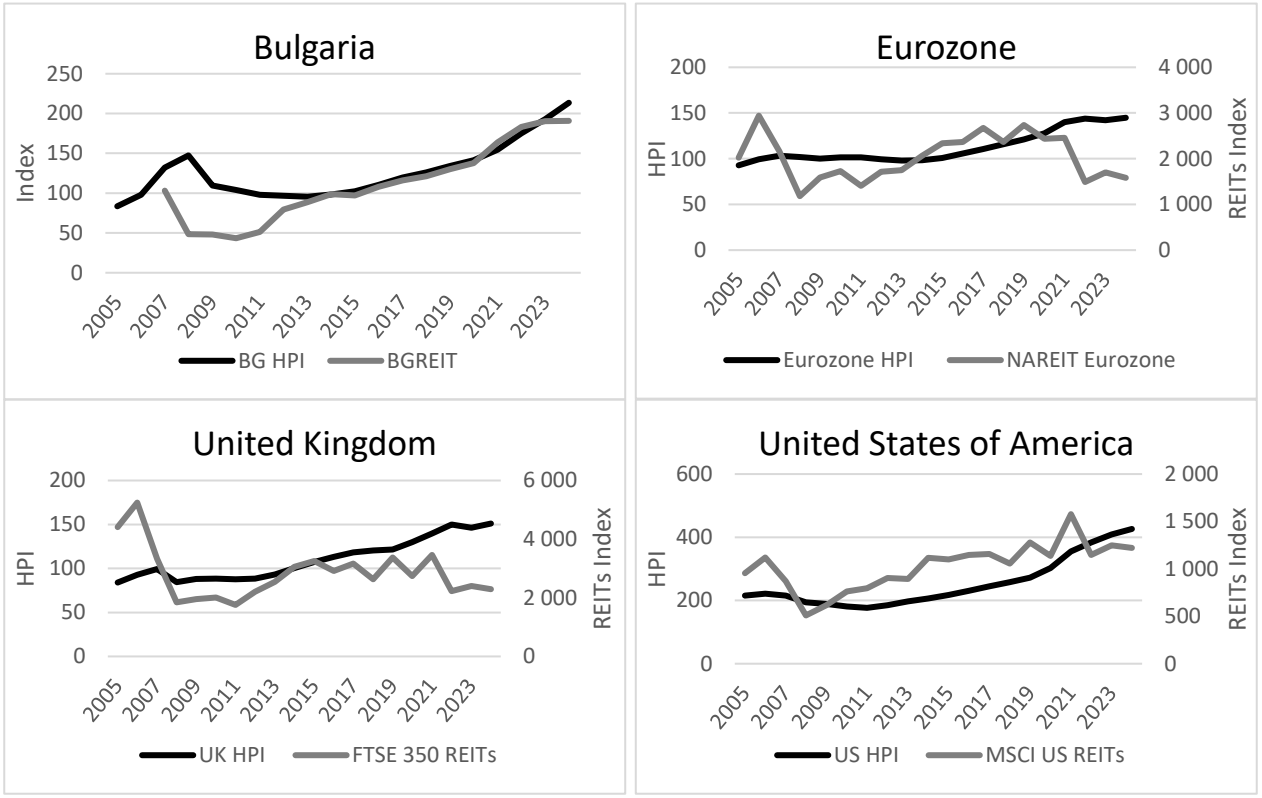


Fig. 5. HPI and REITs indices dynamic by region
Source: Eurostat, HMLR, FHFA, Investing.com

7. Conclusions

Bulgarian house prices gained the most for the period from 2005 to H1 2024 with an average annual return of 5.7%. However, the market experienced the greatest volatility compared to other regions – 11.7%. The second-best performer is the US market where the average return on house prices is 3.8% with volatility of 6.1%. The housing market in the UK gained on average 3.3% with volatility of 5.6% and the eurozone market gained the least – 2.4% with volatility of 3.3%. On risk adjusted basis the eurozone market is the best performer while the Bulgarian market is ranked last. The effect of the financial crisis in 2007 was most significant in Bulgaria which may be due to the fact that this is the only developing market of all. During the post-crisis period from 2010 onwards performance improved across all markets. For this subsample period the best performer was the US market with return of 5.7%, followed by Bulgaria (4.7%), the UK (3.7%) and the eurozone (2.5%). The volatility across all markets reduced and on risk adjusted basis the US market is the top performed with a CV of 0.87, followed by the UK (0.91), Bulgaria (1.23) and the eurozone (1.25). The Bulgarian house prices have grown the most since the Covid-19 pandemic while house prices in the other markets have dipped. The specific factors and their impact are different in each market and require additional analysis to understand the reasons behind the house price dynamics.

Similar to the housing market, the REITs indices in all markets were affected by the global financial crisis in 2007. Their correction was of greater magnitude compared to HPIs in all markets, however, their consecutive recovery was faster. Over the period from 2005 to H1 2024 the Bulgarian market performed the best with an

average return of 6%, followed by the US – 4%, the eurozone – 1.6 and the UK, where the FTSE 350 REITs index had a loss of 1.8% pa. The volatility of the BGREIT index (20.6%) is marginally higher than the volatility of the MSCI US REITs index (19.8%) and is lower than the volatility of the NAREIT eurozone index (23.4%) and the FTSE 350 REITs index in the UK (22.3%). Therefore, the Bulgarian REITs performed the best in nominal terms with the highest return as well as on risk adjusted basis with the lowest CV of 3.42. The high volatility in all indices was due to the financial crisis and the analysis of the subsample period from 2010 onwards revealed lower volatilities in all markets. Still the Bulgarian BGREIT index performed the best with an average annual return of 10.4%, followed by the US – 5.9%, the UK – 2.8% and the eurozone – 1.4%. During the subsample period BGREIT index strengthened its top performing rank on risk adjusted basis by lowering its CV to 1.39, followed by the US – 2.81, the UK – 6.73 and the eurozone – 11.56. Even though there is significant improvement in the risk profile of indirect investment in a more stable economic environment, it is not enough to outperform direct investment on a risk adjusted basis.

Overall direct investments in the residential market appear preferable for the risk averse investor with lower CVs compared to indirect investments in REITs, especially in adverse economic conditions. The average return in the residential market is greater than the return from REITs in the eurozone and the UK and almost equal to it in Bulgaria and the US. However, the volatility is significantly lower than the volatility of REITs returns in all markets. The Bulgarian market performance during the subsample period of a stable economic environment is somewhat an exception – the BGREIT index experienced higher return compared to the housing market and with a CV of 1.39 its risk adjusted performance is very close the residential market CV of 1.23.

References

1. Adair, A., McGreal, S., & Webb, J. (2006). Diversification Effects of Direct versus Indirect Real Estate Investments in the U.K. Journal of Real Estate Portfolio Management, 12(2), 85-90. https://doi.org/10.1080/10835547.2006.12089756

2. Arco Real Estate (2024). https://arcoreal.bg/source/q3%202024/Q3-2024_compressed.pdf [online] [Accessed: 23.10.2024]

3. Boudry, W., Coulson, N., Kallberg, J. and Liu, C. (2012). On the Hybrid Nature of REITs. *Journal of Real Estate Finance and Economics*, 44(1), 230-249. https://doi.org/10.1007/s11146-011-9339-7

4. Chien, M., Lee, C. and Cai, S. (2014). A Panel Cointegration Analysis for Macroeconomic Determinants of International Housing Market. *International Journal of Economics and Management Engineering*, 8(7), 2058-2065. http://doi.org/10.1016/j.jhe.2009.10.005

5. Ekemode B. and Olaleye, A. (2016). Convergence between direct and indirect real estate investments: Empirical evidence from the Nigerian real estate market. *Journal of Financial Management of Property and Construction*, 1(3), 212-230. https://doi.org/10.1108/JFMPC-12-2015-0040

6. Eurostat (2023). Housing in Europe – 2023 edition. [online] Available at: https://ec.europa.eu/eurostat/web/interactive-publications/housing-2023 [Accessed: 23.10.2024]

7. Eurostat database (2024). [online] Available at: https://ec.europa.eu/eurostat/web/main/home [Accessed 05.10.2024]

8. Federal Housing Finance Agency (2024). FHFA House Price Index. [online] Available at: https://www.fhfa.gov/data/hpi [Accessed 05.10.2024]

9. HM Land Registry (2024). UK House Price Index. [online] Available at: https://www.gov.uk/government/collections/uk-house-price-index-reports [Accessed 05.10.2024]

10. Hoesli, M. and Oikarinen, E. (2012). Are REITs real estate? Evidence from international sector level data. *Journal of International Money and Finance*, 31(7), 1823-1850. https://doi.org/10.1016/j.jimonfin.2012.05.017

11. Hoesli, M., Oikarinen, E. and Serrano, C. (2015). Do public real estate returns really lead private returns? *Journal of Portfolio Management*, 41(6), 105-117. https://doi.org/10.3905/jpm.2015.41.6.105

12. International Monetary Fund (2023). World Economic Output. [online] Available at: https://www.imf.org/en/Publications/WEO/weo-database/2023/April/groups-and-aggregates#cee [Accessed: 14.10.2024]

13. Investing.com (2024). [online] Available at: https://www.investing.com/indices [Accessed 05.10.2024]

14. Investopedia (2024). Coefficient of Variation: Meaning and How to Use It. [online] Available at: https://www.investopedia.com/terms/c/coefficientofvariation.asp [Accessed: 22.10.2024]

15. Newell, G. and Hsu, W. P. (2007). The Significance and Performance of Retail Property in Australia. *Journal of Property Investment and Finance*, 25(2), 147 – 165. http://doi.org/10.1108/14635780710733834

16. Oikarinen, E., Hoesli, M. and Serrano, C. (2011). The Long-Run Dynamics between Direct and Securitized Real Estate. *Journal of Real Estate Research*, 33(1), 73-104. https://doi.org/10.1080/10835547.2011.12091299

17. Yovkova, Y. et al. (2018). Nedvizhima sobstvenost = Real Property. *UNSS*, Sofia.