

# RISK AND LOSS AVERSE: HOW ENTREPRENEURIAL INTENTION OCCUR

**Irine Herdjiono, Musamus University, Indonesia**  
**Gerzon Maulany, Musamus University, Indonesia**  
**Benediktus Elnath Aldy, Atmajaya, Jakarta, Indonesia**  
**Fitriani, Musamus University, Indonesia**

## ABSTRACT

*Entrepreneur is professions which always faces uncertainty and risks when make decision. This study was aimed to determine how risk averse and loss averse influence entrepreneurial intention based on Prospect Theory, which an influential decision making perspective. The method was experimental method which was selected because it can provide specific illustration on individual behavior. Risk averse and loss averse were determined by two games. In each of the participants faced nine decisions and a number of questions to identify entrepreneurial intention. The research result showed that risk averse and loss averse influence entrepreneurial intention. This study implied that as future entrepreneurs, students should try business opportunities which have low risks they can handle. Selection of opportunity with low alternative should be done because risk behavior can be controlled by more knowledge and experience.*

**Keywords:** Entrepreneurial intention, Risk averse, Loss averse.

**JEL:** A10, A22.

## INTRODUCTION

Entrepreneurship in Indonesia need to develop. Indonesia is in 90th position of 137 countries in Global Entrepreneurship Index in 2017 and 16th position of 24 countries in Asia Pasific Region. Risk acceptance is one of 14 aspects that support valuation of entrepreneurship index. Decisions made by individuals are affected by personal aspects such as risk (Guiso & Paiella, 2015). Decision to be entrepreneur is also determined by personal aspects. The personal aspects of entrepreneurs in developing countries include high energy, internal locus of control and daring to take risk (Thomas & Mueller, 2000).

Factors that affect entrepreneurship intention are individual attitudes (Potishuk & Kratzer, 2017), family environment (Herdjiono et al., 2017; Ozarali & Rivenburg, 2016), self concept (Nga & Shanmuganathan, 2010), motivation (Tyszka et al., 2011). Krueger (2009) suggest to improve understanding about intention should explore theory and models relate to how decision making occur. This lead to linking intention with prospect theory.

Entrepreneurs will always have to make decisions about something risky. Decisions made by entrepreneurs include how to allocate assets, whether to seize opportunity or not. Subjective factors can affect decision making (Chira et al., 2008). These subjective factors will cause bias, affecting decision making.

Entrepreneur and risk are inseparable. An example that risk is related with entrepreneur is graduates choosing to be civil servants than entrepreneurs for fixed income and pension. Risk profile has role on many aspect of entrepreneur like decision become entrepreneur (Cramer et al., 2002), choice of financing (Elston & Audretsch, 2010) and entrepreneurial survival (Caliendo et al., 2010). Risk influence in every entrepreneurial stage of business.

There are inconsistency result about influence risk and loss aversion on entrepreneurship. Hardenbol (2012) finds no difference on risk attitude between students, managers and entrepreneurs but Bengtsson et al. (2012) find entrepreneurs are less risk averse than no entrepreneurs. Zhang and Cain (2017) conclude that risk had no direct relation to entrepreneurial intention. Koudstaal et al. (2016) conclude that entrepreneurs tend to have lower risk aversion and loss averse than employees.

This study had two contributions which were explaining how risk averse and loss averse affected entrepreneurial intention in future entrepreneurs and using experimental method to understand the effects of risk averse and loss averse, as previous studies often use survey method. This study analyzes the role of personal level variables (Fayolle & Linan, 2014) which try to gain better understanding of how decision making occurs (Krueger & Day, 2010). Contribution of this research is fill the new perspective considering rationality bias which in turn can be used to design entrepreneurship education program.

Unlike Zhang and Cain's study (2017) which develops a entrepreneurial intention and risk model using questionnaire with SEM analysis, the present study used experimental approach to observe the direct effects of risk and entrepreneurial intention. The approach to determine one's risk averse and loss averse doesn't use questionnaire as Yurtkorua et al. (2014). Yurtkorua et al. (2014) pose some questions to identify risk but the questions aren't directly related to financial decision. The advantage of experimental method by money game is more able to show one's decision making. The present study also added feedback aspect as a factor to reinforce the effect of risk aversion on entrepreneurial intention.

Studies on the relation between loss aversion and decision to be entrepreneur are limited (Morgan & Sisak, 2015). Morgan and Sisak (2015) shows a model of relation between loss averse and decision to be entrepreneur. The study of Koudstaal et al. (2016) has important contribution to the difference between loss aversion of entrepreneurs and managers. The present study was a relatively new study which tried to prove the relation between loss and risk aversion and entrepreneurial intention using experimental method.

## LITERATURE

### **Risk Averse and Entrepreneurial Intention**

Decision to join a profession starts with interest (Lee & Wong, 2004). Some of the aspects to be faced by entrepreneurs are uncertainty and risk. The result of Mitchelmore and Rowley (2013) shows that there are four competences entrepreneurs must have, i.e. (1) personal and relationship competencies; (2) business and management competencies; (3) entrepreneurial competencies; and (4) human relations competencies. Daring to take risk is one of entrepreneurial competencies.

Uncertainty and risk are often found by entrepreneurs when they see an opportunity (Holmes et al., 2008). Knight (1921) states that there is fundamental difference between risk and uncertainty. Risk is one's willingness to sacrifice something to get uncertain result whose

probability for success or failure is known. In uncertainty, the probability and possible result are unknown (Ker et al., 2014)

Avoiding uncertainty is closely related with fear of failure and tendency to avoid competition can inhibit entrepreneurs. Baughn and Neupert (2003), Sandhu et al. (2010) conclude that the biggest obstacles for Malaysian graduates in entrepreneurship are lack of network, limited capital and risk aversion. Needs for financial certainty lower entrepreneurial intention (Gelderen et al., 2008).

According to prospect theory (Kahneman & Tversky, 1979), in uncertain situation, individual exhibit risk seeking to avoid a sure loss and risk averse to get a sure gain and framing influences decision making. Some studies conclude that there is positive relation between risk attitudes and decision to be entrepreneur (Cramer et al., 2002; Caliend et al., 2009). McGrath et al. (1992) conclude that entrepreneurs have low tendency to avoid uncertain condition. Similar conclusion is produced by Amit and Muller (1993) who state that entrepreneurs' average willingness to take risk is higher than non-entrepreneurs'. Different conclusion revealed by Keh et al. (2002) that find no impact of risk on entrepreneurial decision making.

A study on the relation between risk and interest in entrepreneurship was performed by Yurtkorua et al. (2014). They surveyed 521 students and measured willingness to take risk based on three dimensions of risk which are risk, free from risk, avoiding risk. The conclusion of their study is risk is closely related with entrepreneurial intention, while free from risk and avoiding risk aren't significantly related to entrepreneurial intention. A test of the effect of risk and entrepreneurial intention was also performed by Zhang and Cain (2017). Zhang and Cain (2017) conclude that risk had no direct relation to entrepreneurial intention but risk aversion can reduce entrepreneurial intention through planned behavior. Similar conclusion revealed by Maresch et al. (2016) that frame entrepreneurship in terms of gain doesn't have positive impact of entrepreneurship intention.

Koudstaal et al. (2016) conclude that entrepreneurs tend to have lower risk aversion and loss averse than employees. Landqvist and Stalhandske (2011) state in their studies that difference in risk perceptions of entrepreneurs and employees is caused by entrepreneurs' experiences. Investor's experience will enhance their skill to asses risk. Investor experiences more uncertain situations and situations which demand them to make decisions. A different condition is experienced by employee which prevent them from making decision because they're bound to superiors or shareholders. Based on explanation above, we propose the hypothesis below:

*H1: Risk averse attitude on individual who have entrepreneurship intention differ from individual who doesn't have entrepreneurship intention.*

## **Loss Averse and Entrepreneurial Intention**

Loss and profit are things which will be experienced by entrepreneurs. Being entrepreneurs doesn't only maximize profit but also calculate loss they can bear-affordable loss (Dew et al., 2009). Avoiding loss to gain uncertain outcome is called loss aversion (Koudstaal et al., 2016).

According to prospect theory, uncertain gain is valued lower than certain gain, otherwise certain loss is more pain full than uncertain loss, which could be greater loss occur (Maresch et al, 2016). Kahneman and Tversky (1979) state that emotion due to loss is experienced twice as strongly as emotion when gaining profit. Emotion due to loss makes individual careful and

avoidant (Foo, 2011; Welpé et al., 2012). The contribution of loss averse to entrepreneur is preventing someone from taking opportunity.

Loss aversion isn't constant but affected by some factors. As stated by Johnson et al. (2006), the older one is, the higher the loss aversion; the higher the education, the lower the loss aversion; the higher the income, the higher the loss aversion, and managers and entrepreneurs have lower loss aversion than employees, farmers and students. Based on explanation above, we propose the hypothesis below:

*H2: loss averse attitude on individual who have entrepreneurship intention differ from individual who doesn't have entrepreneurship intention.*

## RESEARCH METHODOLOGY

### Participant

Participants of game are 500 undergraduate students from economy faculty of two university. Participants are selected randomly.

### Variable and Measurement

#### Loss Averse

Loss aversion is avoiding loss to gain uncertain outcome. The measurement of Loss Aversion in the present study was adopted from Koudstaal et al. (2016). Koudstaal et al. (2016) presented two option case to the participants, i.e. risky option and non-risky option. Risky option is option A which is gaining an amount of money with certain probability or losing money with certain probability. Non-risky option is option B which is gaining less money than option A with 100% certainty. Similar scenarios were used by Fehr and Goette (2007) and Gächter et al. (2010). The present study modified it so that before the game began the participants received an amount of money. Participants of risky option (option A) selected ball which would come out. If they were correct, they would receive some money and if wrong, they would loss some money. Non-risky option (option B) was choosing not to make selection and not getting additional money. Nine risky options had different possibilities. The probabilities of the nine questions were. (Table 1)

A participant was categorized as low loss averse if they chose option A more often than option B (Option A > Option B). Conversely, if they chose option B more often than option A, they're categorized as high loss averse. The dummy used for high loss averse was 0 and the dummy used for low risk averse was 1

#### Risk Averse

Risk averse is avoiding risk in uncertain situation to get certain gain. The measurement of risk averse in the present study was modified from Koudstaal et al. (2016). Koudstaal et al. (2016) present two option cases to the participants, i.e. risky and non-risky options. The risky option was option A which was receiving some money with certain probability or not getting anything with certain probability. The non-risky option was option B which was getting less money than option A with 100% certainty (Table 2).

**Table 1**  
**NINE RISKY OPTIONS OF LOSS AVERSE GAME**

| Case No. | Probability | Reward if Correct | Reward if Incorrect |
|----------|-------------|-------------------|---------------------|
| 1.       | 50%         | 100               | -50                 |
| 2.       | 33%         | 300               | -150                |
| 3.       | 25%         | 400               | -200                |
| 4.       | 20%         | 500               | -250                |
| 5.       | 17%         | 600               | -300                |
| 6.       | 14%         | 700               | -350                |
| 7.       | 13%         | 800               | -400                |
| 8.       | 11%         | 900               | -450                |
| 9.       | 10%         | 1,000             | -500                |

**Table 2**  
**NINE RISKY OPTIONS OF RISK AVERSE GAME**

| Case No. | Probability | Reward if Correct | Reward if not making selection |
|----------|-------------|-------------------|--------------------------------|
| 1.       | 50%         | 100               | 10                             |
| 2.       | 33%         | 300               | 10                             |
| 3.       | 25%         | 400               | 10                             |
| 4.       | 20%         | 500               | 10                             |
| 5.       | 17%         | 600               | 10                             |
| 6.       | 14%         | 700               | 10                             |
| 7.       | 13%         | 800               | 10                             |
| 8.       | 11%         | 900               | 10                             |
| 9.       | 10%         | 1,000             | 10                             |

A participant was categorized as low risk averse if they chose option A more often than option B (Option A > Option B). Conversely, if they chose option B more often than option A, they're categorized as high risk averse. The dummy used for for high risk averse was 0 and the dummy used for low risk averse and low loss averse was 1.

**Measurement of Entrepreneurial Intention**

The questionnaire for entrepreneur intention was adopted from Chen et al. (1998) and Zhao et al. (2005) (Table 3).

**Table 3**  
**ENTREPRENEUR INTENTION QUESTION**

| 1              | 2   | 3 | 4 | 5     | 6 | 7               |   |   |   |   |
|----------------|---|---|---|-------|---|-----------------|---|---|---|---|
| Total disagree |   |   |   |       |   | Total Agreement |   |   |   |   |
| Item           |   |   |   | Scale |   |                 |   |   |   |   |
| 1.             | I am ready to do anything to be an entrepreneur       |   |   | 1     | 2 | 3               | 4 | 5 | 6 | 7 |
| 2.             | My professional goal is to become an entrepreneur     |   |   | 1     | 2 | 3               | 4 | 5 | 6 | 7 |
| 3.             | I will make every effort to start and run my own firm |   |   | 1     | 2 | 3               | 4 | 5 | 6 | 7 |
| 4.             | I am determined to create a firm in the future        |   |   | 1     | 2 | 3               | 4 | 5 | 6 | 7 |
| 5.             | I have very seriously thought of starting a firm      |   |   | 1     | 2 | 3               | 4 | 5 | 6 | 7 |
| 6.             | have the firm intention to start a firm some day      |   |   | 1     | 2 | 3               | 4 | 5 | 6 | 7 |

## DATA ANALYSIS

### Descriptive Analysis

Table 4 shows the demographic characteristics of the respondents. The majority of the respondents were male. Table 5 shows descriptive statistics of loss averse, risk averse and entrepreneurial intention.

| <b>Table 4</b>   |                  |                   |
|--|------------------|-------------------|
| <b>DESCRIPTIVE STATISTICS OF SAMPLE CHARACTERISTIC</b> |                  |                   |
| <b>Characteristic</b>                                  | <b>Frequency</b> | <b>Percentage</b> |
| <b>Gender</b>  |                  |                   |
| Male   | 283              | 57                |
| Female   | 217              | 43                |
| <b>Age</b>   |                  |                   |
| 19   | 45               | 9                 |
| 20   | 54               | 11                |
| 21   | 267              | 53                |
| 22   | 134              | 27                |

Note: This table presents the descriptive statistics for the participant based on gender and age.

| <b>Table 5</b>   |                    |             |                |                |                           |
|--|--------------------|-------------|----------------|----------------|---------------------------|
| <b>DESCRIPTIVE STATISTICS OF LOSS AVERSE, RISK AVERSE, AND ENTREPRENEURIAL INTENTION</b> |                    |             |                |                |                           |
|  | <b>Observation</b> | <b>Mean</b> | <b>Minimum</b> | <b>Maximum</b> | <b>Standard Deviation</b> |
| Risk Averse  | 500                | 0.468       | 0              | 1              | 0.499                     |
| Loss Averse  | 500                | 0.504       | 0              | 1              | 0.500                     |
| Entrepreneur Intention   | 500                | 3.799       | 1.33           | 6.5            | 1.081                     |

Note: This table presents the descriptive statistics for the independent variables (risk averse and loss averse) and dependent variable (entrepreneurs intention).

| <b>Table 6</b>                              |                    |            |                    |            |
|---|--------------------|------------|--------------------|------------|
| <b>RISK AVERSE AND LOSS AVERSE CATEGORY</b> |                    |            |                    |            |
|   | <b>Risk Averse</b> |            | <b>Loss Averse</b> |            |
|   | <b>High</b>        | <b>Low</b> | <b>High</b>        | <b>Low</b> |
| <b>Gender</b>                               |                    |            |                    |            |
| Male  | 147                | 136        | 146                | 137        |
| Female                                      | 119                | 98         | 102                | 115        |
| <b>Total</b>                                | <b>266</b>         | <b>234</b> | <b>248</b>         | <b>252</b> |

Note: This table presents the category of risk averse and loss averse. A participant was categorized as low risk averse and low risk averse if they chose option A more often than option B (Option A > Option B). Conversely, if they chose option B more often than option A, they're categorized as high risk averse and high loss averse.

Based on Table 6, the participants tended to have high risk aversion and low loss aversion, meaning if faced with choice between certain and uncertain outcomes, the participants tended to select certain outcomes. Meanwhile, in the loss averse scenario, the participants tended to dare to take decision, showing low loss aversion.

## Independent t-test

Participants' entrepreneurial intention based on risk aversion and loss aversion characteristic is shown in Table 7. Based on table 7, participants with low risk aversion and low loss aversion had higher entrepreneurial intention than participants with high risk aversion and high risk aversion.

| <b>Description</b>         | <b>Risk Averse</b> | <b>Loss Averse</b> | <b>Entrepreneurial intention</b> |
|----------------------------|--------------------|--------------------|----------------------------------|
| Entrepreneurship Intention | 0.00*              | 0.00*              |                                  |
| Gender                     | 0.521              | 0.310              | 0.147                            |
| Age                        | 0.00*              | 0.022*             |                                  |

## DISCUSSION

This study showed that risk aversion and loss aversion determined entrepreneurial intention. The present study was the first to study students' entrepreneurial intention by considering risk and loss aversions using experimental method. The result of this experimental study confirmed a number of studies in developing countries by survey method, including Sandhu et al. (2011) on risk aversion and failure avoidance inhibiting students in Malaysia from being entrepreneurs, Koh (1996) in Hongkong, Wang and Wong (2004) in Singapore.

The present study also supported the conclusion of (Morgan & Sisak, 2015) that the bigger the afraid of failure, the lower the entrepreneurial intention. The relation between loss averse and entrepreneurial intention was based on business cycle that when one fears loss, they won't start something with uncertain result.

Entrepreneurs always learn from what they do and previous experiences (Davidsson & Honig, 2013), and risk can be minimized by knowledge and understanding. The present study suggested entrepreneurship education emphasizes learning by doing, because by learning by doing students as future entrepreneurs will have knowledge and understanding so that they're able to recognize the risk levels of business opportunities. The importance of experience for entrepreneurs is revealed Wennberg et al. (2010).

The present study implied that high risk aversion and loss aversion would inhibit someone from being an entrepreneur. In real situation, risk can be minimized by sufficient knowledge and experience. To prevent reluctance to be entrepreneur due to fear of taking risk and experiencing loss, students should start businesses with small risk or risk they can handle. Entrepreneurship educators also can introduce hybrid entrepreneurship, mix in both self employment and wage work, for risk averse individuals (Solesvik, 2017; Raffee & Feng, 2014; Petrova, 2012)

Holmes et al. (2008) conclude that entrepreneur will assess opportunity based on perception of the risk of the opportunity. To assess the opportunity, the entrepreneur will explore to enhance their beliefs. If they believe it will work, they will seize the opportunity. Therefore, new entrepreneurs who haven't had sufficient experience and knowledge can start businesses with low risk or high chance of success. Although Maresch et al. (2016) conclude positive framing in terms of gain expectation in entrepreneur education isn't significantly have positive

impact on entrepreneurship intention, entrepreneurship education can use affordable risk approach to stimulate entrepreneurship intention for risk averse type of person.

## CONCLUSION AND LIMITATION

Entrepreneur is profession that individual has to make decision in every stage in uncertain condition. Entrepreneurship intention can be more understand by exploring how human decision making. Aspects that affect decision making are risk averse and loss averse. Based on prospect theory, in uncertain situation, individual exhibit risk seeking to avoid a sure loss and risk averse to get a sure gain and framing influences decision making and actual loss is more pain full than uncertain loss.

This research presents risk and loss averse impact on entrepreneurship intention. When facing certain gain, individual with more risk averse attitude has lower entrepreneurial intention. When facing uncertain, individual with more loss averse attitude has lower entrepreneurial intention.

There are many research in behavioral finance and behavioral economy use experimental approach. A possible critique for this method is generally experimental method is performed on students and doesn't represent real condition (Suto & Toshino, 2005) and experimental method can't be generalized (Zichella, 2014).

This research by experimental method only focused on specific individual behavior. To understand the complexity of decision making by entrepreneurs thoroughly, hybrid method can be used using money games and questionnaire (Zichella, 2014).

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