

# **REVERSAL ON DISPOSITION EFFECT: EVIDENCE FROM INDONESIAN STOCK TRADER BEHAVIOR**

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## **ABSTRACT**

One of the reasons why people afraid to participate in the Indonesia Stocks Market because a stereotype that capital market is gambling. This kind of stereotype, in fact, maybe because people that have already invest or trade in the market experienced a disposition effect. Aspara and Hofman (2015) conduct research about how the disposition effect can be reversed by giving a stimulus to the investor personal responsibility. However, their analysis was not explain the behavior of the respondent in no treatment and treatment condition. In this research, the author wants to conduct a study whether the disposition effect occurs in Indonesia and what kind of demographic factor that affect it. Also, this study also intends to explain the behavior of investors when they perform disposition effect and the reversal of it by looking to the prospect of the respondent using the Cumulative Prospect Theory from Tversky and Kahneman (1992). Based on 182 responses form direct player in the market, statistically is proved that the disposition effect also occurs in Indonesia, and it is can be reverted by giving a stimulus about personal responsibility. The behavior of investors when facing disposition effect and reversal treatment also can be explained by their value function.

**Keywords:** Disposition Effect; Behavior Finance; Prospect Theory.

## **1. INTRODUCTION**

The number of the capital market investor in Indonesia is in a destitute condition. Indonesia stocks exchange release data that shows Indonesia investor in the capital market is around 300.000 investors between 2012-2013. Compare to the total population of Indonesia it is only around 0.1% to 0.2%. This ratio is tiny compared to Malaysia that has a rate of 12.8% and Singapore 30% (Tempo, 2012). One of the reasons that make people in Indonesia afraid to invest in the capital market, especially stocks market, is a stereotype that judge invest in the capital market is not different with gambling. As a solution to the condition, Indonesia Stock Exchange starts an educational program to increase the financial literacy and enhance the number of investors in Indonesia.

One of the financial literacy that is thought in the program is about long term investment. The concept says that rational investors will hold a winning financial instrument and cut losing investment. However, in reality, investors tend to do a bias by sell a winning investment and hold a losing investment. Kahneman and Riepe (1998) describe this bias as disposition effect. When the losing investment that is kept continues to underperform while the winning stocks that are sold still on its trend and continue outperform, disposition effect will affect negatively both on psychological and investors wealth (Odean,

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1998). In the end, people will make another bad investment decision to cut loss his losing stock and buy back the outperform investment that has a high possibility to underperform since it is already overbought. At the time it starts to decrease, the investor will start to panic and finally could be cut loss his investment. In the end, investors will suffer a loss and blame the market for his losing. The bias of disposition effect may be a reason why people in Indonesia said that capital market is such a gambling market.

Some research state that disposition effect could be the most prevalent bias that investors do base on observation in a lab experiment (Weber and Camerer, 1998) and field studies (Odean, 1998). Although it seems prevalent to all investors, some researchers find some factors to mitigate the disposition effect. The elements are full of financial sophistication to the social and psychological condition that affect decision making. Recently, some research is observed more on how to reverse the disposition effect. Aspara and Hoffman (2015) conducted research regarding those issues by making some treatment to a group of respondents to proof that disposition could be reversed.

It is fascinating to see how the disposition effect occurs in Indonesia and what kind of demographic factors that affect disposition effect to the investors in Indonesia. Besides, Indonesia has a diverse ethnicity; this could also be an interesting aspect to be analyzed whether ethnicity affects the disposition effect. This research also wants to find out whether disposition effect can be reversed or not if investors are given a treatment regarding their personal responsibility to winning stock and losing stock. Also, behavior explanation regarding investor decision also will be observed as a robustness check to the statistical finding.

## **2. LITERATURE REVIEW**

Disposition effect is one of the pervasive bias that investor do (Shefrin and Statman, 1985). Kahneman and Riepe (1998) state in his paper that disposition effect is a powerful bias so financial advisors should suggest his client with a real-life example. As a proof of the previous study about the disposition effect, Weber and Camerer (1998) do an experiment in lab settings while Odean (1998) try to conduct research on a field study, and their results support the previous research that disposition effect is a pervasive bias.

After the era of 2000, people start to conduct research to find out factors that related to disposition effect. Several factors has been determine by previous researcher such as financial sophistication (Dhar and Zhu, 2006), investment experience (Chen et al., 2007), whether individuals invest for their own or for other person purposes (Lee et al., 2008), whether individuals invest in non-delegated assets like individual stocks or delegated assets like mutual funds (Chang et al., 2016), the salience of information on an investment's purchase price (Frydman and Rangel, 2014), and whether individuals own a stock through their choice or not (Summers and Duxbury, 2012).

Recently, research on disposition effect starts to observe whether it can be reduced or reversed. Lee et al. (2008) show in one of their experiments that the disposition effect is reduced when individuals are requested to imagine investing as an agent for someone else. Shapira and Venezia (2001) and Chu et al. (2014), who show that professional investors are less susceptible to the disposition effect than non-professional investors. Aspara and Hoffman (2015) state that disposition effect is, more or less, determined by individuals' feelings of personal responsibility regarding the causes of their investments' past performance. They theorize that the framing of a decision's personal responsibility as a moderating condition may eliminate or reverse the disposition effect. In their research, there are three factors related to personal responsibility in changing individuals' susceptibility to the disposition effect: (i) personal

responsibility in terms of prior gains and losses, (ii) personal responsibility related to the source of money invested and (iii) personal responsibility connected with having alternative, socially-oriented goals, such as self-expression besides a financial gains goal. As a result, they state that disposition effect can be reserve based on stimulus that they give to the respondent.

Nevertheless, Aspara and Hoffman (2015) used a methodology that did not cover the value function of respondents about the disposition effect and its. A more thorough understanding of the disposition effect can be derived by how people make a decision based on a prospect. Cumulative prospect theory that is studied by Tversky and Kahneman (1992) can be a method to understand the behavior of investors. In conclusion, it will be more robust to observe the reversal of disposition effect based on the investors value function (Tversky and Kahneman, 1992).

In Indonesia, there is still a lack of research regarding disposition effect. Some previous research in Indonesia only focuses on behavior bias aspect of institutional investor's in government bond market in subprime mortgage period (Gusnidar and Koesrindartoto, 2013), how to make a trading strategy based on contrarian behavior strategy (Pattipeilohy and Koesrindartoto, 2015) and bias response regarding to the government credit card regulation (Eneng and Koesrindartoto, 2015).

To address this gap in the current literature, we will conduct an experimental research regarding disposition effect in Indonesia and which demographic factor that affect the disposition. We also want to find out whether disposition effect can be reversed or not. The research study design will follow the Aspara and Hoffman (2015) research. However, we will only test the control condition and one treatment for reversing the disposition effect. The treatments will be focused on when individuals are led to believe that the winning investment performed well because of external events while the losing investment performed poorly because of their fault. Cumulative Prospect Theory value function will be used in this research to give a robust understanding of the disposition effect and the reversing of it.

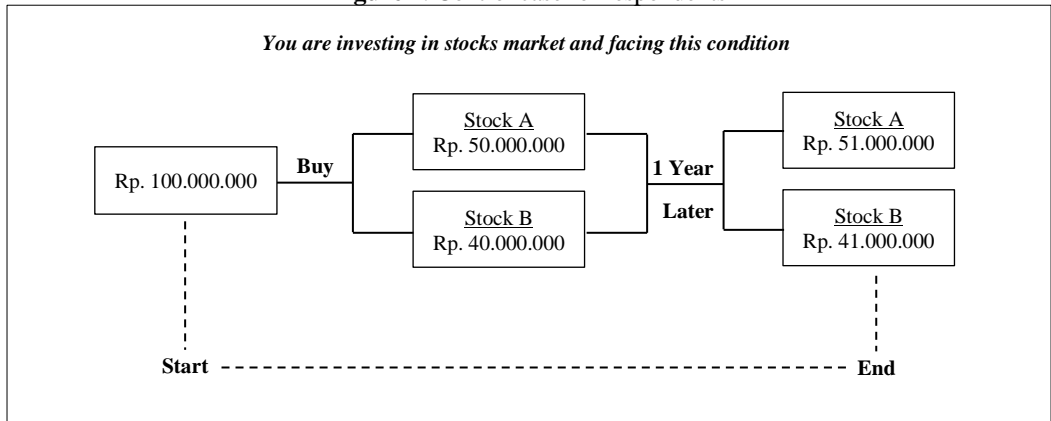
### 3. METHODOLOGY

This research will follow the framework from Aspara and Hoffmann (2015). First, respondents will be asked regarding their gender, age, ethnicity, education, income, individual/professional, and experience stock market. This question is requested to cover the demographic scope of the respondent. Second, respondents will be given a control case and they have to decide to sell one of the stocks (Fig. 1). Since the total expected return on investment is zero, the respondents who choose to sell stock B are experienced the disposition effect. The control treatment is useful to identify the disposition effect among those surveyed.

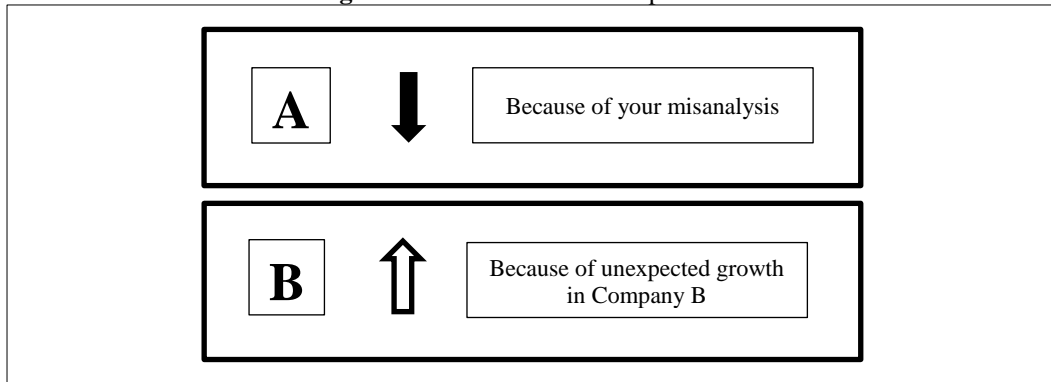
Third, the respondents will be given a treatment question which stated that the loss in stock A because of their misanalysis and increasing in stock B because of unexpected growth in company B. Based on this treatment, respondents are asked to choose once again which stock that they want to sell. This treatment question is useful to proof whether disposition effect can be reversed based on respondents personal responsibility regarding prior gain or loss (Aspara and Hoffmann, 2015).

The questionnaire is distributed directly to the stocks forum in Indonesia to capture actual stocks market investor's behavior. From the collection period between March 20th, 2016 to April 21st, 2016, 182 respondents will be analyzed for this research.

**Figure 1:** Control case for respondents



**Figure 2:** Treatment case for respondents



**3.1. Analysis**

Before getting into the core method to investigate the disposition effect, the descriptive statistic is conducted to see the diversity of demographic from the respondents. Then the choice of prospect from the respondents will be preliminary analyze to see whether disposition effect occurs and it can be reversed based on the treatment or not. Then, logistic regression and Cumulative Prospect Theory are used as the core method for this analysis. Logistic regression is used to see how demographic conditions of respondents affect their decision making. The regression will follow this formula.

$$p = \frac{1}{1 + e^{-(\alpha_0 + \alpha_1 AGE + \alpha_2 EDUCATION + \alpha_3 INCOME + \alpha_4 MALE + A_{all} ETHNIC + \alpha_5 ROLE)}} \tag{1}$$

The dependent variable of this regression is the respondents' decision to sell stock A or stock B. If the respondents choose to sell stock A, then it will be given one else 0. The independent variables are the demographic data from respondents that consist of gender, ethnic, age, education, income, experience, and role (individual/professional). Gender and ethnic will be converted to dummy variable to see the significant influence from each gender and ethnic to the decision of selling stock A or stock B. If coefficients of independence variables have a negative and significant number then it means that

statistically the independent variable or demographic from respondents tend to cause respondents sell Stock B or perform disposition effect.

From now on, we construct the cumulative prospect from each respondent to see utility regarding their decision to sell stock A or stock B. Decision to sell stock A (losing stock) will be considered as positive prospect since it is indicated that the respondents are not the disposition to their choice. On the other hand, the decision to sell stock B (winning stock) will be considered as a negative prospect since it indicates disposition from respondents' choice. The model of cumulative prospect theory can be written as below

$$V(f) = V(f^+) + V(f^-) \quad (2)$$

Where

$$V(f^+) = \sum_{i=0}^n \pi^+ v(x_i) \quad (3)$$

$$V(f^-) = \sum_{i=-m}^0 \pi^- v(x_i) \quad (4)$$

$V(x)$  on the positive and negative value function will follow this rule

$$V(x) \begin{cases} \lambda^\alpha & \text{if } x \geq 0 \\ -\lambda(-x)^\beta & \text{if } x < 0 \end{cases} \quad (5)$$

The decision weight function of  $\pi$  will also be determined by

$$\pi^+ = \frac{p^\gamma}{(p^\gamma + (p+1)^\gamma)^{1/\gamma}}, \pi^- = \frac{p^\delta}{(p^\delta + (p+1)^\delta)^{1/\delta}} \quad (6)$$

The important parameter from the model are  $\alpha$  and  $\beta$ , where  $\alpha$  represents the degree of risk aversion to positive prospect and  $\beta$ , accounts for the negative one (Tversky and Kahneman, 1992). As the parameter  $\alpha$  or  $\beta < 1$ , it implies that the respondents become more risk averse to the positive prospect or negative prospect but if  $\alpha$  or  $\beta > 1$  the respondents become more risk taker to one of the prospects.

## 4. THE EMPIRICAL RESULTS

### 4.1. Demographic

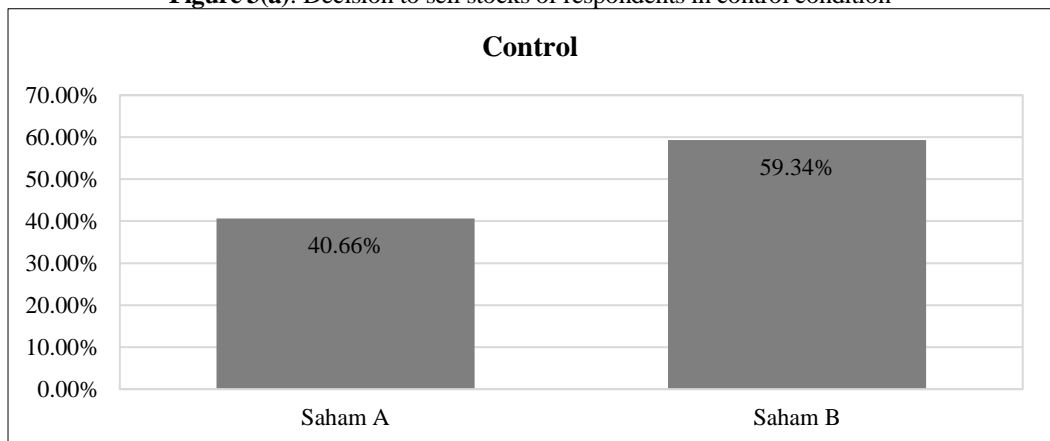
From the evidence that we get, the demographic condition of Indonesian investors is diverse. The respondents are dominated by the male with 65.9% while the female is 34.1%. Ethnicity also diverges among the respondent dominated by Javanese and Chinese ethnic. The age of respondents range from the respondent is centralized between 21-30 years old (69.2%).

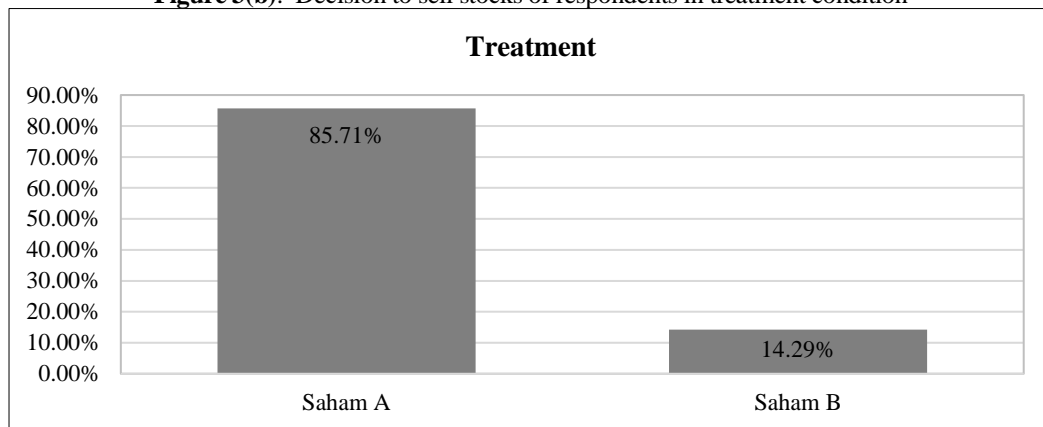
The centralization also occurs for the educational background where most of the respondents have a bachelor degree as their last education. Income is dispersed across four categories dominated by the class between Rp 5.000.000,00 to Rp. 9.999.999,00. The last but not least, the respondents mostly trade or invest in a stock market on their behalf with a one to three years experiences in stocks market.

**Table 1: Demographic Data**

Criteria	Description	%
Gender	Male	65.9%
	Female	34.1%
Ethnicity	Jawa	23.1%
	Sunda	10.4%
	Madura	3.3%
	Bugis	1.6%
	Tiong Hoa	35.7%
	Melayu	4.4%
	Minagkabau	5.5%
	Batak	9.3%
	Betawi	3.3%
	Other (please specify)	3.3%
Age	< 20 y.o	4.4%
	21-25 y.o.	39.0%
	26-30 y.o.	30.2%
	31-35 y.o.	15.9%
	36-40 y.o.	6.0%
	> 40 y.o.	4.4%
Education	High School	9.3%
	Bachelor	70.9%
	Master	16.5%
	Doctor	3.3%
Income	< Rp 5.000.000,00	27.5%
	Rp 5.000.000,00 - Rp 9.999.999,00	34.1%
	Rp10.000.000,00 - Rp 14.999.999,00	23.1%
	> Rp 15.000.000,00	15.4%
Experience	< 1 y.o.	25.8%
	1-3 y.o.	46.7%
	> 3 y.o.	27.5%
Role	Personal	85.7%
	Professional (Broker/MI)	14.3%

#### 4.2. Disposition effect and reversal

**Figure 3(a): Decision to sell stocks of respondents in control condition**

**Figure 3(b):** Decision to sell stocks of respondents in treatment condition

Refer to the decision to sell winning stock (stock B) or losing stock (stock A) with no treatment condition, investors in Indonesia tend to perform the disposition effect. There are 59.34% respondents who choose to sell stocks B rather than stock A. This number is 8.68% more than respondents who want to sell stock A rather than stock B. However, when the treatment case is given to the respondent as a condition to reverse the disposition effect, the number of respondents that initially choose to sell the winning stock is significantly reduced and change their decision to sell the losing stocks. This preliminary result has the same finding with Aspara and Hoffman research that disposition effect can be reversed by giving treatment regarding personal responsibility to winning and losing stock. From the fact above, it is interesting to see which demographic factors from the respondents that have a significant influence to the decision of investors to sell winning stock or losing stock. As a method to answer this research objective, logistic regression is conducted with the demographic of respondents as its independent variables. The results are represented in the table 2 below:

**Table 2:** Logistic regression on decision to sell winning stock or losing stock

Criteria	Variables	Coefficient
	Constant	-0.2618*
Age	Age	0.2203**
Education	Education	0.5322**
Income	Income	0.2129**
Gender	Male	-0.3065***
Experience	Experience	-0.3554**
Ethnic	Jawa	-0.7231**
	Sunda	-0.7433**
	Madura	-1.6905**
	Bugis	-1.4917*
	Tiong Hoa	-0.3975**
	Melayu	-0.3274**
	Minangkabau	-1.0918*
	Batak	-0.3093**
	Betawi	-0.7544**
Role	Individu	-1.0548***

*Note:* The table above represent the logistic regression with the dependent variable is the decision of respondents to buy or sell the given stocks. If the respondents choose to sell losing stock (A) it will be given 1 and decision to sell winning stock (B) it will be given 0. The independent variables are the dummy of demographic factor in order to find out which demographic factor affect the decision of respondent.

The results show that all of the demographic factors are significant to the decision of respondent to sell winning stock or losing stock. Negative coefficients of demographic parameter indicate that those factors give a contribution to reducing the value of the model to zero. In other words, the negative demographic tend to cause the respondent to perform disposition effect or sell the winning stock. In reverse, positive coefficient of demographic indicates that the factors contribute to causing the respondents are not performing the disposition effect.

Gender, experience, ethnic, and role are the variables that tend to cause the disposition effect to the respondents. Male respondents tend to perform the disposition. The reason is that of men are more overconfidence than women. They tend to believe that they can avoid the condition to cut loss the losing stock by averaging the losing stock in lower price using the capital from winning stock. This finding aligns with the Odean (1998) research that men are more overconfidence than women.

Experience also gives a negative contribution to performing disposition effect. This negative impact is caused by most of the respondents that have lower than three years experienced in stocks market. It indicates that investors with below three years experienced still perform the disposition effect. The expectation is when the experienced of investors increase; they will choose the investment decision wisely.

Interestingly, all ethnicity in Indonesia has a negative coefficient. It indicates that no matter what is the ethnic of investors, they still tend to perform the disposition effect. This finding correlated with research from Kahneman and Riepe (1998) which stated that individual persistently makes bias. In nature, individuals tend to act irrationally even though they have already known which one is the truth. Kahneman and Riepe (1988) concludes this condition as a cognitive bias of individual. In sum, ethnicity in Indonesia has a significant contribution to the investment decision to sell stock A or B. However, the since all the coefficient from each ethnic tend to cause disposition effect; it can be concluded that without referring to the ethnic disposition effect tends to occur since individual persistently makes bias.

Lastly, individual role also tends to perform disposition effect. The role describes whether the respondents invest or trade in the stock market on behalf of themselves or someone else. The evidence above aligns with Shapira and Venezia (2001) and Chu et al. (2014) research. They have the same point stated that professional investors are less sensitive to the disposition effect than individual investors. Aspara and Hoffmann (2015) also found that individual's disposition effect can be reversed if the respondent is treated as they invest in a stock market as a professional investment manager. The reason for professional investors (broker/investment manager) is less susceptible to disposition effect because they have a responsibility to their client to manage funds. They will act carefully in making an investment decision and try their best to maximize investors' wealth. In sum, the investment decision depends on personal of professional behalf.

Besides the negative factors that are causing disposition effect, the statistical evidence also shows there is positive factor which reduces the disposition effect. Age, education, income are the factors which not cause disposition effect. The reason is as the age, education and income of investors increase, they will be more wisely in making a decision. They tend to be more risk averse to choose investment decision.

In sum, the demographic factors have a different contribution to the present of disposition effect. Some factors such as gender, experience, ethnic, and role have significantly caused the disposition effect. It indicates that disposition effect occurs to investors regardless their gender, experience, ethnic, and role. However, there are also some factors that do not cause disposition effects such as age, education, and



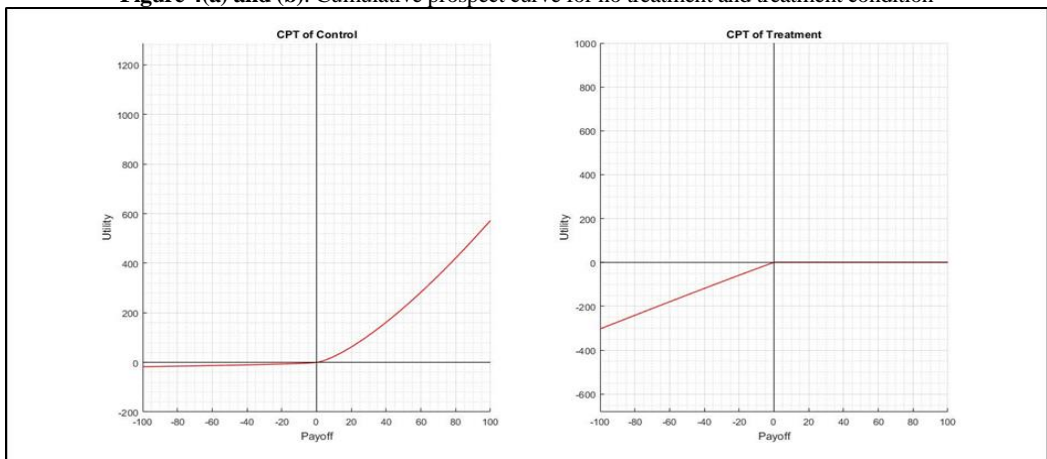
income. As this factor increase, investors will become more careful and wise in making an investment decision.

### 4.3. Cumulative Prospect Theory

Statistical evidence shows that Indonesian's investors tend to perform the disposition effect, since the number of respondents who choose to sell stock B is more than stock A. The disposition effect also seems can be reversed by treating the respondent as the losing in stock A is because of their misanalysis and winning in stock B because of unexpected growth in the market. Nevertheless, this point of view only looks at the decision that investors made. It does not explain how is the behavior of each investor that take the negative or positive prospect. As a robustness check to the findings, cumulative prospect theory is calculated to cover the utility or value from the respondents. Value function of the respondents will include the risk aversion to choosing stock A or stock B and give a robust understanding about the respondent's decision.

Figure 4 represents the value function of respondents before and after the treatment. Value function describe how the behavior of the respondents given the prospect that they have to choose. The graph is constructed by using Tversky and Kahneman (1992) cumulative prospect theory as describe in the methodology section. In no treatment condition, respondents tend to be a risk-taker for positive prospect (sell stock A) and risk averse negative prospect (sell stock B). The reason is that respondents who choose to cut their loss taking a risk of losing their money, while the respondents who want to sell their winning stocks are reluctant or afraid to loss their money, so they become more risk averse. As the treatment condition is given to respondents, the curve significantly changes. The negative prospect becomes less steep than the positive prospect. It means that most of the respondents change their decision to take the positive prospect (sell losing stock) rather than negative prospect (sell winning stock).

**Figure 4(a) and (b):** Cumulative prospect curve for no treatment and treatment condition



In more detail, Table 3 shows all parameter from the cumulative prospect of all respondents. The most important parameter that defines how risk taker the respondent regarding the prospect that give to them is  $\alpha$  and  $\beta$ . At no treatment condition,  $\alpha$  is higher than  $\beta$ . It indicates that respondents in prospect positive expose to the risk of losing their money compare to the respondents who choose sell their winning stock. The coefficient of  $\alpha$  is significantly dropped to 0 as treatment is given to the respondents. The indication

is that almost all of the respondents who choose to cut loss their losing immediately are afraid if their misanalysis can cause further loss to their investment. Therefore, those people become perfectly risk averse when they know mistake that they made. On the other hand, respondents who still choose to sell their winning stock after being given a treatment become a little bit risk taker at this condition since the  $\beta$  is 1.0274. They have already known that they are making a mistake but still reluctant to acknowledge it and still does want to lose their wealth, so they still choose to sell the winning stock.

Tversky and Kahneman (1992) in their research found the coefficient of  $\alpha$  and  $\beta$  is 0.88. This number represents the condition from their respondents given the positive and negative prospects. Compare to this study,  $\alpha$  in the Control condition is higher than  $\alpha$  in Tversky and Kahneman (1992) research, which indicates a more risk taker behavior. While of the other hand,  $\beta$  in this study is lower than  $\beta$  in Tversky and Kahneman (1992), which indicates a more risk averse behavior. This is can be concluded that trader in Indonesia is more risk taker to sell the winning stock rather than losing stock in no treatment condition. On the other hand,  $\alpha$  in treatment condition is lower than  $\alpha$  of Tversky and Kahneman (1992) and the  $\beta$  is higher. This condition is contrary to the no treatment condition which indicates that as the treatment comes in, Indonesian's traders become more risk taker in negative prospect.

**Table 3:** Cummulative prospect theory parameter

	Control	Treatment
$\lambda$	1.086	2.6705
$\alpha$	1.3789	0
$\beta$	0.6038	1.0274
$\gamma$	1	0.0209
$\delta$	0.5064	1.007

Looking at the respondents value function and how risk taker they take one of the prospects, it can be concluded that investors in Indonesia susceptible to disposition effect because they are afraid to lose their wealth. They are afraid to cut their loss, so they tend to sell the winning stock that they have. However, the propose treatment method from Aspara and Hoffmann (2015) is also proven can reduce the risk taker condition to take the negative prospect and reverse respondents decision to take the positive prospect.

## 5. DISCUSSION

The findings from this research prove that the reason why most of the people in Indonesia suffer a lot of loss is not because of the stock market in Indonesia is gambling place. Statistical evidence explains that investors in Indonesia tend to perform disposition effect. They tend to be more risk averse when facing gain and risk taker when facing loss. They also blame the market for their loss and tend to be overoptimism and overconfidence to their skill when they experience gain from the market. This condition related to Kahneman and Tversky statement about overoptimism and overconfidence can cause a catastrophic effect on the wealth of investors.

Some demographic factors give a contribution to the bias. The male has overconfidence level that higher than the female which also cause male to be more susceptible to perform disposition effect. Low experience in the stock market also tends to cause an investor perform disposition in their decision. Role as individual or professional in the stock exchange also contribute to disposition effect. When an investor acts on another person behalf, they tend to be more careful to make an investment decision. These findings align with previous research about professional investors are less susceptible to the

disposition effect than individual investors. Interestingly, all of the majority ethnics in Indonesia has the same state to perform disposition effect. It can be concluded that bias is persistent among individuals no matter their ethnic.

On the other hand, age, education, and income have a positive impact to make unbiased decision. The logical reason is people with that have older age, higher education, and higher income tends to be more wisely to choose which stock that they want to sell. Therefore, they will think more rationally before make their decision and become less susceptible to perform disposition effect.

Since bias is persistent in individual subconscious mind, it is hard to remove it 100% and make the individual act rationally. However, some previous research has proved that disposition effect can be reduced and reversed if the investors are given a treatment that losing in the market is because of their miscalculation and winning is because of an unexpected event in the market. Using the similar framework with previous research, we also found that disposition effect can be reversed. Understanding the behavior behind the disposition and its reversal is done by looking at respondent value function. With no treatment condition, the value function of respondents for the negative prospect (sell the winning stock) indicates a risk averse behavior ( $\beta < 1$ ). It means that investors tend to perform disposition effect since they are afraid of losing their wealth. Reversely, respondents who choose to sell their losing stock indicates a risk taker behavior which explains that face a risk of losing their money as they cut their investment loss.

However, as the treatment comes in, the gradient of the value function in negative prospect become risk-neutral condition ( $\beta$  close to 1) and the positive prospect gradient significantly becomes zero. It indicates that most of the respondents change their decision to sell losing stock rather than winning stock because they are afraid of further loss after knowing their mistake in analysis. Interestingly there are still some people who reluctant to realize their loss even though they know that have already done mistake in their analysis. This is proved by the  $\beta$  coefficient that slightly above 1 which indicates a risk taker behavior.

## 6. CONCLUSION

In sum, the disposition effect also occurs in Indonesia. Demographic factor also contributes significantly to the decision of an investor to choose an investment decision. In average, the disposition effect also proven can be reversed by giving a treatment regarding personal responsibility about gain and loss in stock. Some evidence of the behavior of investors who perform disposition also can be explained by the value function of themselves. This research gives more understanding about the behavior why people perform disposition effect and why it can be reversed.

This research and the previous one have found statistical evidence that professional investors are less susceptible to disposition effect. For the further research, it is interesting to explain the behavior of professional investor such as broker and investment manager regarding their decision about an investment. It is also interesting to add another demographic factor to the model to cover another factor that can be significantly contributed to the disposition effect

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