

CHAPTER VI

RESULTS OF THE STUDY

The previous chapter already illustrated how the questionnaire is created and the risk tolerance and consistency measure are assessed; in this chapter the results which based on the responsive created questionnaire are shown.

6.1 The implied risk tolerance and consistency measure values.

The results acquired from the replied questionnaire are the implied risk tolerance (RT) and consistency measure (CM) values. The implied risk tolerance is assessed by fitting an exponential utility curve of each respondent by using the nonlinear regression technique. It indicates the degree of risk aversion of a decision maker. The consistency measure values also imply the relative consistency by each sample in terms of financial risk-taking across the set of 12 projects presented in the questionnaire.

6.1.1 Results of Group A

Table 6.1: The values of RT and CM of GROUP A¹.

Name	RT (\$MM)	CM
A1. Sr. Manager	15	0.27
A2. Sr. Manager	15	0.48
A3. Sr. Manager	10	0.34
A4. Manager	17	0.46
A5. Manager	18	0.57
A6. Manager	36	0.70

¹For the questionnaire of group A, see APPENDIX A page 59.

Table 6.1: The values of RT and CM of GROUP A (continued).

Name	RT (\$MM)	CM
A7. Manager	56	0.61
A8. Manager	38	0.69
A9. Manager	50	0.62
A10. Manager	26	0.42

6.1.2 Interpretation of results of group A

Group of Sr. Managers

In term of RT, there are relatively small differences of RT value among this group. A1 (RT = 15 MM\$) and A2 (RT = 15 MM\$) have the same RT which is higher than A3 (RT = 10 MM\$). This indicates that A1 and A2 have less degree of risk aversion than A3. When facing with the risky project, A1 and A2 will tend to invest in this risky project in higher % working interest than A3 since they are less risk averse than A3.

In term of consistency measure, A1 (CM = 0.27) has the lowest CM indicates that A1 is more consistent with his risk taking across 12 projects than A2 (CM = 0.48) and A3 (CM = 0.34). While A3 has the greatest CM, indicates that he has low consistency in risk taking when compare with others. Besides the consistency in risk taking, the CM value can also determine the reliable of RT value of each person.

Group of Managers

There are various RT values among the group of managers. A7 (RT = 56 MM\$) has the highest RT, indicates that A7 will tend to participate in the project contains high loss whereas the others will deny in that project or he will tend to participate in higher %WI in the project contains high loss than any others. A4 (RT = 17 MM\$) have the lowest RT, he is much more risk averse than A7. A4 will tend to avoid to participate in the risky project contains high loss.

The consistency measure of this group is relatively small differences. A5 (CM = 0.57), A6 (CM = 0.70), A7 (CM = 0.61), A8 (CM = 0.69) and A9 (CM = 0.62) are the group of high CM when compare with others indicates high inconsistency in

their risk taking. While the rest have lower CM indicates they are more consistent in financial risk taking than A5, 6, 7, 8 and 9.

If we compare the results between the group of senior managers and managers, we found that the risk tolerance of managers is higher than those of senior managers but in term of consistency measure, the group of senior managers is apparently better consistent in decision making under risk and uncertainty than the group of managers. This can be resulted from that the group of senior managers has more working experienced background than managers; they may face with the situations to make a decision many times in their normal working, so this can cause the group of senior managers makes a good consistent decision. Moreover, the risk tolerance of senior managers is relative close together while the group of managers show various risk tolerance values. We can infer from the more consistent behavior of the senior managers and their relative small risk tolerance value within their group, that the risk tolerance of senior managers is more reliable and may be in the range between 10 – 15 million dollars. And the group of managers can be considered that they are too risky in decision making, therefore when they are promoted to higher management level, they should modify their high risk taking attitude. This can be an important thing of the firm because the managers are adopted too high risk taking; they can cause the company in risky condition in the case they are promoted to higher management level. Therefore, this group of managers should be educated or trained to understand more on the decision making under risk in order to reduce their risk tolerance into the appropriate level as the senior managers should be as well as improve their consistent decision making

6.1.3 Results of Group B

Table 6.2: The values of RT and CM of GROUP B².

Name	RT(\$MM)	CM
B1. Sr. Analyst	31	0.37
B2. Commercial Analyst	38	0.54
B3. Commercial Analyst	38	0.50
B4. Commercial Analyst	97	0.38
B5. Commercial Analyst	86	0.37
B6. Coordinator Project	53	0.30
B7. Coordinator Project	45	0.47
B8. Coordinator Project	50	0.59
B9. Coordinator Project	68	0.49
B10. Engineer	45	0.68
B11. Engineer	52	0.64
B12. Engineer	47	0.70
B13. Engineer	82	0.73

6.1.4 Interpretation of results of group B.

Group of analysts: B1, B2, B3, B4 and B5

There are two analysts with apparent high RT, B4 (RT = 97 MM\$) and B5 (RT = 86 MM\$). These two analysts participated 100 %WI in the high ranking EMV prospects, this causes high RT value. We can say that they made a decision based on the EMV concept. In term of RT assessing, we would like the samples to incorporate the risk attitude into their decision making, so the RT of these two analyst may not represent their truly risk tolerance since they made a decision based on EMV.

²For the questionnaire of group B, see APPENDIX A page 60.

Other analysts, B2 (RT = 38 MM\$) and B3 (RT = 38 MM\$) have the same RT indicates that they have the same degree of risk aversion. They will tend to participate in the risky project with the same working interest while B1 (RT = 31 MM\$) who are more risk averse will participate in lower participation than B2 and B3.

In term of consistency measure, B2 (CM = 0.54) and B3 (CM = 0.50) have higher CM than B1 (CM = 0.37), B4 (CM = 0.38) and B5 (CM = 0.37); indicating that these two analysts is less consistency than others. B4 and B5 as stated above, making a decision based on EMV this causes the CM of them is quite close together. B1 is very consistent in risk taking since his CM is the lowest when compare with others.

Group of coordinators: B6, B7, B8 and B9

B9 (RT = 68 MM\$) displays high dominant RT indicating that he is less risk aversion than anyone while B7 (RT = 45 MM\$) has the lowest RT; he is more risk averse than anyone. However, the RT of this group is not much different. B6 (RT = 53 MM\$) and B8 (RT = 50 MM\$) have a vicinity RT, according to their RT, they are less risk averse than B7 but more risk averse when compare with B9 (RT = 68 MM\$). B9 is more willing to take high risk than others. He will take higher participation level in the project contains high loss than anyone.

In term of consistency measure, B6 (CM = 0.30) is very consistent in risk taking when compare with others because his CM is the smallest. We can see that even though B6 and B8 (CM = 0.59) have closely R1 value but the CM of B8 is higher. This indicates that B8 is very inconsistent and this also implies that the RT of B6 is more reliable than B8 since he made a decision in a steady manner than B8. B7 (CM = 0.47) and B9 (CM = 0.49) have closely CM indicates that they are less consistent in risk taking than B6 but more consistent than B8.

Group of engineers: B10, B11, B12 and B13

The group of engineers shows a closely RT value among each others except B13 (RT = 82 MM\$) who has eminent RT. So, B13 is much less risk averse than his friends; B10 (RT = 45 MM\$), B11 (RT = 52 MM\$) and B12 (RT = 47 MM\$), whose RT is relatively close together. B13 is more willing to take larger risk than anyone. In other word, B13 will tend to select or participate in the project contains high large loss while the others will not.

In term of consistency measure, this group also shows a relative closely CM among each other. However, B11 (CM = 0.64) exhibits high consistency in risk

taking than others whereas B13 (CM = 0.73) is the least consistent in risk taking among others. It is noted that B13 has strange values of RT and CM; his RT and CM are very high when comparing with others in the group or even other groups, this is because he is a young engineer therefore low working experiences. So this causes his RT and CM is very high when comparing with others. Because of his young and lacking of the knowledge in decision making under risk and uncertainty, he will tend to make a decision based on his own mind instead of thinking in term of the corporate.

If we compare the results of group B, we found that the group of analysts makes a good consistent decision under risk than other groups, except one thing that there are two analysts who adopt EMV concept. The risk tolerance of the group of coordinators and engineers is relatively small differences however the group of coordinators makes better consistent decision than the group of engineers. Since the group of engineers is less consistent in risky decision than other groups, this can be resulted from that they are a childish engineer, less working experiences and lack of the knowledge in decision making under condition of risk when compare with others. Therefore when they make a decision they may tend to make a decision based on their own way without considering the outcome that might results.

In order to determine the managerial potentiality of this group, we utilize both RT and CM terms. However, the CM is much more important consideration since the RT may change from day to day according to many factors such as financial environment, budget. Among the group of analysts, B1 has a potential to be trained to be a good manager since he made a good steady decision when compare with others. For the group of coordinator, B6 is the most interesting person to be trained to be a good manager. He is less risk averse and very consistent in risk taking than any others. For the group of engineers, B11 is the most likely to be trained to be a manager in future because he is more consistent in risk taking than anyone in the group. However, B10 and B12 are likely to be trained as well as B11 since their RT and CM are not too different from B11. B13 has the least potentiality to be trained to higher management position since his RT and CM is very high when comparing with others. Actually, he should be educated to understand the decision making under risk and modifying his RT and CM into a proper level.

So far the result and its interpretations are described, the next section presents of how RT that we have thrown an attempt to assess is used.

6.2 Implication of observed RT

From the theory explained in chapter III, RT is not the final result since it is only one parameter in the exponential utility function. The RT is denoted as the degree of risk aversion or the degree of curvature of the exponential utility curve. By obtaining RT, the utility curve of a risk – averse preference of individual can be drawn. After we acquire the utility curve, we can use it as a tool to calculate an expected utility value (EU) for a decision alternative in the same manner that we calculate EMV. In this section the implication of RT that we have studied so far is illustrate. The sample A4 (RT = 17 MM\$) and A7 (RT = 56 MM\$) whose RT are quite different are an example to display how the RT affects the selecting of an investment project. Considering sample A4 and A7 whose RT equal 17 and 56 millions dollars, if there are two risk options as in Table 6.3.

Table 6.3: Expected value of two projects.

Prospect A		Prospect B	
Probability	NPV (MMS)	Probability	NPV (MMS)
0.80	100	0.75	50
0.20	-20	0.25	-5
EMV	76	EMV	36.25

From the utility curve of A4 and A7 as shown in Figure 6.1 and 6.2, the utility value of the dollars payoffs is calculated as follow:

$$A4: \quad U(\$100 \text{ MM}) = 0.9972, \quad U(\$ -20 \text{ MM}) = -2.2430,$$

$$U(\$50 \text{ MM}) = 0.9472, \quad U(\$ -5 \text{ MM}) = -0.3419$$

$$A7: \quad U(\$100 \text{ MM}) = 0.8323, \quad U(\$ -20 \text{ MM}) = -0.4292,$$

$$U(\$50 \text{ MM}) = 0.5905, \quad U(\$ -5 \text{ MM}) = -0.0934$$

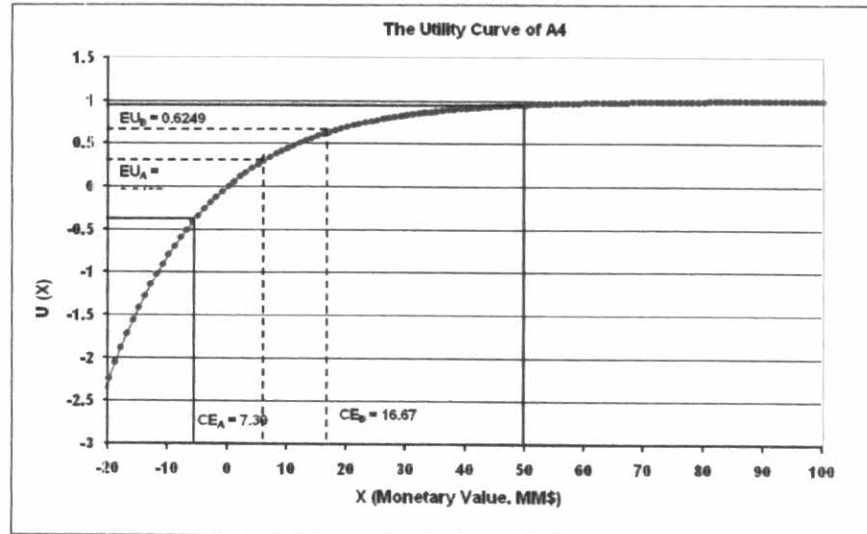


Figure 6.1: The utility curve of A4.

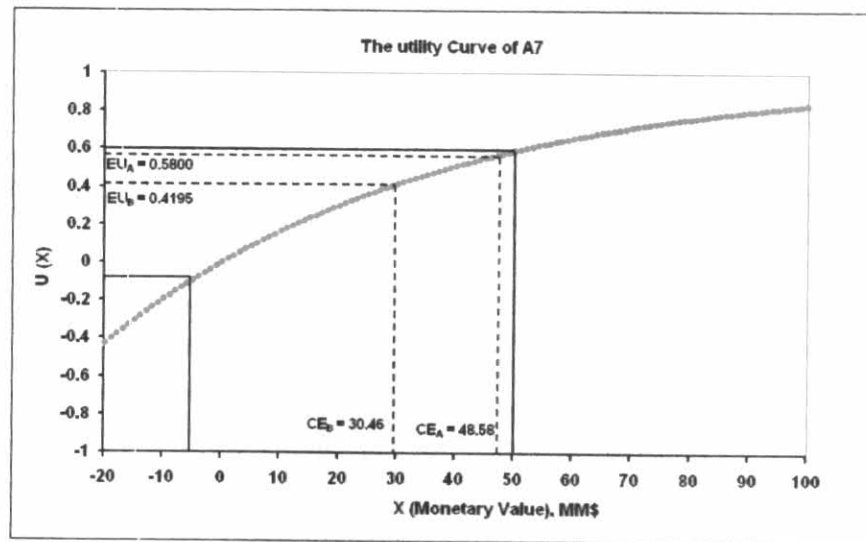


Figure 6.2: The utility curve of A7.

The expected utility (EU) for each project is calculated as

$$\text{A4: } EU_A = (0.70)(0.9972) + (0.30)(-1.4167) = 0.3492$$

$$EU_B = (0.75)(0.9472) + (0.25)(-0.3419) = 0.6249$$

$$\text{A7: } EU_A = (0.70)(0.8323) + (0.30)(-0.3072) = 0.5800$$

$$EU_B = (0.75)(0.5905) + (0.25)(-0.0934) = 0.4195$$

From the utility curve, we can determine the CE of each project as

$$\text{A4: } CE_A = 7.30$$

$$CE_B = 16.67$$

$$\text{A7: } CE_A = 48.58$$

$$CE_B = 30.46$$

From these two projects, the person who is based on the EMV concept should select project A. But it can be seen that, based on the risk tolerance of each person, A4 prefers project B since his $EU_B > EU_A$ and $CE_B > CE_A$ whereas A7 prefers project A since his EU and CE of project A higher than project A.

However, this is only the demonstration of the implication of risk tolerance value. From these observed RT values of A4 and A7 we can only predict that which project they tend to select based on their observed RT. However, in the real situation if we truly present those projects to them, they may not select the project as indicated above. It may be because they change their risk tolerance. However, it is very challenging that if this case is truly proved.

This example already illustrates the use of RT; if we know the utility curve of a person we can use it to determine the preferred project that corresponds to the decision maker's risk preference. The project with the greatest EU or CE is the most desired project, so if there is various risk options present to the decision maker, they can adopt the utility curve to determine the preferred project. Unlike the EMV concept, the EU and certainty equivalent valuations make a clear distinct between the projects, based on the risk preference of the decision maker. And it is evident from this example that the person with different risk tolerance leads to a different decision making. It can be seen that A4 and A7 who take charge in the same working level make a different decision based on their risk preference.

In this chapter the results of RT and CM of all respondents are shown and discussed. Moreover, the use of RT which is the parameter that we assessed is illustrated. The next chapter presents the discussions and conclusions of this study.