KWARTALNIK NAUK O PRZEDSIĘBIORSTWIE

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Study of students' attitudes to risk in the real estate market

Badanie postaw studentów wobec ryzyka na rynku nieruchomości

Keywords:
prospect theory, certainty equivalent, risk attitudes, risk aversion, risk seeking

Abstract: This article aims to provide an insight into the subject of risk in the real estate market taking into account its behavioral aspects. The paper describes attitudes toward risk among students at the University of Warmia and Mazury in Olsztyn according to the assumptions of prospect theory, one of the most important theories of behavioral economics. The research used the method of certainty equivalent to determine the variability of attitudes to risk (risk seeking, risk aversion, and indifference to risk) on the example of games involving investment decisions in the real estate market. The research was carried out for small and large amounts of lottery, both for gains and losses. The most important finding of the research is the confirmation of statistically significant differences between attitudes for gains and losses, and between attitudes for money and housing goods for large amounts.

Słowa kluczowe:
teoria perspektywy, ekwiwalent pewny, postawy wobec ryzyka, awersja do ryzyka, poszukiwanie ryzyka

Streszczenie: Niniejszy artykuł ma na celu przybliżenie tematyki związanej z ryzykiem, jakie występuje na rynku nieruchomości przy uwzględnieniu jego behawioralnych aspektów. W pracy opisano postawy wobec ryzyka wśród studentów Uniwersytetu Warmińsko-Mazurskiego w Olsztynie zgodnie z założeniami teorii perspektywy, jednej z najważniejszych teorii ekonomii behawioralnej. W badaniach wykorzystano metodę ekwiwalentu pewnego, by określić zmienność postaw wobec ryzyka (poszukiwania ryzyka, awersji do ryzyka oraz indyferencję wobec ryzyka) na przykładzie gier losowych obejmujących decyzje inwestycyjne na rynku nieruchomości. Badania przeprowadzono dla małych i dużych kwot loterii, zarówno po stronie zysków, jak i po stronie strat. Najważniejszym wnioskiem płynącym z badań jest potwierdzenie istotnych statystycznie różnic miedzy postawami po stronie zysków i strat, oraz pomiędzy postawami dla pieniędzy i nieruchomości dla dużych kwot.

JEL:
D81, D90, D91, R29

Introduction

Behavioral economics, as a modern economic trend, is also becoming increasingly popular in real estate research. The real estate market, which is regarded as a rather difficult subject of research, is nevertheless a fertile ground for behavioral research in the fields of purchase decision theory, economic rationality theory, heuristics and biases or issues related to market risk and uncertainty.

This article is concerned with investment risk in the real estate market taking into account its behavioral aspects. The specific issue addressed in the article refers to the question of attitudes toward investment risk among participants in this market. According to the prospect theory by Daniel Kahneman and Amos Tversky [1979], which is one of the most important theories of behavioral economics, three attitudes to risk can be distinguished: risk seeking, risk aversion, and indifference to risk. Empirical identification of these attitudes is possible by using the certainty equivalent method. The certainty equivalent is used in practice to determine the utility function for money and, in the case of the research described here, also for housing goods. The certainty equivalent is the value of the payoff for which the decision-maker is indifferent as to whether he or she will receive the payoff for sure or participate in a lottery with a risk variant. It is important to note that the value of the certainty equivalent in a risk game varies depending on the risk attitude of the decision maker.

The purpose of the research was to determine what attitudes risk market participants have in risk variant lottery games for small and large amounts for gains and losses, and to determine whether these attitudes differ for money and for housing goods (real estate for large amounts, housing equipment voucher for small amounts). The research was an experiment and was conducted by using a survey. The survey (100 questionnaires) was conducted among spatial management students at the University of Warmia and Mazury in Olsztyn in December 2022.

The description of the experiment presented might suggest that it does not matter whether the object of the lottery is real estate or money, which makes it possible to buy a flat. In the research, however, it was decided to carry out the analysis separately for the flat and for the money, because it was hypothesized that the flat has a higher value than the corresponding amount of money, because the flat, apart from the financial and investment component, also contains some additional value related to sentiment, a sense of security and psychological well-being. These circumstances may cause a change in attitudes towards risk as explored later in the paper. What is more, people should treat those two things quite differently because when individual analyze real estate as a whole system they have to take into account dealing with mortgages, some transactional cost, e.t.c, but on the other hand flats provide potential gains due to appreciation in the future. Money lotteries do not involve this circumstances.

Literature review

The behavioral approach to the real estate market has become increasingly popular in recent years. This is evidenced by the numerous new publications in this field and the launch of special issues on behavioral topics in leading real estate journals[1]. Behavioral themes implemented in the real estate market are a valuable contribution to current real estate research, as they enrich it with a new point of view. The behavioral approach seems to explain, at least in part, the deviation of observed housing market phenomena from the assumptions of the neoclassical school [Tomal, Brzezicka, 2024]. At the same time, some insights from housing research can provide new perspectives on theoretical questions that are broader in scope than just housing [Ruonavaara, 2024].

One of the most important theories of behavioral economics is prospect theory [Kahneman, Tversky, 1979] and its 'extended' version [Tversky, Kahneman, 1992]. This theory is an alternative to the classical expected utility theory and is the most widely used descriptive model of decision-making under risk. The most important findings of prospect theory, particularly relevant for the remainder of this article, are to prove that the utility function takes a different shape for potential losses and a different shape for potential gains. The curve is convex for losses and concave for gains and steeper for losses than for gains [Zielonka, 2005]. This has been proven in studies of both financial markets [De Giorgi et al., 2010] and in relation to the real estate market [Li et al., 2017; Brzezicka, Tomal, 2023].

These features of the value function are extremely important when it comes to people's attitudes towards risk because depending on what attitude towards risk the decision-maker displays, the utility function will take on a different shape. Depending on the decision situation and the individually determined level of risk acceptance, one can distinguish risk attitudes between risk seeking (convex function), risk indifference (linear function), and risk aversion (concave function) [Tyszka, Domurat, 2004].

A person with risk aversion prefers to choose an option that will bring them some certain value and chooses the risk-averse option [Kahneman, Tversky, 1979, p. 264; Czerwonka, Piktus, 2018]. Decision-makers who show risk aversion are inclined to take risks in cases where it is possible to receive a risk premium to compensate for taking risky decisions [Jajuga, Jajuga, 2011; Szyszka, 2009, p. 247]. According to utility theory, for a risk-averse person, the utility of certainty (receiving a certain amount) will be higher than the utility of a game with a risk option [Tyszka, Domurat, 2004, pp. 86–88]. It is also important to note that decision-makers manifest loss aversion only on the gain

[1] Special issues on behavioral themes have been prepared in 2024 in the "Housing, Theory and Society" journal and in the "Critical Housing Analysis" journal. The first of them has the topic "Behavioral biases in the housing market" and the second "The Contributions of Housing Research to Social and Behavioral Theory".

side, whereas they seek it on the loss side [Kahneman et al., 1991]. The utility function for risk-averse decision makers is increasing and concave [Tyszka, 2010, p. 205]. Risk aversion is the most common attitude. A decision-maker who is willing to take a risk when given a choice between two options – receiving a certain amount of money or participating in a risky game in which he can gain an expected value equal to a certain amount of money – will choose the risky second option [Niedziółka, 2016, p. 52]. The risk-taker will willingly gamble for a higher value than to stop at the certain value offered to them. The utility function in this case is decreasing and convex. The risk-taker will assign greater utility to the expected benefits of the risky game than to the value of a certain amount [Tyszka, Domurat, 2004, pp. 86–88; Kellen et al., 2017]. In addition to propensity and aversion, a decision-maker's neutral attitude towards risk is also possible. Such decision-makers are indifferent as to whether they will participate in the game and be compensated for their risk, or whether they will stay with the certainty option, even if this would mean receiving a lower amount than if they played the risk option [Tyszka, 2010, p. 205].

Risk attitudes can be described using the concept of the certainty equivalent. The certainty equivalent is related to expected utility theory and is used in practice to determine the utility function for money. As defined by Tyszka [2010, p. 202], a certainty equivalent is a payoff value for which the decision maker is indifferent as to whether he or she will receive this value with certainty or a given risky option. Clemen [1996] defined the certainty equivalent as 'the amount of money that is equivalent in your mind to a given situation that involves uncertainty'. In other words, the certainty equivalent denotes a pay-off value that would be accepted regardless of whether it is certain or entails a certain degree of risk. It is the smallest but acceptable payoff that is equivalent to a gamble with a risk option [Tomal, Brzezicka, 2023, p. 2576]. The method of the certainty equivalent has been used in prospect theory [Kahneman, Tversky, 1979], in cumulative prospect theory [Tversky, Kahneman, 1992], and in other studies to determine the parameters of these functions [Rieger et al., 2017].

It is important to note that the value of the certainty equivalent varies depending on the risk attitude of the decision-makers. According to theory [Tomal, Brzezicka, 2023, p. 2], comparing the expected value from the game and the value of the certainty equivalent makes it possible to determine the respondent's attitude towards risk, as interpreted below:

(a) if the amount of the certainty equivalent (X) is equal to the expected value from the game (EV) – risk neutrality;
(b) if the amount of the certainty equivalent (X) is less than the expected value from the game (EV) – risk aversion;
(c) if the amount of the certainty equivalent (X) is greater than the expected value from the game (EV) – risk seeking.

The study of attitudes toward risk in the real estate market itself is an interesting extension of research related to the utility of money and the utility of real estate goods. Real estate, by its very nature, has both consumer and investment functions [Łaszek, 2004]. On the one hand, for households, the purchase of a dwelling is a long-term investment burdening their budget for years [Marsh, Gibb, 2011] and, on the other hand, an important asset in an investor's portfolio [French, 2001]. Furthermore, property ownership and real estate choices are associated with a certain sentimental value and represent an object of emotional attachment [Renigier-Biolozor et al., 2022; Tomal, 2024]. Due to the high importance of decisions related to the choice and purchase of real estate and in connection with the high value of real estate [Źróbek, Walacik, 2016], it is worth looking at real estate also through the prism of attitudes taken by market participants in the face of risky situations on the gain and loss side, which is also undertaken in the research part of this paper.

Data and Methods

Data for the study were obtained through a survey. The survey was conducted in December 2022 and involved 100 people (57 women, 43 men). The respondents were students of the University of Warmia and Mazury in Olsztyn studying spatial management, geodesy and construction. About 80% of the students were engineering students (1st degree), and the remaining 20% were students of supplementary master's studies (2nd degree). These were students from real estate courses so they understand the market better than students from other courses. The survey was conducted in-person, the form consisted of 4 pages in A4 format. Students were not given any incentives to participate in the survey. The primary purpose of the survey was to carry out research for the thesis, which resulted in an engineering thesis and one other research paper. However, the present research does not replicate the aims of previous elaborations. The survey consisted of more than a dozen questions, some of which were used to achieve the above-mentioned research objective, and some were used to examine the differences between the actual and declared attitudes towards financial risk among the students [Brzezicka et al., 2024]. In the research covered in this article, respondents were asked to indicate the value of the certainty equivalent for small and large amounts of money for gains and losses, as is the case in prospect theory. The questions concerned money and real estate goods. The probability of gain/loss was set at 50% each time. Sample questions and details about the questions are presented in Table 1. In detail, one section of the questionnaire is included as an attachment at the end of the article.

Table 1. Sample Questions and details of gain and loss question

Gains	Losses
*Imagine that **you are taking part in a profitable game**. The presenter offers you two possible options as described below: option A – taking part in the lottery and option B – receiving money.* *A: PLN 500.00 (50% chance) or PLN 0.00 (50% chance).* *B: amount of money X (100% chance).* *Determine what the amount X would have to be for you to be indifferent between participating in the lottery (option A) and receiving a payment (option B).*	*Imagine this time that **you are taking part in an unfavorable game**. The presenter offers you two possible options as described below: option A – taking part in the lottery and option B – losing money.* *A: loss of PLN 500.00 (50% chance) or PLN 0.00 (50% chance).* *B: loss of X amount of money X (100% chance).* *Determine what the amount of the loss would have to be X for you to be indifferent to whether you take part in the lottery (option A) or pay the penalty (option B).*
▪ The questions on the gain side concerned the amounts of: PLN 500.00, PLN 5,000.00, PLN 500,000.00 ▪ The questions concerned money and real estate ▪ In the "real estate" questions for the amounts of PLN 500.00 and PLN 5,000.00, a voucher for home furnishings (e.g., from Ikea, Leroy Merlin) was offered, and for the amount of PLN 500,000.00 – an apartment of this value was offered	▪ Questions on the loss side concerned the amounts of: PLN 500.00 PLN 5,000.00, PLN 500,000.00 ▪ Questions concerned money and real estate ▪ In the "real estate" questions for the amounts of PLN 500.00 and PLN 5,000.00, the loss of a voucher for home furnishings (e.g. from Ikea, Leroy Merlin) was presented, and for the amount of PLN 500,000.00 – the loss of an apartment of this value was presented.

Source: own study.

An asset-based understanding of these amounts could be as follows: PLN 500.00 is the amount needed for weekly shopping for a family of four, PLN 5,000.00 is an amount close to but lower than the average net salary, which in 2025 is around PLN 6,000.00, the amount of PLN 500,000.00 is the cost of buying a small flat in the suburbs of Warsaw or the cost of buying a 60-metre flat in a small (district) city.

In this way, 12 variables were obtained, each corresponding to one question: 3 questions on the side of gain for money, 3 on the side of gain for real estate, 3 on the side of loss for money, and 3 on the side of loss for real estate. Each triplet concerned amounts or real estate goods in a gamble with expected value EV = |250.00 PLN|, EV = |2,500.00 PLN|, EV = |250,000.00 PLN | (the absolute value of the results was assumed in the research due to the questions in the domain of losses in the survey), and each triplet contained 4 questions concerning the same amount but different variants of the question. The summary is included in Table 2.

The purpose of the study was to determine students' attitudes towards risk and to indicate differences in these attitudes depending on whether the questions are about gains or losses, money, or real estate. Attitudes were determined based on the relationship between the certainty equivalent and the expected value from a risk game in accordance with the criteria presented in the theoretical part of the article. Each variable contained

three possible variants (risk averse attitude; risk seeking attitude; risk neutral attitude) and for each variable the number of people adopting each of these attitudes was calculated. In the next step, statistical texts were prepared to check whether the differences between the distributions of attitudes toward risk for individual variables were statistically significant. To test the differences, the nonparametric Chi-square goodness of fit test ($\chi 2$) was used to compare the variables pairwise. The study was carried out for each pair of questions separately for the expected value of |250.00 PLN|, |2,500.00 PLN| and |250,000.00 PLN|. One of the distributions in the tested pair was always defined as the expected distribution; the other distribution in the tested pair was the observed distribution. The test should be interpreted that with a result $p<0.05$ is obtained, the differences between variables are statistically significant. Calculations were performed in SPSS software.

Table 2. Architecture of the questions in the survey

Question No.	Expected value |250.00 PLN|	Expected value |2,500.00 PLN|	Expected value |250,000.00 PLN|	Gains	Losses	Money	Real estate goods (voucher / apartment)
1	x			x		x	
2		x		x		x	
3			x	x		x	
4	x				x	x	
5		x			x	x	
6			x		x	x	
7	x			x			x
8		x		x			x
9			x	x			x
10	x				x		x
11		x			x		x
12			x		x		x

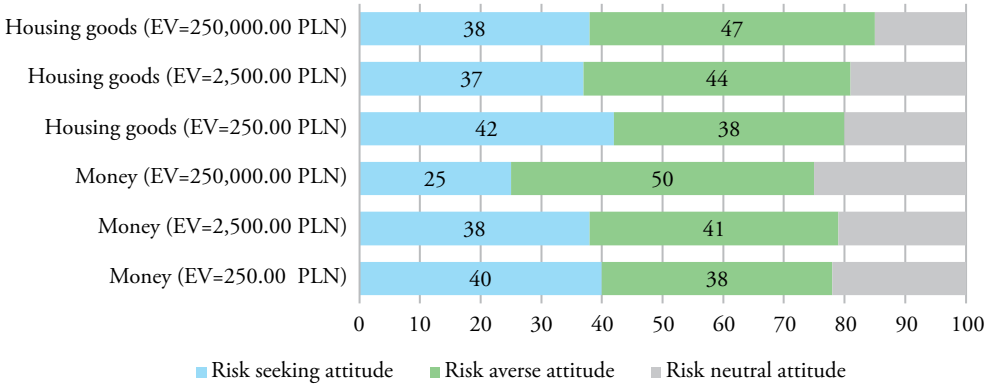
Source: own study.

Results and Discussion

First, attitudes toward risk were examined for each variable. In the case of a positive game (gains), for almost all payoffs, the average value of the certain equivalent for money and housing goods (voucher) is much lower than the expected value, which indicates aversive attitudes of decision-makers (examined as an aggregate value). In the context

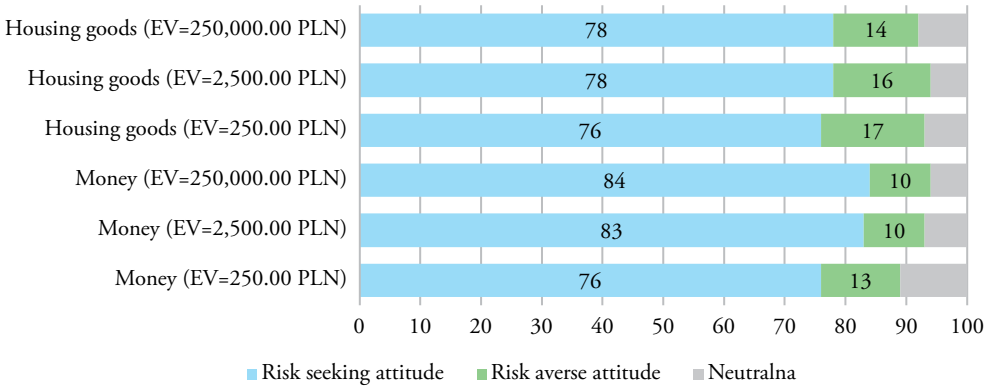
of negative games (losses), the situation is the opposite. Respondents show a risk averse attitude, both in the case of a voucher for home furnishings and money, because the values of certainty equivalents indicated are higher than the expected value from the game. Further study will analyze individual attitudes rather than averages. The results obtained for the gains are presented in Figure 1, and the results obtained for the losses are presented in Figure 2. For gains, a dominant attitude of risk aversion was obtained and for losses, risk seeking was the dominant attitude. On the loss side, about twice as many risk-seeking attitudes were observed as on the gain said. The attitude of risk indifference on the gain side was in the minority (around 20%), and on the loss side was marginal (less than 10%).

Figure 1. Attitudes toward risk on the gain side (in %)



Source: own study.

Figure 2. Risk attitudes on the loss side (in %)



Source: own study.

The next step presents the results of the Chi-square goodness of fit test, conducted to detect differences in the distributions of attitudes for the subsequent variables. Table 3 presents the results for the expected value EV = |250.00 PLN|, Table 4 for the expected value EV = |2,500.00 PLN|, Table 5 for the expected value EV = |250,000.00 PLN |.

Table 3. Test results for EV=|250.00 PLN|

EV = 250.00 PLN	Question 1 (Gains, money)		Question 4 (Losses, money)		Question 7 (Gains, housing goods)	
Question 4 (Losses, money)	Expected N (Question 1)					
	Observed N (Question 4)					
	Chi-square	54,347				
	Significance	**<,001***				
Question 7 (Gains, housing goods)	Expected N (Question 1)		Expected N (Question 4)			
	Observed N (Question 7)		Observed N (Question 7)			
	Chi-square	0,282	Chi-square	70,651		
	Significance	0,869	Significance	**<,001***		
Question 10 (Losses, housing goods)	Expected N (Question 1)		Expected N (Question 4)		Expected N (Question 7)	
	Observed N (Question 10)		Observed N (Question 10)		Observed N (Question 10)	
	Chi-square	54,233	Chi-square	2,685	Chi-square	47,579
	Significance	**<,001***	Significance	0,261	Significance	**<,001***

* statistical significance at the level of 0.001.

Source: own study.

Table 4. Test results for EV=|2,500.00 PLN|

EV = 2,500.00 PLN	Question 2 (Gains, money)		Question 5 (Losses, money)		Question 8 (Gains, housing goods)	
Question 5 (Losses, money)	Expected N (Question 2)					
	Observed N (Question 5)					
	Chi-square	86,062				
	Significance	**<,001***				
Question 8 (Gains, housing goods)	Expected N (Question 2)		Expected N (Question 5)			
	Observed N (Pytanie 8)		Observed N (Question 8)			
	Chi-square	0,436	Chi-square	161,665		
	Significance	0,804	Significance	**<,001***		
Question 11 (Losses, housing goods)	Expected N (Question 2)		Expected N (Question 5)		Expected N (Question 8)	
	Observed N Question 11)		Observed N (Question 11)		Observed N (Question 11)	
	Chi-square	68,063	Chi-square	4,044	Chi-square	72,145
	Significance	**<,001***	Significance	0,132	Significance	**<,001***

* statistical significance at the level of 0.001.

Source: own study.

Table 5. Test results for EV=|250,000.00 PLN|

EV = 250,000.00 PLN	Question 3 (Gains, money)		Question 6 (Losses, money)		Question 9 (Gains, housing goods)	
Question 6 (Losses, money)	Expected N (Question 3)					
	Observed N (Question 6)					
	Chi-squere	185,68				
	Significance	**<,001***				
Question 9 (Gains, housing goods)	Expected N (Question 3)		Expected N (Question 6)			
	Observed N (Question 9)		Observed N (Question 9)			
	Chi-squere	10,94	Chi-squere	175,590a		
	Significance	**0,004****	Significance	**<,001**		
Question 12 (Losses, housing goods)	Expected N (Question 3)		Expected N (Question 6)		Expected N (Question 9)	
	Observed N (Question 12)		Observed N (Question 12)		Observed N (Question 12)	
	Chi-squere	149,84	Chi-squere	2,695	Chi-squere	68,542
	Significance	**<,001***	Significance	0,260	Significance	**<,001***

* statistical significance at the level of 0.001, ** statistical significance at the level of 0.01.

Source: own study.

Statistical tests showed the following statistically significant differences between pairs:

a) between losses for money and gains for money (the pattern is repeated at all EV levels, for EV=250.00 (Questions 1 and 4), for EV=2,500.00 (Questions 2 and 5), and for EV=250,000.00 (Questions 3 and 6);
b) between losses for real estate goods and gains for real estate goods (the pattern is repeated at all EV levels, for EV=250.00 (Questions 7 and 10), for EV=2,500.00 (Questions 8 and 11), and for EV=250,000.00 (Questions 9 and 12);
c) between gains for money and gains for real estate goods – the difference is only for the largest amount EV=250,000.00 PLN (Questions 3 and 9);
d) between losses for money and losses for real estate goods – no statistically significant differences were found (at all levels of amounts).
e) the statistical test also finds statistically significant differences in cross-matched pairs (between gains for money and losses for real estate – questions 1 and 10, 2 and 11, 3 and 12) and between losses for money and gains for real estate (questions 4 and 7, 5 and 8, 6 and 9), but these regularities result from the above-described patterns of general differences for gains and losses, regardless of whether they concern money or real estate.

Of the above statistical test results, the main pattern of differences in attitudes occurring on the loss and gain side (both for money and for real estate goods) is shown. The obtained results are consistent with the scientific theory [Kahneman, Tversky, 1979;

Kahneman et al., 1991] and the literature for both money and real estate goods [Page et al., 2014; Tomal, Brzezicka, 2023], although there is much less real estate research in this area than those conducted for money. Page, Savage and Torgler [2014, p. 121] using the margins of the 2011 Australian floods (Brisbane) as a natural experimental setting, find that homeowners who were victims of the floods and face large losses in property values are 50% more likely to opt for a risky gamble – a scratch card giving a small chance of a large gain ($ 500,000.00) – than for a sure amount of comparable value ($ 10.00). This finding is consistent with predictions of prospect theory regarding the adoption of a risk-seeking attitude after a loss. Tomal and Brzezicka [2023] conducted research, which revealed risk-averse behaviors in the positive domain and risk-seeking behaviors in the negative domain for both money and housing.

The difference in attitudes between money and real estate (both for profits and losses) is in most cases statically insignificant. For small amounts (EV=|250.00 PLN| and EV = |2,500.00 PLN|), decision makers do not show differences in attitudes. Attitudes differ in the case of a high expected value of the game. For the question about large amounts of money, the number of risk-takers decreases significantly, in relation to the number of risk-takers for smaller amounts and for the apartment. The result indicates that the respondents do not want to take risks, they somehow "feel" that the amount is large and attractive. Scientific research by Neumann and Böckenholt [2014] shows that the loss aversion effect is significantly stronger for durable goods, so housing studies should pay attention to loss aversion, given the durability feature of housing products [Bao, Meng, 2017]. The problem requires further research and deepening of the subject. Moreover, differences have not been shown in attitudes towards the loss of money and the loss of housing; decision-makers perceive both of these losses equally, without differentiating what they lose. The research results presented in the section on differences in attitudes towards money and real estate respond to the previously stated research hypothesis, according to which the value of a flat is higher than the value of money due to the additional non-financial components associated with owning a flat. The hypothesis was only partially confirmed, for small amounts there were no differences in attitudes, while for large amounts the differences are statistically significant.

It should also be noted that the respondents were students just entering adulthood and making their first financial decisions. Risk-taking preferences may also change as a result of experience, as well as with increasing competence acquired in the education process [Adamczyk, 2018] and with age [Gawryluk, 2017].

The research limitations of the present study should also be pointed out. First and foremost among the limitations is the lack of a representative sample in the study conducted, which means that the results obtained cannot be generalized. In addition, the study used probabilities of 50% on the gain side and 50% on the loss side, but in the real estate market there is a long phase of rising prices and a shorter phase of falling

prices. This results in an asymmetric distribution of losses and gains, which could be reflected in an asymmetric distribution of probabilities (rather high probability of a relatively high gain and a lower probability of a significant loss). However, an asymmetric probability distribution was abandoned for reason that the issue would be too complicated for students and that the results would be unreliable.

Conclusion

The article concerns the subject of risk attitudes among students in games with risk variant for money and real estate. In the course of the research, students' attitudes towards risk were distinguished, which are treated by the prospect theory: risk aversion, risk seeking, and risk neutrality. The study used the nonparametric Chi-square goodness-of-fit test ($\chi 2$) to compare the variables pairwise. The significance level was set at 0.01. The research confirmed the appearance of statistically significant differences in games with the risk variant between gains and losses, while the differences in questions regarding money and real estate were statistically significant only in the case of a large amount of money. Thus, the research hypothesis formulated in the introduction, according to which the results obtained for real estate and money are different, was only partially confirmed. The article is part of the stream research on behavioral aspects of the real estate market, particularly the issue of choices with the risk variants.

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Appendix 1. Survey questionnaire

The survey consisted of 4 sections for gains and losses for money and for housing goods. Below this were introductory questions (learning the respondent's mindset Part II.0) and one section of relevant questions (questions for profits for money, Part II.1).

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QUESTIONNAIRE

The questionnaire is anonymous. It will be used to explore attitudes to risk in relation to the property market for the purpose of completing an engineering thesis. The questions are theoretical in nature, there is no single correct answer to the questions asked. Please imagine that the choice relates to a real situation.

PART I–INTRODUCTORY INFORMATION

☐ female
☐ male
☐ field of study: .....

PART II.0

0. Imagine that **you are taking part in a profitable game**. The presenter offers you two possible options as described below: option A – taking part in the lottery and option B – receiving money.
A: PLN 100.00 (50% chance) or PLN 0.00 (50% chance).
B: amount of money X (100% chance).
Determine what the amount X would have to be for you to be indifferent between participating in the lottery (option A) and receiving a payment (option B).

.....

PART II.1

1. Imagine that **you are taking part in a profitable game**. The presenter offers you two possible options as described below: option A – taking part in the lottery and option B – receiving money.
A: PLN 500.00 (50% chance) or PLN 0.00 (50% chance).
B: amount of money X (100% chance).
Determine what the amount X would have to be for you to be indifferent between participating in the lottery (option A) and receiving a payment (option B).

.....

2. Imagine that **you are taking part in a profitable game**. The presenter offers you two possible options as described below: option A – taking part in the lottery and option B – receiving money.
A: PLN 5,00.00 (50% chance) or PLN 0.00 (50% chance).
B: amount of money X (100% chance).
Determine what the amount X would have to be for you to be indifferent between participating in the lottery (option A) and receiving a payment (option B).

.....

3. Imagine that **you are taking part in a profitable game**. The presenter offers you two possible options as described below: option A – taking part in the lottery and option B – receiving money.
A: PLN 500,000.00 (50% chance) or PLN 0.00 (50% chance).
B: amount of money X (100% chance).
Determine what the amount X would have to be for you to be indifferent between participating in the lottery (option A) and receiving a payment (option B).

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