



The Influence of Representativeness on Investment Decision through Overconfidence

Hery Kharisma Fitri ✉, Dwi Cahyaningdyah

Management Department, Faculty of Economics, Universitas Negeri Semarang, Semarang, Indonesia

Article Information

Article History:

Received May 2021

Approved June 2021

Published June 2021

Keywords:

Representativeness,
Overconfidence,
Investment Decision

Abstract

This study aims to explore the effect of representativeness on investment decisions through overconfidence as an intervening variable on investors from the Faculty of Economics, Universitas Negeri Semarang. The data used in this study is primary data with a survey method using a questionnaire. The research sample was taken using convenience sampling technique with a sample of 115 investors. The sample was then analyzed using the Partial Least Square (PLS) method with the help of the SmartPLS 3.0 application. The empirical results of this study explain that representativeness has no effect on investment decisions, overconfidence has a significant positive effect on investment decisions, representativeness has a significant positive effect on overconfidence, and overconfidence mediates the relationship between representativeness and investment decisions in full mediating.

INTRODUCTION

Calendar Effect anomalies in the capital market documented in various empirical researches shake efficient market hypotheses. Rozeff and Kinney (1976) saw a higher return seasonality in January, compared to months other than January. McConnell and Wei (2008) found a turn of the month effect anomaly occurred in the United States capital market. Cahyaningdyah and Witiastuti (2010) explained that the lowest return of IHSG was found on Monday and on Friday had the highest return so as to confirm the existence of an anomaly Day of the Week Effect in IHSG. Some of the findings in the study above confirm that there is irrationality of investors from the calendar effect phenomenon.

Some studies have shown that in reality inefficient markets occur due to limited rationality, cognitive and emotional weaknesses, fundamental heuristics, intuitive reasoning and limited information, as well as anomalies that persist in the market and produce inefficiencies (Ajmal et al., 2011). The study of irrational investors in the capital market originated from de Bondt and Thaler (1985) found the results that under certain conditions, irrational behavior of investors really existed. Ritter (2003) found that investors in Taiwan, Japan and the United States has suffered considerable capital losses in trading influenced by irrational behavior conducted by investors in the periods 1987-1988 and 1999, during which time the shares were overvalued. The same is the case with Jiang et al., (2015) indicates the possibility of psychological factors resulting in investors behaving irrationally and can trigger bias in stock transactions because the taste factor in a person exceeds the risk assessment.

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✉ Correspondence Address:

L2 Building, 1st Floor, Faculty of Economics, Universitas Negeri Semarang
Jalan Taman Siswa, Sekaran, Gunungpati, Semarang, 50229
E-mail: karismafti@students.unnes.ac.id

Behavioral Finance is a science about the influence of psychology that an investor has and the impact it has on the market (Sewell, 2007). Individual investors tend to exhibit behavioral biases when trading on the capital market causing errors (Chen et al., 2007). Human actions are assumed based on the expected results if they do so (Martono et al., 2020). Investors are trying to develop strategies to obtain a larger return or abnormal return (Maharani & Witiastuti, 2015). Srianingsih and Khoiruddin (2015) explained that investors will consider the information provided by the market when making investment decisions. Investors will have differences in assessing the information received, changes in information between market participants to be inefficient (Ardiansari & Saputra, 2015). The efficient pasar anomaly shows evidence that the capital market cannot be said to always be in an efficient state (Khoiridah & Wijayanto, 2017).

According to Baker et al., (2019) the most glaring behavioral biases occurring in investors are representativeness and overconfidence. Behavior bias representativeness and overconfidence fall into the category of cognitive biases, namely errors in the process of interpretation, processing, and decision making of a reality or fact (Pompian, 2006).

Representativeness is decision making based on stereotypical thinking that will result in investors making investment decisions that are not necessarily appropriate, namely investment decisions that do not maximize profits (Sina, 2014). Representativeness bias is based on experiences that have occurred and been done or known. The success achieved by these investors is likely to be done again in the future (Chen et al., 2007). This representativeness can lead to incorrect conclusions as it focuses only on familiar events and all other factors as well as related information not analyzed (Parveen et al., 2020). This stereotype will lead to mistakes, since investing in high-income stocks is insufficient (Lakonishok & Shleifer, 1994). This representativeness is contrary to the concept of rationality and the hypothesis of an efficient market, which will influence investment decisions.

Toma (2015) examined the impact of behavioral bias on individual investor investment decisions on the Romania stock exchange. As a result, representativeness bias positively affects investment decisions. Research conducted by Irshad et al., (2016) also found that representativeness has a positive effect on investment decisions. In line Ikram (2016) found positive representative-

ness results significantly influence investment decisions on individual investors on the Islamabad stock exchange. While the research conducted by Athur (2013) democratic rights and freedom of expression have been key issues in discourses surrounding EU, Turkey relations. Discussions on these questions often centre on state censorship and legislative constraints. The role of the media themselves, however, and the deeply-ingrained elements and historically-contingent norms and practices within public culture that shape the public sphere, have received a significantly lower level of attention. Despite recent legislative changes towards greater freedom of expression, major hurdles that limit democratic rights and freedoms persist in practice, as highlighted by the judicial trial (and the subsequent murder in January 2007; Yaowen et al., (2015); Shah et al., (2018) showed that representativeness has a negative influence on investment decisions.

Overconfidence in this study serves as a mediation variable. Overconfidence is cognitive bias, which can be interpreted as a belief that has no reason in intuitive reasoning, assessment and cognitive capabilities of humans (Pompian, 2006). When someone exaggerates their knowledge and skills, it is a reflection of overconfidence (Hvide, 2002). Investors who are already comfortable and already successful with their investments, will make other investments in the future as their confidence levels continue to increase. That high level of confidence that would make someone overconfidence.

An investor who has an overconfidence bias will underestimate risk factors and estimate high returns (Baker & Nofsinger, 2002). Overconfidence makes investors underestimate the predictions made and overestimate to the knowledge possessed by the investor itself because investors exaggerate their abilities (Nofsinger, 2005). According to Kufepaksi (2008) the overconfidence behavior of an investor will present himself as having above average ability so that the investor will look for information that supports his mindset and do not consider information related to his beliefs. Assessment of a phenomenon exceeds real conditions causing errors in investment decisions (Simon et al., 2000).

Bahir et al., (2013) studied the impact of behavioral bias on investment decision making and formulated that biased overconfidence impacts decisions taken by investors. Metawa et al., (2018) shows that overconfidence affects investment decisions. Chen et al., (2007) examined investment decision making in China and found that Chinese investors make bad investment de-

cisions because they suffer from overconfidence bias. Park et al., (2010) studied the impact of overconfidence bias and found negative results on returns. Bakar et al., (2016) explained the various biases and impacts on investment decisions in the Malaysian capital market get the result that overconfidence has a significant negative effect on investment decisions.

Heuristic representativeness uses a rule of thumb that forces individuals to think fast based on past experience, so heuristic will help in spurring overconfidence that will influence investment decisions (Kahneman & Slovic, 1982). Overconfidence investors tend to rely on heuristic representativeness for decision making in conditions of uncertainty (Parveen et al., 2020). Parveen et al., (2020) examines the role of overconfidence as a mediation variable between heuristic representativeness and investment decisions on individual investors in Pakistan. In the study mediators have an important role. The relationship between representativeness and investment decisions is negative. Then overconfidence is used as a mediator between the two and shows significant positive results. It can be concluded that overconfidence of the relationship between representativeness and investment decisions is partial. Parveen et al., (2020) is first study to measure the role of mediators between representativeness and investment decisions.

Based on data from Kustodian Sentral Efek Indonesia (KSEI) the classification of investors based on employment is dominated by students 27.19%, entrepreneurs 13.20%, housewives 4.36%, and the rest in other categories. The phenomenon of increasing the number of new investors dominated by students will certainly lead to different investment decisions. Conditions of representativeness and overconfidence bias are likely to occur in anyone without exception students. The student's background has the probability that the investment decision making made by the student is affected by his psychology. Students can make reasoning mistakes because of uncertainty. So this study took the object of students of the Faculty of Economics, Universitas Negeri Semarang. This study aims to determine the influence of representativeness on the investment decisions of students of the Faculty of Economics, Universitas Negeri Semarang.

Hypotheses Development

According to heuristic theory, representativeness is one of the heuristic biases that can influence a person in the investment decision making process. Kahneman and Tversky (1972)

stated that the decision taken by a person is based on beliefs about the probability of an event. These beliefs can be formed from a heuristic way of thinking representativeness, so it will cause bias because a person tends to deviate from the theory of opportunity due to limitations on cognitive abilities. Investors affected by representativeness will make decisions based on their past experience (Irshad et al., 2016). Representativeness can lead to incorrect conclusions because it focuses only on past events and all other factors as well as related information are not analyzed (Parveen et al., 2020).

Representativeness has several implications for investment decision making. When choosing the company's shares to invest in there is the potential to be influenced by representativeness. The pattern of high income growth makes investors believe that it is likely to repeat itself in the future. The predictability of future profit growth is summed up by past earnings using heuristic representativeness (Shleifer, 2000). Heuristic representativeness encourages investors to invest in high-yielding stocks (Barber & Odean, 2000). While past performance represents future growth potential, this is not the main criterion. This stereotype will lead to mistakes, since investing in high-profit stocks is usually not fully representative (Shleifer, 2000). Overall, representation tends to limit investment decisions and make investors narrow-minded when decisions about equity should be made. It also creates stereotypes that contradict successful progress in the investment process.

Some studies provide results that support heuristic theory where representativeness positively affects investment decisions. Toma (2015) examined the impact of behavioral bias on individual investor investment decisions on the Romania stock exchange. As a result, representativeness bias positively affects investment decisions. Ramdani (2018) conducted research on the influence of representativeness on students who become investors in the city of Yogyakarta and gave results that representativeness positively influenced investment decisions. Research conducted by Ikram (2016) and Irshad et al., (2016) also gave positive results on investment decisions by individual investors. Therefore, the hypothesis built in this study is a significant positive relationship between representativeness and investment decisions of students of the Faculty of Economics, Universitas Negeri Semarang.

H1: Representativeness has a significant positive impact on investment decisions

The rule of thumb on heuristic representativeness forces individuals to think fast based on past experience, so heuristic will help in spurring overconfidence that will affect investment decisions (Kahneman & Slovic, 1982). Overconfidence investors tend to rely on heuristic representativeness for decision making in conditions of uncertainty (Parveen et al., 2020). Overconfidence will increase as his past knowledge and experience increases. Other factors that do not match his beliefs will be ignored.

The results of this study are consistent with research conducted by Parveen et al., (2020) showing that representativeness affects overconfidence in individual investors in Pakistan. Where investors in Pakistan rely on past information such as company profit announcements, to be more overconfidence because it gets a positive return. This shows a tendency overconfidence towards the utilization of heuristic representativeness in making decisions.

H2: Representativeness has a significant positive impact on overconfidence.

Overconfidence is one of the biases that influence a person in making investment decisions. Overconfidence is defined as excessive confidence in the ability and knowledge possessed in making investments (Kansal & Singh, 2018). Investors who associate past success with their abilities and past failures with bad luck tend to overconfidence (Chen et al., 2007).

An investor who has a high level of overconfidence will overestimate the knowledge possessed, by predicting that it will benefit more in making repeated investments (Pradikasari & Isbanah, 2018). This means that the higher the level of overconfidence, the more confident that the investment will result in a high return. According to Kufepaksi et al., (2008) an investor's overconfidence behavior will present itself as above average so that the investor will seek information that supports his mindset and does not consider information related to his beliefs. Assessment of a phenomenon exceeds real conditions causing errors in investment decisions (Simon et al., 2000).

Some studies provide results that support heuristic theory where overconfidence positively affects investment decisions. Bahir et al. (2013) studied the impact of behavioral bias on investor decision making and summarized that biased overconfidence has an impact on decisions taken by investors. Metawa (2018) proves that overconfidence has an influence on investment decisions. Mumaraki and Nasieku (2016), Antony and Joseph (2017), and Javed and Marghoob (2017) in

their research showed consistent results that overconfidence had a significant positive effect on investment decisions. Therefore, the hypothesis built in this study is the positive relationship between overconfidence and investment decisions of students of the Faculty of Economics, Universitas Negeri Semarang.

H3: Overconfidence has a significant positive impact on investment decisions

Overconfidence investors overestimate their abilities and rely on past knowledge, skills, and information (Parveen et al., 2020). The positive role of overconfidence shows that relying on past performance provides a positive advantage (Parveen et al., 2020). Parveen et al., (2020) examines the role of overconfidence as a mediation variable between heuristic representativeness and investment decisions on individual investors in Pakistan. In the study mediators have an important role. The relationship between representativeness and investment decisions is negative. Then overconfidence is used as a mediator between the two and shows significant positive results. It can be concluded that overconfidence mediates the relationship between representativeness and investment decisions partially. This study is the first study to measure the role of mediation between representativeness and investment decisions.

Some studies have shown the role of overconfidence as intervening between different variables. Park et al., (2010) research has tested overconfidence as a mediator between confirmation bias and trading volume. Iqbal et al., (2015) research found the results of overconfidence partially mediated the relationship between self attribution bias and perceived market efficiency. Haixia (2018) conducted research on investor sentiment and investment behavior of companies with managerial overconfidence as mediators between the two. The results showed that the role of managerial overconfidence partially mediated the relationship between investor sentiment and the company's investment behavior. Therefore researchers introduce biased overconfidence as a mediator between representativeness and investment decisions.

H4: Overconfidence mediates the relationship between representativeness and investment decisions.

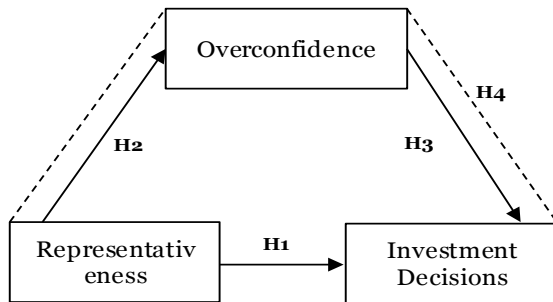


Figure 1. Research Model

METHOD

This research is a type of quantitative descriptive research. The data used in this study is primary data directly obtained from respondents. Data collection techniques using survey methods with questionnaires distributed online. The population in this study was students of the Faculty of Economics, Universitas Negeri Semarang who invested in the capital market.

The number of populations is not known for sure, so the sampling using the formula Purba (1996) with a minimum sample of 96 respondents. Sampling in this study using non probability sampling techniques, namely convenience sampling and final samples in this study were 115 respondents.

The method used to analyze the data in this study is Structural Equation Model-Partial Least Square using SmartPLS 3.0 application.

Research Variables

Investment Decisions

Investment decisions are an alternative selection process of all existing alternatives (Subash, 2012). Investment decisions can be in the form of what instruments capital will be invested and how much capital will be invested (Ningsih & Cahyaningdyah, 2014). Investment decisions begin with the identification of investment opportunities, which are often referred to as capital investment projects (Cahyaningdyah & Ressany, 2012). While investors are faced with the return of investment decisions, risk is the dominant factor to consider because the small amount of risk contained in an investment alternative will affect the investment income (Witiastuti, 2013). Investors and issuers will be faced with market risks for the possibility of obtaining capital gain or capital loss, given the high risk high return and low risk low return (Setiawan & Wijayanto, 2017). The balance between return and risk will maximize the share price in the optimal capital structure (Ridloah, 2013). The company's

improved performance in terms of revenue will make investors expect more returns through dividends (Martono et al., 2020). Investment decisions as bound variables in this study were measured using indicators referring to Humairo (2020) as follows return or rate of return, risk, and relationship of return and risk levels

Representativeness

Representativeness is decision-making based on stereotypical thinking (Sina, 2014). Representativeness bias is based on experiences that have occurred and been done or known. The success achieved by these investors is likely to be done again in the future (Chen et al., 2007). This study uses representativeness indicators that refer to Khan et al., (2017) as follows, failure of investors to consider sample size, ignoring basic reality, and consider certain characteristics as representation of the entire scenario.

Overconfidence

Overconfidence is a cognitive heuristic bias, which can be defined as unwarranted belief in one's intuitive reasoning, judgment and cognitive abilities (Pompian, 2006). Overconfidence makes investors underestimate the predictions made and overestimate to the knowledge possessed by the investor himself (Nofsinger, 2005). This study uses overconfidence indicators that refer to Gill et al., (2018) as follows overestimate on the knowledge possessed, ignoring other factors contrary to his beliefs, and Better than average

RESULT AND DISCUSSION

Before conducting hypothesis testing, an evaluation of the measurement model is conducted for verification of latent indicators and variables that can be tested next. The following is presented a diagram of the outer path of the PLS model in figure 2:

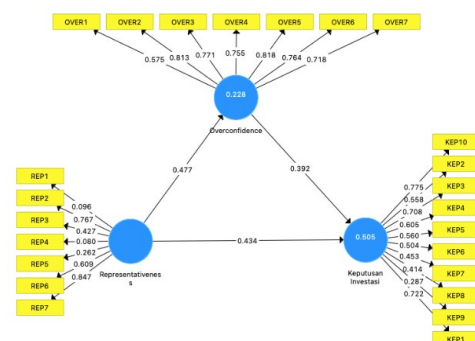


Figure 2. Outer Main Model

Based on figure 2 above can be seen from the outer loadings value to deduce whether the indicator is valid or not. Indicators REP1, REP3, REP5, KEP7, KEP3, KEP5, KEP6, KEP8, and KEP9 are invalid and will be eliminated because outer loadings on the indicator < 0.5 . So that the model is adjusted into figure 3:

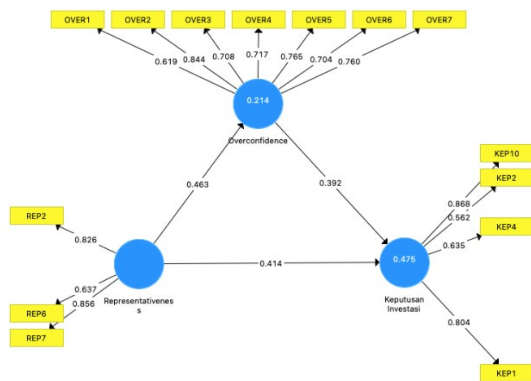


Figure 3. Outer Adjustment Model

Convergent Validity Test

Average Variance Extracted (AVE)

The Average Variance Extracted (AVE) value is said to be valid if the value > 0.5 . This value means that one latent variable is able to explain more than half the variants of its indicators in average. The following are presented the results of the AVE test in table 1:

Table 1. AVE

| Variable | AVE Value | Desc. |
|----------------------|-----------|-------|
| Representativeness | 0.607 | Valid |
| Overconfidence | 0.538 | Valid |
| Investment Decisions | 0.530 | Valid |

In table 1 above, the AVE value in the representativeness variable is 0.607, the overconfidence is 0.538, and the investment decision is 0.530. So it is concluded that all variables are valid because the AVE value > 0.5 .

Outer Loadings

According to Hair et al., (1998) The outer loadings value is said to be valid if the value is 0.05. The following are presented the results of processing outer \geq loadings data in table 2:

Table 2. Outer Loadings

| Indicator | Repre. | Over. | Inv.Dec. | Desc. |
|-----------|--------|-------|----------|-------|
| REP.2 | 0.826 | | | Valid |
| REP.6 | 0.637 | | | Valid |
| REP.7 | 0.856 | | | Valid |
| OVER.1 | | 0.619 | | Valid |
| OVER.2 | | 0.844 | | Valid |
| OVER.3 | | 0.708 | | Valid |
| OVER.4 | | 0.717 | | Valid |
| OVER.5 | | 0.765 | | Valid |
| OVER.6 | | 0.704 | | Valid |
| OVER.7 | | 0.760 | | Valid |
| KEP.1 | | | 0.804 | Valid |
| KEP.2 | | | 0.562 | Valid |
| KEP.4 | | | 0.635 | Valid |
| KEP.10 | | | 0.868 | Valid |

Based on table 2 above all indicators on representativeness, overconfidence, and investment decisions have an outer loadings value of ≥ 0.5 can be concluded all indicators on the above adjustment model are valid.

Discriminant Validity Test

Fornell-Larcker

Fornell-Larcker's criteria is that for each square root value of ave for each latent variable must be higher than the correlation value between latent variables then concluded valid discriminant (Ghozali, 2014). The following is presented the results of data processing Fornell-Larcker in table 3:

Table 3. Fornell-Larcker

| | Inv.Dec. | Overcon. | Repre. |
|----------|----------|--------------|--------------|
| Inv.Dec. | 0.728 | | |
| Overcon. | 0.583 | 0.734 | |
| Repre. | 0.595 | 0.463 | 0.779 |

Based on table 3 above the square root value of AVE investment decision of 0.728 while the value of overconfidence correlation is 0.583 and representativeness is 0.595 so it is concluded valid discriminant because the square root value of AVE investment decision $>$ the value of correlation of overconfidence and representativeness. The square root value of AVE overconfidence is 0.734 while the correlation value of investment decisions is 0.583 and representativeness is 0.463

so it is concluded valid discriminant because the square root value of AVE overconfidence > the correlation value of investment decisions and representativeness. The square root value of AVE representativeness is 0.779 while the value of overconfidence correlation is 0.463 and investment decision is 0.595 so it is concluded valid discriminant because the square root value of AVE representativeness > the correlation value of investment decisions and overconfidence. Overall all three variables tested are valid discriminants.

Cross Loadings

Cross Loading is another measure of discriminant validity. Categorized as valid discriminant if each indicator block has higher loadings for each latent variable measured compared to indicators for other latent variables. The following are presented the results of data processing cross loadings in table 4:

Table 4: Cross Loadings

| Indicator | Inv.D | Over. | Repre. | Desc. |
|-----------|--------------|--------------|--------------|-------|
| KEP.1 | 0.804 | 0.484 | 0.609 | Valid |
| KEP.2 | 0.562 | 0.307 | 0.083 | Valid |
| KEP.4 | 0.635 | 0.485 | 0.385 | Valid |
| KEP.10 | 0.868 | 0.376 | 0.452 | Valid |
| REP.2 | 0.420 | 0.497 | 0.826 | Valid |
| REP.6 | 0.087 | 0.136 | 0.637 | Valid |
| REP.7 | 0.637 | 0.328 | 0.856 | Valid |
| OVER.1 | 0.431 | 0.619 | 0.513 | Valid |
| OVER.2 | 0.627 | 0.844 | 0.443 | Valid |
| OVER.3 | 0.209 | 0.708 | 0.202 | Valid |
| OVER.4 | 0.334 | 0.717 | 0.319 | Valid |
| OVER.5 | 0.220 | 0.765 | 0.211 | Valid |
| OVER.6 | 0.217 | 0.704 | 0.040 | Valid |
| OVER.7 | 0.537 | 0.760 | 0.271 | Valid |

In the table above the indicator block loadings on investment decisions higher than overconfidence and representativeness so that it is concluded valid discriminant. Block indicator loadings on representativeness are higher than overconfidence and investment decisions so that it is concluded valid discriminant. Block indicator loadings on overconfidence are higher than representativeness and investment decisions so that it is concluded valid discriminant. Overall all three variables tested are valid discriminants.

Reliability Test

Reliability tests are required to demonstrate the stability and consistency of an instrument in measuring a concept or variable (Hair et al., 2006). Reliability can be measured by looking at cronbach's alpha and composite reliability values. According to Hair et al., (2006) an indicator is said to have good reliability, when the value of cronbach's alpha and composite reliability is greater than 0.70. The following are the reliability results in table 5:

Table 5. Cronbach's Alpha & Composite Reliability

| | Cronbach Alpha | Composite Reliability | Desc. |
|-------------|----------------|-----------------------|----------|
| Represent. | 0.716 | 0.820 | Reliabel |
| Overcon. | 0.873 | 0.890 | Reliabel |
| Invest Dec. | 0.706 | 0.814 | Reliabel |

Based on table 5 above it can be explained that all latent variables have a value of cronbach's alpha and composite reliability > 0.70. So it can be concluded that the construct that was built shows the accuracy and accuracy of its measurements or reliable.

Descriptive Analysis of Research Respondents

Descriptive analysis of respondent demographics in this study provides information on respondents' picture, among others gender, age, major, level, and length of investment. The following demographic data of research respondents is presented in table 6:

Table 6: Descriptive Analysis of Respondents

| Information | Sum | (%) |
|------------------|-----|--------|
| Gender | | |
| Man | 44 | 38.26% |
| Woman | 71 | 61.74% |
| Department | | |
| Management | 61 | 53.04% |
| Accountant | 27 | 23.48% |
| Development eco. | 13 | 11.30% |
| Economic edu. | 14 | 12.17% |
| Age | | |
| 18 years old | 6 | 5.22% |
| 19 years old | 8 | 6.96% |
| 20 years old | 30 | 26.09% |

| | | |
|--------------|----|--------|
| 21 years old | 41 | 35.65% |
| 22 years old | 25 | 21.74% |
| 33 years old | 5 | 4.35% |

Old Investment

| | | |
|---------------|----|--------|
| < 1 year | 46 | 40.00% |
| 1-2 years old | 48 | 41.74% |
| 2-4 years old | 19 | 16.52% |
| > 4 years old | 2 | 1.74% |

Based on gender data in table 6 shows that 44 respondents (38.26 %) were male and 71 respondents (61.74 %) is a woman. This suggests respondents were dominated by women in the study.

Based on the data of majors in table 6 shows that management majors dominate the 61 respondents (53.04 %), accounting majors are 27 respondents (23.48 %), majors in economic education that is 14 respondents (12.17 %), and development economics is 13 respondents (11.30 %).

Based on age data in table 6 shows that respondents dominated by 21 years old, namely 41 respondents (35.65 %), 20 years old, 30 respondents (26.09 %), 22 years old as many as 25 respondents (21.74 %), 19 years old as many as 8 respondents (6.96 %), 18 years old (5.22 %), and 23 years old as many as 5 respondents (4.35 %).

Based on the data on the length of investment in table 6 shows that respondents are dominated by investors with an investment duration of 1-2 years, namely 48 respondents (41.74 %), investors with an investment duration of < 1 year as much as 46 respondents (40 %), investors with an investment duration of 2-4 years as many as 19 respondents (16.52 %), and investors with a 4-year > investment duration of 2 respondents (1, 74 %).

Descriptive Analysis Variable Research

Descriptive analysis presents the characteristics of research variables covering index values using the threebox method. Here are the results of descriptive analysis of this quality presented in graph 1-3:

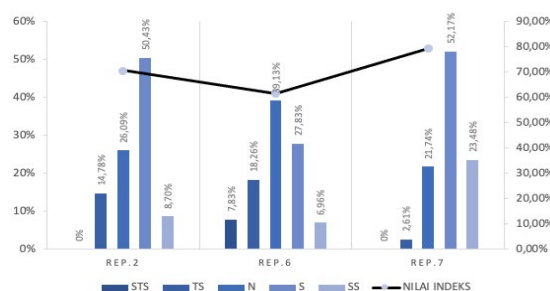


Figure 4. Representativeness Index

Overall the total score of representativeness variables has an average value (mean) of 70.49% and is concluded to be in the high category.

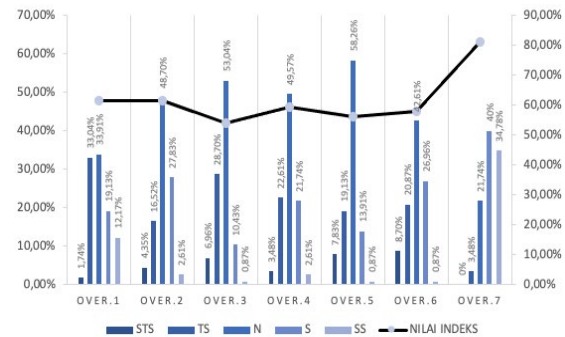


Figure 5. Overconfidence Index

Overall the total score of overconfidence variables has an average value (mean) of 61.69% and is concluded to be in the moderate category.

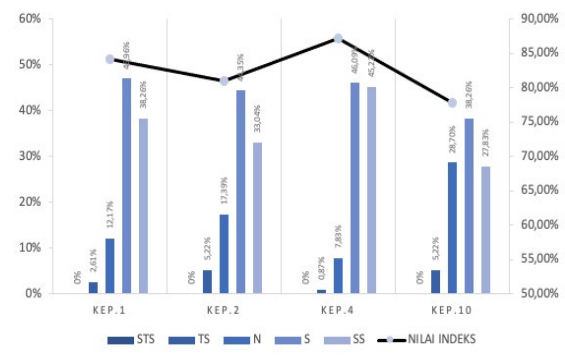


Figure 6. Investment Decision Index

Overall the total score of investment decision variables has an average value (mean) of 85.52% and concluded to be in the high category.

Inner Model Testing

Effect size

Effect size is used to indicate whether endogenous latent variables have a major influence on exogenous latent variables. The provision of effect size is that if the value of f^2 is greater than zero it provides evidence that the model has sufficient effect size on latent variables, but if obtained a value of f^2 below zero then it is proven that the model does not have enough effect size. The categories or parameters of f^2 are 0.02 (small), 0.15 (medium), 0.35 (large) (Chin, 2010). The following is presented the effect size value in table 7:

Table 7. Effect Size

| Variable | Effect Size | Category |
|-------------------|-------------|----------|
| Repre→Invest.Dec | 0.008 | Small |
| Overco→ Repre | 0.295 | Moderate |
| Overco→Invest.Dec | 0.109 | Moderate |

Based on the result of effect size in table 7 above can be stated that variable representativeness to investment decisions has an average value of effect size 0.008 which means in a small category. The variable representativeness of the overconfidence variable has an average effect size value of 0.295 which means in the intermediate category. Variable overconfidence to investment decisions has an average effect size of 0.109 which means in the intermediate category. The model as a whole has an average effect size value of 0.137 this indicates that the model has an effect size in the middle category.

Predictive Relevance

Predictive relevance is used to measure how well the observation value is generated by the model (Ghozali, 2008). A Q-square value greater than zero indicates that the model has predictive relevance, while less than zero indicates that the model has no predictive relevance (Ghozali, 2008). Predictive relevance is categorized into three categories: 0.02 (small), 0.15 (medium), 0.35 (large) (Chin, 2010). The following is presented predictive relevance value in table 8:

Table 8. Predictive Relevance

| | SSO | SSE | Q ² (=1-SSE/SSO) |
|-------------|---------|---------|-----------------------------|
| Represe. | 345.000 | 345.000 | 0.000 |
| Overcon. | 805.000 | 735.511 | 0.086 |
| Invest.Dec. | 460.000 | 345.000 | 0.072 |

Based on the results of the Q-square calculation above, it can be stated that the model has a predictive relevance value on the investment decision variable of 0.072, namely in the weak category, the overconfidence variable of 0.086 is in the weak category. The average obtained from predictive relevance is 0.079 which is in the weak category. Although this does not indicate a strong value, with a Q-square value greater than zero indicating that the model still has predictive relevance.

Coefficient of Determination

The determination coefficient serves to measure how far the model can go in describing variations of dependent variables spread between zero and one (Ghozali, 2008). Rule of thumb R-squared values in structural models are 0.67; 0.33; and 0.19 can be interpreted as good, moderate, and weak coefficients of determination (Chin, 1998). The following is presented r-squared value in table 9:

Table 9. R-squared

| Variable | R-squared |
|----------------------|-----------|
| Investment Decisions | 0.159 |
| Overconfidence | 0.228 |

The R-square value in Table 9 above which has been multiplied by 100% results in the value of the coefficient of determination of the investment decision is 15.9%. The value indicates that a 15.9% variation in the value of investment decisions can be explained by representativeness and overconfidence. While the remaining 84.1% was explained by other variables outside the model in the analysis of this study. The coefficient of determination of overconfidence yields a value of 24.6%. The value indicates that a 24.6% variation in the overconfidence value can be explained by representativeness. While the remaining 75.4% was explained by other variables outside the model in the analysis of this study. From the results of the coefficient of determination test can also be concluded that this study has a moderate coefficient of determination with a figure of more than 0.387.

Direct hypothetical test (direct effect)

Direct impact testing is evaluated based on original sample, t-statistic, and p-value values. Direct influence testing shows the direction of influence by looking at the positive or negative of the original sample as well as the magnitude of the influence of independent variables on dependent variables and the estimated value describing the relationship between latent variables obtained by bootstrapping procedures (Ghozali, 2008). Furthermore, for the measurement items used can be said to be influential if the t-statistic value is greater than 1.96 at a significant level of 5% (Ghozali, 2008). The following are presented the results of the hypothesis test directly in table 10:

Table 10. Path Coefficients

| Variable | Original Sample | T-Statistic | P-Value | Desc. |
|----------------------------|-----------------|-------------|---------|---------------|
| Repre→ Invest. Dec | 0.095 | 0.742 | 0.459 | Re- jected |
| Overco→ Invest. Dec. | 0.477 | 7.375 | 0.000 | Ac- cepted |
| Overco→ Invest. Dec | 0.344 | 2.976 | 0.003 | Ac- cepted |

Based on table 10 here is an explanation of the results of data processing with direct tests between variables, namely as follows:

Bootstrapping resampling test results in the table above, variable representativeness relationship to investment decisions obtained t-statistic value of 0.742 or below t-table value of 1.96 and p-value of 0.459 or above significant value of 0.05. The results showed that variable representativeness had no effect and no indicated on investment decisions. Then for the parameter of the coefficient of variable representativeness against investment decisions of 0.095 can be interpreted as variable representativeness to investment decisions have a positive relationship. So it was concluded, H_1 rejected that representativeness has a positive effect on investment decisions.

As a result of the bootstrapping resampling test in the table above, the relationship of a representativeness variable to an overconfidence variable is obtained by a t-statistic value of 7,375 or above the t-table value of 1.96 and a p-value of 0.000 or below a significant value of 0.05. These results show that variable representativeness has a significant effect on variable overconfidence. Then for the coefficient parameter of the variable representativeness against the variable overconfidence of 0.477 can be interpreted variable representativeness against the variable overconfidence has a positive relationship. Thus concluded, H_2 accepted that representativeness has a significant positive effect on overconfidence.

Bootstrapping resampling test results in the table above, the variable relationship of variable overconfidence to investment decisions obtained t-statistic value of 2,976 or above the t-table value of 1.96 and p-value of 0.003 or below a significant value of 0.05. The results show that variable overconfidence has a significant effect on investment decisions. Then for the parameter of variable coefficient overconfidence to investment

decisions of 0.344 can be interpreted as variable overconfidence to investment decisions have a positive relationship. Thus concluded, H_3 accepted that overconfidence has a significant positive effect on investment decisions.

Indirect effect

Mediation variable testing in this study was conducted by paying attention to the significance and path parameters between latent variables through the total indirect effect by looking at the original sample, t-statistic, and p-value values. The measurement item used can be said to be significant if the t-statistic value > 1.96 at the level of 5% p-values significant. The following are presented the results of indirect hypothesis test in table 11:

Table 11. Indirect Effect

| Variable | Original Sample | T-Statistic | P-Value | Desc. |
|-------------------------------------|-----------------|-------------|---------|---------------|
| Repre→ Overco→ Invest. Dec | 0.164 | 2.621 | 0.009 | Ac- cepted |

Based on table 11 above, it can be explained that the relationship of variable representativeness to investment decisions through overconfidence variables obtained t-statistic values of 2,621 or above the t-table value of 1.96 and p-value of 0.009 or below a significant value of 0.05. The results show that variable representativeness has a significant effect on investment decisions through variable overconfidence. Then for the parameter of coefficient of variable representativeness against investment decisions through variable overconfidence of 0.164 can be interpreted as variable representativeness against investment decisions through variable overconfidence has a positive relationship. Thus concluded, H_4 accepted that overconfidence is able to mediate the relationship of influence between representativeness and investment decisions. The resulting mediation effect is full mediating because the relationship between representativeness to investment decisions is not influential and insignificant, then the relationship between representativeness and investment decisions through variable overconfidence becomes significant, so it is concluded that overconfidence mediates in full the relationship between representativeness and investment decisions.

Effect of representativeness on investment decisions

Based on bootstrapping test results using Partial Least Square (PLS) original sample value of 0.095 and t-statistic of $0.742 < 1.96$ with p-value of $0.459 > 0.05$. So it is concluded that H1 is rejected, that variable representativeness positively affects investment decisions and the direction of the relationship between representativeness to investment decisions is positive. The results showed that investment decisions made by students of the Faculty of Economics, Universitas Negeri Semarang do not have a tendency to be exposed to biased representativeness behavior.

Representativeness is biased in financial behavior to make investment decisions that are too fast without in-depth analysis and rely on past experience that is considered capable of representing or being a reference to current investment decisions (Pompian, 2012). The findings were obtained that students of the Faculty of Economics, Universitas Negeri Semarang do not have a tendency to be exposed to bias representativeness. According to Pompian (2012) representativeness bias can be minimized through financial education and investment. So it is suspected that students of the Faculty of Economics, Universitas Negeri Semarang in making investment decisions have conducted an in-depth analysis, so as not to be affected by the existence of heuristics. On the other hand, investment decision making must also consider other aspects such as financial readiness and motivation to determine investment decisions.

The results of this study showed that representativeness has no effect on investment decisions in line with research conducted by Kurniawari and Sutrisno (2019) in research conducted in the city of Yogyakarta. Sihotang et al., (2020) on investors in Palembang city. However, the results of this study are not supported by Khan et al., (2017); Irshad et al., (2016); Ikram (2016); and Toma et al., (2015).

Effect of representativeness on overconfidence

Based on bootstrapping test results using Partial Least Square (PLS) original sample value of 0.477 and t-statistic of $7.375 > 1.96$ with p-value of $0.000 < 0.05$. So it is concluded that H2 is accepted, that the representativeness variable positively affects the overconfidence variable and the direction of the relationship between the representativeness variable to the overconfidence variable is positive. The results showed that

representativeness bias in students of the Faculty of Economics, Universitas Negeri Semarang will increase overconfidence.

The rule of thumb on heuristic representativeness forces individuals to think fast based on past experience, so heuristic will help in spurring overconfidence that will influence investment decisions (Kahneman, Slovic & Tversky, 1982). Overconfidence investors tend to rely on heuristic representativeness for decision making in conditions of uncertainty (Parveen et al., 2020). Overconfidence will increase as his past knowledge and experience increases. Other factors that do not match his beliefs will be ignored.

The results of this study are consistent with research conducted by Parveen et al., (2020) showing that representativeness affects overconfidence in individual investors in Pakistan. Where investors in Pakistan rely on past information such as company profit announcements, to be more overconfidence because it gets a positive return. This shows a tendency overconfidence towards the utilization of heuristic representativeness in making decisions.

Effect of overconfidence on investment decisions

Based on bootstrapping test results using Partial Least Square (PLS) original sample value of 0.344 and t-statistic of $2.976 > 1.96$ with p-value of $0.003 < 0.05$. So it is concluded H3 accepted, that variable overconfidence positively affects investment decisions and the direction of the relationship between variable overconfidence to investment decisions is positive. Overall it was concluded that investment decisions taken by students of the Faculty of Economics, Universitas Negeri Semarang have a tendency to be influenced by overconfidence behavior bias.

In accordance with heuristic theory where cognitive biases include overconfidence that involves psychological aspects and will create irrational behavior. An investor who has a high level of overconfidence will be overestimate to the knowledge possessed, they predict that it will get a greater profit in making repeated investments (Pradikasari and Yuyun, 2018). According to Kufepaksi (2008) the overconfidence behavior of an investor will present himself as having above average ability so that the investor will look for information that supports his mindset and do not consider information related to his beliefs. The assessment of a phenomenon beyond real conditions can lead to mistakes in making in-

vestment decisions (Simon et al., 2000).

The results of the study provide results that support heuristic theory where overconfidence positively affects investment decisions. Bahir et al. (2013) studied the impact of behavioral bias on investor decision making and concluded that overconfidence bias has an impact on decisions taken by investors. Metawa et al. (2018) show that overconfidence affects investment decisions. Mumaraki and Nasieku (2016), Anthony and Joseph (2017), and Javed and Marghoob (2017) in their research showed consistent results that overconfidence had a significant positive influence on investment decisions. However, the results of the study were not supported by Shah et al., (2018); Paramita et al., (2018); Bakar and Yi (2016); Kafayat (2014); Wulandari and Irmani (2014); and Park et al., (2010).

Overconfidence mediates the relationship between representativeness and investment decisions

Based on bootstrapping test results using Partial Least Square (PLS) original sample value of 0.164 and t-statistic of $2,621 > 1.96$ with p-value of $0.009 < 0.05$. So it was concluded **H₄ accepted**, that variable overconfidence mediates the relationship between representativeness and investment decisions. The direction of the relationship between variable representativeness to investment decisions through variable overconfidence is positive. The resulting mediation effect is full mediating because the relationship between representativeness to investment decisions is not influential and insignificant, then the relationship between representativeness and investment decisions through variable overconfidence becomes significant, so it is concluded that overconfidence mediates in full the relationship between representativeness and investment decisions. Overall, students of the Faculty of Economics of Universitas Negeri Semarang use heuristic representations that will spur overconfidence and influence investment decisions.

The results of this study are consistent with research conducted by Parveen et al., (2020) where overconfidence mediates the relationship between representativeness and investment decisions. In the study the positive role of overconfidence showed that relying on past performance provided positive returns. It's just that in the research Parveen et al., (2020) the role of partial mediation while in this study the role of mediation overconfidence against representativeness and investment decisions is full mediating.

CONCLUSION AND RECOMMENDATION

This research was conducted with the aim of providing empirical evidence on the influence of representativeness on investment decisions through overconfidence as an intervening variable in student investors of the Faculty of Economics, Universitas Negeri Semarang. Based on the results of research and eradication that have been described in the previous chapter, it can be concluded that representativeness has no effect on investment decisions, representativeness has a significant positive effect on overconfidence, overconfidence has a significant positive effect on investment decisions, and overconfidence mediates the relationship between representativeness and investment decisions in a positively significant way with full mediating. Limitations in this study include finding data through questionnaires shared online will make different thoughts, perceptions, and understandings in each respondent so as not to describe the actual condition. Respondents used in this study are homogeneous, so tend to have almost the same investment decisions. The model used in this study has a low r-square value, it is thought that there are other behavior factors that are more dominant in influencing investment decisions. The suggestion that researchers can provide for researchers can then add other variables according to the classification of bias in the Schulmerich (2013).

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