

The Role of Risk Tolerance in Mediating the Effect of Overconfidence Bias, Representativeness Bias and Herding on Investment Decisions



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ABSTRACT: This study aims to analyze the impact of Overconfidence Bias, Representativeness Bias, and Herding towards investment decision making through Risk Tolerance, where psychological and social factors could have effect on the investors' decision making process. The sample was gathered using Snowball Sampling technique on 200 stock investors who have made transactions in the Indonesian Stock Exchange. The data was analyzed using SEM PLS with Smart PLS 3.2.9 application. The result shows that Overconfidence Bias and Representativeness Bias have significant impact on both direct and indirect investment decision making process through Risk Tolerance. On the other hand, Herding shows no effect on direct and indirect investment decision making process through Risk Tolerance.

KEYWORDS: overconfidence, representativeness, herding, risk tolerance, investment decision, financial behaviour

I. INTRODUCTION

Investment is one of the determining factors of the economic development success in one country, therefore it is becoming necessary to increase the number. Indonesian government through its policy has been striving to simplify the investment process that will create conducive situation which will attract more investors. Nevertheless, the increase of investors and the simplicity offered does not necessarily decide that they will be decent. The psychological and social factor also have major roles in term of investment. [1] Stated comprehensively that *Behavioral Finance* consists of three interdisciplinary study (*Integrate Behavioral Finance*), i.e. psychology, sociology, and finance. *Behavioral Finance* could never be able to eliminate *Traditional Finance*, instead the sociology and psychology field will complement the study.

[2] Declared that after receiving facts and information, investor will make a decision based on cognitive and emotional factors. However, in practice, both factors often do not serve their role as expected. Emotional bias tend to focus on feeling and spontaneity rather than on facts, such as *Overconfidence Bias*. On *Overconfidence Bias*, investors more frequently utilize their self-confidence using knowledge and skill possessed to boost expected result. They tend to be too overconfidence with the prediction and result gained from the investment. The highest the self-confidence, the more certain they are that their investment will be profitable.

[3] studies the impact of *Overconfidence Bias* towards investment decision making process on 230 stock investors in Indonesia, the data was analyzed using Smart PLS 3.2.8 application with PLS (Partial Least Squares) methods, the result showed that *Overconfidence Bias* does have positive impacts towards the investment decision making process, as also found by [4]. Similar result was also found by [5] and [6]. However, [7] found that *Overconfidence Bias* have negative impacts on investment decision. On the other hand, [8] stated that *Overconfidence Bias* does not have any impacts toward investment decision, which is in line with the result found by [9].

Other than emotional factors, cognitive factors also play significant roles in investor decision making process. The cognitive factors include understanding, processing, summarizing facts or information. Bias cognitive displays the error or deviation in those process which one of the examples is *Representativeness Bias* [2]. Representativeness Bias Behavior could result in incorrect investment decision making. Investors tend to jump into conclusion without further analysis due to limited information and lack of knowledge, and decisions are often made only based on past experiences.

The study undertaken by [10] in order to find out the impact of *Representativeness Bias* towards investment decision making process in the Islamabad Stock Exchange is important for those who have made investment since the result of the study assists

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the investor to produce objective analysis. The study showed that the impact of *Representativeness Bias* towards investment decision making process do exist, as also found by [11] and [12]. On the other hand, [13] found that *Representativeness Bias* has negative impact towards investment decision making process. Meanwhile, [14] found that *Representativeness Bias* has no impacts towards investment decision making process which is similar to the findings of the research carried out by [15].

According to [16], *Herd Behavior* is one of the important elements in the concept of *Behavioral Finance* which is originated from social interaction. This social interaction encourages investors to follow other investor's behavior and copy the investment decision of the more dominant group. Meanwhile, *Herding* occurs when public information affect someone's information. *Herding Behavior* describes the attitudes that put other investors as *influencers* which has substantial effect compare to previous performa. Hence, the absence of fundamental principle in decision making process will only result in irrational perspective.

[5] studied about the effect of Herding towards investment decision using questionnaire distributed to 150 active respondents in Pakistan Stock Exchange and resulted in 100 completed questionnaire. This study used *Ordinary Least Square (OLS)* methods. The result showed that *Herding has impacts towards the investment decision making process, as also found by [15] and [17]*. In the mean time, [13], [14], [18] and [19] found that Herding does not have any effect on investment decision.

Every decision made has its own risks, including the decision to invest. The higher one's tolerance level towards the potential risks in making a decision, the easier and faster that person in making one. Several researches about psychological and social factors that have impacts on investment decision showed inconsistency in the results. Therefore, it becomes necessary to undertake further study about bias behavior in order to gather comprehensive understanding and provide more assurance for the investors to be able to control themselves in making accurate and rational investment decision. To answer the inconsistency of previous studies, a new research model with mediation variable is needed. Hence, this study aims at analyzing the impact of *Overconfidence Bias*, *Representativeness Bias*, and *Herding* in investment decision making process by inserting *Risk Tolerance* as the mediation variable.

II. LITERATURE REVIEW

A. Behavioral Finance

Behavioral Finance is a study about how human actually behave in a financial decision making, particularly studying about how psychological condition affects the investment decision, and company and stock market financial decision. Behavioral Finance is an analysis that emphasize on the psychological effect which also influences the investment decision making process, particularly in stock investment [16].

[1] stated that behavioral finance is an interdisciplinary of three studies (Integrate behavioral finance), i.e. psychology, sociology, and finance. [1] also stated "when studying the concept of behavioral finance, traditional finance is still the centerpiece. However, the behavioral aspects of psychology and sociology are integral catalysts within this field of study." It means that behavioral finance never discard traditional finance, instead it completed the study by involving sociology and psychology.

B. Investment Decision

Investment means every economic activity that requires financial support where the business activity is passive and investors only provide the capital. Other parties will be responsible to manage the resources provided by the investors, and the investors will be expecting profit from their investment. Generally, investment decision is an activity that involves planning for capital utilization so that the investment target could be achieved and profit could be generated [16].

According to [20], investment is a capital installment activity to a certain business that aims at generating additional income or profit. Investment decision is a policy or decision made to plant capital on one or more assets or to allocate capital in any kind of investment that will bring profit in the future.

C. Overconfidence Bias

Overconfidence Bias is one form of emotional bias. Investment decision could be made because of investors are too overconfident on their prediction and information [16]. [2] declared that *behavioral finance* is a study of psychological factor that influence investment decision making. After receiving information and facts, investors tend to make a decision based on cognitive and emotional factors which unfortunately both factors are often bias or deviate. Emotional bias, such as *Overconfidence Bias*, emphasizes on feelings and spontaneity rather than facts, hence results in poor decision.

Those who have high self-confidence will immediately make a decision which sometimes is necessary particularly in facing fluctuate situation in stock market. Too much consideration often does not necessarily guarantee a success in investment. When *Overconfidence Bias* occurs, the decisions made are mostly based on self-confidence rather than rumors or other investors' opinion which could result in bad decision and loss.

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Theory and understanding of *Overconfidence Bias* positively affects the investment decision as it is found by [3], [4], [5], [6], [11], [17], [18], [19], [21] that described how *Overconfidence Bias* positively impact the investment decision. Based on the theory and empirical findings, first hypothesis can be inferred as follows:

H.1 : *Overconfidence Bias* positively impacts the investment decision.

D. Representativeness Bias

[2] stated that in *behavioral finance*, cognitive factors includes understanding, processing, and summarizing acquired information. Cognitive bias depicts the deviation or error in the process; one of the example is *Representativeness Bias*. According to [16], Representativeness Bias is one form of Cognitive Bias, where investors only rely on past experiences without making any further analysis so that the decision is made hastily.

However, past experiences could actually be used as references in making investment decisions. Repeated success and failure could be used as a beneficial sources for the investors to learn the pattern in investment. In fact, stereotyping could help investors in thinking positive towards the believed success indicators so that investors would not have any doubts in making decisions. The positive thinking and confidence is also beneficial for the company in stock exchange because more and more investors that will put their capital in a certain company, hence it will open more opportunities to success.

The understanding the *Representativeness Bias* positively impacts the investment decision is in accordance with the findings of the studies undertaken by [3], [10], [11], [21], [22] and [23] which showed that *Representativeness Bias* have positive impacts towards investment decision. Based on this findings, second hypothesis could be formulated as follows:

H.2 : *Representativeness Bias* have positive impacts on investment decision.

E. Herding

[1] Described that *behavioral finance* is an interdisciplinary of three studies (*Integrate behavioral finance*), i.e. psychology, sociology, and finance. According to [16], social interaction is the source of *Herd Behavior* which is one of the substantial elements in the concept of *Behavioral Finance*. Social interaction will encourage investor to copy other investors' behavior and to follow the most dominant group's investment decision.

Investor would never be separated from Herding because stock investment needs plenty information, so that investors tend to join related investors forum and social media. The information acquired will assist investors in making decision which means Herding affects the investors decision. According to [16], *Herding Behavior* is an exogenous factor that influence human behavior, which means will also influence investors in making investment decision.

The understanding that *Herding* has positive impacts on investment decision is in accordance with previous studies undertaken by [5], [17], [22], [24] and [25] and which showed that *Herding* has positive impacts on investment decision. Based on the theory and empirical findings, the third hypothesis could be formulated as follows:

H.3 : *Herding* has positive impacts towards investment decision.

F. Risk Tolerance

Risk Tolerance is a level of ability accepted in taking an investment risks [20], and each investor has different perception on tolerance level. In relations to investor references, risks are differentiated into three types, i.e. investor who enjoys risks, investor who avoids risk, and investor who chose to be neutral towards risk [26].

According to [27], *Risk Tolerance* is defined as individual evaluation on how risky a situation is in terms of probabilistic estimation from the level of situational uncertainty. How far the uncertainty can be controlled and the level of confidence on the estimation is two most significant methods on understanding and following up risks. [28] argued that risks as feelings refers to instinctive and intuitive reaction towards dangerous and risks as an analysis which involves logics, reasoning, and scientific review to support risks evaluation and decision making.

Risk Tolerance mediation variable is chosen in this model due to consistent results of previous studies which showed the positive influence of *Risk Tolerance* as independent variables towards investment decision, as also found by [3], [4], [8], [29], [30], [31] and [32]. The most recent study undertaken by [11] proved that there is direct positive impacts between Risk Tolerance and investment decision, as well as indirect impacts between *Overconfidence Bias* and *Representativeness Bias* with the investment relation through *Risk Tolerance*. Based on the theory and empirical findings, the formulated hypotheses are as follows:

H.4 : *Risk Tolerance* has positive influence on investment decision.

H.5 : *Overconfidence Bias* has positive influence on *Risk Tolerance*.

H.6 : *Representativeness Bias* has positive influence on *Risk Tolerance*.

H.7 : *Herding* has positive influence on *Risk Tolerance*.

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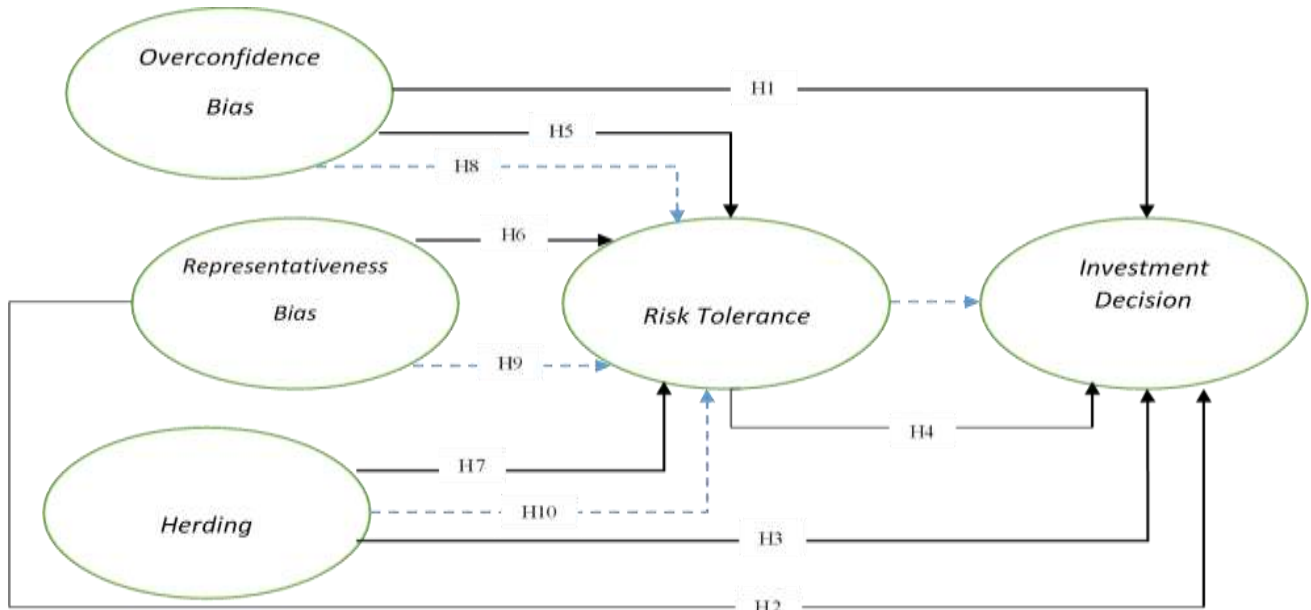
H.8 : *Overconfidence Bias* has positive influence on investment decision through *Risk Tolerance*.

H.9 : *Representativeness Bias* has positive influence on investment decision through *Risk Tolerance*.

H.10 : *Herding* has positive influence on investment decision through *Risk Tolerance*.

III. METHODS

A. Conceptual Model



Picture 3.1. Conceptual Model

B. Data Collection

The population of this study is stock investors in Indonesian Stock Exchange at the end of Semester I year 2022, i.e. 4.002.289 investors. Sample was gathered using Non-probability Sampling with Snowball Sampling technique. The size of the sample was calculated using Slovin formulation that is 100 samples. However, in order to acquire a more representative result, the researcher set 200 respondents as the samples. The data source of the research is primary data, while the data collection technique is using online questionnaire with Likert Scale as the measurement scale.

C. Data Analysis

The study design is quantitative using causal approach to examine the influence of *Overconfidence Bias*, *Representativeness Bias*, and *Herding* towards the investment decision through *Risk Tolerance*. The data was analyzed using descriptive statistics and differential statistics *Structural Equation Model (SEM)* approach based on *Partial Least Square (PLS)* using *Smart PLS* application. The testing phase includes *Evaluation Measurement Model (Outer Model)* to test *Convergent Validity*, *Discriminant Validity*, and *Composite Reliability*, as well as *Evaluation Structural Model and Hypotheses Testing (Inner Model)* to measure the *R-Square* score, *Goodness of Fit Model* and *Hypotheses Examination Results*.

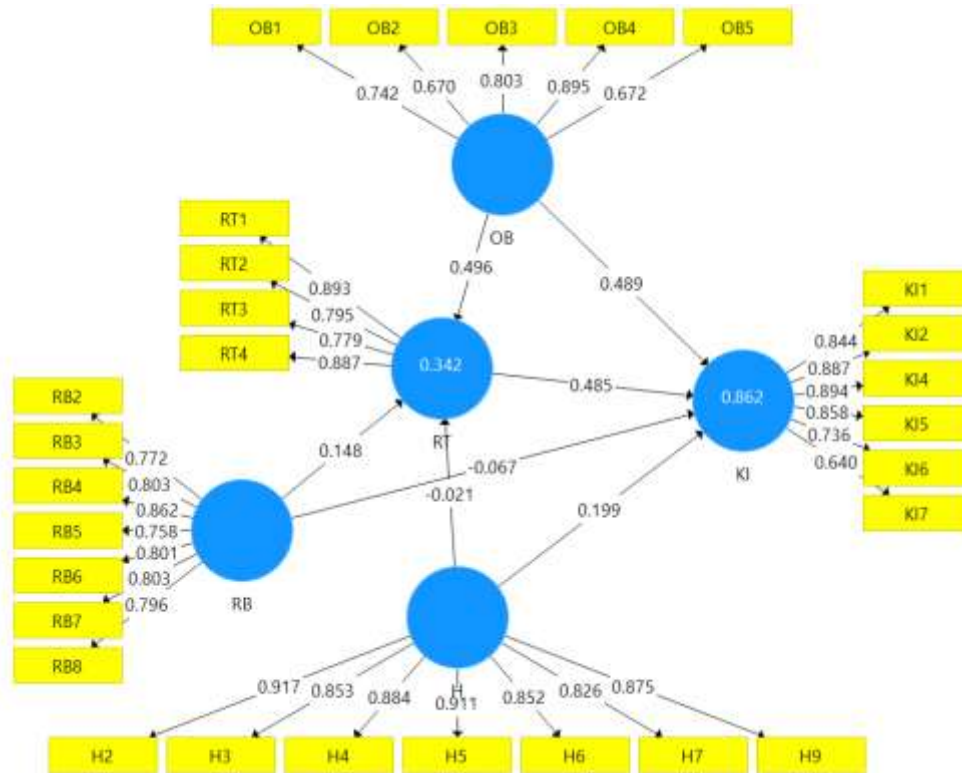
IV. THE RESULTS OF THE STUDY

A. The Results of Evaluation Measurement (Outer) Model

Convergent Validity

The *convergent validity* score is calculated from *loading factor* score on latent variable with its indicators. The picture below shows the calculation result of each indicator *loading factor*. It is considered high if the correlation is more than 0,60 with the calculated construct.

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Picture 4.1. The Test of Convergent Validity (Modification 2)

Based on Picture 4.1, it can be seen that all the indicators have complied to the *convergent validity* due to its *loading factor* score is above 0.60. Aside from the *loading factor score*, the validity can also be seen from AVE score, it is considered valid if the AVE score more than 0.5.

Table 4.1. Average Variance Extracted Test

Variable	AVE
<i>Overconfidence Bias</i>	0.579
<i>Representativeness Bias</i>	0.640
<i>Herding</i>	0.765
<i>Risk Tolerance</i>	0.706
<i>Investment Decision</i>	0.664

It can be seen from Table 4.1 that the score test result of *square root of average variance extracted (AVE)* for each construct with the relation of each construct towards other constructs is above 0,5, which means a good *convergent validity* score.

Discriminant Validity

Table 4.2. The Test of Discriminant Validity Cross Loadings (Modification 3)

Cross Loadings	Overconfidenc e Bias	Representativ eness Bias	Herding	Risk Tolerance	Investment Decision
H2	0.497	0.719	0.918	0.336	0.527
H3	0.478	0.726	0.854	0.319	0.540

Table 4.2 (continued)

Cross Loadings	Cross Loadings	Cross Loadings	Cross Loadings	Cross Loadings	Cross Loadings

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H4	0.573	0.679	0.885	0.380	0.601
H5	0.379	0.587	0.912	0.171	0.406
H6	0.256	0.478	0.851	0.245	0.364
H7	0.246	0.603	0.824	0.294	0.346
H9	0.388	0.750	0.875	0.256	0.433
KI1	0.759	0.526	0.597	0.621	0.853
KI2	0.752	0.449	0.421	0.691	0.873
KI4	0.718	0.431	0.327	0.760	0.891
KI5	0.661	0.462	0.456	0.630	0.891
KI6	0.577	0.559	0.541	0.568	0.767
OB1	0.746	0.440	0.316	0.443	0.613
OB2	0.676	0.406	0.256	0.075	0.495
OB3	0.802	0.378	0.337	0.553	0.717
OB4	0.892	0.703	0.620	0.558	0.728
OB5	0.668	0.299	0.218	0.381	0.479
RB3	0.456	0.817	0.452	0.348	0.343
RB4	0.577	0.852	0.757	0.307	0.494
RB5	0.503	0.751	0.624	0.132	0.333
RB6	0.555	0.795	0.603	0.212	0.488
RB7	0.441	0.818	0.668	0.567	0.529
RB8	0.413	0.819	0.537	0.388	0.474
RT1	0.515	0.522	0.305	0.893	0.663
RT2	0.421	0.153	0.071	0.794	0.537
RT3	0.461	0.375	0.293	0.776	0.532
RT4	0.516	0.376	0.414	0.891	0.799

Table 4.2 shows that each indicator highest *cross loading* score is in accordance with the latent variable which means that it has a good *discriminant validity* score.

Reliability Testing

Construct reliability testing is measured using *Composite Reliability* and *Cronbach's Alpha*. Construct is considered reliable if the score is above 0,70.

Table 4.3. Reliability Testing

Variable	<i>Cronbach's Alpha</i>	<i>Composite Reliability</i>
<i>Herding</i>	0.949	0.958
<i>Investment Decision</i>	0.908	0.932
<i>Overconfidence Bias</i>	0.819	0.872
<i>Representativeness Bias</i>	0.860	0.919
<i>Risk Tolerance</i>	0.860	0.905

From the results above, all the construct have *Composite Reliability* score and *Cronbach's Alpha* score above 0,70, which means that the construct has good reliability.

B. The Evaluation Structural Model Result (Inner Model)

The testing phase on the structural model (*Inner Model*) in this research is undertaken through this steps:

R Square Adjusted

Table 4.4. R² Adjusted

	R ²	R ² Adjusted
<i>Investment Decision</i>	0.821	0.797

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Table 4.4 shows that the R^2 Adjusted score is 0.797 which means that every changes in Investment Decision dependent variable is explainable by independent variable (*Overconfidence Bias, Representativeness Bias and Herding*), mediator variable (*Risk Tolerance*), and its interaction is 79.7 percent. There are still other factors that explain the 20.3 percent of the investment decision variable.

Q Square Test

Q Square Score shows the appropriateness of the model and its parameter in generating observation score. Q Square score more than 0 (zero) shows that the model has a *predictive relevance score*, while Q Square score less than 0 (zero) shows that the model has less *predictive relevance*. The Q^2 is calculated using:

$$\begin{aligned} Q \text{ Square} &= 1 - (1 - R^2_1)(1 - R^2_2) \cdots (1 - R^2_p) \\ &= 1 - (1 - 0.342)(1 - 0.821) \\ &= 1 - (0.658)(0.179) \\ &= 1 - (0.118) \\ &= \mathbf{0.882} \end{aligned}$$

The calculation above shows that the Q^2 score is 0.882 and more than 0 (zero), which means that every investment decision can be predicted by *Overconfidence Bias, Representativeness Bias, Herding and Risk Tolerance* as much as 88.2 percent. It shows that the model has *predictive relevance score* and is considered worthy.

Goodness of Fit (GoF)

$$\begin{aligned} \text{Goodness of Fit} &= \sqrt{AVE * R^2} \\ &= \sqrt{0.688 * 0.581} = \sqrt{0.400} = \mathbf{0.632} \end{aligned}$$

The calculation above shows the *GoF* score is above 0.38, that is 0.632; it means that this model has a very high compatibility, where the differences between the observed scores and the expected scores in the model is low.

The Hypotheses Test Result

Table 4.5. The Hypotheses Test Result

Variable	Original Sample	T-Statistics	P Values	Explanation
OB -> KI	0.636	14.346	0.000	Positive - Significant
RB -> KI	0.173	1.870	0.031	Positive - Significant
H -> KI	-0.059	0.621	0.267	Negative- insignificant
RT -> KI	0.453	6.736	0.000	Positive - Significant
OB -> RT	0.481	7.689	0.000	Positive - Significant
RB -> RT	0.310	2.966	0.002	Positive - Significant
H -> RT	-0.082	0.891	0.187	Negative- insignificant
OB -> RT -> KI	0.218	5.378	0.000	Positive - Significant
RB -> RT -> KI	0.140	2.814	0.003	Positive - Significant
H -> RT -> KI	-0.037	0.901	0.184	Negative- insignificant

Direct Influence Hypotheses Testing

a. The Hypotheses Test Result of *Overconfidence Bias* towards Investment Decision

It can be seen from Table 4.7 that the *Original Sample* scores 0,636, with *T-Statistics* scores 14,346 and *P Values* scores 0.000 < alpha = 0,05, which means that the *Overconfidence Bias* have significant positive influence towards investment decision. It can be inferred that the first hypotheses (H.1) is accomplished and proven that the higher the *Overconfidence Bias*, the higher the investment decision.

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b. The Hypotheses Test Result of *Representativeness Bias* towards Investment Decision

It can be seen from Table 4.7 that the *Original Sample* scores 0,173, with *T-Statistics* scores 1,870 and *P Values* scores 0,031 < alpha = 0,05, which means that the *Representativeness Bias* have significant positive influence towards investment decision. It can be inferred that the second hypotheses (H.2) is accomplished and proven that the higher the *Representativeness Bias*, the higher the investment decision.

c. The Hypotheses Test Result of *Herding* towards Investment Decision

It can be seen from Table 4.7 that the *Original Sample* scores -0,059, with *T-Statistics* scores 0,621 and *P Values* scores 0,267 > alpha = 0,05, which means that the *Herding* have insignificant negative influence berpengaruh towards investment decision. It can be inferred that the third hypotheses (H.3) is not accomplished and not proven, hence it can be concluded that *Herding* does not have any influence towards investment decision.

d. The Hypotheses Test Result of *Risk Tolerance* towards Investment Decision

Table 4.7 shows that the *Original Sample* scores 0,453, with *T-Statistics* scores 6,736 and *P Values* scores 0.000 < alpha = 0,05, which means that the *Risk Tolerance* have significant positive influence towards Investment Decision. Hence, the fourth hypotheses (H.4) is accomplished and proven that the higher the *Risk Tolerance*, the higher the Investment Decision.

e. The Hypotheses Test Result of *Overconfidence Bias* towards *Risk Tolerance*

Table 4.7 shows that the *Original Sample* scores 0,481, with *T-Statistics* scores 7,689 and *P Values* scores 0.000 < alpha = 0,05, it shows that the *Overconfidence Bias* have significant positive influence towards *Risk Tolerance*. Therefore, the fifth hypotheses (H.5) is accomplished and proven that the higher the *Overconfidence Bias*, the higher the *Risk Tolerance*.

f. The Hypotheses Test Result of *Representativeness Bias* towards *Risk Tolerance*

Table 4.7 shows that the *Original Sample* scores 0,310, with *T-Statistics* scores 2,966 and *P Values* scores 0.002 < alpha = 0,05, it shows that the *Representativeness Bias* have significant positive influence towards *Risk Tolerance*. Hence, the sixth hypotheses (H.6) is accomplished and proven that the higher the *Representativeness Bias*, the higher the *Risk Tolerance*.

g. The Hypotheses Test Result of *Herding* towards *Risk Tolerance*

Table 4.7 shows that the *Original Sample* scores -0,082, with *T-Statistics* scores 0,891 and *P Values* scores 0,187 > alpha = 0,05, it shows that *Herding* does not have any influence towards *Risk Tolerance*. Therefore, the seventh hypotheses (H.7) is not accomplished and not proven that *Herding* does not have any influence towards *Risk Tolerance*.

Hypotheses Testing on Indirect Influence

a. The Hypotheses Test Result of *Overconfidence Bias* towards Investment Decision through *Risk Tolerance*

Table 4.7 shows that the *Original Sample* scores 0,218, with *T-Statistics* scores 5,378 and *P Values* scores 0,000 < alpha = 0,05, it shows that *Overconfidence Bias* have significant positive influence towards investment decision through *Risk Tolerance*. Hence, the eighth hypotheses (H.8) is accomplished and proven that *Overconfidence Bias* have positive significant influence towards investment decision through *Risk Tolerance*.

b. The Hypotheses Test Result of *Representativeness Bias* towards Investment Decision through *Risk Tolerance*

Table 4.7 shows that the *Original Sample* scores 0,140, with *T-Statistics* scores 2,814 and *P Values* scores 0,003 < alpha = 0,05, which means that the *Representativeness Bias* have positive significant influence towards investment decision through *Risk Tolerance*. Therefore, the ninth hypotheses (H.9) is accomplished and proven that *Representativeness Bias* have positive significant influence towards investment decision through *Risk Tolerance*.

c. The Hypotheses Test Result of *Herding* towards Investment Decision through *Risk Tolerance*

Table 4.7 shows that the *Original Sample* scores -0,037, with *T-Statistics* scores 0,901 and *P Values* scores 0,184 > alpha = 0,05, which means that *Herding* does not have any influence towards investment decision through *Risk Tolerance*. Therefore, the tenth hypotheses (H.10) is not accomplished and not proven that *Herding* does not have any influence towards investment decision through *Risk Tolerance*.

V. DISCUSSION

The overconfidence that results in *Overconfidence Bias* is one form of decision making which is influenced by emotion (*emotional bias*), so that investors tend to have more audacity to make a risky decision [33]. Over confidence will encourage someone to easily make a decision, without any doubts, with further consideration, so that the decision is immediately made.

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The decisions made to invest is mostly encouraged by self-assurance. Meanwhile, this study found that the most dominant dimension of *Overconfidence Bias* is Self-Optimism, where investors have un limited optimism about the future. Investors have very high confidence that their decision to invest will always results in profit, and with the over confidence investors tend to neglect the risks or even more tolerant to the potential risks.

Price fluctuation is one of the condition encountered by investors in stock market. Rapid investment decision and investors assurance towards their investment could actually help investors in handling those situation. Investors who are optimist towards the success of their investment will not be easily influenced by rumors and other investors opinions to make a different decision which could cause loss. Optimism and courageous in taking bigger risk will help investors gaining larger opportunities of success. The result of this study strengthen previous studies that shows the positive influence of *Overconfidence Bias* towards investment decision, including those undertaken by [3], [4], [5], [6], [11], [18] and [24]. On the contrary, the finding of this study does not support the studies that found that *Overconfidence Bias* does not have any influence on investment decision, as those undertaken by [8], [9] and [20]. The difference in the findings is resulted from certain differences, such as research methods, research tools, research object, and the period the study is carried out. Despite the similar data analysis method used by [20], the different respondents, which is lecturers of Economic Studies in Surabaya, resulting in different findings. Different results also occur to study carried out by [9] due to different respondents which are located in Kepulauan Riau. This study also used different data analysis tools, that is SPSS. Meanwhile, the respondents in the study performed by [8] is college students in Pekalongan, and the data is analyzed using SPSS.

Representativeness Bias is one type of cognitive bias. The most dominant dimension of representativeness bias is Stereotype dimension, where most respondents believe that high stock market price is resulted from a good company performance. This stereotyping assist investors to think positive towards the company and tend to be more tolerant towards risk, so that they would not have any doubts in making decision. The companies could also use the stereotypes as a reflection in maintaining company performance which could generate more opportunities to have more investment installed to their companies.

The result of this study also strengthen the findings of previous studies carried out by [3], [10], [11], [22], [25] and [34] which described the positive influence of *Representativeness Bias* towards investment decision. On the other hand, this study does not support the study undertaken by [9], [14] and [15] which showed that *Representativeness Bias* does not have any influence towards investment decision which, among others, are resulted from different research methodology, research object, and period when the research takes place. The study carried out by [9] is not only different in terms of respondents, which are investors in Kepulauan Riau, but also in terms of data analysis tools which using SPSS. Meanwhile, [14] used different set of respondents that is college students in Universitas Muhammadiyah Surakarta which have invested in stock market from June to August 2021; which is different from [15] that chose young investors in Surabaya as the respondents, despite using similar data analysis tools.

Herding in investment decision making is usually in form of copying others' success, the most popular trend will be the main source of investment decision consideration. This study found that most respondents are individuals with high level of self-confidence, so that they are not easily influenced by information acquired from investors forums or related social media. Exposure and access towards adequate information could also be supporting factors that will encourage investors to make analysis before making an investment decision. This indicates investors' rational behavior for not easily influenced and making rapid reaction towards the change of other investors' references. *Risk Tolerance* could not provide mediation for *Herding* towards investment decision making. Most respondents are confident that their tolerance towards risk is based on in depth analysis process from knowledge and competence so that their decision in making investment is not merely based on the most popular trend.

This study does not endorse findings of previous studies that proved *Herding* has positive influence towards investment decision making process, as also found by [5], [17] and [25]. This differences are resulted from different research methodology, different data analysis tools, different set of respondents, and different period of time. [17] does not only have different respondents that already have invested, but also using different data analysis tools, i.e. SPSS. Meanwhile, [5] have different respondents and research location which are active investors in stock market in Pakistan, and use *Ordinary Least Square (OLS)* as the data analysis tools. In addition, [25] chose college students in Yogyakarta as respondents and analyze the data using SPSS. The findings of this study actually supports previous research that proved that Herding does not have any influence towards the investment decision, as also found by [13], [18] and [19].

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VI. CONCLUSIONS

According to the findings of this research, it can be concluded that *Overconfidence Bias* have significant influence towards the investment decision either directly or through *Risk Tolerance*. Investors who are overconfident tend to be more tolerant towards potential risks and induce them to immediately make decisions. Immediate investment decision making could help investors in engaging the fluctuation of market price. The investment decision resulted from self-confidence could help investors avoid rumors and other investors' opinions which could cause different decision and loss. Investors optimism and courageous to take risks could open more opportunities for success.

Representativeness Bias have significant influence towards investment decision either directly or through *Risk Tolerance*. Investment decision which is based on bias stereotyping and neglecting potential risks, without any analysis will urge investors to make an immediate decision. The stereotyping will prompt investors to think positive about the believed indicators. Investors could also find investment pattern from both bad and good previous experiences as a reference for their current decision.

Herding does not have any influence towards investment decision making either directly or through *Risk Tolerance*. Investors with high level of self-confidence will not be easily influenced by the information available from investors' forum or related social media. They will not be influence by other investors, and will not make any hasty reaction towards the change of other investors' references. *Risk Tolerance* could not mediate *Herding* towards investment decision making. Investors believe that their tolerance towards risk is based on depth analysis of their knowledge and competence so that the investment decision made does not depend on popular trend, and the risks tolerance possessed is not because of following other investors. These investors are more rational and have decent capability in calculating the suitable risk tolerance so that they could easily make a decision.

The researcher took this opportunity to make suggestions as follows: (1) Provide adequate training for investors in term of investment management, risk management, emotional bias control, and cognitive investment decision making; (2) to increase investors and investment transaction, Indonesian Stock Exchange needs to elevate the investors' risk tolerance; (3) Companies need to satisfactorily maintain their performance since most investors make a decision based on stereotypes by making evaluation on companies' positive performances based on high stock price; (4) *Probability Sampling* is encouraged to be used in the following research in the future in order to have a more representable population.

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