

# Behavioral Factors Analysis in Investment Decision-Making

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## ABSTRAK

Penelitian ini berfokus untuk menyelidiki faktor-faktor perilaku yang mempengaruhi keputusan investasi individu yang aktif berdagang di Bursa Efek Indonesia. Bahasan dalam artikel ini menekankan pasar keuangan yang kurang berkembang (di Indonesia) untuk mengisi kesenjangan literatur. Tujuh (7) perilaku keuangan manusia yang dikategorikan sebagai bias heuristik diukur dengan berbagai pertanyaan dalam kuesioner online, untuk menguji hubungan antara sifat kecemasan, terlalu percaya diri, sifat marah, pengendalian diri, faktor pengembalaan, penahan/penyesuaian, dan bias ketersediaan, dengan keputusan berinvestasi. Untuk menguji hipotesis, sampel 168 investor di Bursa Efek Indonesia dianalisis menggunakan metode statistik regresi dan analisis korelasi. Hubungan bias perilaku keuangan dan keputusan berinvestasi dianalisis dalam penelitian ini. Hasilnya menunjukkan bahwa sikap terlalu percaya diri dan pengendalian diri memiliki kaitan dengan keputusan berinvestasi, sementara sifat marah, kecemasan sifat, efek pengembalaan dan bias ketersediaan, dan penahan dan penyesuaian tidak terkait.

Kata kunci: Keputusan berinvestasi, Kecemasan, Sikap terlalu percaya diri, Faktor Herding, Bursa Efek

## ABSTRACT

*This study focuses in investigating behavioral factors that affect individual investment decision who actively trading in Indonesia stocks exchange. The paper emphasizes in less developed financial markets (Indonesia) to occupy literature gap. Seven (7) human financial behavior which categorized as heuristic biases are measured by numerous questions under online questionnaire, to examine the relationship between trait anxiety, overconfidence, trait anger, self-monitoring, herding factor, anchoring/adjustment, and availability bias with investment decision. To test the hypothesis, sample of 168 Indonesian Stocks Exchange investors are analyzed using statistical methods of regression and correlation analysis. Relationship of financial behavior biases and investment decision is analyzed on the research. The result indicates that overconfidence and self-monitoring are related with investment decision while trait anger, trait anxiety, herding effect and availability bias, and anchoring and adjustment are not related.*

*Keywords: Investment decision, Anxiety, Overconfidence, Herding Factor, Stock exchange*

## INTRODUCTION

Decisions-making ability of human beings are usually referred to their instinct and past experience, rather than formulating complete information, which would assist them to make a more reliable decision. Investor as human beings are no exception in contrary with traditional finance theory which assumes that all investment decisions are made rationally. Financial behavior biases severally distract the rationality of the investors in making decisions, including investing in stock market. Kubilay and Bayrakdaroglu (2016) pointed out that latest standard finance studies indicates that making rational investment decision is desired by individual investors. Such study will be a major aid for stock market traders and investors to be aware of their own financial behavior biases that will enhance their investment decision-making ability, especially in developing country like Indonesia where such analysis is still need to be implemented.

In many times, investors face difficulties to decide where to invest their money due to complex situations and unpredictability investors usually undergo such as, decisions based on beliefs, partiality and bias. In traditional finance, it is expected that investors have adequate knowledge and analytical foundation to make decision for their investment, while in the real case some investors longing only insufficient knowledge. In addition, individual investors, according to traditional finance, are rational human being who create investment decisions under the fundamental of capital gain maximization, concurrently evaluating intrinsic value of share prices (fair value) to minimize the risk.

However, behavioral finance field of study argues that several psychological biases

have a huge impact on investment decision made by individuals. Under behavioral finance subject, psychological biases are utilized to assess investing judgment of individuals. It explains how the market efficiency has shifted along with how individual investors have deviated from conventional financial philosophy. To improve the individual investor's behavior in a country, understanding the presence and nature of behavioral biases is necessary.

Chen and Volpe's (1998) discovered that financial knowledge and financial behavior possess a direct impact on investment decision-making. According to East (1993), individual investors' attitude can be used to forecast their investment decision-making. Therefore, several longitudinal experiments on human behavior and investment decisions have been conducted in recent years in various countries with various behavioural biases. This study looks into the correlation between financial behavior biases and investment decision making of Indonesian stock exchange individual investors.

## LITERATURE REVIEW

### Investment Decision

Investment decision indicates where, when, how, and how much fund of the assets that will be invested by individual investor or firm. The investment decision is fabricated by individual investors. An investor is determined as an individual (person) whose money are placed to buy financial product for the sake of expected return with regard to maximizing return and minimizing risk (Rahman & Gan, 2020). Since every investor seek optimal investment decision (Sharpe, 1994), an advance financial knowledge shall be equipped to them to not only making optimal but also rational decision (Merton, 1987). Under the concept of standard

finance, individual investor will always have adequate information and make rational investment decision (Shah, Ahmad, & Mahmood, 2017).

In contrary, Bikhchandani et al., (1992), under the subject of behavioral finance, dictate that investment decision can be irrational due to several factors such as: inadequate information, behavioral biases (Shefrin, 2007) or psychological biases (Baker and Nofsinger, 2002) and to understand irrational decision-making, psychological history of investors' mental status will be a key parameter.

The rationality of an investor is compromised by several psychological factors that yield irrational behavior. This study will examine seven reliable personal traits and psychological biases which are anxiety, overconfidence, trait anger, self-monitoring, herding factor, anchoring/adjustment, and availability bias to know how investment decision is influenced by those characteristics.

### **Trait Anger**

Trait anger is assigned to general tendency of individuals to experience state anger across time and situation. Forgays et al. (1997) define that anger is "Individual differences in the temperament to perceive a broad range of situations as irritating or frustrating, as well as the proclivity to react to such situations with increased levels of state anger". Anger is at the center of mood disturbances, and it's linked to impulsive violence, destructive acts, and other issues (Wilkowski and Robinson, 2010). In addition, Han et. al (2007) reveal that anger is related with the sense of certainty and control. Hence, an angry individual might become more optimistic to take risks. This individual may will face extreme challenges

in settling on significant choices and endure incredible great loss. Further, it is consistent with the finding by Lerner & Keltner (2001) that anger can lead optimistic beliefs and anger will bias only the negative events. Emotional states can impact on decision making assessment (Slovic et al., 2004). Thus, we hypothesize:

H1: Trait anger is not related to Indonesia Stock Exchange individual investment decision-making.

### **Trait Anxiety**

Trait anxiety is a personality trait that is expressed in most personality models and refers to an individual's reasonably stable tendency to perceive a broad variety of environmental events as potentially alarming, and report negative emotions such as fears, worries, and anxiety across many situations. Krigman and Jeff us (2016) regarded emotion as the reaction resulted from certain affairs, and both greedy and fear were extreme emotion. When making decisions, investors would not merely appear greedy and fear, anxiety was another kind of emotion reaction in the middle. Both greedy and fear would induce anxiety. Since concern about one thing can increase the level of anxiety, investors who possess more information will be feeling more anxious. An investor who get anxious will likely to hold their portfolio management strategy and would be unwilling to modify it. Van Winden et al. (2011) indicated that trait anxiety prevent individual investor to obtain investment-related knowledge by causing lack of confidence and ultimately leads to the decision not to invest. Coakley et al. (2014) indicated that an individual would appear anxiety on the behaviors when expecting or actually receiving disagreement signals from one or several interested parties. Yalcin (2016) explained anxiety as the

disturbed and nervous state, generated from personal self-concept inconsistent with real experience. Bensi and Giusberti (2007) affirm that anxiety steer a likelihood to elude investing in order to secure his/her capital. The ultimate objective of individual with anxiety is to minimize the uncertainty that can lower the level of his/her anxiety. Thus, we hypothesize:

H2: Trait anxiety is not related to Indonesia Stock Exchange individual investment decision-making.

### **Overconfidence**

Overconfidence is linked to psychological bias way of examining a situation. A significant amount of research suggest that people are overconfident. People believe they are better than ordinary and most of them determine themselves superior than their actual performance (Taylor and Brown, 1988). Fischhoff, Slovic, & Lichtenstein (1977) concluded that people are usually overconfident because they overestimate their capacity to accurately interpret details.

For years, the relationship between overconfidence and capital return has been under examination. According to Bondt and Thaler (1995), overconfidence is a pervasive human trait. They examined that the investors' judgement on investment decisions is affected by overconfidence. Glaser and Weber (2007) said that 50% of investors are overconfidence about their capacities which persuades excessive investment trading. This finding is upheld by Shiller (1997) who expresses that overconfident investors will abandon the margin of error they should focus on. Dittrich et al. (2001) states that overconfident investors are likely to possess a lower accuracy of investment decisions. Rahman & Gan (2018) also revealed that

overconfident investors tend to overestimate their proficiency, accomplishment, and probability of information accuracy. Thus, we hypothesize:

H3: Overconfidence is not related to Indonesia Stock Exchange individual investment decision-making.

### **Herding Effect**

Behavioral bias of Herding Effect is associated as the following-direction behavior possessed by individual. The existence of herding has always been intercorrelated with financial industry and will continuously be explored by future researchers. Tan et al. (2008) declare that herding effect allows share prices to drift away from the fundamental value of the stocks, whether it is higher or lower. Bennet et al. (2012) say that in this new era, internet has taken a big role to facilitate speedy and easy access of trading information. Therefore, investors can react faster than ever regarding the sentiment spreading over the internet. One of the causes for the speculative bubble on the stock market, according to Caparrelli et al. (2004), is the existence of herding effect. Meanwhile, herding factor can lead to better decision-making if the information are aggregated correctly. In Indonesia, Gunawan et al. (2011) discovered that herding behaviour happens while the market is stressed, while in normal situation investors tend to be more rational and can be said more calculative. According to Setiyono et al. (2013), there is institutional herding in the Indonesian stock market. In addition, Indonesian investor tends to follow foreign activities. Thus, we hypothesize:

H4: Herding effects is related to Indonesia Stock Exchange individual investment decision-making.

### **Self-monitoring**

Personal trait of Self-Monitoring demonstrate by people to keep an eye on their intense behavior and self-reflection. Self-monitoring can be defined as the ability to adjust behavior to accommodate external social situations (Biais et al (2005). Eyster and Rabin (2005) point out that investors with low level of self-monitoring are expected to understate the degree to which other investors' trading practices are linked to their knowledge. Even though there are few studies on self-monitoring ability and investment decisions, results of these studies have been inconsistent especially in case of male and female traders (Biais et al., 2005). Thus, it becomes highly relevant to understand whether self-monitoring might have a positive influential relationship to investor behaviour and their decisions. Personality traits and psychological biases such as self-monitoring, risk tolerance, and social influence, according to Kourtidis et al. (2011), have a major impact on investors' investment decisions. Thus, we hypothesize:

H5: Self-monitoring is related to Indonesia Stock Exchange individual investment decision-making.

### **Anchoring and adjustment**

One of cognitive heuristic bias, anchoring and adjustment is based on the first information that comes to people's mind and they make anchor from that one point of information to do things. People will adjust their beliefs based on the initial value as a starting point until the decisions are made according to what they think is acceptable. Most of the time, those adjustments are inadequate, leaving final estimates too close to the original anchor, which is a problem when the anchor is far from the correct answer or value (Slovic and Lichtenstein, 1971). Different starting points, according

to Kahneman and Tversky (1974), produce different estimates that deviate from the initial value. This is what we define as anchoring circumstance. As a result, Pompain (2006) said that the anchoring and adjustment bias can be demonstrated by an investor's propensity to «anchor» to a logically unrelated relation when they are facing decision-making situation. Based on Epley and Gilovich (2006), adjustments to self-generated anchor values appear to be inadequate because once a plausible value is reached, they terminate unless one is able and willing to look for a more precise calculation. Thus, we hypothesize:

H6: The anchoring and adjustment bias is not related to Indonesia Stock Exchange individual investment decision-making.

### **Availability Bias**

Availability Bias is widely known as behavioral shortcut that occurs when people make decisions or predict something based on easily available information (Ngoc, 2014). It happens when individual investors consider some results based on how easy the result comes out of their minds. (Kahneman and Tversky, 1974).

For those who lack of availability information are usually failed to alter and diversify their portfolio of investment, because they pick investment established on uncertainty and obscurity rather than carefully analyze the whole things in detail. They fail to choose the suitable alternative investment because they limit their opportunities.

H7: Availability bias is related to Indonesia Stock Exchange individual investment decision-making.

### **METHODS**

SPSS software as empirical method is used

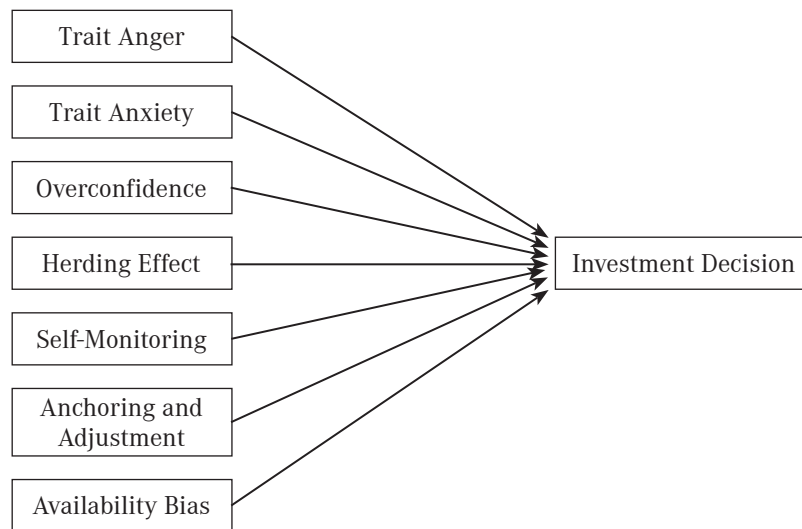


Figure 1. Conceptual Model

for the research. Cronbach’s Alpha test, Descriptive Statistics, Correlation Analysis, and Regression Analysis were among the statistical methods used to accomplish the research goals.

**Target Population, Sampling, and Data Collection**

Individual investors who actively trading at Indonesia Stock Exchange (IDX) are the population for this study. Research objective was achieved by collecting the data using online questionnaire because Covid-19 pandemic constraint.

Questionnaires were filled and returned from 168 individual Indonesian investors currently trading at the IDX through online platform. Hair et al. (1998) found that in quantitative studies, data from at least 100 respondents is needed in order to obtain accurate findings from the data analysis statistical tools.

**Instrumentation for Data Collection**

Primary data was obtained in the questionnaire using five-point Likert scales. Unless otherwise stated, questions were

answered using five-point Likert scales (1 for strongly disagree and 5 for strongly agree). Nine parts consisted on the questionnaire. In the first segment, the participants were asked questions about their period of participation in the stock market. Detail of other sections are discussed below (table 1).

**RESULT AND DISCUSSION**

**Validity of the Construct**

From the 168 filled questionnaires, we found that several items on each construct are not valid and need to be excluded. The exclusion is determined by the validity threshold of 0.5.

**Excluded items**

- Investment Decision: ID5
- Trait Anger: Agr6, Agr7, Agr8, Agr9
- Trait Anxiety: Axy9, Axy10
- Overconfidence: Odf6
- Self-Monitoring: SM2, SM3, SM8, SM9, SM10
- Availability: Av4

Meanwhile, herd behavior and anchoring and adjustment construct are completely valid.



Table 1. Questionnaire Details

| Section  | Items   |
|--|---|
| Section 2: Investment decision<br>5 Items are adapted from Kourtidis et al., 2011                          | <ol style="list-style-type: none"> <li>1. In most cases my investment decisions support my investment objectives</li> <li>2. My reactions towards losses are normal</li> <li>3. Usually I get my expected return on my investment decision</li> <li>4. I have risk tolerance towards my investment decisions</li> <li>5. My investment holding periods are spread over</li> </ol>   |
| Section 3: Trait anger<br>10 Items are adapted from Gambetti and Giusberti, 2012                           | <ol style="list-style-type: none"> <li>1. I am quick tempered</li> <li>2. I feel annoyed when I am not given recognition</li> <li>3. I am a hot-headed person</li> <li>4. I get angry when I'm told I'm wrong in front of others</li> <li>5. I fly off the handle</li> <li>6. When I get mad, I say nasty things</li> <li>7. When I am frustrated, I feel like hitting someone</li> <li>8. I feel infuriated when I do a good job and get a poor evaluation</li> <li>9. I get angry when I have to wait because of other's mistakes</li> <li>10. I am an impulsive person</li> </ol>  |
| Section 4: Trait Anxiety<br>10 Items are adapted from Gambetti and Giusberti, 2012                         | <ol style="list-style-type: none"> <li>1. I tire quickly</li> <li>2. Some unimportant thought runs through my mind and bothers me</li> <li>3. I feel that difficulties are piling up so that I cannot overcome them</li> <li>4. I wish I could be as happy as others seem to be</li> <li>5. I worry too much over something that really doesn't matter</li> <li>6. I take disappointments so keenly that I can't put them out of my mind</li> <li>7. I get in a state of tension or turmoil as I think over my recent concerns and interests</li> <li>8. I am losing out on things because I can't make up my mind soon enough</li> <li>9. I feel pleasant</li> <li>10. I am "calm, cool and collected"</li> </ol>  |
| Section 5: Overconfidence<br>10 Items are adapted from Mumaraki and Nasieku, 2016                          | <ol style="list-style-type: none"> <li>1. You believe that your skills and knowledge of the stock market can help you to outperform the market</li> <li>2. You feel you have ability enough to manipulate the investments in your favour</li> <li>3. You feel that you are always lucky to invest in the best deals</li> <li>4. You feel you are experienced enough to forecast the winning investments</li> <li>5. You take least time possible to analyse and rely on available market statistics</li> <li>6. You conduct more trades in between the accounting periods</li> <li>7. You feel that you have control over the investment returns flows</li> </ol>   |
| Section 6: Herding Factor<br>4 Items are adapted from Kengatharan and Kengatharan, 2014                    | <ol style="list-style-type: none"> <li>1. Other investors' decisions of the stock volume have impact on your investment decisions</li> <li>2. Other investors' decisions of buying and selling stocks have impact on your investment decisions</li> <li>3. Other investors' decisions of choosing stock types have impact on your investment decisions</li> <li>4. You usually react quickly to the changes of other investors' decisions and follow their reactions to the stock market</li> </ol>   |
| Section 7: Self-Monitoring<br>10 Items are adapted from Biaisi et al., 2005 and Snyder and Gangestad, 1986 | <ol style="list-style-type: none"> <li>1. I feel a bit awkward in public and do not show up quite as well as I should</li> <li>2. I can make impromptu speeches even on topics about which I have almost no information</li> <li>3. I can only argue for ideas, which I already believe</li> <li>4. At parties and social gatherings, I do not attempt to do or say things that others will like</li> <li>5. I have trouble changing my behaviour to suit different people and different situations</li> <li>6. I find it hard to imitate the behaviour of other people</li> <li>7. I would not change my opinions (or the way I do things) in order to please someone or win their favour</li> <li>8. I guess I put on a show to impress or entertain others</li> <li>9. I can look anyone in the eyes and tell a lie with a straight face</li> <li>10. I may deceive people by being friendly when I really dislike them</li> </ol> |
| Section 8: Anchoring and adjustment<br>6 items are adapted Nada and Moa'mer, 2013                          | <ol style="list-style-type: none"> <li>1. I compare the current stock prices with their recent year high and low price to justify my stock purchase.</li> <li>2. I am likely to sell my stock after the price hits recent year high</li> <li>3. I am unlikely to buy a stock if it was more expensive than last year</li> <li>4. I see the stock price as high if the price has increased to the current year high</li> <li>5. I believe that the position of the year high and low price determined the current stock price movement range.</li> <li>6. I use the stock purchase price as a reference point for trade.</li> </ol>  |
| Section 9: Availability  | <ol style="list-style-type: none"> <li>1. If I heard from a friend about a stock that achieved high returns, I would buy it.</li> <li>2. If I want to invest in the stocks of a certain company, I will rely on my co-workers opinions</li> </ol>   |

### Reliability test

The results showed that the Cronbach's alpha value for all parameters is greater than 0.6, indicating that the variables to be used in further study are reliable.

### Regression analysis

From regression analysis, trait anger, trait anxiety, herd behavior, anchoring and adjustment, and availability have no relationship with IDX's investor decision-

Table 2. Variable reliability test

| Construct                | Cornbach's Alpha | N of items |
|--------------------------|------------------|------------|
| Investment Decision      | .669             | 4          |
| Trait Anger              | .803             | 6          |
| Trait Anxiety            | .868             | 8          |
| Overconfidence           | .811             | 6          |
| Herding Behavior         | .862             | 4          |
| Self-monitoring          | .677             | 5          |
| Anchoring and Adjustment | .779             | 6          |
| Availability             | .724             | 5          |

Table 3. Regression Analysis

**Model Summary**

| Model | R                 | R Square | Adjusted R Square | Std. Error of the Estimate |
|-------|-------------------|----------|-------------------|----------------------------|
| 1     | .558 <sup>a</sup> | .312     | .282              | .58578                     |

a. Predictors: (Constant), AvailInfo, AnchornAdj, Anxiety, SelfMonitor, Overconf, HerdBhvr, Anger

**ANOVA<sup>b</sup>**

| Model |            | Sum of Squares | df  | Mean Square | F      | Sig.              |
|-------|------------|----------------|-----|-------------|--------|-------------------|
| 1     | Regression | 24.866         | 7   | 3.552       | 10.353 | .000 <sup>a</sup> |
|       | Residual   | 54.901         | 160 | .343        |        |                   |
|       | Total      | 79.768         | 167 |             |        |                   |

a. Predictors: (Constant), AvailInfo, AnchornAdj, Anxiety, SelfMonitor, Overconf, HerdBhvr, Anger

b. Dependent Variable: InvestDec

| Model |             | Unstandardized coefficients |           | Standardized coefficients | t      | Sig.  |
|-------|-------------|-----------------------------|-----------|---------------------------|--------|-------|
|       |             | B                           | Std.Error | Beta                      |        |       |
| 1     | (Constant)  | 2.851                       | 0.394     |                           | 7.233  | 0.000 |
|       | Anger       | -0.044                      | 0.72      | -0.051                    | -0.603 | 0.547 |
|       | Anxiety     | -0.123                      | 0.070     | -0.154                    | -1.772 | 0.078 |
|       | Overconf    | 0.337                       | 0.066     | 0.380                     | 5.092  | 0.000 |
|       | HerdBhvr    | -0.033                      | 0.058     | -0.042                    | -0.565 | 0.573 |
|       | SelfMonitor | 0.162                       | 0.068     | 0.170                     | 2.369  | 0.019 |
|       | AnchornAdj  | 0.115                       | 0.067     | 0.123                     | 1.706  | 0.090 |
|       | AvailInfo   | -0.145                      | 0.077     | -0.148                    | -1.886 | 0.061 |

making, which has significance coefficient values of 0.547, 0.078, 0.573, 0.090, and 0.061 respectively. Besides, overconfidence and self-monitoring are related to IDX's investor decision-making with coefficient value of 0.380 and 0.170.

**Hypothesis Testing**

The researchers of this study tested the relationship between the constructs based on the hypotheses test findings. From the test, we can state that trait anger, trait anxiety, anchoring and adjustment,



herding factors, and availability bias are not related to investment decision, thus H4 is not supported. It supports the result of Rahman and Gan (2018) who found the trait anger and herd behavior are not related to investment decision making. They also found that individual investment decision is related to personal trait of Self-Monitoring. The study also found that overconfidence and self-monitoring are correlated to the individual decision making, thus H3 is not supported while H5 is supported. This result contradicts Rahman and Gan's (2018) finding that overconfidence has no impact on investment decision-making. In addition, according to research conducted by Dittrich et al. (2001), the more overconfident investors are, the lower the margin of error they can commit to.

**CONCLUSION**

According to the results of this study, overconfidence and self-monitoring have a major impact on an individual's investment

conduct to purchase securities for their account. It may be presumed that the factors of anchoring and adjustment can influence the investment decisions of consumers. Individual investors, the government, Bank Indonesia (BI), Otoritas Jasa Keuangan (OJK) and financial institutions will benefit the significant insight from the study. The study shows that the citizens of Jakarta have tendency analyze quickly as possible, rely on only available market statistics and feel that they have authority to the flow of capital gain. The relationship between behavioral bias and individual investment decisions is a valuable point in this paper. and shows that before making policy adjustments, policymakers should consider the related factors carefully. Otoritas Jasa Keuangan (OJK) will benefit from the finding of individual behavioral factors to be more care in supervise the financial institutions that gives consultation services to their consumers. The discovery of behavioral anchoring and adjustment

Table 4. Hypothesis Testing

| Hypothesis | Description   | Results       |
|------------|---|---------------|
| H1         | The trait Anger is not related to the Individual investment decision making in Indonesia Stock Exchange           | Supported     |
| H2         | The trait Anxiety is not related to the Individual investment decision making in Indonesia Stock Exchange         | Supported     |
| H3         | The Overconfidence is not related to the individual investment decision making in Indonesia Stock Exchange        | Not supported |
| H4         | The Herd Behaviour is related with individual investment decision making in Indonesia Stock Exchange              | Not Supported |
| H5         | The Self-Monitoring behaviour is related to the Individual investment decision making in Indonesia Stock Exchange | Supported     |
| H6         | The Anchoring and Adjustment is related to the Individual investment decision making in Indonesia Stock Exchange  | Not Supported |
| H7         | The Availability Bias is not related to the Individual investment decision making in Indonesia Stock Exchange     | Supported     |

factor will benefit financial institutions, especially investment banks and mutual funds by providing access to information for consumers in order to influence them in purchasing securities. In order to achieve better investment returns in the future, investors should obtain knowledge of their own behavioral vulnerability and then intensify it. They should analyze their prior investment history for themselves and find out whether the behavioral variables have an effect on them.

### Future Research

Since this research is conducted during Covid-19 pandemic, the stock market are unprecedentedly ineffective where market data and stocks movement are not representing its fundamental value. Many individual investors face dramatic fear and anxiety when they are trading their stocks. Therefore, research under stable Indonesia Stock Market is needed. Moreover, enlargement of the size of the sample would yield a more reliable research. ◀

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