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The Attractiveness of Investments in Residential Real Estate Compared to other Investment Directions in the Financial Market

Rafał Wolski[1], Magdalena Załęczna [2]

[1] *University of Lodz, Poland, ORCID: https://orcid.org/0000-0002-4001-2415, rafał.wolski@uni.lodz.pl*
[2] *University of Lodz, Poland, ORCID: https://orcid.org/0000-0003-4385-6119, magdalena.zaleczna@uni.lodz.pl*

ABSTRACT

Purpose – verification of the attractiveness of residential investments concerning other investments in the financial market. A research hypothesis was formulated: such investments are characterized by higher average rates of return and a more favorable risk-to-return ratio than other investments in the financial market.

Design/methodology/approach – critical analysis of the literature, descriptive and statistical analysis of the equality of means ANOVA with the study of the relationship of the rates of return and risk measured by standard deviation.

Findings – the research hypothesis was verified negatively.

Research limitations – first of all, the research was conducted on historical data. The risk varies over time, and the obtained results cannot be used as a basis for assessing the future.

Research implications – the Polish financial market is getting closer to mature markets with its development. New analytical tools are emerging that enable more extensive analyzes.

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INTRODUCTION

We are witnessing a massive change in the perception of the role of housing resources in current socio-economic conditions. Post-war housing policy in many countries created an image of housing as a basic necessity for every human being. This situation has changed very clearly in recent years; an apartment has started to be equated with an equity investment. It is also evidenced by the current trend in Poland - the interest in residential assets is growing dynamically among people with financial surpluses and looking for ways to multiply their capital. Other investment directions perceived by the average domestic investor do not seem so attractive - the stock market carries a high risk, and government securities do not always guarantee capital protection against inflation. The attractiveness of real estate as an investment is confirmed by research; for example, real estate is mentioned as one of the best forms of hedging against inflation in the long term (Fugazza, Guidolin & Nicodano, 2007; Korkmaz, 2019), and behavioral factors have recently started to be appreciated (Salzman & Zwinkels, 2017). The presented article attempts to refer to the research that the authors conducted over 15 years ago. (Wolski & Załęczna, 2007). An attempt was made to verify whether the purchase of flats is an attractive form of investing capital surpluses in the current economic and social reality. Earlier studies were conducted with limited data sources; there was no such thing as hedonic indices for real estate.

LITERATURE REVIEW

The economic problems of the 1970s triggered the recommodification of the housing stock (Forrest & Williams, 1984; Forrest, 2011; Lis, 2017; Kucharska-Stasiak et al., 2020). It meant putting the social function of an apartment aside and emphasizing its investment potential. It was due to, among other things, changes in the direction of the housing policy because efforts were made to significantly reduce the role of the state and other public entities in satisfying housing needs. It produced minimized public expenditure on housing, a new way of managing housing stock at the disposal of public entities (e.g., through privatization, transfer of management to private entities). The housing policy instruments began to be widely used that supported the demand side and not the supply side (Dewilde & De Decker, 2016). At the legislative level, restrictions on the level of rental rates for residential premises and special protection for tenants were abolished. It encouraged private investors to invest in rental housing. In the 1980s, the

financialization of the housing stock began, which was dynamically developing in the following years. The causes were, among other things, liberalization of the rules governing financial markets, globalization, and development of securitization instruments (Fernandez, 2016; Aalbers, 2017; Fields, 2018; Lewicki, 2014; Gadowska-dos Santos, 2018). As a result, the demand for mortgage loans grew dynamically, the share of private ownership of the housing stock increased, and at the same time, prices in housing markets, in particular in large cities, increased. In many countries, hyper commodification is observed (Marcuse & Madden, 2016; Rogers, Nelson & Wong, 2018; Jackobs & Manzi, 2020; Kadi, Vollmer & Stein, 2021). It is the result of perceiving the entire process related to the construction and use of the housing stock as a way to accumulate capital and invest. These activities are no longer limited to the local or national investment market. Thanks to the latest technologies, it is possible to purchase residential real estate worldwide (with restrictions resulting from legal regulations). Undoubtedly, such assets of international interest are the rights to housing resources in the largest and most attractive cities.

In Poland, the post-transformational housing policy has stimulated residential premises ownership over the years. However, the private rental market did not develop dynamically (Markowski et al., 2018). The intense formal protection of tenants deterred many potential investors. Only legislative changes, incl. introducing occasional and institutional residential leases, a dynamic increase in prices on the housing market, and very cheap mortgage loans contributed to revealing the investment potential of the residential assets. In Polish literature, attempts were made to study the nature and results of residential investments, considering, among other things, their specificity and prices (Foryś, 2013; Cesarski, 2017; Konowalczuk, 2018; Brzezicka et al., 2021).

In world literature, many authors deal with the very problem of profitability, the risk-reward relationship, or capital allocation between investment instruments. One of the most critical works on this topic is the article by Fama and French from 1989. Although the authors omit real estate in their work, their research shows that the expected rates of return are lower in stable economic conditions, while these rates are higher when conditions are weak. To paraphrase, investors demand higher rates of return in times of uncertainty (Fama & French, 1989).

The investment opportunities offered by real estate are also noticed in Polish literature (Dittmann, 2020, p. 37). In this context, it is puzzling how investors perceive real estate investments. Wolski pointed out that investments in bonds were the safest, then investments in real estate and

finally in equities. However, when examining the risk to reward ratio, it turned out that real estate is the least effective investment (Wolski, 2017). Among the many studies, however, there is an interesting observation. The correlation between the rates of return on real estate and the return on shares is low or even negative. As a result, real estate becomes an investment that allows you to diversify your investment portfolio (Benjamin, Sirmans & Zietz, 2001; Szumilo et al., 2018; Anderson, Beracha & Propper, 2021).

APPLIED DATA SOURCE AND METHODS

The study used two indices from the capital market, WIG20 and WIG Nieruchomości (marked in the article with the symbol WIG-N), the money market index TBSP. The index and three hedonic indices calculated by the National Bank of Poland from the real estate market: index for the seven largest cities (Gdańsk, Gdynia, Łódź, Kraków, Poznań, Warszawa, Wrocław), from now on referred to as index7 in the study, the index for ten cities (Białystok, Bydgoszcz, Katowice, Kielce, Lublin, Olsztyn, Opole, Rzeszów and Szczecin), from now on referred to as index10 and index for six cities (from now on referred to as the index6), which is an index similar to the index7, but excluding Warsaw - the composition of the index: Gdańsk, Gdynia, Łódź, Kraków, Poznań, Szczecin, Wrocław. No data on real estate investment funds were used in the study (insufficient data).

When selecting these indices, the authors were guided by specific reasons. The WIG Nieruchomości index was chosen as an alternative investment, however, related to the real estate market. The authors' goal was to diversify the directions of investing. Efforts were made to determine whether an indirect investment in the real estate market may be attractive. It should be emphasized that when investing indirectly, it is also impossible to use instruments not related to the residential real estate market. Regrettably, there is no index in Poland showing profitability in the commercial real estate market.

The choice of the WIG20 index (not the WIG index, the sWIG80 index, or the mWIG40 index) resulted from the continued popularity of the WIG20 index among investors. This popularity is reflected in the available derivatives - the WSE currently lists three ETFs based on the WIG20 index. In the period Authors took into consideration, there was an ETF directly following the WIG20 index. It means that investors can "buy the WIG20 index". Thus, this index is a viable investment alternative. The popularity of the WIG20 index among investors is reflected in the methodology of calculating the beta

factor on the Polish market. Bloomberg uses the WIG20 index for this purpose, despite the literature indicating the need to use the broadest possible index. It is also worth mentioning that the turnover of companies from the WIG20 index is 73.5% of the total turnover of the exchange on October 8, 2021, mWIG40 is 17.5%, and sWIG80 is only 3.6% of the exchange turnover. Such proportions persist on the WSE. The bond index was chosen naturally as a consequence of studying the literature on the subject. Referring to the use of the money market index in the study, the TBSP Index is the only benchmark of this kind.

A study period was limited by the availability of data on the one hand and the business cycle on the other hand. After analyzing the exchange rates, Autors decided to set the research period from the 4th quarter of 2008 to the 1st quarter of 2021. The exclusion of the period up to the 3rd quarter of 2008 resulted from the exceptional economic situation reflected in high price drops.

The time series used in the study was 50 quarters for each index. In the beginning, quarterly rates of return and descriptive variables were calculated, such as quarterly average rate of return, standard deviation, standard error, minimum, maximum, and total rate of return calculated as the increase in the index value from the first observation in the fourth quarter of 2008 to the last observation in the first quarter of 2021. In the final step, the coefficient of variation was calculated using the standard deviation and the total rate of return. This ratio allows you to determine how much risk is allocated to the profit unit. Thus, it is, in a sense, the price that is incurred when investing. The lower the ratio, the more rational it is to undertake a given investment. After the descriptive statistics were calculated, the indices were grouped in pairs to precisely define their relationships. In this way, 13 unique pairs were obtained, where the condition of the existence of "peer-to-peer" observation was met.

One-way ANOVA is resistant to variance heterogeneity with groups of equal size, so Levene's homogeneity of variance test was not performed. The purpose of ANOVA was to check the probability of the same expected values in subsequent trials. Recognizing that the expected values are equated with the average, it is checked whether the average quarterly rates of return of subsequent indexes differ statistically significantly. Demonstrating the difference between subsequent trials and identifying the direction of these differences would verify the hypothesis: real estate investments are characterized by higher average rates of return and a more favorable risk-to-return ratio than other investments in the financial market. In one-way ANOVA, the null hypothesis about equality of means was verified against the

alternative hypothesis about the lack of this equality. All tests were performed using PS Imago software.

In the last step, the Authors examined all indices with the indicators used to test the effectiveness of investment portfolios (indices are a kind of portfolios). The index efficiency analysis was performed by calculating three efficiency indicators (Jobson & Korkie, 1981; Flaherty & Li, 2004; Pilotte & Sterbenz, 2006): Sharpe (1966, 1994), Treynor (1966), and Jensen (Jensen, 1968). The beta coefficient used in the Treynor index and the Jensen index (also known as the Jensen alpha) was calculated using the WIG index for the period compliant with the research period, i.e., from Q4 2008 to Q1 2021, using quarterly rates of return. The standard deviation used in the Sharpe index was calculated on the same data. The market values of the rate of return, beta, and standard deviation are the values calculated for the WIG index. Profitability was assumed as the risk-free rate of return. In all indicators, when the average rate of return from the market or the index was needed, the average annual rate of return was used. As a result, it was compatible with the risk-free annual rate of return.

RESULTS &DISCUSSION

The analysis of the total rates of return indicated the WIG Nieruchomości index (WIG-N) as the most profitable investment, the average quarterly rate of return of 1.36%, and the total rate of return 102.32%. Investments in residential real estate turned out to be the least profitable in terms of the average quarterly rate of return. The lowest average quarterly rate of return belonged to the Index10, the hedonic index of prices on the residential real estate market for ten large Polish cities and amounted to 0.06%. The development of quarterly rates of return is presented in Figure 1.

On the other hand, the lowest total rate of return was 8.33%, and it belonged to the WIG20 index. The low total return rate of 31.46% belonged to the hedonic housing price index for the seven largest Polish cities. The exceptionally weak result of the WIG20 index is a kind of anomaly. The poor profitability of the largest companies in Poland says a lot about the condition of the capital market and large companies.

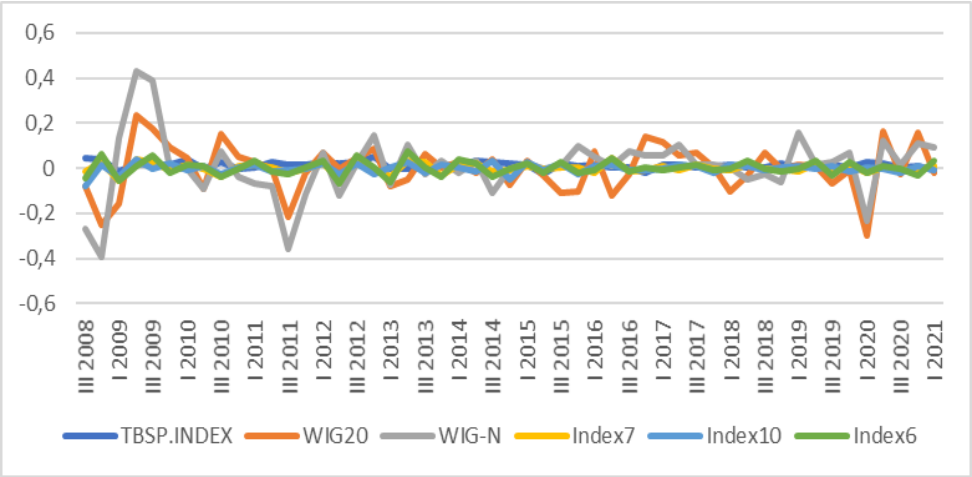

Figure 1. Quarterly rates of return on subsequent analyzed indices
Source: own study.

The order of investments in terms of the degree of risk, measured by the standard deviation, remains in line with investors' expectations and general beliefs. Investments in the capital market turned out to be the riskiest, while investments in the money market turned out to be the least insecure. Of the order of 13.56%, the highest risk was recorded for the WIG Nieruchomości index, marked as WIG-N. The lowest risk is associated with investments in bonds—the TBSP.Index recorded a standard deviation of 1.44%. Investments in residential real estate are close to this value. Hedonic indices for this market recorded a standard deviation from 1.89% for the hedonic index calculated for ten Polish cities to 3.17% for the hedonic index calculated for the six largest cities excluding Warsaw. The values of descriptive statistics are presented in Table 1.

Table 1. Descriptive statistics of subsequent asset classes

Index	Average rate of return	Standard deviation	Standard error	Min.	Max.	Total rate of return	Con. volatility	Con. beta
TBSP.INDEX	1.30%	1.44%	0.20%	-2.46%	5.18%	81.80%	0.02	0.00
WIG20	0.16%	10.58%	1.50%	-29.64%	23.18%	8.33%	1.27	0.98
WIG-N	1.36%	13.56%	1.92%	-39.20%	42.98%	102.32%	0.13	0.97
Index7	0.10%	2.16%	0.31%	-5.83%	4.27%	31.46%	0.07	0.04
Index10	0.06%	1.89%	0.27%	-5.17%	4.10%	36.56%	0.05	0.02
Index6	0.18%	3.17%	0.45%	-6.57%	7.49%	35.77%	0.09	0.03

For 50 observations
Source: own study.

The volatility coefficients reflected the risk levels and profitability for subsequent indices. It could be assumed that the lower the volatility coefficient, the more favorable the risk-reward ratio is for the investor. So it is possible to say that the most rational investments were in bonds (volatility coefficient of 0.02, and the least reasonable in the 20 largest listed companies WIG20 (1.27). Against this background, real estate investments with volatility coefficients from 0.05 for Index10 to 0.09 for Index6 look favorable.

The coefficient of variation, combined with the analysis of the rates of return and standard deviation, allowed for identifying favorable, from the point of view of the risk-profitability relationship, investments. However, the credibility of the presented data remains unresolved. ANOVA analysis conducted on average quarterly rates of return allowed to answer whether the differences between the rates of return are statistically significant. Confirmation of these differences gives credibility to the profitability and risk analysis performed.

Before starting the ANOVA, a data distribution study was performed using the Lillefors test. In all cases, the Authors did not adopt the alternative hypothesis about the lack of normality of the distribution for statistical significance at the level of 1%.

Table 2. Lilleforse tests for normal distribution

Index	Lilliefors test	p
TBSP.INDEX	0.09	0.33
WIG20	0.01	0.23
WIG-N	0.13	0.04
Index7	0.07	0.79
Index10	0.06	0.88
Index6	0.07	0.75

Source: own study using PS Imago software.

As indicated earlier, ANOVA tested the null hypothesis of equality of means versus the alternative hypothesis of non-equality of means. In three cases, an alternative hypothesis to the null hypothesis was adopted. In another 11 cases, there was no reason to reject the null hypothesis, which suggests the existence of equality of means. The results are presented in Table 3.

Table 3. One-way ANOVA in consecutive pairs of indices

Index	One-way ANOVA	The sum of the squares	df	The mean square	F	Significance
TBSP.INDEX-WIG20	Between groups	0.00	1	0.00	0.56	0.46
	Inside groups	0.56	98	0.01		
	Total	0.56	99			
TBSP.INDEX-WIG-N	Between groups	0.00	1	0.00	0.00	0.98
	Inside groups	0.91	98	0.01		
	Total	0.91	99			
TBSP.INDEX-Index7	Between groups	0.00	1	0.00	10.61	0.00***
	Inside groups	0.03	98	0.00		
	Total	0.04	99			
TBSP.INDEX-Index10	Between groups	0.00	1	0.00	13.61	0.00***
	Inside groups	0.03	98	0.00		
	Total	0.03	99			
TBSP.INDEX-Index6	Between groups	0.00	1	0.00	5.14	0.03**
	Inside groups	0.06	98	0.00		
	Total	0.06	99			
WIG20-WIG-N	Between groups	0.00	1	0.00	0.24	0.63
	Inside groups	1.45	98	0.01		
	Total	1.45	99			
WIG20-Index7	Between groups	0,00	1	0.00	0.00	0.97
	Inside groups	0.57	98	0.01		
	Total	0.57	99			
WIG20-Index6	Between groups	0.00	1	0.00	0.00	0.99
	Inside groups	0.60	98	0.01		
	Total	0.60	99			
WIG-N-Index7	Between groups	0.00	1	0.00	0.42	0.52
	Inside groups	0.92	98	0.01		
	Total	0.93	99			
WIG-N-Index10	Between groups	0.00	1	0.00	0.45	0.50
	Inside groups	0.92	98	0.01		
	Total	0.92	99			
WIG-N-Index6	Between groups	0.00	1	0.00	0.36	0.55
	Inside groups	0.95	98	0.01		
	Total	0.95	99			
Index7-Index10	Between groups	0.00	1	0.00	0.01	0.92
	Inside groups	0.04	98	0.00		
	Total	0.04	99			
Index7-Index6	Between groups	0.00	1	0.00	0.02	0.88
	Inside groups	0.07	98	0.00		
	Total	0.07	99			
Index10-Index6	Between groups	0.00	1	0.00	0.05	0.82
	Inside groups	0.07	98	0.00		
	Total	0.07	99			

*** statistically significant for p<0.01

** statistically significant for p<0.05

Source: own study using PS Imago software.

Average quarterly returns differ statistically significantly between the TBSP.Index bond market index and hedonic housing market indices. In other cases, when comparing the average monthly rates of return between equity indices, housing market indices, and bond market indices, no statistically significant differences between the means were found.

Table 4. Investment efficiency indicators

Index/indicator	Treynor indicator	Sharpe indicator	Jensen indicator
market (indeks WIG)	0.03	0.27	0.06
TBSP.INDEX	34.49*	4.41*	0.06*
WIG20	-0.06	-0.52	-0.11
WIG-N	-0.07	-0.44	-0.12
Index7	0.22*	0.41*	0.01*
Index10	1.47*	1.04*	0.03*
Index6	0.47*	0.35*	0.01*

* the indicator indicates the effectiveness of the investment

Source: own study.

The Treynor and Sharpe indices indicate the effectiveness of investments when they are higher than the market indices. On the other hand, the Jensen index suggests the effectiveness of the investment when it is positive. Each time the higher the ratio, the more effective the investment.

Considering successive indexes from the point of view of efficiency measured with indexes, the obtained results were consistent with the previous analysis results. Bond investments were the most effective; subsequently, investments in the housing market and, finally, investments in shares of the largest 20 companies and companies from the real estate sector. Additionally, all three indicators point to the ineffectiveness of investments in the stock market.

The analysis of the profitability of the discussed investments indicates bonds as the most profitable capital investment. They were followed by the real estate market, leaving the stock market behind. The latter turned out to be the least effective, especially considering the profit to risk ratio, both total (calculated by the standard deviation) and systematic (calculated by the beta coefficient). Therefore, it would be worth considering the consequences for the investor and analyzing why the real estate market has become so popular in recent years. The authors believe that the popularity of the residential market, contrary to calculations pointing to the bond market as the most effective, is supported by at least three factors. Firstly, as shown in the

literature cited earlier, real estate can be a very good hedge against the negative effects of inflation. These factors have gained importance in recent years (although the analysis was carried out over almost 13 years). Currently, so high inflation, in the order of 6%, may lead to the reality that even bonds indexed to inflation will not secure capital. Suffice it to mention the 19% tax on capital gains, the absolute value of which can consume all additional, beyond inflation, the value of interest earned. The second premise may be the lack of trust in the state and its institutions. Narodowy Bank Polski seems to be passive in the present reality. Investors are starting to lose confidence in his decisions, linking them with politics rather than economics. The third factor may be the instrumental - politically motivated - exploiting companies with a dominant state position. Nepotism, hiring employees without competition, and central control of companies - such as an order for Poczta Polska to conduct correspondence elections or the import of uncertified masks with transport paid by, among others, KGHM undermines investors' confidence in the capital market.

Against all these factors, the residential market seems to be an oasis of peace. These are the factors that, according to the authors, attract investors to the residential assets. The research presented in this paper, in some way, confirms the collective wisdom of investors. However, it is feared that the rush of investors to the housing market may lead to a price bubble, a significant overvaluation of residential premises, and thus social and economic consequences.

CONCLUSION

In the study, two types of rates of return were used. While analyzing the profitability of investments, quarterly rates of return were applied to calculate the risk level. While estimating the profitability of investments, the total rate of return was analyzed. The study covered the period from the 4th quarter of 2008 to the 1st quarter of 2021. Investments in bonds and real estate showed the best total return to risk ratio. The WIG20 index of the 20 largest listed companies was the worst. The WIG Nieruchomości index, although it had the highest overall rate of return of 102.32%, showed a high risk of this investment (volatility coefficient), relatively, concerning the obtained rate of return, much higher than for other investments. In this light, the bond index fared the most, combining risk and rate of return the best.

Additionally, the ANOVA showed differences between quarterly rates of return on the residential and the bond market, but such differences do not characterize the other relations between assets. It means that it is difficult to

find differences in yields on the stock market, real estate market, and bond market in the short term. The final research was the calculation of efficiency indicators, all of which indicated that the bond and residential real estate markets were effective. It can be concluded that the research hypothesis was falsified. The coefficient of volatility also points to bonds as the most profitable investment.

However, some reservations should be added to the research result. First of all, the study was conducted on historical data, and meanwhile, the risk varies over time (Kandel, Stamnaugh & Ferson, 1987; Cooper & Priestley, 2009). Falling interest rates on government bonds or very low rates of return certainly impact investment choices.

At this point, it is worth comparing the current results to the results obtained 15 years ago. The Polish financial market is approaching mature markets with its development. New analytical tools emerge, such as hedonic real estate indices or equity market indices of companies operating in real estate turmoil and the bond market index. Therefore, referring to the work published in 2007, it is difficult to compare the specific numerical results. It is worth noting that the risk-reward relationships are arranged following global trends. Bonds are the safest, then real estate and stocks are the riskiest. However, the risk-reward ratio presented as the coefficient of variation looks different than in the previous analysis. From this point of view, the most profitable investments at present were in bonds, then in residential assets, and finally in the stock market. It is worth emphasizing, however, that the current market situation may give rise to concerns. It is not about threatening with a crisis, but the lack of other investment opportunities and readily available loans drive only the residential market.

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