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Impact of Information about Risk on the Attractiveness of Tourist Travel

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ABSTRACT

The aim of the paper is to investigate how information on the two kinds of risk (natural and involving human activity) varying in their level influences the assessment of holiday attractiveness. The impact of a political and natural risk on the assessment of attractiveness of tourist offers was evaluated.

The achievement of the paper's objective was done based on an experimental study carried out on 353 individuals studying at two different higher education institutions. The data

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obtained were subject to statistical analysis using classic and location descriptive measures, linear regression and statistical tests such as one-way ANOVA.

We did not find evidence that people react differently to different risks, but the results indicate that the sensitivity of measures of reaction (changes in prices and attractiveness) is not the same.

Keywords: risk, rational choice, tourism

Introduction

According to rational choice theory and expected utility theory, two actions that can bring the same results with the same probabilities should be valued equally by a decision maker. Nevertheless, scientists have often observed behaviors deviating from these theories' assumptions (Tversky, Kahneman, 1986). Following the latest data[1] on changes in demand for travels in countries like Italy and France[2], it seems that people are more sensitive to information on terrorist attacks than, for example, to earthquakes. Since it is not possible to compare *ceteris paribus* decline in demand in real cases, the authors decided to work in laboratory conditions. However, what is to be investigated is not demand but:
  – how the nature of risk influences attractiveness of holiday destinations,
  – how changes in probabilities of harmful events affect the price that people are willing to pay for holiday and the attractiveness of a tourist offer,
  – if information on risk affects more the price people are willing to pay for a trip or attractiveness (measured on a 7 point scale) of the trip.

The aim of the paper is to examine how the information about the two kinds of risk of different levels impacts the assessment of holiday attractiveness.

Therefore, we are going to verify the following hypotheses:

Hypothesis 1. Potential clients' reaction to the additional knowledge about risk varies depending on the nature of the risk

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[1] www.insee.fr/en/statistiques/2578079#titre-bloc-16 (31.03.2017); www.istat.it/en/archive/tourism (31.03.2017).

[2] Central Italy has suffered from several big earthquakes in 2016 and 2017, France has often been targeted by terrorists in the past few years.

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Hypothesis 2. Potential clients' reaction to the additional knowledge about risk is different in terms of price changes and changes in attractiveness expressed *explicite.*

The hypotheses will be verified using the data obtained based on the experimental study where the persons surveyed responded to questions while being influenced by selected pieces of information given to them.

1. Basics of choice under risk

To some extent, the explanation why certain actions deviate from those maximizing the expected value can be found in Simon's views (1957), who argues that people are characterized merely by bounded rationality. Likewise, Kahneman and Tversky (1974) do not agree with the traditional concept of rationality and, supported by their studies, they argue that the bounded rationality is the result of the time pressure and complexity of information.

Many researchers emphasize the fact that a subjective perception of probability plays an important role in decision-making in the presence of risk. It is believed that people tend to underestimate large probabilities and overestimate small probabilities (Bahill, Madni, 2016). Moreover, the research conducted by Gonzaleza and Wu also shows that people are more sensitive to changes in probability at the ends of an interval rather than in the middle of an interval (Gonzalez, Wu, 1999), so, e.g., they value more the probability of reducing a loss risk from 10% to 5% than from 40% to 35% level. According to Tversky and Kahneman's observations, people are willing to pay more for the elimination of a potential loss, in other words, for reducing the probability of incurring any losses to 0, e.g. from 10% level, than for reducing the probability of incurring a loss from 40% to 30% (Tversky, Kahneman, 1981), which was called non-linearity of probability. Those findings relate to the so called certainty effect which consists in a bigger decrease in expected utility of a gamble (with positive results i.e. gains) when the probability of winning drops from 1 to 0,9 than when it falls from 0,5 to 0,4 (Tversky, Kahneman, 1986). At the same time the observation made was that the certainty effect disappears or gets reduced when the certainty is replaced with an option involving probabilities which are close to unity. In other words, if all decisions are made under risk, then, even if the risk is very small, the certainty preference does not occur systematically (Weber, 2015, p. 7). Since the difference between the probability equal to 1 and the probability that is not equal to

one (also including zero and nonzero probability) is huge from the psychological point of view, what Wakker, Thaler and Tversky show seems quite logical (1997). They argue that consumers are willing to pay a considerable premium for the certainty on the insurance market. They examined probabilistic insurance, i.e. insurance policies with a small probability that the client will not be paid compensation. It turns out that clients demand a 20% reduction in their insurance premiums in order to compensate for 1% risk of default.

As it was mentioned before we are going to examine how changes in the probabilities of harmful events affect the price that people are willing to pay for holiday and the attractiveness of a tourist offer. On the basis of literature, we would expect stronger reactions (increases in price and attractiveness) to the information about no risk of harmful events than to the information that a small or big probability of harmful events exists. On the other side, most studies show that there is a big difference between willingness to pay and willingness to accept. For example, Knetsch and Sinden (1984) conducted a survey dividing respondents into two groups. Half of them received a lottery ticket and was asked to say for how much money they were willing to sell it, while the other half without lottery tickets was to name the price for which they would be willing to buy the ticket. On average, sellers wanted much more money for the ticket than buyers. Therefore it is to be expected that the price change when the price is increased (due to positive information) will be lower (as to the absolute value) than the required price reduction when there is information on the presence of some nonzero risk.

2. Results

In order to verify the hypotheses stated a preliminary survey was conducted[3].

Objects
The survey was conducted on 353 students of Wroclaw University of Economics and WSB University in Wroclaw. Around 80% were women. Average age of participants was 23.

Methodology
Each of the group of students was presented with an offer to stay in a hotel located in an exotic place. It consisted of photographs of the hotel, beach and de-

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[3] An extended version with use of a representative sample is planned as soon as we receive financing.

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scription of facilities offered by the hotel and tourist attractions nearby. Then each participant received a questionnaire to fill in. It comprised 6 questions. Five questions (number 1, 2, 3, 5 and 6) were always the same:

Question 1

You have just seen a holiday offer. Please assess the attractiveness of the travel destination. Mark the relevant box with an X.

Unattractive	Very little attractive	Little attractive	average	Rather attractive	Attractive	Very attractive

Question 2

How much would you be willing to pay for a two-week holiday in this hotel (including flight, basic insurance and care of a resort representative)? Please name the price for one person in a double room.

Question 3

The basic insurance package for this kind of holiday covers the cost of medical treatment up to 30 000 euro, accident insurance up to 3500 euro. Would you be willing to purchase a supplementary travel insurance covering medical treatment costs up to 60 000 euro, accident insurance up to 15 000 euro for the price of 300 zł (approximately 70 euro), covering, among other things, medical assistance, transport of the deceased to their home country, hospital stay and assistance of specialist doctors?

Question 5

After having received the above information, please answer the question again: how much will you be willing to pay for a two-week holiday in this hotel (including flight, basic insurance and care of a resort representative) being aware of possible dangers?

Please name the price for one person in a double room.

Question 6

Would you be willing to purchase a supplementary travel insurance covering the costs of medical treatment up to 60 000 euro, accident insurance up to 15 000 euro for the price of 300 zł (approximately 70 euro) covering, among other things,

medical assistance, transport of the deceased to their home country, hospital stay and assistance of specialist doctors?

Only the fourth question differed. In this question information about risk was given (note this information was significant to questions 5 and 6). Different scenarios looked as shown in Table 1.

Table 1. Additional information about risks among scenarios A, B, C, D and E

Scenario A (Code UWT)	According to the information of the Ministry of Foreign Affairs, there is a moderately high terrorist threat in the travel destination region. Please re-evaluate the offer.
Scenario B (Code UWN)	According to the information of the Ministry of Foreign Affairs, there is a moderately high risk of earthquake or tsunami in the travel destination region. Please re-evaluate the offer.
Scenario C (Code BZ)	According to the information of the Ministry of Foreign Affairs, there is no risk of earthquake neither tsunami nor terrorist threat in the travel destination region. Please re-evaluate the offer.
Scenario D (Code UNT)	According to the information of the Ministry of Foreign Affairs, there is a moderately low terrorist threat in the travel destination region. Please re-evaluate the offer.
Scenario E (Code UNN)	According to the information of the Ministry of Foreign Affairs, there is a moderately low risk of earthquake or tsunami in the travel destination region. Please re-evaluate the offer.

Source: own work.

340 valid sheets were obtained. Some needed to be excluded because of lacking answers or irrational answers.

Firstly we calculated how participants changed the price they were willing to offer:

$$\Delta P = \frac{P_1 - P_0}{P_0} \qquad (1)$$

where:

ΔP – percentage change in price

P_0 – price before information,

P_1 – price after information.

Secondly we calculated changes in attractiveness:

$$\Delta A = A_1 - A_0 \qquad (2)$$

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where
  ΔA – change in attractiveness,
  P_0 – attractiveness before information,
  P_1 – attractiveness after information.

Average, mean and mode of ΔP and ΔA are showed in Table 2. Afterwards we checked whether for each type of information given ΔP and ΔA were on average significant (dependent sample t-test for changes in attractiveness, single variable t-test for prices[4]). Each information had a significant effect on prices (although when the information about a small risk of terrorist attack was given the price change was not significant at 0.001 level. After reviewing the data we noticed that some of participants considered this information as positive and raised prices) and attractiveness.

Table 2. Descriptive statistics of changes in prices and attractiveness

| Variable	Scenario	N	Average	Mean	Mode	Standard deviation
ΔP	BZ	78	0.069	0.00	0.00	0.182
ΔA	BZ	78	0.282	0.00	0.00	0.532
ΔP	UNN	64	−0.082	0.00	0.00	0.151
ΔA	UNN	64	−0.656	0.00	0.00	0.979
ΔP	UNT	51	−0.095	0.00	0.00	0.274
ΔA	UNT	51	−0.373	0.00	0.00	0.958
ΔP	UWN	90	−0.282	−0.25	0.00	0.209
ΔA	UWN	90	−1.544	−1.00	−1.00	1.291
ΔP	UWT	57	−0.29	−0.25	0.00	0.213
ΔA	UWT	57	−1.667	−1.00	−1.00	1.393

Source: own work.

To verify hypothesis 1, a one-way Anova was conducted. It showed that for two variables there were significant changes in averages between the scenarios (with p-value in each case lower than 0.000000). Post hoc least significant difference test's results show that significant differences can only be found between different levels

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[4] If dependent sample t-test for changes in prices was used, it would check if there was a change in absolute values. As there might have been for example a person who valued a trip at 100000 and after receiving information at 1000, and ten people valuing it 2000 before and after dependent sample t-test in this case could give a misleading answer.

of risk and, in line with statistical rules, there are no significant differences in average changes (neither for prices, nor for attractiveness) between scenarios saying that there is a nonzero probability of natural disaster, and scenarios saying there is a nonzero probability of terrorist attacks.

We can only see some difference if we look at the distributions of changes in prices and attractiveness (Fig. 1). One can notice that participants were more unanimous when they dealt with natural risks.

Figure 1. Distributions of changes in prices and attractiveness
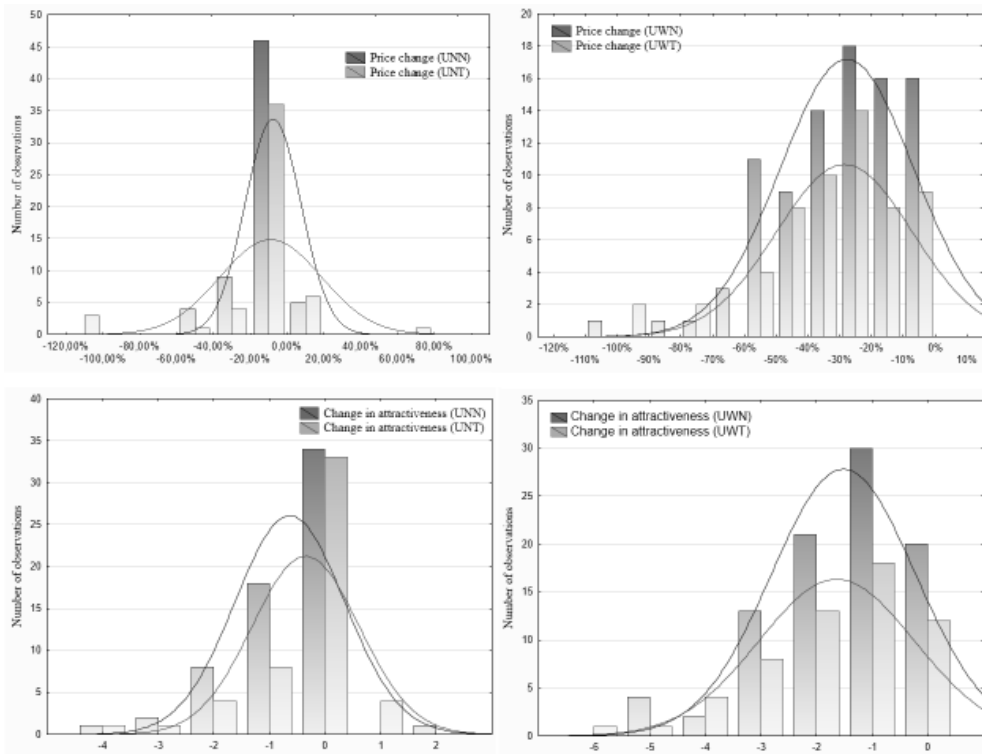
Source: own work.

It is also visible looking at the results that each time the probability of a harmful event is lowered, an increase in prices and increase in attractiveness occurs (ceteris paribus).

What was expected was that participants would be willing to pay extra premium for certainty of safety which would effect big changes in plus in prices and attractiveness upon receiving information about no risk of harmful events. However, especially for prices, the leap was smaller than for any other type of information (0.06866 vs. –0.0819, –0.0946, –0.2818; –0.2899)

In order to verify hypothesis 2 we can first compare values in Table 2. In the case of the information about relatively small risk, the mean and modal choice was not to change prices and not to change attractiveness. For relatively high risk the modal choice was not to change price but change attractiveness (we can compare neither mean values nor average because they are expressed in different units, we only let ourselves compare no changes [zero's] with some changes [no zero's]. Following this, we can take into account the correlation coefficients between drops/increases in attractiveness and prices. The correlation was not usually very high (between 0.42 and 0,79) but in each case there was a significant relationship between the variables investigated. It is difficult to check which variable is more strongly affected by the information about risk because, as it was mentioned before, ΔP and ΔA are expressed in different units. To make a comparison, we decided to standardize both variables

$$\Delta P_S = \frac{\Delta P - \overline{\Delta P}}{S(\Delta P)} \qquad (3)$$

$$\Delta A_S = \frac{\Delta A - \overline{\Delta A}}{S(\Delta A)} \qquad (4)$$

where:
$\Delta P_S, \Delta A_S$ – standardized values of ΔP, ΔA respectively,
$S(...)$ – standard deviation,
$\overline{\Delta P}, \overline{\Delta A}$ – average changes in prices and attractiveness

and afterwards to estimate parameters of linear regression with ΔP_S as a dependent variable and ΔA_S as an independent variable. The value of a slope parameter equal 1 would mean that the strength of reaction is the same for price and attractiveness. A slope higher than one implies that the reaction expressed in prices was stronger than the one expressed in attractiveness. A slope lower than one that the reaction expressed in prices was weaker than reaction in attractiveness. For the sce-

narios UNN, UWN and UWT the null hypothesis about the slope being equal to one has to be rejected and one can believe that the slope is smaller than 1. For the other scenarios the null hypothesis should not be rejected.

We also investigated how many participants did not change price level, how many participants did not change attractiveness, how many participants changed both, how many participants changed only price and how many participants changed only attractiveness. A summary of these calculations is presented in Table 3. According to the data, changes in prices were occurred more often than changes in attractiveness, which somehow contradicts the earlier calculation. It is, however, possible that the changes in prices appeared more frequently but were of a smaller size.

Table 3. Changes in prices and attractiveness at individual level

Scenario	No changes in price	No changes in attractiveness	Changes in both price and attractiveness	Changes only in price	Changes only in attractiveness	No changes
BZ	72%	76%	14%	14%	10%	62%
UNN	48%	53%	34%	17%	13%	36%
UNT	39%	65%	33%	27%	2%	37%
UWN	17%	22%	73%	10%	4%	12%
UWT	16%	21%	68%	16%	11%	5%

Source: own work.

Conclusion

In general, hypothesis 1 assuming that people would respond differently when dealing with risks of different nature cannot be confirmed. Averages, means and modal choices were equal between scenarios with the same risk level but of different nature. There exist only small differences between the distribution of answers.

Hypothesis 2 saying that prices are affected with different strength than attractiveness was confirmed. However, it is not possible to say (because it depends on the measure we use) which of these variables was affected more.

In summing up the study, we can assert that there was no statistically significant difference in respondents' reactions to various risks. The surveyed also reacted in a similar way to the change in the level of threats, regardless of what kind of threat that was.

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WPŁYW INFORMACJI O ZAGROŻENIACH NA OCENĘ ATRAKCYJNOŚCI WYJAZDÓW TURYSTYCZNYCH

Streszczenie

Celem artykułu jest zbadanie, w jaki sposób informacja o dwóch rodzajach ryzyka (naturalnym i obejmującym działalność człowieka) różniących się poziomem wpływa na ocenę atrakcyjności wakacji. Oceniono wpływ ryzyka politycznego i naturalnego na ocenę atrakcyjności ofert turystycznych.

Realizacja celu artykułu została oparta na eksperymentalnych badaniu przeprowadzonym na 353 osobach uczących się w dwóch różnych instytucjach szkolnictwa wyższego. Uzyskane dane poddano analizie statystycznej, stosując klasyczne i lokalizacyjne miary opisowe, regresję liniową i testy statystyczne, takie jak jednoczynnikowa ANOVA. Nie znaleziono dowodów, że ludzie różnie reagują na różne rodzaje ryzyka, ale wyniki wskazują, że wrażliwość miar reakcji (zmiany cen i oceny atrakcyjności) nie są takie same.

Słowa kluczowe: ryzyko, racjonalny wybór, turystyka

Kody JEL: D12, Z30