

Exploration of Risk taking behaviors for Financial decision making in Malaysia

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Abstract - We used and evaluated a simple real payoff choice investment alternatives to measure risk taking behavior of Malaysian youth and also applied this measure to examine differences in risk taking behavior of male, female, younger and older adult university students. Participants chose which of ten 50/50 chance to win or loss alternative they wish to choose. We found significant ethnic difference when Malay and Chinese were placed in-groups, Chinese showed a stronger pro-risk position than Malay. While no significant difference was found between Indian and Chinese. However, overall there was a significant gender difference in investment risk taking behavior. Females turned out in a stronger pro-risk position than males. In terms of choosing investment alternatives, there was a significant difference between age groups, such that younger adults were relatively more risk taker than older adults.

Keywords: risk taking; ethnicity; investment decision-making; gender; age difference

1. INTRODUCTION

Risk plays a very important role in almost every investment decision. Thus, economists and psychologists have long been researching on the most popular issue 'individual decision making under risk' (Brañas-Garza, Georgantzis, & Guillen, 2007[8]; Donkers, Melenberg, & Van Soest, 2001[10]; Guiso & Paiella, 2008[13]; Renneboog & Spaenjers, 2012[19]). Risk-return concept states that the higher the risk of a particular investment, the higher the return. But individuals do not always understand how to determine the level of risk that their portfolios should bear. Moreover, many investors are not fully aware about their level of risk preference under uncertain investment alternatives (Arrow & Lind, 2013[5]; Hirshleifer, 1965[14]; Weber & Johnson, 2008[21]). Thus, most economics and psychology researchers measure risk attitudes by framing the basic problem as a general case in which individuals make choices based on probability-payoffs pairs (Brañas-Garza et al., 2007; Eckel & Grossman, 2008[11]; Loomes, 1998[18]). The most popular empirical methods of measuring risk include questionnaires, experiments, and real world data (Caliendo, Fossen, & Kritikos, 2009[9]; Donkers et al., 2001; Kahneman & Tversky, 1979[16]). This study used experiment to measure the financial risk preference and develop risk profiling for the three ethnic groups in Malaysia.

In this paper, we study financial risky decisions made by the participants who have basic knowledge about risk-return concept and indirectly affected by the financial risk because they are highly dependent on their family income that are directly or indirectly involved with financial risk. The main objective of this study is to investigate whether three ethnic groups in Malaysia are different in their risk preference toward safe and risky investment decision, and if so, in what way. In addition, we also want to know whether these three ethnic groups are significantly different when they make investment from safe and risky investment alternatives. In order to address these questions, 223 participants were given a real payoffs investment choices introduced by Funk, Rapoport, and Jones (1979)[12] and further developed and discussed in Kamstra, Kramer, Levi, and Wermers (2013[17]). The experimental questions are designed to capture two dimensions of investment decision making under risk. First, the results can be used to distinguish between risk loving and risk-averse participants. It can also be used to measure individual's degree of risk loving. Second, the experiment captures the participant's actual behavior to different risk premia. Our sample consists of three different subsamples. The subsamples are labeled as Chinese (95 participants), Indian (17 participants), and Malay (111 participants).

The findings show that three different ethnic groups in Malaysia vary with respect to five different levels of risk

preferences. The vast majority of Malaysian prefer to invest their capital in moderate to high risky investment. Using real pay-off choice investment alternatives, ethnic difference was found when Malay and Chinese are placed in-groups, Chinese showed a stronger pro-risk position than Malay. While no significant difference was found between Indian and Chinese. However, overall there was a significant gender difference in investment risk taking. Females turned out in a stronger pro-risk position than males. In terms of choosing investment alternatives, there was a significant difference between age groups, such that younger adults (≤ 20 years old) were relatively more risk taker than older adults (≥ 21 years old).

The remainder of this paper is organized as follows. Section 2 discusses the research hypothesis. Section 3 details the experiment design, procedures, questions, and demographics used in this study. Section 4 provides the results and discussion. Section 5 provides concluding remarks with limitations of this study and implication for future research.

2. HYPOTHESIS

Albaity, Rahman, Mahfuzur, & Shahidul (2014)[3] found that Malaysian students have behavioural biases such as risk preference and time preference. In addition, Albaity & Rahman (2012a)[1] and Albaity & Rahman (2012b)[2] found that there are differences in individual characteristics (luck, trust, maximization and risk) based on gender-ethnic as well as gender-religion groups. Similarly studies were conducted in other countries and found that there are differences among races with regards to risk (Anderson & Galinsky, 2006[4]; Yao, Gutter, & Hanna, 2005[22]). In order to develop a clear picture and sound understanding of risk preference of the three ethnic groups (Chinese, Indian, and Malay) about the safe and risky investment, we test a hypothesis. In particular, we aim to develop financial investment risk profile as no such study has yet been undertaken in Malaysia. Thus, we propose the following hypotheses to achieve the objectives of this study:

Hypothesis: Three ethnic groups are different in risk preference toward safe and uncertain investment alternatives.

3. EXPERIMENTAL DESIGN AND DEMOGRAPHICS

3.1 Experimental design

Our analysis explores whether participant s' decision regarding risky investment choices vary among ethnic groups. To examine whether risk preferences are associated with ethnic group difference, we ran a controlled experiment where the participants comprised undergraduate students from three different ethnic groups (Malay, Chinese, and Indian). The experiment was conducted by paper and pen in a large classroom with target number of participants equal to 60 and an average of

the actual number of participant s equal to 50. The participation rate was around 84% in all the sessions. Six sessions were conducted from two different public universities in Malaysia. In total, 223 participant s participated in our experiment from October 2013 to December 2013 over 6 sessions. The experiment was conducted in a large classroom of the University of Malaya Business School and International Islamic University of Malaysia Business School. The same classroom was used in all experimental sessions. Students were informed about the experiment earlier by the lecturer. So upon arrival, students were seated throughout the classroom in a way that each participant could not see what other participant s were doing, and could not be seen the choice of investment by others. In the experiment, students were instructed not to write their names in order to make the experimental results completely anonymous. Moreover, in order to avoid any experiment effect, I was introduced as a Ph.D. student performing an anonymous socio-economic academic research for scientific purpose rather than investment purpose. The experimental design is based on the following slightly revised version of investing capital on safe and risky alternatives(Funk et al., 1979[12]; Kamstra et al., 2013[17])

3.2 Experimental procedures

To examine the risk preferences for investment decisions, participant s were asked to choose one of the ten risky investment alternatives which involved different amount of capital investment. The option stated 0% investment in the original experimental design conducted by Funk et al. (1979) and Kamstra, Kramer, Levi, and Wermers (2013) was taken out from the experimental design of this study. The tendency among many individuals to go for easy option which do not represent their true choices particularly where risk is involved, motivated us to take out the 0% investment alternative to engage all the participant s in risky investment choices. Participant s participated as the participant pool voluntarily by confirming to their lecturer. The experiments were conducted with the help of two lecturers in the faculty of Business and Accountancy at University of Malaya and one lecturer in the Faculty of Economics and Management Sciences at International Islamic University of Malaysia. The lecturers allowed me to conduct the experiment in their class and allocated some marks as the outcome of the investment game of the experiment. It is hoped that the marks work better as an outcome of the investment game than monetary benefits for the students especially right after their midterm exams when they become more concern about their final grade of the participant.

When students entered the classroom for participation in the experiment, they were told that the experiment is about decision making for risky investment choices and they will be offered one mark for participation and two marks for making investment in 10 investment alternatives. They can make up to five marks by participating in the experiment.

On average participants will earn around 2-3 marks, though they may end up with less than that. The total amount of time they will spend in this study will be less than 15 minutes.” When a participant entered the classroom, he/she was given a sheet consisted of 10 different investment alternatives with marks payoffs attached to every investment option. The participant needed to choose an investment out of 10 investment alternatives. Along with the investment alternatives table, step by step instructions were given to them including specific examples to clarify the use of the tables. The instructions given to the participant s are displayed in the *Appendix 1*.

After reading the instructions, participant s were given an opportunity to ask questions. There was no time limit for the experiment and participant s had the opportunity to ask additional questions during the experiment in private. Two representatives were present to answer questions and to ensure that participant s did not communicate with each other. After all participant s made their decisions, we randomly determined their payoffs by tossing a coin and added the marks to their continuous assessment marks based on the provided student ID number. As soon as everybody had chosen their investment alternatives, participant s knew about their payoffs and could leave the classroom where the experiment was taking place.

3.3 Investment alternatives and participants

The instructions of the questions and questions are in English since the medium of instructions of the two public universities, we considered for this study are English. Besides, based on our respondents view they are comfortable answering questionnaires in English. The safe and risky investment alternatives questions were adapted from (Funk et al., 1979; Kamstra et al., 2013). The simple 10 items investment choices are very powerful tool to develop risk preference profile. The questions were not foreign in nature to the respondents in the sense that respondents easily understood the mechanism of the investment choices and payoffs when explained. Hence, it is justified for this study to consider the university students. The risky investment alternatives consist of the following 10 investment alternatives. If a participant s choose to invest his/her capital (2marks given as initial capital) in the following percentage

1. 100% (There are equal chances that they will receive either 5marks or 0marks.)
2. 90% (There are equal chances that they will receive either 4.5marks or 0.2marks.)
3. 80% (There are equal chances that they will receive either 4marks or 0.4marks.)
4. 70% (There are equal chances that they will receive either 3.5marks or 0.6marks.)
5. 60% (There are equal chances that they will receive either 3marks or 0.8marks.)
6. 50% (There are equal chances that they will receive either 2.5marks or 1marks.)

7. 40% (There are equal chances that they will receive either 2marks or 1.2marks.)
8. 30% (There are equal chances that they will receive either 1.5marks or 1.4marks.)
9. 20% (There are equal chances that they will receive either 1marks or 1.6marks.)
10. 10% (There are equal chances that they will receive either 0.5marks or 1.8 marks.)

To construct the financial preference profile of the participant s toward safe and risky investment, we calculated 100 minus the percentage value associated with the choice selected. This produces a score that can range in value from 0 for the first option to 90 for the last option since 0% investment option was taken out of the this experimental design . (For instance, if a participant selected the second option, 90%, his or her score would be $100-90=10$.) The score reflects the percent of the “portfolio” allocated to the safe option. So the participant who placed 90% of his/her capital (2marks) in this experiment is considered as high risk taker which falls in the category of very aggressive risk taker. In this experiment design, option1 represents the “riskier” investment and option10 represents the “safer” investment in which participant s need to invest 100% of their capital for the option1 and 10% for the option10 respectively. For instance, if the participant selects the first option, option1, then there is an equal chance for the participant to receive either 5marks or 0marks whereas if the participant selects option10, then there is an equal chance that the participant will receive either 0.5marks or 1.8 marks.

3.4 Demographics

Table 1 reports the demographics of the population on which the experiment was conducted. The population of the experiment indicates low dispersion in age, marital status, ethnic groups, parents’ occupation, and religious faith. However, the sample appears to be more evenly distributed when it comes to sex, gamblers among family members and parents’ bank savings to which the current status of the economy is a concern. The effect of the same set of variables on investors’ risk preference have been widely studied (Bassi, Colacito, & Fulghieri, 2013[6]; Benjamin, Choi, & Fisher, 2010[7]; Guiso & Paiella, 2008[13]; Renneboog & Spaenjers, 2012[19]; Shu, Sulaeman, & Yeung, 2010[20]). Table 1 also presents that majority of our participant s are female (64%), 20 years old or below (67.4%), single (99.4%), and Muslim (55.8%). Moreover, our participants consist of Malay (45.9%), Chinese (39.3%), and Indian (7%). It is found that majority of the participants’ parents are involved with business (33.9%) and work under private companies (22.2%). In addition, majority (95.3%) of the respondents’ family members is not involved in gambling and (84.2%) preferred to have bank savings. In this way, our experiment is an ideal platform to test the hypothesis of the risk preference of Malaysian youth on safe and risky investment alternatives.

Table 1. Demographics statistics

Demographic Profile		Percent (%)	Significance test
Sex	Male	36	-2.29*
	Female	64	
Age	20 years old or bellow	67.4	1.735*
	21-30 years old	32.6	
Marital Status	Single	99.4	1.41
	Married	0.6	
Religion	Buddhism	31.0	0.716 [±]
	Christianity	7.4	
	Hinduism	5.0	
	Islam	55.8	
	Others	0.8	
Parents' occupation	Business	33.9	1.83
	Government servant	19.9	
	Private company service holder	22.2	
	Teacher/Lecturer/Professor	10.5	
	Others	13.5	
Gamblers among family members	No	95.3	-0.13
	Yes	4.7	
Parents' bank savings	No	15.8	-1.12
	Yes	84.2	

* Significant at 5% and 10% respectively. ± ANOVA test

4. RESULTS AND DISCUSSION

To categorize the individual investors' level of financial risk preferences regarding investment choices, we created a five category of risk preferences that associated risk/reward profiles. Although this category is by no means scientific, it provides a guideline that investors can use when picking different investments or making their portfolio investment. Table 2 presents the categories of financial risk which help us to understand and differentiate the level of risk preference by different ethnic group in Malaysia. The financial risk categories are labeled as very

aggressive (willing to invest 90-100% of their capital), aggressive (willing to invest 70-80% of their capital), moderately aggressive (willing to invest 50-60% of their capital), moderately conservative (willing to invest 30-40% of their capital), and conservative (willing to invest 10-20% of their capital). ANOVA and t-test were performed to examine whether significant differences exist between and among groups. The results indicate that there is a significant difference in gender and age. The results indicate that females scored higher mean than males. In addition, respondents of the age of 20 years and younger scored higher than the other age group.

Table 2. Level of financial risk preference by different ethnic groups

Level of risk preference		Ethnic groups		
		Chinese	Indian	Malay
Riskier	Very aggressive	17 (17.9%)	3 (17.6%)	36 (32.4%)
	Aggressive	25 (26.3%)	4 (23.5%)	24 (21.6%)
	Moderately aggressive	34 (35.8%)	9 (52.9%)	33 (29.7%)
	Moderately conservative	11 (11.6%)	1 (5.08%)	11 (9.9%)
Safer	Conservative	8 (8.4%)	0 (0%)	7 (6.3%)
Total		95 (100%)	17 (100%)	111 (100%)

The findings indicate that in terms of very aggressive risk preference, both Chinese (17.7%) and Indian (17.6%) are similar while Malay has higher (32.4%) percentage. But in terms of aggressive risk preference, Chinese (26.3%) is higher than both Indian (23.5%) and Malay (21.6%). On the other hand, in terms of moderately aggressive risk preference, Indian (52.9%) is far higher than Chinese (35.8%) and Malay (29.7%). However, in terms of moderately conservative and conservative risk preference, the percentage of Chinese is higher than Malay and Indian. The results indicate that majority of Chinese and Malay prefer moderate to high financial risk while the rest prefer to be conservative. The results also show that more than

90% Indian prefer moderate to high financial risk while the conservatives are negligible. Finally, the experiment results indicate that three ethnic groups are different for risk preference regarding safe and risky investment alternatives which literally confirms the proposed hypothesis of this study. This finding is supported by Albaity, Rahman & Islam (2014), Albaity & Rahman (2012a), and Albaity & Rahman (2012b).

Figure 1 represents safe and risky investment choices by three ethnic groups (Chinese, Indian, and Malay) in Malaysia. First, we compare financial investment behavior across three ethnic groups.

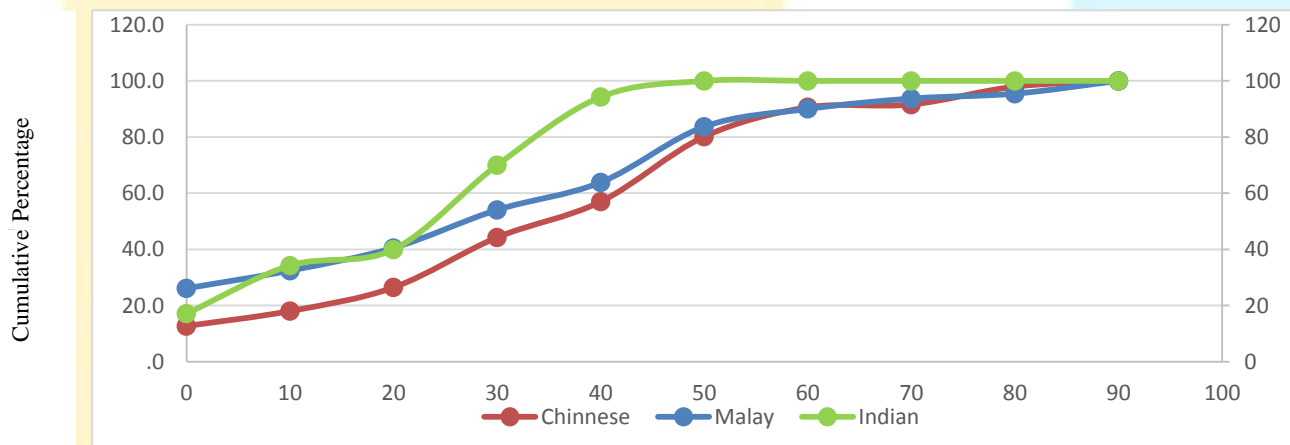


Figure 1. Cumulative Frequency of Investment Choices: Chinese; Indian; Malay

Figure 1 presents cumulative frequencies of investment choices by participant subsample. The horizontal axis represents the percentage that they didn't invest, which determines the preferred amount of capital that they willing to put in risky investment. Notice that amount of capital not invested by the participants are then ordered in the figures starting by the riskier (10% not invested = 100% - 10% = 90% invested) and finishing with safer (90% not invested = 100% - 90% = 10% invested). The vertical axis represents the cumulative frequency of choices. We can see how a very high percentage of Malays (blue continuous line with black dots) prefer the riskier option (see, for example, the high percentage of people choosing not to invest = 0% to 10%, means they are investing either 100% or 90% of their provided capital of 2marks). We can see that Chinese and Indian have similar preference for riskier option (e.g., Orange and green continuous line). More than 60% Chinese prefer to invest 60-80% of their capital in the risky investment alternatives whereas almost 80% of the Indians prefer to invest 60-80% of their capital in the risky investment alternatives. Likewise, about 50% of the Malays prefer to invest 60-80% of their capital in the risky investment alternatives. Hence, the experiment results show that overall Malaysians prefer to put more than 50% of their money in risk investments.

Furthermore, in the investment choice, the behavior of Malays (continuous line with blue color) lies between the behaviors of the other two ethnic groups. Besides, higher percentage of Chinese are found as low or minimum risk taker compare to Malay and Indian. As found in the experiment results that almost 20% of the Chinese prefer to invest only 10% to 40% of their capital in risky investments. Lastly, the experiment results indicate that three ethnic groups are different for the preference of putting their capital in risky investment. In Figure 2, the horizontal line indicates the amount of capital each ethnic group placed as safe. In other words, didn't not invest in the 10 risky investment choices. The first 0% to 10% capital placed as safe can be labeled as very aggressive group (invested 100-90% of their capital), 20% to 30% can be labeled as aggressive group (invested 80-70% of their capital), 40% to 50% can be labeled as moderately aggressive group (invested 60-50% of their capital), 60% to 70% can be labeled as moderately conservative group (invested 30-40% of their capital), and 80% to 90% can be labeled as conservative group (invested 10-20% of their capital).

We also employed t-test to see whether three ethnic groups are significantly different in choosing safe and risky investment alternatives. Table 3 reports that the only one case show a significant difference. Chinese (Mean=4.8) are

more willing to accept higher risks than Malays (Mean=4.2). Although, there are difference in mean score between Indian (Mean=4.2) with Chinese but that difference is not significant. However, Albaity & Rahman (2012a) and

Albaity & Rahman (2012b) who studied several behavioral traits of the Malaysian population, found significant differences between races, religions and genders in terms of general risk taking behavior.

Table 3. t-test of difference in mean between races

Ethnicity	Mean difference	t-test
Malay (46%) vs. Chinese (39%)	0.623	1.81*
Malay (46%) vs. Indian (7%)	0.037	0.056
Chinese (39%) vs. Indian (7%)	0.59	0.99

*significant at 10%. Subscript numbers refer to the percentage of participants in the data.

Perhaps, the difference in risk preference of different ethnic groups does not significantly influence their investment decision behavior. Maybe teenagers are more rational in the case of actual behavior compare to emotional activities. For instance, Huang, Wood, Berger, and Hanoch (2013)[15] found that youths demonstrate high risk under conditions of emotional arousal and be rationale decision-makers under more deliberative conditions. In addition, the fact that may be influencing Malaysian teenagers regardless of their race to behave in a similar pattern for financial risk taking is the exposure of the similar financial constraint. However, significant

ethnic difference was found when Malay and Chinese were placed in-groups, Chinese showed a stronger pro-risk position than Malay. While no significant difference was found between Indian and Chinese. However, overall there was a significant gender difference in investment risk taking behavior. Females turned out in a stronger pro-risk position than males. In terms of choosing investment alternatives, there was a significant difference between age groups, such that younger adults were relatively more risk taker than older adults. Figure 2 represents capital placement on investment alternatives by three ethnic groups (Chinese, Indian, and Malay) in Malaysia.

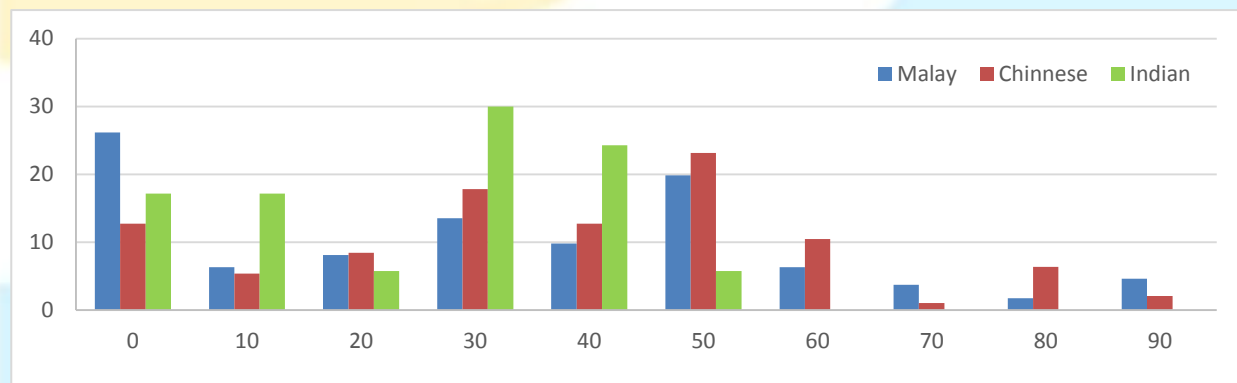


Figure 2. Placing capital on investment alternatives: Chinese; Indian; Malay

5. CONCLUSION

This study provides theoretical and empirical contributions to research on individual financial risk preference. This study examines the level of individual's risk preference for investing capital on safe and risky investment alternatives among Malaysian. The findings indicate that the three different ethnic groups in Malaysia vary with respect to five different level of risk preference. The study also found a significant ethnic difference when Malay and Chinese were placed in-groups, Chinese showed a stronger pro-risk position than Malay. While no significant difference was found between Indian and Chinese. However, overall there

was a significant gender difference in investment risk taking behavior. Females turned out in a stronger pro-risk position than males. In terms of choosing investment alternatives, there was a significant difference between age groups, such that younger adults were relatively more risk taker than older adults. The vast majority of Malaysian prefer to invest their capital in moderate to high risky investment. Most research on individual risk attitudes focused on the relationship between individuals' cognitive abilities, characteristics and risk attitudes. Besides, many research has been focused on general risk attitudes. However, this study examines the financial risk preference instead of general risk preference of the three different

ethnic groups in Malaysia. This study has contributed to develop the theoretical framework for the relationship between ethnic group, gender, and age difference and financial risk preferences. In addition, it also has contributed to the methodology by conducting experiment with actual payoffs to examine individuals' risk preference for safe and risky investment alternatives.

Despite the contribution, this study has some limitations. Limited number of samples and contracted research setting, this research results may not be generalizable in greater extent. In the future, researchers may collect more samples and greater coverage in terms of setting to reconfirm this study results as some of the findings do not support previous research as discussed earlier.

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6. REFERENCES

- [1] Albaity, M, & Rahman, M. (2012a). Behavioural Finance and Malaysian Culture. *International Business Research*, 5(11).
- [2] Albaity, M, & Rahman, M. (2012b). Gender, Ethnicity, and Religion and Investment Decisions: Malaysian Evidence. *Journal of Sociological Research*, 3(2), Pages 502-519.
- [3] Albaity, Mohamed, Rahman, Mahfuzur, & Shahidul, Islam. (2014). Cognitive reflection test and behavioral biases in Malaysia. *Judgment and Decision Making*, 9(2), 149-151.
- [4] Anderson, Cameron, & Galinsky, Adam D. (2006). Power, optimism, and risk-taking. *European journal of social psychology*, 36(4), 511-536.
- [5] Arrow, Kenneth J, & Lind, Robert C. (2013). Uncertainty and the evaluation of public investment decisions. *Journal of Natural Resources Policy Research*(ahead-of-print), 1-16.
- [6] Bassi, Anna, Colacito, Riccardo, & Fulghieri, Paolo. (2013). 'O Sole Mio: An Experimental Analysis of Weather and Risk Attitudes in Financial Decisions. *Review of Financial Studies*, hht004.
- [7] Benjamin, Daniel J, Choi, James J, & Fisher, Geoffrey W. (2010). Religious identity and economic behavior: National Bureau of Economic Research.
- [8] Brañas-Garza, Pablo, Georgantzís, Nikolaos, & Guillen, Pablo. (2007). Direct and indirect effects of pathological gambling on risk attitudes. *Judgment and Decision Making*, 2(2), 126-136.
- [9] Caliendo, Marco, Fossen, Frank M, & Kritikos, Alexander S. (2009). Risk attitudes of nascent entrepreneurs—new evidence from an experimentally validated survey. *Small Business Economics*, 32(2), 153-167.
- [10] Donkers, Bas, Melenberg, Bertrand, & Van Soest, Arthur. (2001). Estimating risk attitudes using lotteries: A large sample approach. *Journal of Risk and Uncertainty*, 22(2), 165-195.
- [11] Eckel, Catherine C, & Grossman, Philip J. (2008). Forecasting risk attitudes: An experimental study using actual and forecast gamble choices. *Journal of Economic Behavior & Organization*, 68(1), 1-17.
- [12] Funk, Sandra G, Rapoport, Amnon, & Jones, Lyle V. (1979). Investing capital on safe and risky alternatives: An experimental study. *Journal of Experimental Psychology: General*, 108(4), 415.
- [13] Guiso, Luigi, & Paiella, Monica. (2008). Risk aversion, wealth, and background risk. *Journal of the European Economic association*, 6(6), 1109-1150.
- [14] Hirshleifer, Jack. (1965). Investment Decision under Uncertainty: choice—theoretic approaches. *The Quarterly Journal of Economics*, 79(4), 509-536.
- [15] Huang, Yumi, Wood, Stacey, Berger, Dale, & Hanoch, Yaniv. (2013). Risky choice in younger versus older adults: Affective context matters. *Judgment and Decision Making*, 8(2), 179-187.
- [16] Kahneman, Daniel, & Tversky, Amos. (1979). Prospect theory: An analysis of decision under risk. *Econometrica: Journal of the Econometric Society*, 263-291.
- [17] Kamstra, Mark J, Kramer, Lisa A, Levi, Maurice D, & Wermers, Russ. (2013). Seasonal asset allocation: evidence from mutual fund flows: CFR Working Paper.
- [18] Loomes, Graham. (1998). Probabilities vs money: a test of some fundamental assumptions about rational decision making. *The Economic Journal*, 108(447), 477-489.
- [19] Renneboog, Luc, & Spaenjers, Christophe. (2012). Religion, economic attitudes, and household finance. *Oxford Economic Papers*, 64(1), 103-127.
- [20] Shu, Tao, Sulaeman, Johan, & Yeung, P Eric. (2010). Local religious beliefs and organizational risk-taking behaviors. *Working Paper, University of Georgia*.
- [21] Weber, Elke U, & Johnson, Eric J. (2008). Decisions under uncertainty: Psychological, economic, and neuroeconomic explanations of risk preference. *Neuroeconomics: Decision making and the brain*, 127-144.
- [22] Yao, Rui, Gutter, Michael, & Hanna, Sherman. (2005). The financial risk tolerance of Blacks, Hispanics and Whites. *Journal of Financial Counseling and Planning*, 16(1).

APPENDIX

Instructions

All the participant s (students) had to gamble the marks given to them as a capital to invest in the stock. In this experiment, I offered them the opportunity to have 2marks and they have to "invest" that marks. Like all nonguaranteed investments, this means they might end up with more than 2marks or they might end up with less than 2marks. (As explained above, if they wish to get this investment opportunity, they have to participate in nonguaranteed investments described below.) I asked them to indicate what percentage of their 2marks (if any) they would like to invest. There is one-in-two (50:50) chance that this investment will more than double the amount they invest (i.e., it will pay a 150% return on their investment), and there is an equal probability that the risky opportunity will pay a -100% return on the amount they invest (i.e., they will lose the amount they invested). For example: If they invest 100% of their 2marks, there are equal chances that they will receive either $(2+2 \times 150\%) = 5\text{marks}$ or $(2+2 \times -100\%) = 0\text{marks}$. If they invest 50% of their 2marks, then they will receive 1marks with certainty, plus there are equal chances that they will receive either $(1+1 \times 150\%) = 2.5\text{marks}$ or $(1+1 \times -100\%) = 0\text{marks}$. That is, their total payment will be either 3.5marks or 1marks. They were given 10 different investment opportunities to choose one. The outcome of their investment determined by tossing a coin. They were asked to indicate the percentage of their 2 marks they would like to invest in this risky opportunity.

Investment and its outcome

2.90% (There are equal chances that they will receive either 4.5marks or 0.2marks.)
3.80% (There are equal chances that they will receive either 4marks or 0.4marks.)
4.70% (There are equal chances that they will receive either 3.5marks or 0.6marks.)
5.60% (There are equal chances that they will receive either 3marks or 0.8marks.)
6.50% (There are equal chances that they will receive either 2.5marks or 1marks.)
7.40% (There are equal chances that they will receive either 2marks or 1.2marks.)
8.30% (There are equal chances that they will receive either 1.5marks or 1.4marks.)
9.20% (There are equal chances that they will receive either 1marks or 1.6marks.)
10.10% (There are equal chances that they will receive either 0.5marks or 1.8 marks.)

They had to choose one of the 10 risky opportunities. The investment payoffs were promised to add in their final grade of the participant. Therefore they took the experiment with care. At the end of the experiment I tossed the coin for each student to determine his/her investment outcome in term of marks. And their marks were added to their final grade of the participant. In the experiment, students received marks instead of monetary benefits as it is hoped that marks might work better as an outcome of the investment game than monetary benefits. 1.100% (There are equal chances that they will receive either 5marks or 0marks.)