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BEHAVIOURAL BIASES OF OVERCONFIDENCE AND DISPOSITION EFFECT AND THEIR IMPACT ON INVESTMENT DECISIONS IN THE INDONESIAN CAPITAL MARKET

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Abstract—The Odean methodology revealed that investors are more susceptible to realizing profits than losses as indicated by disposition effects. This study intended to analyze the effect of overconfidence bias and the disposition effect on investment decisions in Indonesia. The sampling method was purposive sampling, with the respondents being 40 young investors who were members of Club Investors. Data collection was done by distributing questionnaires. The analysis method in this study was quantitative analysis. The analytical tool used was binomial regression analysis and multiple linear regression. Binomial regression was used to discover investor behavior and whether it tended to be biased or rational in its investment decisions. After discovering the attitude of the investors, be it biased or rational, the effect of the bias was analyzed using multiple linear regression. A multiple linear test was used to predict the probability of influence of each investment decision variable. The results showed that overconfidence had an effect on investment decisions. Some investors tend to experience an overconfidence bias in decision making, which shows that the investors feel very confident in their experience and ability to choose stocks. The investors believe that the results will be in line with their expectations.

Keywords—disposition effect, investment decision, overconfidence

I. INTRODUCTION

Traditional financial theory analyzes the financial markets by assuming that there are rational market participants. Baltussen (2009) said that rationality means that they make the best choices for themselves. Fama (1970), the father of the Efficient Market Hypothesis (EMH), defined efficient financial markets as markets where the prices are efficient and where they instantly reflect all relevant information. The prices represent the fundamental values and resources directed at their most efficient use. Fama (1970) also presented empirical data showing that the US stock market is efficient. Although this still has a basis in finance, the traditional view has been questioned by a new paradigm of behavioral finance. Financial behavior goes against the assumptions of rationality and this specialization intend to improve the understanding of financial markets by applying knowledge in terms of psychology and sociology (Baltussen, 2009).

Starting from the 1980s, a variety of studies appeared which went against the efficient theoretical basis of the market. All three theoretical propositions have been opposed. Kahneman and Tversky (1979, 1973) modeled the investors who deviated from rationality consistently. Much of the empirical data about the behavior of irrational investors arises from the trading pattern of individual investors. These studies challenge EMH's first proposition by having found that investor decisions conflict with the expected utility theory. Odean (1999), Barber and Odean (2000) and Grinblatt and Keloharju (2009) found that individual investors are too confident in trading. They trade too much and thus reduce their wealth. Shefrin and Statman (1985) and Odean (1998a) found that individual investors keep their lost investments too long and sell the gained investments too quickly, which shows a disposition effect. Kaniel, Saar, and Titman (2008), Hirshleifer, Myers, and Teoh (2008) found that individual investors sell stocks that announce positive news and buy stocks that announce negative news. Griffin, Harris and Topaloglu (2003) and Grinblatt and Keloharju (2000) found that individual investors following a contrarian trading strategy was related to their past returns. Finally, a lot of research (Blume and Friend, 1975; Barber and Odean, 2000; Polkovnichenko, 2005; Goetzmann and Kumar, 2008) found that there was a serious lack of diversification in the investors in the financial markets. Barber, Odean and Zhu (2009), among others, tested the second EMH proposition and found that individual trading is highly correlated and persistent. Goetzmann and Massa (2008) and Statman, Thorley and Vorkink (2006) dealt with the third proposition by investigating the disposition effects

that tend to be disposition and investors who are too confident on the stock market respectively. Experts found there to be reverse movements and turnover.

We choose to resolve this overconfidence because this behavior is theoretically strong. The consensus of psychologists indicates that people are generally overconfident. The disposition effect, on the other hand, was chosen because it was well-documented, and it is the most popular behavioral bias investigated in the academic. We found that individual investors in the Indonesian stock market showed a disposition effect. We found that, in some cases, investors who suffer from disposition effects have an impact on the Indonesian Stock Market where both of them affect investment decision making

Goetzmann and Massa (2008) performed regression analysis and constantly found there to be a statistically and economically significant negative relationship between proxy disposition and stock returns, volatility, turnover and volume. This confirms that stocks that have more investors tend to be of a particular disposition because stockholders are rather insensitive to fundamental fluctuations. The disposition effect is not only specific to stock trading but also to the overall market level. The irrationality of investors in the capital market makes the market panic and this has the potential to disrupt the market. The market movements thus become abnormal. The investor behavior that is influenced by the cognitive and emotional factors means that the investors are unable to translate information properly, so the investors become irrational. Irrational forms of investor are expressed in terms of their behavioral bias. In addition to the cognitive and emotional factors, there are social factors that can also influence investment decisions. In Fityani's research (2015), there are social variables that influence investment decisions, namely Effects of Disposition.

Statman, Thorley and Vorkink (2006) researched the stock market's reaction to excessive trust. They relied on the theoretical implications of Odean (1998b) and Gervais and Odean (2001), who developed multi-period models in which excessive trust increases when the investors associate it with high returns in relation to their skills rather than walking randomly into secure prices. These models conclude that higher market returns cause the next volume to become higher. Statman, Thorley and Vorkink (2006) tested this and found there to be a strong relationship that confirmed the theoretical predictions. The author also found that stock returns can be predicted by using the previous trading volumes. These results are consistent with those of Daniel, Hirshleifer and Subrahmanyam (1998). If investors are too confident when it comes to increasing turnover and when the trading volume predicts secure returns, the overconfident investors have a price impact.

Seeing the differences in the results and variables used in various studies, the authors decided to test the behavior bias of overconfidence and disposition effects in investment decision making using data and variables that are different from the previous studies. This study tried to research whether overconfidence bias and disposition effects are affecting the investment decisions in the Indonesian Stock Exchange.

II. Literature Review

The disposition effect is a form of deviant behavior from investors that happens in the capital market. When the stock price falls, investors who have this disposition effect do not sell their shares but retain their shares instead, with the hope that a few moments later, the stock price will rise again. Taking a decision like this makes the condition of the capital market inefficient.

Other studies have investigated the effects of disposition. Talpsepp (2010) investigated investor trading characteristics, disposition effects and their relationship with performance in Estonia. He found that the disposition effect was associated with lower portfolio returns. Grinblatt and Keloharju (2000) found the disposition effect using Finnish data. Chen, Kim, Nofsinger and Rui (2007) investigated brokerage account data from China. They found that investors in China experience the disposition effect and that the effect from the bias was higher than in the US, as shown by Odean (1999) and Barber and Odean (2000, 2001, 2002), while the investors that were primarily interested in excessive trust still repeatedly found themselves in a situation where there was a disposition effect. Weber and Camerer (1998) performed an experiment to determine whether investors showed a disposition effect. The authors found that investors tend to continue to lose and sell their gained stock. Weber and Zuchel (2001) also conducted an experiment to study whether the previous results influenced risky choices. The author found there to be an increase in risky behavior after experiencing a loss, which is in accordance with the disposition effect. Fernandes, Pena, and Tabak (2008) did the same experiment throughout the country and once again, they found that the previous results influenced risky choices in the form of loss aversion. Oehler, Heilmann, Volker and Oberlande (2002) investigated 490 investors in 3 stock markets and concluded that the majority of them showed a disposition effect.

There are two main explanations about the disposition effects that are rationally relevant. First, the disposition effect may be caused by portfolio rebalancing. Second, it can be justified by investor expectations about average returns. Odean (1998a) found that none of the explanations made sense. He determined that the traders are systematic about their beliefs.

H1: *The disposition effect has a significant effect on stock investment decisions*

Most people are generally too confident about their abilities (Frank, 1935). The experts who have investigated subjective probabilities found that people tend to overestimate the accuracy of their knowledge (Alpert and Raiffa, 1982; Fischhoff, Slovic and Lichtenstein, 1977). Such excessive confidence happens in many professional sectors, and not just economics (Barber and Odean, 2001).

Odean (1998b) developed a model of overconfidence in the financial securities market. Investors overestimate their ability to judge secure values more precisely than others. Individuals believe in their own judgment, which will leads to differences of opinion that motivate trade (Varian, 1989; Harris and Raviv, 1993). However, individuals may only trade if it increases the expected utility (Grossman and Stiglitz, 1980). Odean (1998b) found that more investors were too confident the more that he traded, and there was a lower expected utility. This is because investors have unrealistic beliefs about how exactly the returns can be estimated, but they then spend too many resources gathering the information. Over-confident investors also have a more risky portfolio than rational investors.

Barber and Odean (2005) said that besides investors being too confident about the accuracy of their information, they are also too confident in their ability to interpret the information. Investors, because they are too confident in interpreting the information, have mistaken beliefs about the average, rather than (or in addition to) the accuracy of the probability distribution of their information. In this case, the average investor loses more than just the transaction costs.

Barber and Odean (2000) studied the same phenomenon - whether individual investors trade excessively. However, they used different methodologies. In contrast to Odean (1999), they did not only say that investors trade too much, but they also analyzed how the performance of each investor was in aggregate. Their empirical data supported the view that excessive trust causes excessive trade. There are other studies that have investigated overconfidence. Biais, Hilton and Mazurier (2005) conducted an experiment with 245 participants and found that investors were too confident in the accuracy of their information and that overconfidence reduced trade performance. Daeves, Luders and Luo (2009) did an experiment and analyzed whether overconfidence caused more trade. They found it to be true at the individual level and at the market level as well. Barber and Odean (2001) tested excessive trust by partitioning the investors by sex. Using the Barber and Odean (2000) method, they found that men traded 45% more than women and that trading reduced the men's net income by 2.65 pts, as opposed to 1.72 pts for the women.

Emotional bias can cause the investors make less optimal decisions. This is because emotional bias is rarely realized in the decision making process. Emotional bias relates to how a person makes decisions compared to how they think. Emotional bias is partly related to overconfidence bias. Overconfidence bias often occurs in novice investors who want to be fast and who want to get a high return as they have confidence in their own stance. Overconfidence is a condition where there is an overconfident attitude about how well the individual understands the limits of their knowledge and abilities (Supramono & Wandita, 2017). Bias in reference to overconfident behavior can affect investment decisions.

H2: *Overconfidence bias has a significant effect on stock investment decisions.*

The research framework can be seen in Figure 1.

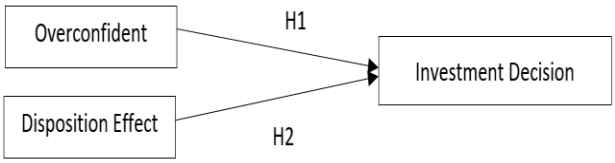

Fig. 1. Research Framework

III. METHODS

The object of this research is focused on the investors who invest in Investor Club. This study examined the aspects of bias behavior that affect investor behavior in Denpasar in stock investment decision making. This was done by examining the variable aspects of influential behavioral bias, which are overconfidence bias and disposition effect respectively. The sampling method was purposive sampling. The data collection method was done by distributing questionnaires. The number of respondents totaled 40 investors. The variable measurement scale used was a Likert scale using 5 points, which were from scale 1 (strongly disagree) to scale 5 (strongly agree). The empirical indicators for each variable in this study were overconfidence, disposition effect and investment decision.

Overconfidence is an overconfident attitude related to how well someone understands their own abilities and the limits of their knowledge (Nofsinger in Subash, 2012: 2). The indicators are believing in one's own abilities, trust in the knowledge that they have and aggressiveness when it comes to buying and selling shares. The disposition effect is the behavior of investors who rush to realize profits and who hold back losses that may happen for too long (Shefrin and Statman (1985). The disposition effect is a form of deviant investor behavior that happens in the stock exchange. When stock prices fall, investors who have this disposition effect do not sell their shares. They retain the shares instead with the hope that a few moments later, the stock price will rise again. Taking a decision like this could make the capital market conditions inefficient. The investment decision referred

to in this study is the process of allocating funds conducted for investment in the hope that the capital owners benefit.

The analysis method used in this study was quantitative analysis. The analytical tools used in the study were binomial analysis and multiple linear regression. Binomial regression has 2 possible outcomes, such as: success or failure and agree or disagree depending on what is chosen. The binomial regression conducted in this research was used to discover if investor behavior whether tends to be biased or rational in its investment decisions. After discovering the bias or rationality of the investor, the researcher analyzed the effect of the bias using multiple linear regression. Multiple linear regression is a statistical tool used to determine the effect of one or several variables on more than one variable (Chandrain, 2017). The multiple linear test is used to predict the probability of influence of each investment decision variable. The variables in this study were overconfidence bias and disposition effects and the dependent variable was investment decisions.

IV. Results and Discussion

The data was obtained from 40 respondents who were recorded as being the sample in this study. The researcher obtained the respondents' descriptive statistical data as shown in Table 1.

TABLE 1. CHARACTERISTICS OF THE RESPONDENTS

No	Category	Sub Category	Amount	Percentage
1	Age	25-30 years > 30 years	32 10	76,2% 23,8%
2	Status	Student Worker	37 5	81% 9%
3	Sex	Male Female	35 15	70% 30%

(Source: Primary data, processed)

Table 1 shows that the age range is 25 years old and above. The majority of the respondents are students. Based on this status, there is a tendency for the respondents to be young investors.

The testing of the validity and reliability of the research instruments has been presented in Table 2. Based on the results, the statement on the variable overconfidence and disposition effect is valid. This can be seen from the calculated r value being greater than 0.361. Likewise, the reliability of each variable was found to be reliable.

The data normality test aimed to test whether the results in the residual variable regression model had a normal distribution (Ghozali, 2005). The normality test was conducted for all three variables. The analysis technique used was the Kolmogorov-Smirnov. The results of the analysis can be seen from the significance (2-tailed). The data was said to be normally distributed if the significance value was greater than 0.05 at a significance level of a = 0.05. The results of the processing of the data showed that the data was sig. (2 tailed) with 0.743> 0.05. It can thus be concluded that the three research variables are normally distributed.

The multicollinearity test aimed to test whether the regression model was found to have a relationship or if there was a high degree of correlation between the independent variables. If the independent variables are correlated with each other then the independent variables are not orthogonal. Orthogonal variables are independent variables whose correlation value to other independent variables is zero. The results of the data processing show that the tolerance value of the Overconfidence (X1) and Disposition Effect (X2) variables was 0.867 and 0.861 respectively. The data shows that this is greater than 0.10. While the value of VIF overconfidence (X1) and Disposition Effect (X2) was equal to 1.153 and 1.041, the data showed that it was smaller than 10.00. It can thus be concluded that the three research variables did not result in multicollinearity.

The heteroscedasticity test aimed to test whether, in the regression model, there was an inequality of variance from one residual observations to another observation. The basis of the decision is that heteroscedasticity does not occur when the significance value is greater than 0.05. The results of the data processing showed that the significance value of the variables Overconfidence (X1) and Disposition Effect (X2) respectively were 0.502, 0.214, which means it is greater than 0.05. This shows that there is no heteroscedasticity.

The linearity test is a test that aimed to determine whether the regression was linear or not. If the significance value is > 0.05, then it can be concluded that there is a significant linear relationship. The results of the data processing indicate that the significance value seen from deviations from the linearity was more than 0.05. The results showed that there was a significant relationship between overconfidence and disposition effect with the investment decisions.

TABLE 2. VALIDITY AND RELIABILITY TEST RESULTS

Variable	Item	r	Information	*Cronbach's Alpha*	Information
Overconfidence	Question 1	0,689*	Valid		
	Question 2	0,728*	Valid		
	Question 3	0,651*	Valid		
	Question 4	0,779*	Valid	0,779**	Reliable
	Question 5	0,811*	Valid		
	Question 6	0,770*	Valid		
	Question 7	0,643*	Valid		

Disposition Effect	Question 1	0,845*	Valid		
	Question 2	0,753*	Valid	0,789**	Reliable
	Question 3	0,700*	Valid		
	Question 4	0,591*	Valid		

(Source: Primary Data, processed)

There were two variables analyzed in this study; overconfidence and disposition effect. The assessment of each research variable can be seen from the average value. In Table 3, the number of respondents totaled 40 investors who all made investments. The total number of statements for each of the different variables was 7 indicator statements for the overconfidence variable and 4 indicator statements on the disposition effect variable. Based on Table 3, it is known that the average value of the variable disposition effect (X3) was 3.14 in the medium category. However, the average value of the overconfidence (X2) variable was 3.47, which means that overconfidence falls into the high category.

TABLE 3. STATISTIC DESCRIPTIONS

Variabel	N	*Minimum*	*Maximum*	*Mean*
Overconfidence				
V1P1	40	2	5	3,43
V1P2	40	2	5	3,24
V1P3	40	1	5	3,29
V1P4	40	1	5	3,12
V1P5	40	2	5	3,76
V1P6	40	2	5	3,69
V1P7	40	2	5	3,81
			Mean	3,47
Disposition Effect				
V2P1	40	1	5	3,33
V2P2	40	1	5	3,19
V2P3	40	1	5	3,17
V2P4	40	1	5	2,88
			Mean	3,14

(Source: primary data, processed)

The above is the binomial test based on the distributed questionnaire (Table 4). Each variable had a significance value of <0.05, which means that the average variable has respondents who are biased. There are no variables that were 100%, meaning that they have completely rational respondents. If each variable has a bias in terms of decision making, then the decision becomes irrational. Thus, if investors tend to be biased, then this will affect their investment decisions.

TABLE 4. BINOMIAL TEST RESULT

No	Variable	Catagori	Amount	Observed Prop.	Test Prop.	Asymp. Sig. (2-tailed)
1	Overconfidence	Bias	31	0,79	0,50	0,000
		Rasional	9	0,21	0,50	
2	Disposition Effect	Bias	26	0,67	0,50	0,044
		Rasional	14	0,33	0,50	

(Source: primary data, processed)

To see how the effect of overconfidence bias and disposition effect bias on investment decisions, multiple linear regression analysis was conducted. The results of the multiple linear regression analysis have been presented in Table 5, which shows that overconfidence and the disposition effect jointly influence investment decisions. Based on the results of the analysis, Hypotheses 1 and 2 were accepted at a significant level of 10%. This means that overconfidence and disposition effects affect investment decisions.

Table 5. Multiple Linear Regression Test Results

Model	β	t Statistik	Sig.
(Constant)	10,809	3,929***	0,000
Overconfidence	0,175	1,906*	0,064
Disposition Effect	0,053	0,458	0,050
		F	Sig.
		2,853*	0,049
Model Summary	R. square	0,184	

(Source: primary data, processed)

The results showed that overconfidence had an effect on investment decisions. Some investors tend to experience overconfidence bias in their decision making. This shows that investors often feel very confident in their experience and ability to choose stocks. The investors believe that the results will be in line with their expectations. These results prove that investors are very confident and brave when making stock investment decisions because they have a high level of risk. These results indicate that novice investors have courage and high confidence in terms of making decisions. Young investors, with an average age of 18-25 years, are influential. Investors are also too confident in terms of the accuracy of their information. If this is true even before calculating the transaction costs, then investors are also too confident in their ability to choose stocks. The results show that disposition effects influence decision making. Investors have a tendency to realize fewer profits compared to their tendency to realize losses. The proportion of gains (losses) realized is measured by the total amount of gains (losses) realized divided by the total realized gains (losses) and profits (losses). Investors in Indonesia experienced behavioral bias from the effects of excessive disposition and confidence. This will result in a reduction in their final wealth. Investors will be better if they do not hold their stock for too long and if they do not sell the stock that they gain too fast. This goal can be achieved by increasing investor sophistication. Investor literacy can be improved by educating young people. Such an approach is carried out in many developed countries.

V. CONCLUSION

The purpose of this study was to look at the influence and impact of overconfidence bias and disposition effects on investment decisions in Indonesia. The first step was to identify whether investors behave irrationally. By calculating the effects of disposition and

excessive trust, we have shown that investors are behavior biased. They are more willing to realize profits compared to losses. In addition, investors are too confident and trade too much. As such, investor behavior reduces their final wealth and expected utility. Putting it all together, we can see that there are three main implications. First, because investors in the Estonian stock market act irrationally, we believe that this is a basis for improvement. Existing or future investors should be educated about rational financial behavior.

This study found that the overconfident variable and disposition effects influenced investment decisions. These results indicate that investors tend to always rely on their cognitive abilities when decision making. Based on the age of the investors, which was between 18-25 years, these results indicate that novice investors tend to be overconfident with their abilities and knowledge. They believe that their investment choices will be as expected.

This study had limitations, such as in the process of collecting the data. The researchers did not accompany some of the respondents when they were answering questionnaires. There is the possibility that the respondent did not correctly understand the contents of the questionnaire. In further research, it is expected that the data collection can be done directly by assisting the respondents when they are filling in the questionnaire. Further research can consider using the overconfidence variable as a moderating variable.

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