



received: 30 August 2018  
accepted: 1 December 2018

pages: 7-20

# RELATIONS BETWEEN RISK ATTITUDES, CULTURE AND THE ENDOWMENT EFFECT

ANITA KOLNHOFER DERECSKEI

## ABSTRACT

The main purpose of this research was to examine whether systematic cross-national differences existed in risk preferences. As a part of the survey, it was also tested how the subjects decided on behalf of their friends. Considering the type of risk-taking and the role of endowment plus relevant cultural backgrounds, the answerers were grouped, and each segment could be identified. Finally, this segmentation could be correlated with behaviour in risk decisions. Here, the Allais situation was used testing respondent behaviour in risky decision-making on behalf of others. This paper used the validated DOSPERT Scale, measuring risk perceptions and risk preferences of international students (n=244). The used survey contained different risk attitudes depending on decision making and involved the following criteria: Ethical, Financial, Health or Safety, Recreational, and Social Risks. Applying the DOSPERT Scale, differences were also found between 'Risk-Taking', 'Risk-Perceptions', and 'Expected Benefits'. This result can be explained by different risk attitudes particular to people making decisions involving measured risks. At the same time, thanks to the worldwide sample, this paper focused on cultural differences and observed the impact of different cultural backgrounds on risk-taking. Comparing personal traits with Hofstede's cultural UAI (Uncertainty Avoidance Index) helped us understand deeper cultural influences. The sample was widely heterogeneous, which led to some changes in the original research question and provided a new method in the conceptual model. Based on the state of the art, a conceptual model was deduced, three hypotheses were tested, and three various segments were identified regarding the personal DOSPERT (Domain-Specific Risk-Taking Scale) Risk Preferences. In the second part of the paper, Personal Risk Preferences were connected and tested not only using the national culture background but also attitudes towards the endowment. Although there was no significant correlation between the distribution of risk perception, the styles of each role might show how the cultural heritage impacts various decisions and risk levels.

## KEY WORDS

**risk, management, cultural differences, principal-agent problem, ownership**

DOI: 10.2478/emj-2018-0019

Corresponding author:

Anita Kolnhofer Derecskei  
Obuda University, Hungary  
e-mail: derecskei.anita@kgk.uni-obuda.hu

## INTRODUCTION

Risk is a relevant part of the life of a business and society. Furthermore, it forms an integral part of a business as risk is attached to every choice between various alternatives and final decisions. Almost every important economic decision involves some risk and uncertainty. But in mainstream economics, where a subject allocates resources in order to satisfy his or

her needs, risk is explained by utility theories. Seemingly, "risk attitude is nothing more than a descriptive label for the shape of the utility function presumed to underlie a person's choice. A person's risk attitude describes the shape of his or her utility function (derived from a series of risky choices) for the outcomes in question" (Weber et al., 2002, p. 264). Nowadays, it is insufficient to use a lonely model or

inductive theories to determine the business behaviour of actors and estimate their final decisions. As a major approach, the Homo economicus model demands an interdisciplinary view. Therefore, psychology and economics need each other, and this phenomenon appears in findings of the field of economic psychology (e.g. Palmer et al., 2013 studied cognitive neuroscience and moral philosophy revelations of risk in hypothetical financial options).

Risky problems are mainly encountered in financial or gambling situations. The DOSPERT Scale serves as one of the validated solutions measuring risk in three dimensions and six different aspects. According to this method, 'risk' as an expression refers to uncertainty as a synonym. "People differ in the way they resolve decisions involving risk and uncertainty, and these differences are often described as differences in risk attitude" (Blais & Weber, 2006, p. 33). These results were assumed in H2. Based on individual DOSPERT scores, the respondents can be grouped into no more than three clusters, and each cluster can be characterised.

Although risk can be characterised using personal differences, our personalities are affected by culture and society. Our perceptions are driven by the living environment, values, common experiences, exhibited habits and used languages. Therefore, this paper aims to produce a wide study of risk measurement using the validated DOSPERT scales as well as to make a comparison using the Hofstede's Uncertainty Avoid Index.

According to Bakacsi (2015), who referred to Eisenhardt's work, the premises of the Homo economicus model are based on ideas of 'selfish or self-authored' agents, bounded rationality and risk avoidance. The tendency for risk avoidance leads to problems in contracts and agreements. So, there is a closed circle where the principal-agent relationship and the endowment effect impact the political and legal background that forms our culture while culture influences our risk perception. Hopes that Homo economicus is not only self-oriented can be substantiated using the study by Chang et al. (2016) maintaining that economists are also concerned about the well-being of others and have other-regarding preferences. Dawes and Thaler (1988) detailed the effect of altruism. According to them, altruism is the reason behind cooperation, and it results in "doing the right (good, honourable, ...) things", which clearly motivates many people. Indeed, all of these interconnections form the fabric of culture and trigger ethical concern. Moreover, all these soft

factors impact decisions made by Homo economicus because usually people decide differently on behalf of others than on behalf of themselves, which is indicated in H3. Characteristics particular to respondent clusters can be connected with roles of the endowment. Therefore, this research focused on risk perceptions (personal level) depending on the cultural background and the outcome of a risky situation encountered by a recipient. Most of these factors mentioned above were tested using game experiments similar to those described in this study. This paper aims to fill the research gap regarding the dependence of risk perceptions (personal level) on the cultural background. Consequently, the paper follows the classical IMRAD structure (i.e. introduction of detailed methods and results is followed by a conclusion and discussion). The remaining part of the article consists of several sections, starting with the Introduction, which reviews the importance and relevance of the topic. Next, literature review focuses on risk, its cultural differences and their relevance as well as the endowment effect. Based on the endowment effect, the subjects were divided into four groups. Besides, the literature review served as a basis for the formulation of hypotheses and the theoretical model presented in the section named research questions and hypotheses. Next, there is a section detailing the methodology and samples, which is followed by results. Final sections are discussion followed by Conclusions and a brief overview of research limitations explaining implications for future research efforts.

## 1. LITERATURE REVIEW

---

According to Kahneman (2013), risk is not objective; so, it is not possible to give its clear definition because it depends on the way a subject judges each risky situation. After all, the Nobel Prize-winning authors Kahneman and Tversky firstly considered risk a notable economic factor (Tversky & Kahneman, 1974). In their earliest work, risk was identified with the probability of an outcome and the uncertainty of a situation. In economics, risk is addressed using expected utility theories. The authors called the attention of economists to the need for understanding psychology.

Dohmen et al. (2009) collected and tested individual risk attitudes. The authors focused on the

measurement, determinants and behavioural consequences of risk. An etic approach was suggested because risk measurement and recommendations focused on those possibilities that were considered unrelated to cultural differences. An etic account attempts to be “culturally neutral”, limiting any ethnocentric, political, and/or cultural biases. This paper aims to find cultural differences among risk perception styles. Therefore, as an emic account comes from a person within the culture (Morris et al., 1988), the so-called emic approach was chosen. Using this approach, cultural variables fit into general causal models of a particular behaviour. This approach offers a methodology that focuses on external and measurable features that can be assessed by parallel procedures at different cultural sites. That is why the use of a multi-setting survey makes a cross-sectional comparison possible. This part assumed H1. Namely, Individual DOSPERT scores and the Hofstede’s cultural UA dimension index had significant relationships.

Risk is judged depending on its definition. Blais and Weber (2006) marked out that everybody would have different attitudes when making decisions that involve Ethical, Financial, Health/Safety, Recreational, and/or Social risk. Moreover, differences exist between “Risk-Taking”, “Risk-Perceptions”, and “Expected Benefits”. It can be stated that they followed an etic approach as well. They suggested a validated (i.e. scientifically approved) scale for risk measurement. Only one dimension was used from these branches and it is detailed further. Although in Hungary, Radnóti (2010) translated and tailored the survey to Hungarian specifications, this study preferred the original English version. That means that although the emic approach is also implemented, this study used the original version and was compared with the Hofstede indices which are absolutely emic-approach related.

According to Faragó and Kiss (2005), the level of uncertainty and the level of stakes impact on the outcome of hypothetical bet situations. While entrepreneurs focused on the level of stakes, students were more influenced by the probability factor. There is an absolute agreement with the statement because profit-making and loss-avoiding situations motivate business-sector participants to choose higher stakes that sometimes entail higher risk. Consequently, greater emotional value is attached to profit and loss. This can lead to further investments in loss-making projects and such situations can be explained by the endowment effect. Faragó (2008) found that the type

and amount of resources (reference points) also impact on risk-taking behaviour. Approaching the extinction point, people take greater risks. The abundance of resources also means the tendency to take big risks, but mainly in the opposite direction (a negative frame). Finally, having a medium amount of resources indicates the avoidance of risk.

At the same time, most cultural differences have to be taken into account. Birnbaum (2008) summarised the state of the art and completed the individual level with a group level. Before Weber et al. designed the DOSPERT Scale, they also focused on a cultural comparison in the field of risk.

In their study (Weber & Hsee, 1998), they divided the reasons for differences in risk perception into three levels: (1) individual, (2) situational, and (3) cultural. They found that reliable cultural differences in the pricing of risky options exist among American, Chinese, German and Polish respondents. They thought that these differences were caused by the individualism–collectivism factor, which is also used in Hofstede’s work. Among others, Vasvári (2015) also handled the impact of different cultural backgrounds. However, the earliest studies focusing on cultural differences can be traced back to Hofstede. Based on Hofstede’s research (1980), attitudes to uncertainty avoidance, and consequently judgments of risk, can be assumed to differ by culture. Hofstede defines uncertainty avoidance as the following: “the way that a society deals with the fact that the future can never be known: should we try to control the future or just let it happen. This ambiguity brings with it anxiety and different cultures have learnt to deal with this anxiety in different ways. The extent to which the members of a culture feel threatened by ambiguous or unknown situations and have created beliefs and institutions that try to avoid is reflected in the score on Uncertainty Avoidance” (Hofstede Centre, 2018). It has to be underlined that Hofstede focused on uncertainty (i.e. “The Uncertainty Avoidance dimension expresses the degree to which the members of a society feel uncomfortable with uncertainty and ambiguity”) and not on risk, because in their opinion, risk is mainly a personal trait involving how the probability of an event’s positive or negative outcome can be managed. Vasvári (2015) drafted the concept of risk and referred to Hofstede’s dimensions; the author underlined that where uncertainty, measurability and decision are familiar concepts, the joined areas result in risk.

Faragó (2008) also used Hofstede’s dimensions and demonstrated “some specific tendency

characterising Hungarian organisational culture: both proactive and aggressive competition are practised in successful organisations while competitive aggression is found to be a risk-averse strategy in other countries. Further, dynamic and friendly environment attracts aggressive competition, and a dynamic and hostile environment provokes proactivity. The opposite relation was found in western organisations. The decreasing risk-taking propensity of unsuccessful and worsening organisations might prevent them to use adaptive strategies to become more successful” (p. 29).

According to Camerer (1998), some studies concentrated on fitting theories to individuals. As mentioned earlier, risk-taking preferences might be taken into account. Palmer (Palmer et al., 2013) detailed how individual differences could be measured, also mentioning cross-cultural differences. However, it is not only separate individuals that are affected by culture as sometimes a decision has to be made on behalf of friends (partners) and this challenges individuals’ risk perceptions and risk-taking attitudes (Kolnhofer-Derecskei, 2017). The other side of the coin is that altruistic behaviour can be motivated.

Making a decision on behalf of somebody else (i.e. a decision is made by one person, but the outcome is enjoyed by somebody else) can be described using the following theories: indifferentists, agents against principal, the braves or the double Risk-Takers, good friends (Tab. 1).

Information included in Tab. 1 helps to clarify each group facing them with decision alternatives.

The paper by Andreoni and Sprenger (2010) is absolutely relevant because the Allais problem might be connected with an uncertain and certain effect. The management of uncertainty among different

cultures was measured by Hofstede (2017). However, a more in-depth study is available in an early work by Kolnhofer-Derecskei (2017) relating ethnicity to different roles. In this paper, subjects were grouped into types mentioned before (Tab. 2). Further and wider evaluations were investigated because individual-based roles were connected with cultural impacts.

Individual levels should be connected with the cultural level, and the transition could be the level of regulation (e.g. the national legal system). Fehr and Fischbacher (2003) highlighted the interaction between altruists and selfish subjects in human cooperation. A minor group of altruists can affect the majority of selfish subjects. The authors tested the effect of punishment and reward in the case of altruism. Calabuig et al. (2016) found that the endowment effect disappeared with punishment. So, punishment has an opposite psychological effect on intrinsic motivation. Friendship and subjective positive feelings between owners and decision makers improve rationality through shared responsibility (e.g. unwritten businessmen agreement). Previous findings by Kolnhofer-Derecskei’s (2017) assumed that people decided systematically differently about their own property rather than that of others. People tended to be more risk-averse when the outcome was theirs but would risk on behalf of others. At the same time, this verified the Agent–Principal Theory and the endowment effect. However, it should be underlined that in the second situation, the safe wins were more attractive for the subjects than the feeling of risk (like in the original Allais paradox situation) if no punishment was applied. On the other hand, Allais followed the between subjects methodology with no replications nor feedback.

Tab. 1. Ownership effects

THEORY	RESEARCHERS AND THEORIES	DEFINITION
Indifferentists	Endowment effect (Kahneman et al., 1991)	those who neither risk themselves nor on behalf of a friend. They select the same safe choices two times, i.e. in both cases
Agents against principal	Principal and Agent (Bakacsi, 2015)	those who avoid risk when they have to decide about their money, but take risk on behalf of their friends
The braves or the double Risk-Takers	Fairness (Falk et al., 2008)	those who take risk in both situations (they are not influenced by the identity of the owner)
Good friends	Altruism (Dawes & Thaler, 1988)	those who play risky for themselves but avoid risk in place of a good friend (protect their gains)

Tab. 2. Response variations

OWNER	SELF		GOOD FRIEND	
	Certain	Uncertain	Certain	Uncertain
Same safe choices INDIFFERENTIST	X		X	
Good friends FRIEND		X	X	
Double Risk taker BRAVE		X		X
Principal agent AGENT	X			X

## 2. RESEARCH QUESTIONS AND HYPOTHESES

The original plan — by which it means discovering the connection between individual risk perception and the level of cultural heritage — was not successful; the main reason was on account of a widely heterogeneous sample. The original idea was expanded and required a larger conceptual model (Fig. 1) where, based on DOSPERT, firstly respondent scores can be segmented and characterised. Later, this segmentation was studied in relation to ownership roles. Finally, three hypotheses were formulated.

Following hypotheses were formulated:

H1. Individual DOSPERT scores and Hofstede’s cultural UA dimension index have significant relationships.

Weber and Hsee (1998) divided the reasons for differences in risk perception into three levels, namely, (1) individual, (2) situational, and (3) cultural. Blais et al. (Blais & Weber, 2006) prepared DOSPERT as a tool that measures risk perceptions on the individual level. One of Hofstede’s dimensions focuses on uncertainty which can be considered as the cultural level of risk. Faragó (2008) and Vasvári (2015) found the interaction between the two levels. In this study, this relationship was measured by both indexes. Focusing on the individual level, the following hypothesis was formulated:

H2. Based on individual DOSPERT scores, the respondents can be grouped into no more than three clusters, and each cluster can be characterised.

DOSPERT as a possible indicator of individual risk level relies on various dimensions. These results help us identify and understand different clusters of subjects. Because of the number of respondents, these clusters are no more than three. Characteristics of these clusters are based on the original DOSPERT’s groups (Blais & Weber, 2006). Making a decision on behalf of somebody else is a risky situation, which also causes ownership problems. This gave rise to the following hypothesis:

H3. Characteristics of the clusters can be connected with endowment roles.

Due to the state of the art (Tab. 1) ownership applies to four different types of behaviour. Kolnhofer-Derecskei (2017) underlined that the subjects respond differently when deciding about their own interests

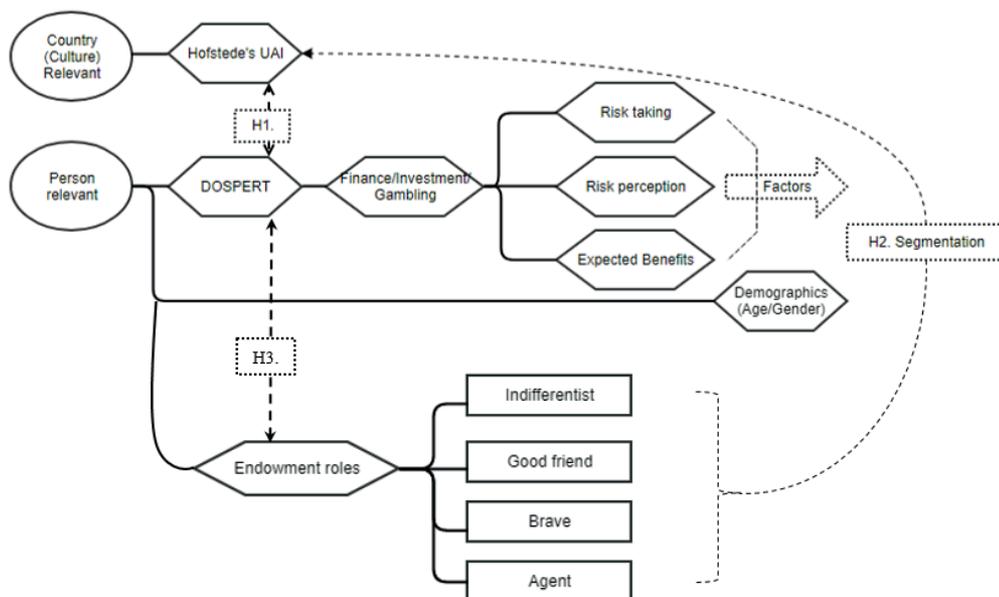


Fig. 1. Conceptual Model

and the interests of their friends. The actors can be identified using the aforementioned types. However, these behaviour types are influenced by a risk level particular to each actor.

### 3. METHODOLOGY AND SAMPLES

Data collection process was based on empirical primer survey where the text originated from the original DOSPERT Survey detailed in Tab. 3. In each part, semantic differential scales with 7 items were used, according to the original work.

Investment and Gambling statements were the following:

- Investing 10% of your annual income in a moderate growth diversified fund. (I\_1)
- Investing 5% of your annual income in a very speculative stock. (I\_2)
- Investing 10% of your annual income in a new business venture. (I\_3)
- Betting a day's income at the horse races. (G\_1)
- Betting a day's income at a high-stakes poker game. (G\_2)
- Betting a day's income on the outcome of a sporting event. (G\_3)

Ownership roles were identified earlier (Kolnhofer-Derecskei, 2017). The whole survey was used worldwide in 2017. However, these results can be caused by non-representative sample selection methods. Nevertheless, descriptive histograms (Fig. 2) show some differences among participants' cultural backgrounds.

The participants were contacted via email, requesting to fill-out a survey presented as a Google Survey Form. The respondents came from different

home countries (Fig. 2). The statements were offered randomly.

The methodological background was observed after wider descriptive statistics, each factor was

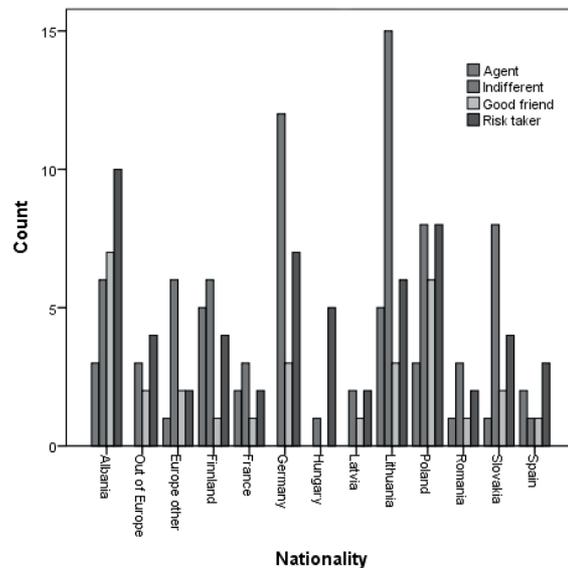


Fig. 2. Distributions depending on respondent roles  
Source: author elaboration on the basis of (Kolnhofer-Derecskei, 2017).

summarised and grouped into three main clusters using principal component analysis methods with standardised values (predefined factors reasoned that); in the frame of hypothesis testing (comparison Hofstede's UAI with clustered DOSPERT RT, RP and EB), the nonparametric testing and crosstabs analysis were used. Finally, in the case of segmentation, descriptive statistics and average linkage cluster analysis were preferred again. All the techniques used SPSS (anywhere with p = 0.95) and Excel.

Hanoch (Hanoch et al., 2006) highlighted how the interests of subsamples could take a domain-

Tab. 3. DOSPERT Survey

DOMAIN SUBSCALES OR LIFE DOMAINS	ITEMS NUMBER	RISK-TAKING (HOW RESPONDENTS ENGAGE IN RISKY ACTIVITIES)	RISK PERCEPTION (HOW RESPONDENTS ASSESS THE LEVEL OF RISK IN EACH ACTIVITY)	EXPECTED BENEFITS OF RISK (WHAT KIND OF BENEFIT RESPONDENTS OBTAIN IN EACH RISKY SITUATIONS)
Ethical	6 statements	Instruction: "For each of the following statements, please indicate the likelihood that you would engage in the described activity or behaviour if you were to find yourself in that situation." 7 point ranking scale	Instruction: "we are interested in your gut-level assessment of how risky each situation or behaviour is." 7 point ranking scale	Instruction: "For each of the following statements, please indicate the benefits you would obtain from each situation." 7 point ranking scale
Financial (Investment/ Gambling)	6 statements			
Health/Safety	6 statements			
Recreational	6 statements			
Social	6 statements			
5 categories	30 items	30 items (from 5 categories) have to be evaluated 3 times = 90 scales		

specific approach, hereby influencing the final results of the DOSPERT test. In this study, the major population was foreign university students from partner institutes of the Obuda University. Finally,  $n=244$  valid respondents formed the sample from 28 countries; they were born between 1960 and 1998 (average age of 25.68); 107 males and 137 females filled the survey, mainly students from the fields of Engineering and Business.

## 4. RESULTS

Mean scores of each measured DOSPERT statement can be found in Tab. 4. The whole sample estimated gambling situations as riskier with a lower evaluated income/benefit (i.e. gambling statements were scored higher in risk perception and lower in the willingness of participation or risk-taking with no significant difference made). However, in the case

where participants wanted to take part in financial or investment situations, gambling was less preferred.

All the aforementioned endowment roles (types of subjects) can be identified among the subjects with the following frequencies (Tab. 5). Around 70 percent of the subjects chose the same options for themselves and on behalf of their friends, half of them voted for the risky (certain) and another half for the uncertain (not risky) outcomes.

Unfortunately, none of the separated DOSPERT statements showed significant relationships with Hofstede's UAI (Using Crosstabs analysis Pearson Correlation assymp. sig. were  $p>0.05$  in all cases). The main problem was rooted in the small members of each subpopulation. Finally, only the most successful members across the nationalities were selected. Even then, there were no more stochastically significant connections but the results can be seen in Fig. 3. Hofstede's scores are between 0–100; here, these results were divided by 10, so histograms offer a better overview of data (numbers of members are mentioned).

Tab. 4. Descriptive statistics

DESCRIPTIVE STATISTICS	N	MIN.	MAX.	MEAN	STD. DEVIATION
Risk-taking (willing to take part) scores 1–7					
Investing 10% of your annual income in a moderate growth diversified fund. (F/I)	244	1.00	7.00	3.62	1.78
Investing 5% of your annual income in a very speculative stock. (F/I)	244	1.00	7.00	4.19	1.81
Investing 10% of your annual income in a new business venture. (F/I)	244	1.00	7.00	4.20	1.73
Betting a day's income at the horse races. (F/G)	244	1.00	7.00	2.44	1.71
Betting a day's income at a high-stakes poker game. (F/G)	244	1.00	7.00	3.11	1.92
Betting a day's income on the outcome of a sporting event. (F/G)	244	1.00	7.00	2.52	1.71
Risk perception (evaluation of risk level) scores 1–7					
Investing 10% of your annual income in a moderate growth diversified fund. (F/I)	244	1.00	7.00	4.41	1.64
Investing 5% of your annual income in a very speculative stock. (F/I)	244	1.00	7.00	3.82	1.55
Investing 10% of your annual income in a new business venture. (F/I)	244	1.00	7.00	4.24	1.45
Betting a day's income at the horse races. (F/G)	244	1.00	7.00	4.66	1.78
Betting a day's income at a high-stakes poker game. (F/G)	244	1.00	7.00	4.40	1.77
Betting a day's income on the outcome of a sporting event. (F/G)	244	1.00	7.00	4.79	1.82
Expected Benefit (outcome) scores 1–7					
Investing 10% of your annual income in a moderate growth diversified fund. (F/I)	222	1.00	7.00	4.09	1.71
Investing 5% of your annual income in a very speculative stock. (F/I)	232	0.00	7.00	4.27	1.82
Investing 10% of your annual income in a new business venture. (F/I)	233	0.00	7.00	4.30	1.84
Betting a day's income at the horse races. (F/G)	223	1.00	7.00	3.19	1.71
Betting a day's income at a high-stakes poker game. (F/G)	220	1.00	7.00	3.39	1.72
Betting a day's income on the outcome of a sporting event. (F/G)	220	1.00	7.00	3.28	1.85
Valid N (listwise) 0.00 missing value	206				

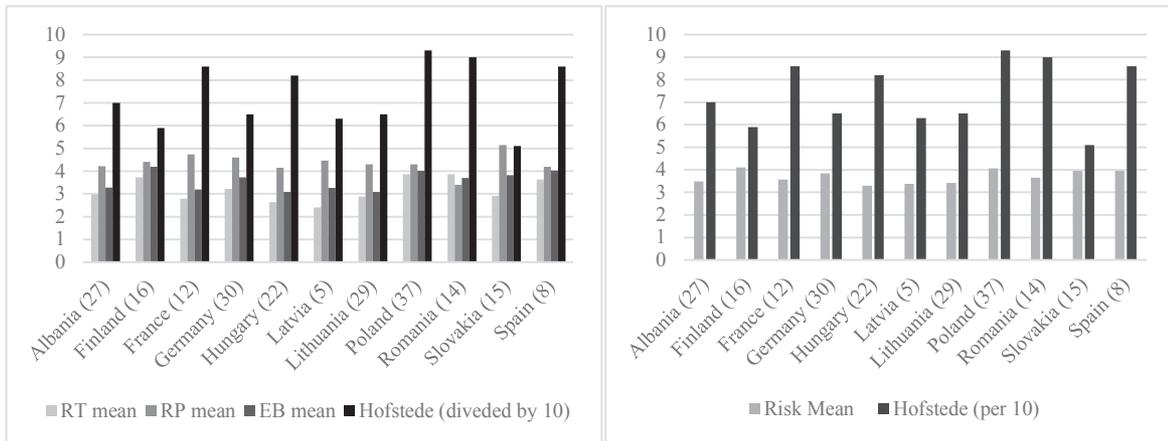


Fig. 3. DOSPERT Survey

Because of heterogeneity, the national differences did not allow a satisfying segmentation. In order to understand the differences between respondents, the cluster analysis was used but beforehand, the high number of factors from a previous grouping (18 statements were grouped into 3 factors) proved meaningful. The MDS Scale draws a stable relationship among statements (Tucker's Coefficient of Congruence = 0.969) in Fig. 4.

After a more in-depth data selection and cleaning, n=204 full filled answers were taken into account. Although in each dimension an average value also could be used, the reliability test (Cronbach's Alfa 0.739) reasoned the usage of three determined factors (based on standardised values). With these three factors the respondents were clustered into three segments (two segment variation was also tested). The three segments are described in Tab. 6.

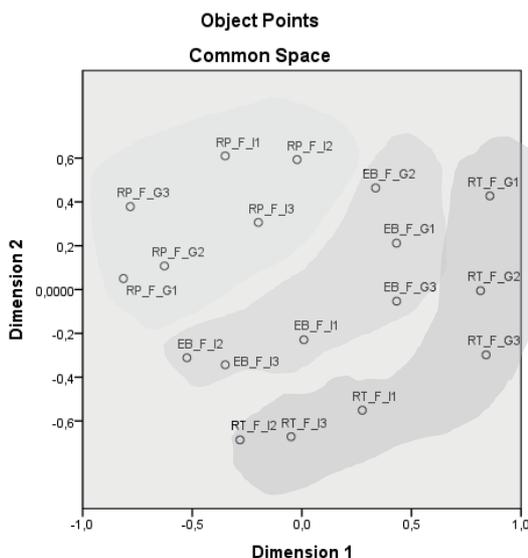


Fig. 4. MDS Scale of the DOSPERT Survey statements

Tab. 5. Crosstabs according to roles (capita)

ROLES	FREQUENCY	PERCENT (DISTRIBUTION)
Agent	23	12.4
Indifferent	74	39.8
Good friend	30	16.1
Risk taker	59	37.7
Total	186	100

Tab. 6. Final Cluster Centres

	CLUSTER		
	1	2	3
Risk Taking	-.45410	.86199	-.70572
Risk Perception	-1.30375	-.10001	.69505
Expected Benefits	-.62056	.61586	-.37929
Number of Cases	35	87	84

Missing 38 (not answered)

The results show that a minus value means non-typical characteristics and a plus value means typical characteristics in each cluster. Results of segmentation and wider implications can be realised in the next chapter.

## 5. DISCUSSION

In real life of a business, actors are subjects who are not able to be fully rational and, as Simon (1978) suggested, have bounded rationality with predictable mistakes (biases). Knowing these heuristics as a human side of actors helps us understand and tell the truth sometimes to influence rationality. In this paper, financial and gambling risk-taking situations were examined in hypothetical bet situations presented in the form of the DOSPERT Survey. The

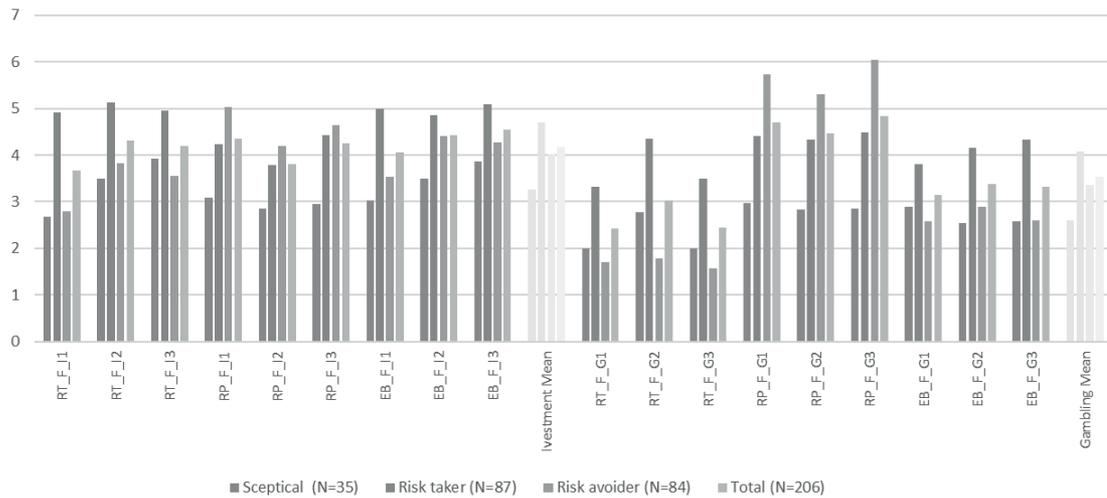


Fig. 5. Comparison of segments

subjects had to value each situation using seven ranking scales in three dimensions: (1) risk-taking willingness or how respondents engage in risky activities, (2) risk perceptions or how respondents assess the level of risk in each activity, and (3) expected benefits or what kind of benefit respondents obtain in each risky situation. At the same time, cultural differences were also taken into consideration measuring by Hofstede’s Uncertainty Avoid Index, which expresses the degree, to which members of a society feel uncomfortable with uncertainty and ambiguity (in other words, in risky situations). People as members of society regularly face decision challenges. In business, this challenge is making a decision on behalf of another person. Finally, three hypotheses were formed and tested.

H1. Individual DOSPERT scores and Hofstede’s cultural UA dimension index have significant relationships. REJECTED

H2. Based on individual DOSPERT scores, the respondents can be grouped into no more than 3 clusters, and each cluster can be characterised. ACCEPTED

H3. Characteristics of the clusters can be connected with endowment roles. REJECTED

According to Tab. 6 and Fig. 5, the respondents can be divided into three segments. Where the values are positive, those characteristics are typical; negative ones are non-characteristic. The segments are stable and (with 0.05 sig level in each case  $p=0.00$ ) differ significantly from each other.

Segmentation characteristics are the following:

Sceptical Segment 1: respondents do not like risk. In addition, they do not search for risk either in

gambling or in investment situations. (The eldest being on average 26.051 yrs.) Hofstede’s UAI mean is 74.91 with std. deviation of 12.45.

Risk Taker Segment 2: respondents do not perceive risk, which explains their enjoyment of risky situations; besides, they anticipate a higher outcome benefit, mainly in investment situations. (The youngest being on average 24.95 yrs.) Hofstede’s UAI mean is 77.84 with std. deviation of 15.46.

Risk Avoider Segment 3: respondents avoid risk because they perceive it at the highest level in each situation. They do not want much in return (average age of 25.54 yrs.). They mostly reject gambling situations because of high risk. Hofstede’s UAI mean is 68.93 with std. deviation of 14.04

Tab. 7 shows the statistical differences between each segments . To figure out how the aforementioned countries can be characterised with each segment, Fig. 6 shows the distributions of segments in various countries.

This research attempts to explore whether there are systematic cross-national differences in choice-inferred risk preferences between nations. Unfortunately, this study was not able to verify cultural influences on risk attitudes, but Hsee and Weber (1999) found that Chinese were significantly more risk-seeking than Americans, although they found significant differences only in the investment domain and not in others (medical and academic decisions). Baillon (Baillon et al., 2016) investigated the rationality of group decisions versus individual decisions under risk. They found that communication led to more rational choices, but on the other hand, groups violated stochastic dominance less often than

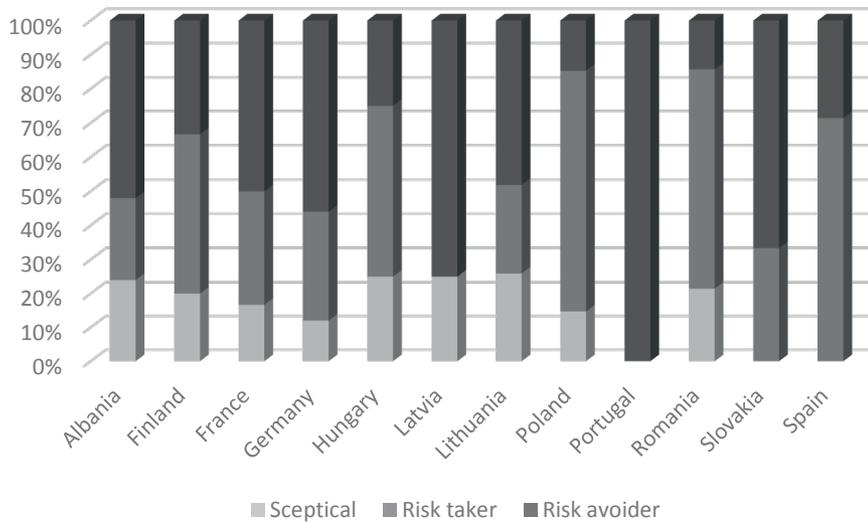


Fig. 6. Distribution of segments in countries

Tab. 7. Cluster Report

SCORES		RISK TAKING	RISK PERCEPTION	EXPECTED BENEFIT	ETA	ANOVA SIG.
SCEPTICAL	Mean	2.8286	3.2097	3.1054	0.645	0.00
	N	35	35	35		
	Std. Deviation	.94628	1.02209	1.04268		
	Grouped Median	2.9150	3.2767	3.4660		
RISK TAKER	Mean	4.1469	4.2806	4.3405	0.539	0.00
	N	85	85	84		
	Std. Deviation	.92751	.92475	.95274		
	Grouped Median	4.1177	4.3100	4.1623		
RISK AVOIDER	Mean	2.5993	4.9462	3.3407	0.456	0.00
	N	84	84	84		
	Std. Deviation	.78879	.96700	1.15359		
	Grouped Median	2.5400	4.9773	3.3300		
TOTAL	Mean	3.2835	4.3709	3.7138		
	N	204	204	203		
	Std. Deviation	1.14101	1.13314	1.17817		
	Grouped Median	3.2623	4.5378	3.8678		

Tab. 8. Crosstabs analysis

OWNERSHIP ROLES * SEGMENTATION CROSSTABULATION					
COUNT		RISK TYPES SEGMENTATION (3 CLUSTERS)			TOTAL
		SCEPTICAL	RISK TAKER	RISK AVOIDER	
Ownership roles (4 types)	Indifferent	14	32	42	88
	Good friends	8	12	12	32
	Double Risk taker	8	29	22	59
	Agent	4	14	7	25
<b>TOTAL</b>		<b>34</b>	<b>87</b>	<b>83</b>	<b>204</b>

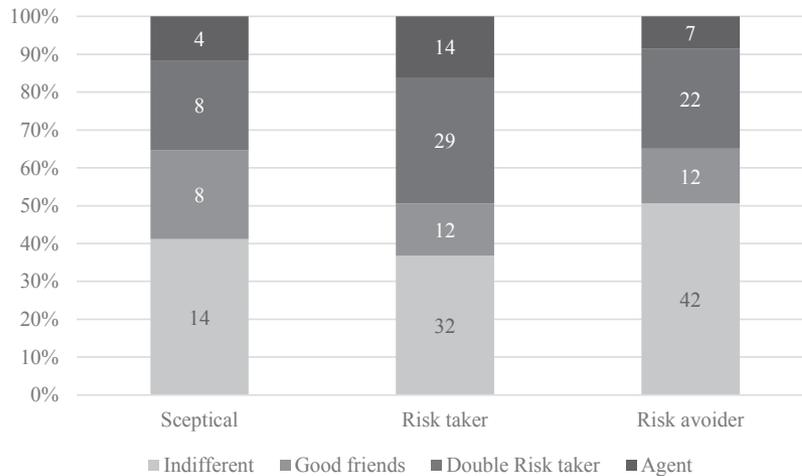


Fig. 7. Distribution (number of respondents) of endowment roles and risk-taking clusters

individuals did. Here, just the individual situation was investigated, but later it would be interesting to observe the impact of group decisions (e.g. conformity).

In Hungary, Faragó (2005), widely studied risk-taking behaviour presented in field experiments. She found that subjects took much smaller risks in real situations where they had to face real consequences, so people did not engage in extreme risk-taking strategies. She also built the famous framing effect into the design and demonstrated the prospect theory (i.e. in a positive frame, we gain risk-taking behaviour, and in a negative frame, we lose risk-avoidance behaviour). These decisions affect the success of a business; the author (Faragó, 2008) found that successful organisations were more willing to take risks than unsuccessful ones. The direction of change had a strong influence on risk-taking as well: organisations which were getting better took more risks and the ones that were getting worse refrained from risk-taking.

Finally, the two clusters (a type of segmentation) were studied. Here, ownership roles and segmentation are evaluated using the crosstabs analysis (in Tab. 8).

Unfortunately, no significant correlation was found, Cramer's V (0.128) showed a weak connection and was not significant (approx. sig. 0.353). Due to the result, H3 was rejected. Tab. 9 helps to describe risk perceptions crossed with the ownership roles.

Although there was no significant correlation, the distribution of risk perception styles in each role might be interesting (Fig. 7) and show how the

Tab. 9. Crosstabs analysis

		REPORT		
		RT_ MEAN	RP_ MEAN	EB_ MEAN
Indifferent	Mean	3.0485	4.4241	3.5319
	N	97	97	94
	Std. Deviation	.99738	1.05535	1.17857
	Minimum	1.00	1.17	1.00
Good friends	Mean	3.5046	4.1963	3.5194
	N	35	35	35
	Std. Deviation	1.26124	1.27092	1.11040
	Minimum	1.33	1.67	1.00
Double Risk taker	Mean	3.2661	4.6687	4.0297
	N	67	67	66
	Std. Deviation	1.14643	1.12973	1.18302
	Minimum	1.33	1.83	1.00
Agent	Mean	3.5859	4.0066	3.7739
	N	29	29	28
	Std. Deviation	1.19340	1.16232	1.28361
	Minimum	1.00	1.67	1.00
Total	Mean	3.2508	4.4079	3.7077
	N	228	228	223
	Std. Deviation	1.12187	1.13944	1.19622
	Minimum	1.00	1.17	1.00
Total	Maximum	7.00	7.00	7.00

cultural heritage impacts our decisions and risk levels. Matching these two cases of segmentation, the following can be provided. It is obvious that a Risk Avoider will not take any risk on their behalf or behalf of others, or a part of Risk Takers are more likely to take any risk on behalf of others. But it is interesting that in the Sceptical group, the biggest share of Good Friends could be found.

## CONCLUSIONS

---

Wang (Wang et al., 2017) highlighted how cross-cultural dimensions mattered more than macroeconomic variables in explaining loss aversion. Wang, Rieger and Hens (2017) conducted a standardised survey in 53 countries worldwide that included questions from the Hofstede survey on cultural dimensions as well as lottery questions on loss aversion. They found that Hofstede's individualism, power distance, and masculinity increased loss aversion, whereas the impact of uncertainty avoidance was less significant. Such findings could explain the results of this research as well. Moreover, the authors also found a relation between the distribution of major religions in a country and loss aversion. In comparison, the connection of loss aversion to macroeconomic variables seemed to be much smaller. Chang (Chang et al., 2016) highlighted that the political implication could encourage people to help strangers by lowering the associated costs e.g. "Good Samaritan" laws (protect this group of people) would be necessary nowadays when the countries are going through a rapid urbanisation process. So, it seems that the cultural background greatly increases the likelihood of how people would deal with strangers in their daily life.

Guiso and Paiella (2008) used household survey data to construct a direct measure of absolute risk aversion and they related this measure to consumer's endowments and attributes and to measures of background risk. They also received an interesting result. The risk aversion was a decreasing function of the endowment, and they also showed that the consumer's environment affects risk aversion.

Ferreira (2018) used a method similar to that applied in this research; however, she found an attitude of risk-aversion across the entire sample of 12,500 (approx.) supported by the ING. She also used the DOSPRT Scale but changed the topic or the

target of risk to financial markets' products (i.e. shares, mutual funds, and bonds). According to her, people in Germany, Poland and Austria appeared to associate riskier investments with lower expected benefits. She found significant differences in risk aversion between the 15 countries studied. Germany, Austria and the Netherlands were most risk averse while the US, Turkey, Australia and the UK were more accepting of risk. All of this must be taken in consideration in the case of investment sector. More interestingly, significant differences between countries were found in terms of institutional, cultural and geographical factors. They seemed to have a substantial influence on the formation of individual risk-benefit perceptions associated with financial investment. Significant heterogeneity in the strength of such relationships became evident from country-specific correlations between financial risk and benefit perceptions. In the Netherlands, Belgium, the Czech Republic, and Turkey, no significant pattern was found in the way people constructed their perceptions of financial risks and benefits. Moreover, people living in Germany, Austria and Poland seemed to believe that the riskier the investment, the lower the expected benefits. In contrast, people of France, Spain, the UK and the USA perceived (standardised) risk and the expected benefit level (also standardised) showed a positive rising correlation. A somewhat weaker but ascendant connection was found in the case of Luxemburg, Italy, Romania and Australia.

The author of this article underlined that risk attitudes were not uniform across or within countries. She found that the overall negative association between the perceived financial risks and the risk-taking propensity held for all countries but three clear groups were identified. She measured the country-specific correlations between the financial risk propensity and the perceived risk level. Finally, countries in the first group were relatively more risk-prone (Turkey, the USA, Poland, Italy and the UK), moderated risk connection was found (Austria, Belgium, the Czech Republic, Spain and Austria), at the end countries in group C were the most risk-averse (Germany, France, Luxemburg, the Netherlands, Romania). Her paper verified that the use of a bigger representative sample could show cultural differences. Unfortunately, this paper faced massive unexplained heterogeneity.

## RESEARCH LIMITATIONS

The main problem of this survey is rooted in the methodological background; branches of effect impact on main final findings but the problem can be corrected using a high number of representative samples. The limitation of this study was related to hypothetical situations that were verbally described rather than represented visually or numerically. Typically, such situations are new to subjects, so their judgements could be based on simple guessing or misinterpretation. It also must be underlined that the majority of subjects were students with none or limited financial experience, and according to Camerer (1998), the past actually affects our risk perception.

In summary, this study verified various types of risk attitudes and can be a good basis for future efforts. Hopefully, this paper helps to understand how risk perceptions can help businesses improve decision making in relation to financial problems. The behavioural economics agenda should focus on the remaining most interesting questions and further research on the institutional and cultural determinants of risk perceptions and attitudes.

## ACKNOWLEDGEMENTS

The research was supported by the New National Excellence Program ÚNKP-17-4/I of the Ministry of Human Capacities. Some parts of the paper were based on the oral presentation of the author, given at the International Scientific Conference Emerging Trends in Economics, Culture and Humanities (ETECH2018) in Riga, Latvia.

## LITERATURE

- Andreoni, J., & Sprenger, C. (2010). Certain and Uncertain Utility. The Allais Paradox and Five Decision Theory Phenomena. *Levine's Working Paper Archive* 926159295. Retrieved from <https://pdfs.semanticscholar.org/83da/ed55d89ad8d0b94ac72e509dbb11-8983-f069.pdf>
- Baillon, A., Bleichrodt, H., & Liu, N. (2016). Group Decision rules and group rationality under risk. *Journal of Risk and Uncertainty*, 52(2), 99-116.
- Bakacsi, Gy. (2015). Valtozo vezetesi paradigma – valtozo megbizo ugnok problema? [Changing leader-paradigm – changing principal-agent problem?]. In Gy. Bakacsi & K. Balaton (Eds.), *Vezetes es szervezettarsadalmi kontextusban: Tanulmanyok Dobak Miklos 60. szuletesnapja tiszteletere* (pp. 29-54). Budapest, Hungary: Akademiai Press.
- Birnbaum, M. H. (2008). New Paradoxes of Risky Decision Making. *Psychological Review*, 115(2), 463-501.
- Blais, A. R., & Weber, E. U. (2006). A Domain-Specific Risk-Taking (DOSPERT) scale for adult populations. *Judgement and Decision Making*, 11(1), 33-47.
- Calabuig, V., Fatas, E., Olcina, G., & Rodriguez-Lara, I. (2016). Carry a big stick, or no stick at all Punishment and endowment heterogeneity in the trust game. *Journal of Economic Psychology*, 157, 153-171.
- Camerer, C. (1998). Bounded Rationality in Individual Decision Making. *Experimental Economics*, 1, 163-183.
- Centre for Decision Sciences, DOSPERT ORG. Retrieved from <https://sites.google.com/a/decisionciences.columbia.edu/dospert/>
- Chang, S., Dee, T. S., Tse, C. W., & Yu, L. (2016). Be a Good Samaritan to a Good Samaritan: Field evidence of other-regarding preferences in China. *China Economic Review*, 41, 23-33. Doi: 10.1016/j.chieco.2016.08.007
- Dawes, M. R., & Thaler, R. (1988). Anomalies Cooperation. *Journal of Economics Perspectives*, 2(3), 187-197.
- Dohmen, T., Falk, A., Huffman, D., Sunde, U., Schupp, J., & Wagner, G. (2011). Individual risk attitudes: Measurement, determinants, and behavioral consequences. *Journal of the European Economic Association*, 9(3), 522-550.
- Falk, A., Fehr, E., & Fischbacher, U. (2008). Testing theories of fairness – Intentions matter. *Games and Economic Behavior*, 62(1), 287-303.
- Farago, K., & Kiss, O. (2005). Risk-taking Entrepreneurs: the Role of Uncertainty, Stake and Framing. *Magyar Pszichologiai Szemle, LX(1)*, 203-223.
- Farago, K. (2005). A kockázatvállalás vizsgálatá terepkiserletekben. *Magyar Pszichologiai Szemle, LX(3)*, 343-370.
- Farago, K. (2008). Siker, kockázatvállalás és versengés szervezetekben. *Alkalmazott Pszichologia, 1-2*, 7-29.
- Farago, K. (2008). The Effect of Accumulated Resources on Risk Taking in Memory of Ferenc Merei. *Magyar Pszichologiai Szemle, 63(4)*, 651-675.
- Fehr, E., & Fischbacher, U. (2003). The nature of human altruism. *Nature*, 425, 785-791. Doi: 10.1038/nature02043
- Ferreira, M. (2018). Risk Seeker or Risk Averse? Cross-Country Differences in Risk Attitudes Towards Financial Investment. In A. Samson (Ed.), *The Behavioral Economics Guide 2018*. Retrieved from <http://www.behavioraleconomics.com>
- Guiso, L., & Paiella, M. (2008). Risk Aversion, Wealth, and Background Risk. *Journal of the European Economic Association*, 6(6), 1109-1150.
- Hanoch, Y., Johnson, J. G., Wilke, A. (2006). Domain Specificity in Experimental Measures and Participant Recruitment An Application to Risk-Taking Behavior. *Psychological Sciences*, 17(4), 300-306.

- Hertvig, R., Barron, G., Weber, E. U., & Erev, I. (2004). Decisions From Experience and the Effect of Rare Events in Risky Choice. *Psychological Sciences*, 15(8), 534-539.
- Hofstede, G. (1980). *Culture's consequences: International differences in work related values*. London, United Kingdom: Sage.
- Hofstede, G. (2018). *The Hofstede Centre*. Retrieved from <https://geert-hofstede.com>
- Hsee, C. K., & Weber, E. U. (1999). Cross-National Differences in Risk Preference and Lay Predictions. *Journal of Behavioral Decision Making*, 12, 165-179.
- Kahneman, D. (2013). *Thinking fast and slow*. New York, United States: Farrar, Straus and Giroux.
- Kahneman, D., Knetsch, J. L., & Thaler, R. (1991). The Endowment Effect, Loss Aversion, and Status Quo Bias. *Journal of Economic Perspectives*, 5(1), 193-206.
- Kolnhofer-Derecskei, A. (2017). The Indifferent, the Good Samaritan, the Brave and the Agent in Allais Paradox situation – or How Endowment Effect Influences Our Decision in Case of Allais Paradox? *Organizacija*, 50(4), 299-313.
- Kolnhofer-Derecskei, A., & Nagy, V. (2016). Under Risk. In R. Reicher (Ed.), *Proceedings of FIKUSZ '16 Symposium for Young Researchers* (pp. 161-172). Retrieved from [https://kgk.uni-obuda.hu/sites/default/files/16\\_De-rec-skei\\_Nagy.pdf](https://kgk.uni-obuda.hu/sites/default/files/16_De-rec-skei_Nagy.pdf)
- Luigi, G., & Paiella, M. (2008). Risk aversion, wealth, and background risk. *Journal of the European Economic Association*, 6(6), 1109-1150.
- Morris, M. W., Leung, K., Ames, D., Lickel, B. (1999). Views from Inside and Outside: Integrating Emic and Etic Insights about Culture and Justice Judgment. *Academy of Management Review*, 24(4), 781-796.
- Palmer, C. J., Paton, B., Ngo, T. T., Thomson, R. H., Hohwy, J., & Miller, S. M. (2013). Individual differences in Moral Behaviour: A Role for Response to Risk and Uncertainty? *Neuroethics*, 6, 91-103.
- Radnoti, I. (2010). A kockázatvállalási szándék merése. *XXI. Szazad – Tudományos Közlemények*, 24, 31-54.
- Simon, H. (1978). Rational Decision-Making in Business Organization. *Nobel Memorial Lecture*, 8th of December 1978.
- Tversky, A., & Kahneman, D. (1974). Judgement Under Uncertainty: Heuristics and Biases. *Science*, 185(4157), 1124-1131.
- Vasvari, T. (2015). Risk Perception, Risk Management – a Review of the Literature. *Public Finance Quarterly*, 60(1), 29-48.
- Wang, M., Oliver, M., & Hens, R. (2017). The impact of culture on loss aversion. *Behavioral Decision Making*, 30(2), 270-281.
- Weber, E. U., Blais, A. R., & Betz, N. (2002). A domain-specific risk attitude scale: Measuring risk perceptions and risk behaviors. *Journal of Behavioral Decision Making*, 15, 263-290.
- Weber, E. U., & Hsee, C. (1998). Cross Cultural Differences in Risk Perception, but Cross Cultural Similarities in Attitudes Towards Perceived Risk. *Management Science*, 44(9), 1205-1217.