THE INFLUENCE OF NEUROTICISM PERSONALITY TRAITS ON HERDING AND OVERCONFIDENCE IN INVESTMENT DECISION MAKING

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ABSTRACT

This study is to determine the effect of neuroticism personality trait on stock investment decisions. This study is trying to find how fear and anxiety from the perspective of neuroticism personality trait affect the emergence of herding and overconfidence in investment decision. This study is conducted by distributing questionnaires to 116 millennial stock investors in Indonesia. Structural Equation Modelling (SEM) is used as the data analysis method in this study. This study is using PLS 3.0 to perform data analysis. The result reveal that neuroticism affect herding behavior in stock market. With this study result investor can be aware of biases they commit as a result of their personality.

Keywords: *Behavioral finance, Investment decision, Investor, Personality, Stock.*

1. INTRODUCTION

Due to Covid-19 the number of investor on the Indonesian Stock Market has increased rapidly more than 50% to 2.6 million Single Investor Identification (SID) as of August 2021 (Kustodian Central Efek Indonesia-KSEI, 2021). This increase is mostly due to the sudden technology growth as a result of many lockdowns. The number of active daily investor also increased, and it affected how big the market moves. This becomes a concern that Indonesia Stock Exchange revised the auto rejection policy to 7% for the maximum decrease in price to control the fear in the market. While the auto rejection for the maximum increase in price is not revised and still on 25%. The main reason of this policy is to maintain the market and prevent market failure. Fear affects investors in decision making by making investors taking suboptimal decisions because of the lack of certainty in the market.

Fear is closely related to neuroticism from Big Five Theory (McCrae & Möttus, 2019). Neuroticism accounts emotional stability and distress in individuals. Investors with high level of neuroticism tend to avoid risk as a result of their anxiousness of losing the temporary gain (Fung & Durand, 2014). Investors reactions from risk are affected by their own personalities which give emotional comfort not optimum return (Statman, 2019).

Statman (2019) stated that people build their portfolio based on their behavior and commit emotional and cognitive biases. Both amateur and professional investors exposed to cognitive errors since both share common emotional shortcuts, but professionals learn from experience that is why biases can be suppressed with knowledge. Some of cognitive biases are herding behavior and overconfidence. Even though there are many biases this study will only focus on two biases.

Behavioral finance studies are still rarely done in Indonesia. Behavioral finance is becoming an interesting topic for investors in Indonesia as psychology in the market is becoming a crucial issue in decision making. This research is trying to act as a bridge of knowledge and awareness on how important of knowing investors personalities and their biases in decision making especially in stock market.

2. LITERATURE REVIEW AND HYPOTHESIS DEVELOPMENT

Behavioral Finance

Traditional finance is a study of how investor make the most optimum decision based on the assumption that investors are rational and evaluate every possible options and calculate risks and returns (Ackert, 2014). Efficient Market Hypothesis (EMH), one of many staple studies of traditional finance, lay on assumption that investors are rational therefore they will make decisions without affected by emotional biases (Ackert, 2014; Fama, 1970; Shiller, 2003). If every investor accounts all information into one decision, market will become efficient and reflect all information. In reality there are anomalies in EMH that shows market is not efficient and investors are not rational therefore the model used cannot give enough explanation of decision making (Ackert, 2014; Altman, 2014). Statman (2019) also mentioned that market is not efficient in the way of pricing because there are a lot of emotional and cognitive errors. Altman (2014) claimed that emotion is a factor of making a suboptimal decision.

Behavioral finance, in contrast of traditional finance, is looking for why investor make a specific decision and the emotion beneath it (Statman, 2019). Behavioral finance explains that rationality of an investor is affected by psychological therefore making a less optimal decision (Ackert, 2014; Kapoor & Prosad, 2017).

Personality Traits

Personality traits are characteristics of human personalities mapped according to each unique facets into five categories (McCrae & Mõttus, 2019). Each category represents emotions that can be distinguished from each other's namely, Agreeableness, Extraversion, Conscientiousness, Neuroticism, and Openness.

Agreeableness represents the tendency to sympathize with other people and act unselfishly. Extraversion represents the urge to have intense and frequent interpersonal interaction and tendency of being optimistic. Conscientiousness represents the ability to control desire in order to achieve a goal, in short discipline. Neuroticism represents forms of emotional distress, fear, and having unrealistic ideas. Openness represents the urge to seek out new experiences and having flexible way of thinking (McCrae & Mõttus, 2019).

Neuroticism is closely related to higher activation of the right frontal lobe relative to the left. This brain activity is related to emotions connected to withdrawal behavior. This part of brain manages experience of pain, disgust, and loss (Fung & Durand, 2014). This same part of brain also control risk aversion and negative effects (Fung & Durand, 2014). Neuroticism, originates from psychopathology, first observed on a patient with neurosis (McCrae & Costa Jr., 2013). People with high level of neuroticism are exposed to depression and tend to have less intelligence due to anxiety and stress (Fung & Durand, 2014).

Personality traits from Big Five theory can be measured using NEO Personality Inventory (NEO PI-R) containing psychology questionnaires for five groups of personalities with Likert scale.

Cognitive Bias

The unique capacity of human brain in processing information affects decision making (Altman, 2014). Emotions can reduce the capability of decision making from the optimal decision (Altman, 2014; Fung & Durand, 2014). Investors tend to make decision which create emotional comfort for them. Investors exposed to biases because they no longer capable of making the most optimal decision since they affected by emotions (Gonzalez-Igual et al., 2021). Two of many cognitive biases that emerge from this phenomenon are herding and overconfidence (Ahmad, 2020; Altman, 2014; Fung & Durand, 2014).

Herding emerges when market is volatile and investors struggle to predict or analyze it then they try to mimic major opinion to make a decision (Altman, 2014). Even institutional investors and analysts can experience this since they need to analyze a lot while humans capabilities are limited therefore they herd or copy other analysts (Statman, 2019).

Overconfidence happens when investor place too much confidence on their assessment of decision (Statman, 2019). This condition makes investors underestimate the risk and think they are too smart to make a poor decision and as a result they decided to take more risk (Altman, 2014).

High level of neuroticism can indicate low level of confidence while low level confidence exposes investor to believe other investors decisions are better therefore they commit herding behavior (Sanjaya et al., 2020). Since high level of neuroticism indicates low level confidence, investor should not susceptible to overconfidence, but Sanjaya, Basana, & Anastasia (2020) states that placing too much believe on unrealistic idea of negative things also classified as overconfidence. Therefore, neuroticism affect both herding and overconfidence.

Hypothesis Development

This study examines whether a significant relationship exists between neuroticism and both cognitive biases, herding and overconfidence. To achieve this objective, the following hypothesis used are below:

H1: Neuroticism have a significant effect on herding behavior.

H2: Neuroticism have a significant effect on overconfidence.

Figure 1. SEM PLS Diagram Path

3. RESEARCH METHODOLOGY

Data and Sample

The population of this study are Indonesian investors under 40 years old. Having SID is the sample requirement used in this study. Demographic data of Indonesian investors show that over 70% is under 40 years old or belong to millennial group (KSEI, 2020).

Using Slovin formula the number of samples required for this study is 100 investors. Data collection for this study is collected by distributing online questionnaires through private messages, investment study groups and investor communities. Respondents will pick a statement that describe themselves using Likert scale from 1 to 5 with 1 – strongly disagree, 2 – disagree, 3 – neutral, 4 – agree, 5 – strongly agree. The questionnaire for personality traits can be found online because Big Five is already commonly used in psychology.

Methods

This study used SMARTPLS 3 to analyze the relationship between neuroticism and the two biases, herding and overconfidence. SMARTPLS is a software capable of analyzing structural equation modelling (SEM) through multivariate statistical analysis technique combining factor analysis and multiple regression analysis to examine relations between variables and latent constructs.

Outer model testing will be tested through convergent validity, discriminant validity and composite reliability. Convergent validity test will need outer loadings of each item to be above 0,5 while every variable has to have at least 0,7 on average variance extracted. The method on eliminating items will be all items with loading below 0,4 will be deleted immediately while items with loadings between 0,4-0,5 will be eliminated one by one because elimination might increase other items loadings. For the process of increasing average variance extracted, item with lowest loading from the variable will be removed one by one until the variable meet the AVE required. For discriminant validity checking this study will use cross loadings and all items within their variables have to have higher loadings than with other variables. While for composite reliability this study will use Cronbach's alpha and composite reliability with minimum requirement of 0,7.

4. RESULTS AND DISCUSSIONS

Sample Demographics

From the data collected, most of the respondents are men (64.7%), ages 19-25 years old (47.2%), bachelor's degree (60.3%), less than 5 years of experience in stock market (83.7%).

Table 1. Composite Reliability and Average Variance Extracted

	Cronbach's Alpha	Composite Reliability	AVE
Herding	0.841	0.886	0.610
Neuroticism	0.873	0.899	0.504
Overconfidence	0.735	0.789	0.567

Validity and Reliability

Construct validity is assessed by using convergent and discriminant validity. From table 2 shown that all items' loadings are significant and above 0,5 after eliminations of unqualified items. From table 1 can be seen all variables have Cronbach's alpha and composite reliability above 0,7 and have AVE above 0,5 therefore all variables are valid. All items also unique and capable of describing its own variables as shown from table 2 all items have higher loadings with their own variable than other variables. In this elimination process there are 3 items in total eliminated due to their loading and due to their variable's AVE. 1 of them are from neuroticism while the other 2 are from overconfidence.

Table 2. Cross Loadings

	Herding	Neuroticism	Overconfidence
H1	0.717	-0.253	-0.191
H2	0.836	-0.377	-0.272
H3	0.827	-0.203	-0.106
H4	0.784	-0.276	-0.138
H5	0.732	-0.347	0.015
N1	-0.254	0.712	-0.086
N3	-0.289	0.737	0.047
N4	-0.153	0.510	0.072
N5	-0.211	0.680	-0.051
N6	-0.319	0.732	0.008
N7	-0.137	0.590	-0.192
N8	-0.404	0.841	-0.121
N9	-0.269	0.655	-0.131
N10	-0.325	0.860	-0.049
OC3	-0.158	-0.080	0.916
OC4	-0.150	-0.052	0.768
OC5	-0.091	0.006	0.521

Path Analysis

Table 3 shows that neuroticism has significant effect on herding behavior but not on overconfidence. Neuroticism has negative effect on herding behavior means the higher level of neuroticism lessen the tendency of the investor to commit herding behavior. For the second relation, between neuroticism and overconfidence, the t-statistics shows that the relation is not significant.

Table 3. Effect of Neuroticism

	Original Sample	T Statistics	P Values
Neuroticism -> Herding	-0.391	5.847***	0.000
Neuroticism -> Overconfidence	-0.083	0.463	0.644

Neuroticism has a significant negative effect on herding behavior. It means neuroticism makes people doubt other people decision as a product of anxiety and fear of what might happen in the future as well as other people. From this study we can see that people with neuroticism have more doubt on other people decision rather than their own decision therefore they do not herd. Rather than having less confidence on their decision, investors with high level of neuroticism have less trust on other people decision. Neuroticism personality trait drives investor to fear of other people making mistakes, so they avoid herd instead. The herding behavior apparently also accounts the credibility of information and how much trust they put in them (Susanto & Anastasia, 2019). This explains why neuroticism have negative effect on herding behavior because people with high level of neuroticism does not believe other people decision and think they are not credible, so they do not follow other people. With the same principal people with low neuroticism will tend to herd because they do not skeptic about other people decision. Investors with low level of neuroticism are not anxious about what might happen when they follow other people decision.

The effect of neuroticism on overconfidence is not statistically significant. This means that this study cannot see the relation between the two. Overconfidence being a subjective behavior without concrete act might be a reason why this study cannot see the relation. How much confidence investor cannot be properly assessed while the act of herding can be properly assessed. In other perspective this can also be seen as neuroticism does not affect overconfidence in any way. Neuroticism only makes anxiety and fear inside people but does not materialize as an investment decision. Other possible reason why this study fails to see the effect between the two is because overconfidence variable had 2 items removed due to their AVE. With using more items for overconfidence might help studies to explain better and see the effect.

5. CONCLUSION

This study is to determine the effect of neuroticism on two cognitive biases. These two biases can be seen through investors response on other people decision as well as their own. Ahmad (2020) conducted a research on college students in Pakistan about the relation between personality traits and cognitive biases. Ahmad (2020) found that neuroticism has positive effect on herding behavior, while this study found that neuroticism has negative effect instead. Ahmad (2020) also found that neuroticism should prevent overconfidence. Fung & Durand (2014) stated that neuroticism do not significantly predict overconfidence. This might be the other reason why this study cannot find the relation.

LIMITATION AND STUDY FORWARD

Possible factor that this study cannot see the relation between neuroticism and overconfidence is because overconfidence need more concrete indicator to prevent subjectiveness in assessment. This can be seen from three out of five indicators on overconfidence does not pass validity check. More respondent might also improve the capability of overconfidence indicator. Other solution to see the relation is by using moderating variable because Fung & Durand (2014) mentioned some more factors that might affect overconfidence such as intelligence. The small size of sample can also affect why this study cannot see the effect of neuroticism on overconfidence.

This study can also be more useful by investigating other personality traits as well. Having moderating variables can also give more explanation on the relations. For example is information sources used to make investment decision since according to Susanto & Anastasia (2019), credibility affect herding behavior.

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