Gender Differences, Risk and Probability Weights in Financial Decisions

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Abstract

Numerous studies have shown that decision makers do not usually treat probabilities linearly. Instead, people tend to overweight small probabilities and underweight large probabilities. The purpose of this research is to investigate whether women weigh probabilities differently than men. Besides that, this research also aims to examine whether women exhibit greater financial risk aversion than men. Women are commonly stereotyped as more risk averse than men in financial decision making. To examine some of the beliefs and preferences that underlie this difference, a stratified sample of 289 working adults (144 males and 145 females) aged 20–54 were interviewed within randomly selected geographical area across Penang Island. With this field experiment, we wish to generate a more credible and accurate results as compared to previous studies that used students as their subjects. This study confirmed the findings of previous researches that men and women differ in their financial decisions. In the gain domains, men tend to overweight smaller probabilities more than women (risk seeking) and women tend to underweight larger probabilities more than men (risk averse). While in the loss domains, when the probabilities were small, women were risk averse because they tend to overweight smaller probabilities more than men. When the probability became larger, women were exhibited as risk seeking as men because both of them perceived to have low chance of losing the lotteries. The overall results of this research indicate that men were willing to accept significantly more financial risk than women.

Keywords: *Gender differences; Risk seeking; Risk averse.*

1. Introduction

Financial decisions are part of every individual's life while most of the financial decisions that we made have consequences that are significant and long lasting. In everyday life, individuals are called upon to make financial decisions that are vary in risks and rewards. Choosing between education and employment options, deciding on pension contribution levels, selecting a health insurance package or planning a home purchase are the common financial decisions that everyone should make and it may affect our lives in future.

However, women behave differently than men in financial decision making. Women are often stereotyped as more risk averse than men and they are more conservative in making financial investment decision. (Helga Fehr-Duda et al., 2006; Jianakoplos & Bernasek, 1998; Powell & Ansic, 1997). Besides that, women engage in less risky or aggressive behavior, which could also influence their financial decision (Flynn et al., 1994).

Stronger effect in gender differences is discovered in gamble choices (Eckel & Grossman, 2002). According to the results of experiment by Eckel & Grossman (2002), women are more than four times likely as men to choose risk-free gamble and about one-third as likely to choose the highest-risk gamble. Moreover, Powell & Ansic (1997) found out that women adopt strategies that avoid loss while men focus on achieving best possible gain. According to Levy et al. (1999), lower willingness to accept financial risk can decrease returns to women investors. Moreover, women are shown to be less confidence in areas related to finance (Barber & Odean, 2001).

Johnson & Powell (1994) argued that women perceived to be less able to make risky decisions, are less likely to be given corporate promotions. If women are perceived as more risk averse, they may receive less generous initial offers in employment negotiations and face more aggressive bargaining, leading to lower negotiated wages. Babcock & Laschever (2003) found that "women don't ask" for as much as men do in negotiations and thus leads to differences in earnings between the sexes in similar jobs. Asking for less or failing to ask is consistent with lower willingness to take on risk.

To our knowledge, hardly any field work has been done using Malaysia population as subject on the question of whether women assess probabilities differently than do men. In order to explore the issue of gender-specific probability weighting, we conducted a field experiment based on a wide range of probabilities (0.05, 0.20, 0.50, 0.80 and 0.95). To be able to estimate gender-specific average behaviour, we had interviewed a large number of male and female subjects from the labour market with real monetary incentives, allowing us to generate a credible and accurate field data on certainty equivalents for winning and losing lotteries in an abstract environment. The elicited certainty equivalents were used to estimate the parameters in Prospect Theory, enabling us to check value and probability weighing functions for gender differences.

2. Literature Review

A large number of studies have been done in the field of gender differences in risk preferences. Some of the major studies are reviewed below.

Women are commonly stereotyped as more risk averse than men in financial decision making. Philip & JoNell (2013) investigated the relative effects of multiple psychological dimensions of gender differences in financial risk tolerance. This research uses MANAVO and hierarchical linear regression to test gender differences in financial risk tolerance. The result shows that men are more risk tolerant and make riskier financial decisions than women.

Jonas & Romualdo (2010) conducted a quantitative study to investigate the differences in risk aversion and overconfidence between the genders in financial decisions. This research used the significance of Chi^2-test to evaluate differences between the genders in financial decisions. The results show that men display tendencies to take more risk compared to women and overconfidence is found both in men and women. Men show a slightly stronger tendency to be overconfident.

Powell & Ansic (1997) examined whether gender differences in risk propensity and strategy in financial decision making can be viewed as general traits, or whether they arise because of context factors. With the help of SPSS, they conducted Chi^2-tests. They found that females are less risk seeking than males irrespective of familiarity and framing, costs or ambiguity. This research also examined how gender differences affect asset allocation in retirement pension accounts. It showed that women exhibit a greater relative risk aversion when choosing the allocation in their retirement savings account.

Helga Fehr-Duda et al. (2006) examined whether women differ from men in actual risk-taking behaviour by means of a laboratory experiment with monetary incentives. Subjects' risk taking behaviour is driven by their valuations of outcomes and assessments of probability information. The results indicated that men and women differ in their probability weighting schemes, women tend to be less sensitive to probability changes and they also tend to underestimate large probability of gains more strongly than men.

Embrey & Jonathan (1997) discussed that gender differences in the investment decision-making process. This study used a sample of one person households from the 1995 Survey of Consumer Finances to explain gender differences in the investment decision-making process. The result supports previous studies which found that women invest in less risky assets than men and more in assets involving little risk, historically yielding low returns. However, women were more likely to hold risky assets if expecting an inheritance, employed and holding higher net worth; while men invested in risky assets if they were risk seekers, divorced, older, and college educated.

Barber & Odean (2001) tested whether men are being more overconfident than women in trading. Theory predicts that men will trade more excessively than women. Using account data for over 35,000 households from a large discount brokerage, they analyse the common stock investments of men and women from February 1991 through January 1997. The result was that men traded 45% more than women. Hence, this empirical test provided strong support for the behavioural finance model. Furthermore, these differences are most pronounced between single men and single women.

Faff et al. (2011) investigated the relationship between financial risk tolerance and gender. This study is conducted with deriving the key proxy of risk tolerance score (RTS) from a 25 questions survey devised by Finametrica using a large sample of adult Australians. Using multiple regression analysis in which RTS is the dependent variable, the paper tested the importance of gender in explaining cross-sectional variation, while controlling for a range of demographic characteristics. The result of this research showed strong evidence that women differ from men in their attitudes towards financial risks. With considering the demographic features, women are shown to be less risk tolerant than men.

In this research, we are going to investigate the gender differences in risk and probability weighting in financial decision making. In previous related studies, most of the results are getting from laboratory experiments that involved only students while in this paper; we did a field experiment that involves real working adults and monetary incentives. With this field experiment, we hope that the results will be more credible and accurate as compared to the laboratory experiment. In short, we hope that the results of this study will make some contributions to the existing studies.

3. Experimental Design and Procedures

3.1 *Participants*

We had interviewed 289 working adults in Penang which follows the gender ratio population of Malaysia which is 1 : 1.01 (male : female). We interviewed 144 respondents of male and 145 respondents of female to complete the questionnaire which consists of 30 lotteries and a few demographic questions. We used about 5 weeks to collect data which covered most of the area in Penang.

3.2 *Experimental Design*

We designed 30 lotteries to elicit respondents' certainty equivalents for estimating value and probability weighting functions. The questionnaire consists of 15 lotteries in gain domain and 15 lotteries in loss domain. The questionnaire design comprises lotteries with probabilities of 5, 20, 50, 80 and 95%. Outcome for the lotteries ranged from RM10 to RM30. Each lottery has two options, option A is lottery with element of risk and Option B is a riskless option with guaranteed payoff (see Table 3.1). These guaranteed payoffs are arranged in algebraically descending order, starting with the larger gamble outcome and descending in equal steps towards the smaller gamble outcome. In the questionnaire, it consists of total 30 lottery games (15 in gain domain and 15 in loss domain) that the respondents need to make choices. One game consists of 20 choices, so 15 games consist of 300 choices in gain domain alone. With gain and loss domains, each respondent has to make a total of 600 choices.

3.3 *Procedures*

In the 15 gain domain lotteries, respondents must start from option B which is the guaranteed payoff and for the 15 loss domain lotteries, respondents must start from option A which is the lottery choices. Since the calculation of certainty equivalence is required to estimate probability weighting functions, we require respondents to switch from option B to option A (or vice versa) just once. If a respondent exhibits inconsistent choices, it is considered

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illogical if he switch from A to B and then back to A. For example, in the Table 3.1, if he chooses option B in the first choice, then we say he is risk averse because it is obvious option B is higher in payoff. In the second choice, if he chooses option A, then we say he is risk seeking when the guaranteed amount drops to RM9.50. But if he goes back to option B in third choice, it becomes illogical and difficult to explain. This is because in the second choice he is willing to take risk although the guaranteed amount is RM9.50, but when the guaranteed amount is RM9, he is not willing to take risk. So, it is not logic.

1	Option A	Your choice :		Option B Guaranteed payoff amounting to :
		A	B	RM
1				10
2				9.5
3				9
4				8.5
5				8
6				7.5
7				7
8				6.5
9	Profit of RM10 with probability 5% and profit of RM0 with probability 95%			6
10				5.5
11				5
12				4.5
13				4
14				3.5
15				3
16				2.5
17				2
18				1.5
19				1
20				0.5

Table 3.1 Option table with gamble (option A) and guaranteed payoff (option B)

Note: Design in the above table is gain domain. There are two options, for each of the 20 lines on the table, the respondent has to decide whether he/she prefers the lottery (option A), or the guaranteed payoff (option B) for the respective choices from 1 to 20.

3.4 *Data Analysis Technique*

We need to specify an analysis technique that allows us to estimate individual value and probability weighting functions to test our hypothesis. First of all, we calculate the outcomes of the lotteries using certainty equivalence (CE). CE is the amount of payoff that a respondent would have to receive to be indifferent between the guaranteed payoff (option B) and a given lottery (option A). We calculate the certainty equivalence of every lottery, the formula of the certainty equivalent is:

$$CE = \frac{x_1 + x_2}{2} \quad (1)$$

After that, we calculate the expected payoff (EP) of every lottery. The formula of expected payoff is:

$$EP = p(x_1) + (1 - p)(x_2) \quad (2)$$

where *p* denotes the probability of x_1 occurring and *1-p* denotes the probability of x_2 occurring. The decision weight depends on the respondent's domain-specific probability weighting function π(p). We use several methods to find the probability weighting function and draw the weighting function graph. First, we need to get $w(p)$ by using the below formula:

$$\frac{CE}{z} \quad (3)$$

where z denotes the largest profit of a lottery, there are RM10, RM20 and RM30 respectively. Next, we need to find the value of median of the certainty equivalence for each lottery by using the below formula:

$$Median = \frac{\sum_1^N CE/_Z}{N} \quad (4)$$

where $\sum_1^N CE/_Z$ denotes the certainty equivalence divided by the largest profit of a lottery for all the respondents and N denotes the total respondents of the survey. We calculate the median of the certainty equivalence of male and female for every lottery. Then, we insert all the median and probabilities (0.05, 0.20, 0.50, 0.80 and 0.95) to predict y-hat and plot the median and y-hat to draw the probability weighting function graph.

Tvesky & Kahneman (1992) proposed the following one-parameter which used for the probability weighting function w(p). We derived w(p) from the following equation:

$$log \frac{w(p)}{1 - w(p)} = \gamma \ log \frac{p}{1 - p} + \log \delta \quad (5)$$

Solving for w(p) we get:

$$w(p) = \frac{\delta p^{p\gamma}}{\delta p^{\gamma} + (1-\text{p})^{\gamma}} \quad (6)$$

We call the functional form in equation (6) "linear in log odds". The probability weighing function has an inverted S-shape – first concave when the probability is small and convex when the probability is large. We use non-linear least square to estimate parameters for the functions which are gamma (γ) and delta (δ), where γ parameter controls curvature (slope) and δ parameter controls elevation (intercept). The weighting function is constrained at the end points [w(0)=0 and w(1)=1].

The smaller the value of γ, the more curved the $w(p)$ curve which is flatter in the range of medium probabilities and steeper near the end probabilities. The variable γ reflects a subject's responsiveness to changes in probability. The smaller the γ, the subject is less responsive to the changes in probability. The greater the value of δ, the more elevated the curve and vice versa.

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After that, to test the significant of the results of fourfold pattern of risk attitudes, we run the Wilcoxon signed-rank test. First of all, we calculate the mean CE of CE > EP for risk seeking and CE < EP for risk averse. The formula to calculate mean CE is as follow:

$$Mean\ CE = \frac{\sum_1^R CE}{R} \quad (7)$$

where $\sum_1^R CE$ denotes the CE for the larger group of respondents either risk seeking (CE > EP) or risk averse (CE < EP) and R denotes the number of larger group respondents for the respective lotteries. Then, we run the signed-rank test for mean CE of male equals to mean CE of female to test the significant between male and female.

After test for the fourfold pattern of risk attitudes, we now discuss the second component of the model which we used it in our study, which is the value function (v).

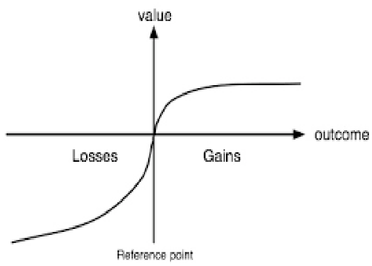

Figure 3.1 Value function curve

The value function captures how a particular loss compares with a gain of the same magnitude. The curvature (slope) of value function is determined by how subjects value payoff for a similar lottery probability in the gain and loss domain. First, we compare the ratio CE gain/ CE loss to illustrated the difference of CE in gain and in loss with a symmetric payoff while holding the lottery probability constant. For example, L1 vs L16 means comparing lottery 1 (0.05, 10; 0.95, 0) and lottery 16 (0.05, -10; 0.95, 0). Male CE for lottery 1 is 2.25 and lottery 16 is -1.25, the ratio is 2.25/-1.25 = 1.8. The higher the value of the ratio reflects requiring higher value of gain to compensate the loss. In other words, the higher the value of ratio, it reflect greater sensitivity to loss than gain and the curvature of the value function for loss is steeper whereas for gain is flatter.

3.5 *Research Hypotheses*

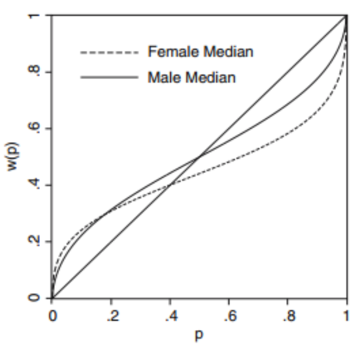

Figure 3.2 Gain Domain

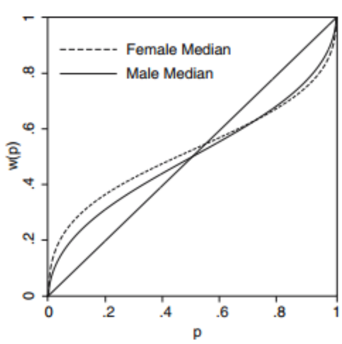

Figure 3.3 Loss Domain

(Source: Helga Fehr-Duda et al., 2006)

H1 : When the probability is low in gain domain, men will be risk seeking than women.

H2 : When the probability is high in gain domain, women will be risk averse than men.

H3 : When the probability is low in loss domain, women will be risk averse than men.

H4 : When the probability is high in loss domain, men will be risk seeking than women.

4. Results

We used fourfold pattern of risk attitudes, probability weighting function and value function in the Prospect Theory to test whether men and women evaluate probability differently under risky prospects. We used fourfold pattern of risk attitudes (Tversky & Kahneman, 1992) to explain the inequality between certainty equivalent (CE) and expected payoff (EP) for the risky prospects (i.e. either gain or loss).

Table 4.1 shows the number of subjects who were risk seeking (CE > EP) or risk averse (CE < EP) for low probability (i.e. p=0.05 and p=0.2), medium p=0.5 and high probability (i.e. p=0.8 and p=0.95) in both gain and loss domains. We estimated the degree of risk behaviour of male and female subjects according to the stated CE and mean CE. When CE > EP (CE < EP), the subjects were categorized as risk seeking (risk averse). The higher (lower) the CE, the higher the risk seeking (risk averse) behaviour. From Table 4.1, when p=0.05 and p=0.2 in the gain domain, both genders displayed risk seeking behaviour. In order to identify both genders are risk seeking when probabilities are small, we run a Wilcoxon signed-rank test between the CE > EP and CE < EP with all the lotteries for male and female subjects. The result shows that male subjects are significantly risk seeking when probabilities are small (i.e. lottery 1, z-value = 3.736, p-value = 0.0002). Female subjects are significantly risk seeking when probability = 0.05 and probability = 0.2 (i.e. lottery 2, z-value = 3.204, p-value = 0.0014). For p=0.8 and p=0.95, both genders displayed risk averse behaviour in the gain domain. Male subjects were significantly risk averse when probability more than 0.8 (i.e. lottery 15, z-value = 5.936, p-value = 0.0000). Female subjects were significantly risk averse when probabilities are large (i.e. lottery 15, z-value = 4.520, p-value = 0.0000).

Besides, we also identify whether male subjects are more risk seeking than females. First of all, we calculated the mean CE of males and females from L1 to L30. After that, we run the Wilcoxon signed-rank test for $\sum$ mean CE for male = $\sum$ mean CE for female. In the gain domain for low probability (i.e. p=0.05, and p=0.2), the result from the signed-rank test was z-value = 1.992, p-value = 0.0464, indicated that male subjects were risk seeking than female subjects significantly below 5%. In the gain domain for high probability (i.e. p=0.8, and p=0.95), the result from the signed-rank test was z-value = 2.201, p-value = 0.0277, indicated that female subjects were risk averse than male subjects significantly below 5%.

In the loss domain, both genders displayed risk averse when probabilities are small. Male subjects are significantly risk averse when p=0.05 and p=0.2 (i.e. lottery 16, z-value = 4.855, p-value = 0.0000). Female subjects are significantly risk averse when probabilities are small (i.e. lottery 18, z-value =3.846, p-value = 0.0001). For p=0.8 and p=0.95 in loss domain, both genders were significantly risk seeking (i.e. male, lottery 30, z-value = 4.084, p-value = 0.0000) and (i.e. female, lottery 25, z-value = 4.982, p-value = 0.0000).

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On the other hand, we also identify whether female subjects are more risk averse than males in loss domain, we compared the mean CE for male and female. In the loss domain for low probability (i.e. p=0.05 and p=0.2), the result from the signed-rank test was z-value = 2.201, p-value = 0.0277, indicated that female subjects were risk averse than male subjects significantly below 5%. In the loss domain for high probability (i.e. p=0.8, and p=0.95), the result from the signed-rank test was z-value = 1.363, p-value = 0.1730, indicated that male subjects were not significantly risk seeking than female subjects.

Therefore, the results indicated that male subjects were risk seeking than female subjects (for low probabilities) and female subjects were risk averse than male subjects (for high probabilities) in the gain domain. In the loss domain, female subjects were risk averse than male subjects (for low probabilities) and female subjects were slightly risk seeking than male subjects (for high probabilities). This may suggest that both genders evaluated the probability of gain and loss differently.

Table 4.1 Number of risk seeking and risk averse subjects and certainty equivalent according to gender

	Male				Female			
C1 The Gain Domain	C2 CE > EP	C3 CE = EP	C4 CE < EP	C5 Mean CE	C6 CE > EP	C7 CE = EP	C8 CE < EP	C9 Mean CE
p = 0.05								
L1 (0.05, 10 ; 0.95, 0)	126**	0	18	2.587	123**	0	22	2.604
L2 (0.05, 20 ; 0.95, 0)	131**	0	13	5.221	132**	0	13	5.091
L3 (0.05, 30 ; 0.95, 0)	130**	0	14	7.765	134**	0	11	7.629
p = 0.20								
L4 (0.20, 10 ; 0.80, 0)	130**	0	14	3.719	123**	0	22	3.652
L5 (0.20, 20 ; 0.80, 0)	135**	0	9	7.663	128**	0	17	7.125
L6 (0.20, 30 ; 0.80, 0)	128**	0	16	11.297	120**	0	25	10.625
p= 0.50								
L7 (0.50, 10 ; 0.50, 0)	86**	0	58	8.545	62	0	83*	8.509
L8 (0.50, 20 ; 0.50, 0)	89**	0	55	16.854	59	0	86*	16.291
L9 (0.50, 30 ; 0.50, 0)	84**	0	60	26.518	63	0	82*	25.628
p= 0.80								

L10 (0.80, 10 ; 0.20, 0)	48	0	96*	6.809	23	0	122*	6.643
L11 (0.80, 20 ; 0.20, 0)	42	0	102*	13.873	20	0	125*	13.02
L12 (0.80, 30 ; 0.20, 0)	50	0	94*	20.234	28	0	117*	18.673
p= 0.95								
L13 (0.95, 10 ; 0.05, 0)	41	0	103*	8.573	23	0	122*	8.258
L14 (0.95, 20 ; 0.05, 0)	32	0	112*	17.054	20	0	125*	16.388
L15 (0.95, 30 ; 0.05, 0)	44	0	100*	25.41	26	0	119*	24.511

	Male				Female			
C1 The Loss Domain	C2 CE > EP	C3 CE = EP	C4 CE < EP	C5 Mean CE	C6 CE > EP	C7 CE = EP	C8 CE < EP	C9 Mean CE
p = 0.05								
L16 (0.05, -10 ; 0.95, 0)	30	0	114*	-1.899	29	0	116*	-2.256
L17 (0.05, -20 ; 0.95, 0)	26	0	118*	-3.932	24	0	121*	-4.491
L18 (0.05, -30 ; 0.95, 0)	23	0	121*	-5.739	19	0	126*	-6.738
p = 0.20								
L19 (0.20, -10 ; 0.80, 0)	34	0	110*	-3.227	31	0	114*	-3.338
L20 (0.20, -20 ; 0.80, 0)	29	0	115*	-6.356	29	0	116*	-6.888
L21 (0.20, -30 ; 0.80, 0)	34	0	110*	-10.133	33	0	112*	-10.62
p= 0.50								
L22 (0.50, -10 ; 0.50, 0)	95**	0	49	-6.889	94**	0	51	-7.108
L23 (0.50, -20 ; 0.50, 0)	79**	0	65	-17.342	73**	0	72	-18.938
L24 (0.50, -30 ; 0.50, 0)	77**	0	67	-26.805	71**	0	74	-29.746
p= 0.80								
L25 (0.80, -10 ; 0.20, 0)	109**	0	35	-6.536	113**	0	32	-6.624
L26 (0.80, -20 ; 0.20, 0)	105**	0	39	-13.405	115**	0	30	-13.613

L27 (0.80, -30 ; 0.20, 0)	102**	0	42	-20.044	109**	0	36	-20.222
p= 0.95								
L28 (0.95, -10 ; 0.05, 0)	126**	0	18	-8.542	133**	0	12	-8.477
L29 (0.95, -20 ; 0.05, 0)	124**	0	20	-16.911	132**	0	13	-16.769
L30 (0.95, -30 ; 0.05, 0)	123**	0	21	-25.299	122**	0	23	-25.451

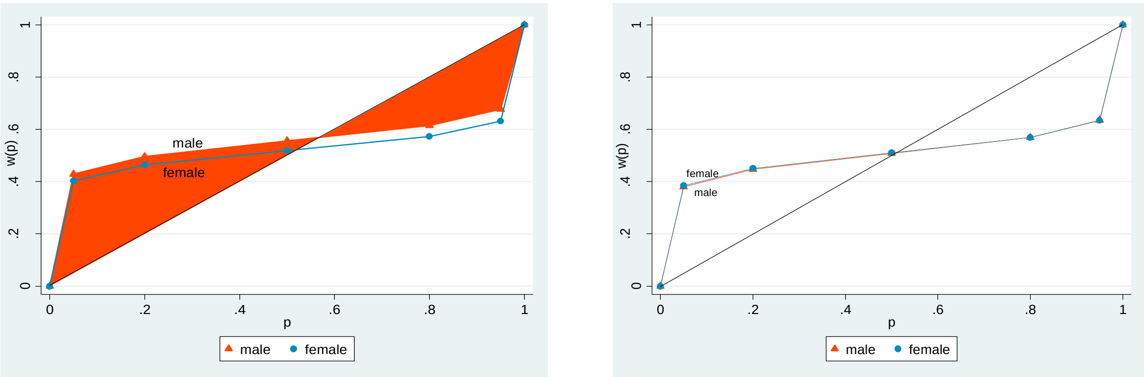

Figure 4.1 The probability weighting function in both genders in gain domain (left panel) and loss domain (right panel)

We estimated the probability weighting function w(p) based on the median CE from male and female subjects. Subjects are risk seeking if the function lies above the diagonal line in gain domain (left panel) and below the diagonal line in loss domain (right panel). Subjects are risk averse if the function lies below the diagonal line in left panel and above the diagonal line in right panel. The probability weighting function is inverse-S-shaped due to people overweight small probability (when w(p) is above the diagonal line) and underweight large probability (when w(p) is below the diagonal line).

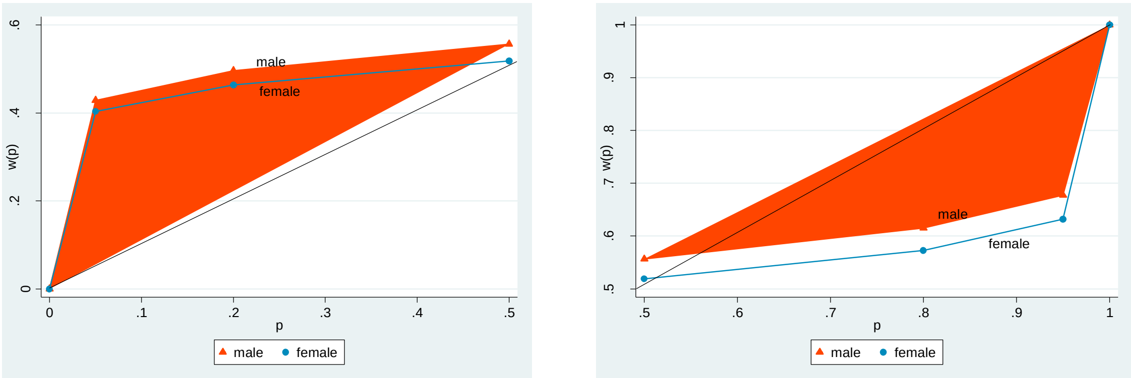

Figure 4.2 The probability weighting function in gain domain is broken down into two graph; (left panel with the probability 5%, 20% and 50%) and (right panel with the probability 50%, 80% and 95%)

Figure 4.2 shows the probability weighting function for both genders in gain domain which is enlarged and broken into two graphs. The triangle dot denote male and circle dot denote female. In the left panel, the w(p) function lies above the diagonal line. When p=0.2, both genders perceived to have 4% chance of winning the lottery. Therefore, both genders overweight the small probabilities and become risk seeking. The result shows that male subjects were risk seeking than female subjects which the triangle dot line is on top of the circle dot line in the left panel. But for the right panel, the w(p) function lies below the diagonal line. When p=0.8, both genders perceived to have 6.5% chance of winning the lottery. The result shows that both genders underweight the high probabilities and female subjects were risk averse than male subjects which the circle dot line is below the triangle dot line in the right panel.

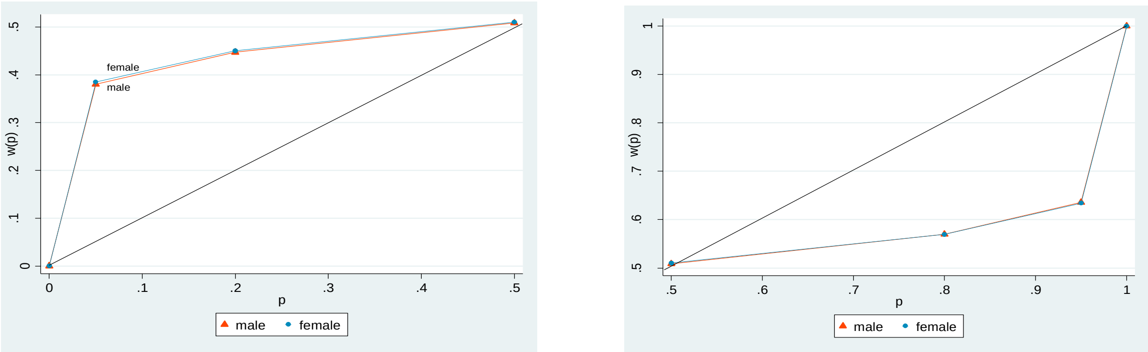

Figure 4.3 The probability weighting function in loss domain is broken down in two graph; (left panel with the probability 5%, 20% and 50%) and (right panel with the probability 50%, 80% and 95%)

In loss domain (Figure 4.3), the triangle dot denote male and circle dot denote female. In loss domain, both genders overweight small probabilities. When p=0.05, they perceived to have 3.5% chance of losing the lottery. Therefore, the result shows that female subjects were risk averse than male subjects. The circle dot line is slightly lies above the triangle dot line in left panel. But, both genders were no difference in loss domain when probability was high in the right panel. Therefore, female subjects were exhibited as risk seeking as male subjects when having higher chance of losing a lottery.

Therefore, the weighting function conforms to the fourfold risk pattern observed in Table 4.1 above. Female subjects were risk averse than males in the lotteries for which both genders were risk averse in gain domain. In the loss domain, the results from weighing function and fourfold pattern of risk is different, which is both genders are equally risk seeking when the probability is high in the loss domain as shown in Figure 4.3 right panel. We next turn to how subjects evaluate lottery payoff.

Table 4.2 Test of value function

	CE gain / CE loss			CE gain / CE loss	
	Male	Female		Male	Female
L1 vs L16	1.8	1.17	L9 vs L24	1.11	0.9
L2 vs L17	1.29	1	L10 vs L25	1.07	1
L3 vs L18	1.29	1.29	L11 vs L26	1	1

L4 vs L19	1.18	1.18	L12 vs L27	1.07	1
L5 vs L20	1.36	1.18	L13 vs L28	1.06	1
L6 vs L21	1.18	1.18	L14 vs L29	1	1
L7 vs L22	1.11	1	L15 vs L30	1	0.95
L8 vs L23	1.11	1			

The ratio CE gain / CE loss in the above table illustrates the difference of CE in gain and in loss with symmetric payoff. For example, L1 vs L16 denotes the comparison between lottery 1 (0.05, 10; 0.95, 0) and lottery 16 (0.05, -10; 0.95, 0). Male CE for lottery 1 is 2.25 and lottery 16 is -1.25, the ratio is 2.25/-1.25 = 1.8. The higher the value of the ratio indicates that more gain is required to compensate for the loss incurred.

Table 4.2 above provides information about how the respondents of males and females valued the payoff of each lottery in the gain and loss domains. The L1 to L15 represent the lotteries for gain domain whereas L16 to L30 represent the lotteries for loss domain. The curvature of the value function depends on the difference between how subjects value payoff for a similar lottery in the gain and loss domains.

Referring to the above Table 4.2, the columns compare the CE for a lottery with a symmetric payoff while holding the lottery probability constant. For example, L1 vs L16 means comparing lottery 1 (0.05, 10; 0.95, 0) and lottery 16 (0.05, -10; 0.95, 0). When comparing the value function for gain domains and loss domains, it is obvious that the curvature for loss domains is steeper than in gain domain. It is because most of the lotteries with symmetric payoff showed ratio of CE gain/ CE loss that are larger than value of 1. This means that the subjects showed greater sensitivity to loss as they need more gain to compensate for loss. For example, if the value of CE gain/ CE loss for L5 vs L20 is equals to 1.36, it means that RM 1.36 gain is needed to compensate for RM 1 in loss.

In comparing male and female subjects, it is clear that male subjects showed marginally greater sensitivity to loss than gain in some of the lotteries (for lotteries 2 vs 17, 3 vs 18 and 5 vs 20). The curvature of the value function for female subjects did not reflect greater sensitivity to loss than gain in all the lotteries.

5. Conclusion

This research has examined the gender differences in weighing probability and payoff under risky prospects. We found that women were more sensitive to the probability of an event than men. When the chance of winning a lottery is low, men were more optimistic than women, thus they are considered risk seeking than women. When the chance becomes medium or large, women became more careful and pessimistic of the lottery outcomes, thus they are risk averse than men. On the other hand, when the chance of losing a lottery is low, women were more pessimistic than men, thus they are considered risk averse than men. When the chance becomes medium or large, men were more optimistic of the lottery outcomes, thus they are risk seeking than women.

According to the research results, H1, H2 and H3 are accepted and H4 is rejected. The results from this research had matched the theory as mentioned by Tversky & Kahneman (1992), which is the fourfold pattern of risk attitudes. H1 is accepted because men perceived the chances of winning the lottery is higher than women, so they are risk seeking than women. Besides that, H2 is accepted because women perceived the chances of winning the lottery is lower than men and became risk averse. H3 is also accepted because women perceived to have higher chances of losing the lottery than men and became risk averse. Lastly, H4 is rejected because women were exhibited as risk seeking as men. This is because both of them perceived to have low chance of losing the lotteries.

From the overall results, we found that gender differences have an effect on financial decisions. In general, women uncover lower tolerance of financial risks; they approach financial decisions in a more conservative way as compared to men in this research. Thus, we can conclude that women show an inclination towards being more risk averse than men.

The findings of this research are very important as it may contribute more information to the field of finance such as stocks market. The results of this study can assist financial practitioners in financial sectors to better understand their clients' attitudes toward money and investment.

As we know that women are more risk averse than men in financial decision making, they often invest in low return investments such as the fixed deposits, this may not enough for their future retirement spending. Therefore to aid women improving their financial status, financial companies could provide more information of their financial products to women so that they can differentiate between the low/high risk investments and thus encouraging them to invest in higher return investments. In other words, women should reframing risk as an opportunity to succeed rather than a path to failure.

Moreover, men often possess higher position than women in companies; this is mainly because women are perceived to be less able to make risky decisions. Thus, as knowledge helps one to be confident, women should be educated that taking risks are also a great opportunity to stand out and to present themselves as the leaders.

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