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The Existence of Behavioral Biases and Personality Traits in Explaining the Effect of Fundamental and Technical Analysis to Investment Performance in Indonesia Stock Exchange

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ABSTRACT

Rational investors focus on the fundamental and technical analysis in their investment decisions. In fundamental analysis, they consider economic conditions, industry analysis, and company analysis if they use a top-down approach, and vice versa if they use a bottom-up approach. Technical analysis focuses on the historical movement of stock price to predict the future price by using the pattern of a chart. However, in modern finance, investors are not fully rational as they are also affected by the psychological factors when making their investment decisions. These psychological factors then create behavioral biases, which becomes the basic assumption of behavioral finance This research is aimed at investigating the role of availability bias and disposition effect as behavioral biases that make investors irrational in their behaviors and whether it is supported by the Big Five Personality Traits, which include openness, conscientiousness, extraversion, agreeableness, and neuroticism (OCEAN). It needs to explore the influence of fundamental analysis and technical analysis on investment performance with the existence of behavioral biases as mediating variable and personality traits as a moderating variable between fundamental analysis and behavioral biases.

Keywords: *Fundamental Analysis, Technical Analysis, Disposition Effect, Availability Bias, Personality Traits*

INTRODUCTION

According to the data from Statistics Indonesia (BPS), Indonesia's population of 265,015,300 (in 2018) with GDP over USD 1 trillion is still attractive and remains challenging for investors. Most of Indonesians still prefer to put their money in the savings account. The ratio of savings and investment is 79:21 (www.idntimes.com). This shows that for Indonesians, investing is not as interesting as savings. Based on the data from Indonesia Securities Central Depository (KSEI), the number of investors in

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Capital Market at the end of 2019 is 2,478,243 or there is an increase of 53.04 per cent from 2018. The number is still relatively low as compared to populations in Indonesia, which is only 0.93 per cent of the total population. There are several investment alternatives, and each has its own risk and return. Among these alternatives, stock investment has the highest return, which in turn carries a high risk as well. Investors must take some time to analyze the stock to gain maximum profit in their investment.

LITERATURE REVIEWS

Types of Investment Analysis

There are two types of investment analysis; fundamental analysis and technical analysis that is used in traditional finance and the result is a rational investment decision. However, in modern finance, the investment decision is affected by several cognitive and psychological errors, so-called behavioral biases. and it is the basic concept of behavioral finance. Psychological factors are related to the personality traits of each investor and there is evidence that personality traits affect investors' behavior. All those factors will influence the investment performance.

Fundamental Analysis

Fundamental analysis is an analysis that has the objective to determine the fair value or intrinsic value of the stock. It gives the information on whether the stock is underpricing or overpricing. Investors will look for a stock that has good financial performance but underpricing, which happens when the fair value of a stock is higher than the current stock price (Elbialy, 2019). There are two approaches in the fundamental analysis, top-down approach and bottom-up approach. The top-down approach starts by analyzing the economic condition, then industry analysis, and company analysis. The stock market will be affected by the economic condition of a country. This includes GDP, inflation, interest rates, exchange rates, growth rates, employment, monetary policy, financial policy, income, production, and consumption. One example is when the inflation rate and interest rates decline, the stock price will increase (Elbialy, 2019, Tirea & Negru, 2014). The industry analysis includes business competition, government intervention, the status of the company, supply and demand, business movement and effectiveness related to the economy (Tirea & Negru, 2014, Elbialy, 2019). Then, the company analysis will include data from a financial statement and the analysis of financial ratios, such as liquidity ratio, profitability ratio, activity ratio, leverage ratio that determine company's profitability, risk, and growth (Tirea & Negru, 2014). The bottom-up approach begins from company analysis, then the industry to which the company belongs, and the economic condition (Elbialy, 2019).

Technical Analysis

Technical analysis is the analysis of stock price movement. It has three assumptions: (1) price and trading volume represents the critical factors, meaning they reflect all information, such as economic, political, psychological factors; (2) there is a trend in the price movement that will be indicated by the chart to predict the future price; (3) the prediction of the market movement depends on the historical event (Elbialy, 2019). The movement of stock price follows a certain trend which can be upward or downward and it shows the shift in demand and supply (Murugesan, 2016). Previous studies found that both fundamental and technical analysis have a significant effect on the effectiveness of investment decision in the Egyptian Stock Exchange. It is shown by the p-value less than 5% (p=0.000), using the multiple regression analysis (Elbialy, 2019).

Types of Behavioral Biases

The basic theory of behavioral bias, the Prospect Theory, was developed by Kahneman and Tversky (1979). This theory theorizes that psychological factors may cause irrationality and affect investment decision making. This theory also describes how human judgement and decision-making process involves risk amid uncertainty. In the gain position, investors are more likely to be risk-averse, while in the losses, they will be more likely to be risk-seekers. The irrationality of investment decisions due to psychological biases is the basic assumption of behavioral finance.

There are two types of biases, cognitive and emotional. (Pompian, 2011). The first one usually happens by wrong reasoning, while the second is by sudden emotions and insights. Biases in cognitive biases include overconfidence, representativeness, anchoring, framing, cognitive dissonance, availability, mental accounting. On the other hand, emotional biases consist of endowment bias, loss aversion, optimism and status quo (Heybati, Roodposhti & Moosavo, 2011). Shefrin (2000) classifies biases differently; they are heuristic-driven and frame-dependent biases. A heuristic is the use of a mental shortcut to make a quick and easy decision. Tversky and Kahneman (1974) stated that there are three heuristic-driven biases, representativeness, availability, and anchoring, while the frame-dependent biases include loss aversion, narrow framing, mental accounting, and the disposition effect. Two psychological biases are related to personality traits, those are availability bias and disposition effect (Durand, Newby, Peggs & Siekierka, 2013)

Availability Bias

Availability bias, or also called availability heuristic, is a situation where people have easily recalled information, which then includes judgmental heuristics (Prosad, Kapoor, Sengupta, 2015). Therefore, when making an investment decision, investors' analysis of the stock market probability is based on information that is only readily available to them. easy to retrieve from several sources, such as advertising, friends, and financial advisors (Tversky& Kahneman, 1973). The availability and accessibility of the data are used as a basis for decision making (Kahneman & Tvesky, 1982). The consideration of investors to choose stocks lies on the ones recently caught their attention (Barber & Odean, 2007). Events that easily recalled will have a higher probability than events that hardly remember, imagine or perceive (Kim & Nofsinger; 2008, Prosad et.al. 2015). There is a tendency to have a quick decision based on the availability of data, which may come from analyst’s recommendation and daily information of market returns (Gholipour, 2007; Kliger & Kudryavtsev, 2010).

Barberis (2001) and Abdin, Farooq, Sultana & Farooq (2017) also state that availability bias exists when investors prefer to invest in local stock due to familiarity, ease of access and availability of information to access, regardless the fundamental principles of portfolio investment. Another finding by Waweru, Uliana & Munyoki (2008) shows that 96% of the respondents in his research have heuristic behavior in investment decision or are affected by availability bias. They put too much weight on easily available information. There is a significant difference between the respondents who exhibited this behavior and those who did not (t = 4.8538, *p-value* = 0.001).

Disposition Effect

Investors tend to hold the loser's stocks too long and sell the winning stock too early (Prosad et al., 2015). The phenomenon of disposition effect indicates by a tendency of investors to realize the gains early and reluctant to realize losses by holding on to losing stocks (Shefrin & Statman, 1985). According to Odean (1998), the disposition effect occurs when investors try to maintain their self-esteem by realizing profits but holding onto losing stocks. This is because investors have the tendency of holding losing stock too long and selling the winning stock too early (Prosad et.al, 2015; Shefrin & Statman, 1985). The disposition effect is in line with prospect theory, in which people tend to be more risk seekers when experiencing loses (Kahneman & Tversky, 1979).

Investors with disposition bias have a lower return in their investment performance and have poor trading choices (Feldman, 2011). Previous research done by Chen, Nofsinger, Kim & Rui (2007) found that 35% of their respondents are exhibited the disposition effect and have poor trading choices. Moradi, Meshki & Mostafaei (2013) studied factors affecting disposition effect in the Tehran Stock Exchange and found that conscientiousness has a positive influence on disposition effect. Muermann and Volkman (2006) stated that disposition effect occurs because investors seek pride-when selling stock early-and avoid regret-when holding on to loser stocks too long.

Types of Personality Traits

Personality is one of the key determinants of human behaviour (Barber & Odean, 2000). Each person has unique characteristics and different types of personalities that affect the choice of an investment portfolio and investment performance. There are several approaches to measure personality, but the most popular is the "Big Five Personality", identified by Costa and McCrae (1985). It includes five personality traits: Openness, Conscientiousness, Extraversion, Agreeableness, and Neuroticism (OCEAN). Maital, Filer & Simon (1986) and Lin (2011) stated that big five personality traits influence investors' behaviour. Previous studies found that emotional stability, extraversion, openness and conscientiousness all have a positive relationship with disposition effect. Agreeableness is not susceptible to any behavioral bias. Sadi, Asl, Rostami, Gholipour & Gholipour (2011) stated that behavioral biases correlate with personality traits measured by the big five personalities. Their findings show that agreeableness has no relationship with behavioural biases.

Openness

Openness is related to the interest toward novelty, aesthetics and new ideas with the existence of emotion (Costa & McCrae, 1997). Individuals who have this characteristic are creative and imaginative (Martins, 2002). They are adaptive to new things and like to experiment. They are also modern, curious, and more risk-tolerant (Mayfield, Perdue & Wooten, 2008; Costa & McCrae, 1992). Previous studies show that there is a negative correlation between openness and availability bias (Sadi et al., 2011), while there is a positive relationship with disposition effect (Bashir et. al., 2013).

Conscientiousness

Conscientiousness people are very competent, discipline, active in decision making. They are also credible, which leads to the needs of high-quality and reliable information. (Costa & McCrae, 1997; Mayfield et al., 2008; Costa & McCrae, 1992; Heinström, 2003). Conscientiousness has a positive and insignificant relationship with risk-taking (Bashir, Shah & Khan, 2019). Lin (2011) found that conscientiousness has a positive relationship with disposition effect ($t = 2.15$, $p<0.05$), meaning that investors with the trait of conscientiousness are more cautious than other investors, so they tend to sell their winning stocks earlier. This is corroborated by the study conducted by Durand et al. (2006) which show the tendency of conscientious people to take lower risks when making investment decisions.

Extraversion

People with extraversion trait are friendly, energetic, adventurous and assertive (Costa & McCrae, 1992). They are extrovert and love socializing (Leary, Reilly & Brown, 2009). People with this trait are also characterized as having high excitement, optimistic, and ambitious (Costa & McCrae, 1997; Sadi et.al, 2011). They will have intensive interaction with friends, peers, family, and superiors in the process of decision making (Heinström, 2010). Previous studies (Bashir et al., 2013, Durand, 2013) found that there is a negative relationship between extraversion and disposition effect. They tend to use external factors rather than personal to evaluate their decision (Sadi et al., 2011). Studies found that people with this trait are not bothered by the risk of investment. For them, risks are natural, which they do not try to avoid (Dohmen et al., 2011). Another study about the relationship between extraversion and availability was done by Moradi et al. (2013) who found that there is a relationship between extraversion and availability bias; therefore, the suggestion is to increase the information and awareness to investors through the publication of articles and books and hold seminars and classes to reduce this bias**.**

Agreeableness

Agreeableness trait is related to warmth, friendliness, and ability to work together within social interactions (Costa & McCrae, 1997). Individuals who have this trait tend to follow social norms and will try to maintain harmony by being courteous and avoiding conflict (Martins, 2002; Costa & McCrae, 1992). Bashir et al. (2013) found that the disposition effect is positively correlated with agreeableness. They believe what people say without trying to reconfirm the information and readily accept any kind of misinformation (Heinström, 2010). Agreeable people are risk-taking and tend to give priority to others' opinion. Another study (Dhiman & Raheja, 2018) also found that people with this trait are more risk-tolerant.

Neuroticism

People with neuroticism are characterized as highly emotional, stressed, insecure, anxious, high-tempered, depressed, and impulsive (Costa & McCrae, 1997). They are overreactive to external factors. (Costa & McCrae, 1992). A previous study (Lin, 2011) also found that neuroticism and availability bias are positively correlated. Thus, investors with this characteristic will rely more on the availability heuristic. Neuroticism was also found to be positively correlated to the disposition effect. This makes investors with this trait tend to sell their stocks earlier as they are afraid of losing profit from their investment in advance because they are more worried about their loss of investment. Durand (2013) found that availability bias has a statistically significant positive association with negative emotion (neuroticism). The more neurotic investors, the more they rely on the availability heuristic (coefficient = 2.1701, p-value = 0.0565). Meanwhile, neuroticism has negative and insignificant relationship with disposition effect (coefficient = −0.0129, p-value = 0.073). The same argument was stated by Bashir et al. (2013), that neuroticism has a negative and insignificant relationship with disposition effect with a coefficient of regression -.013 and p-value above 0.05. There is a negative relationship between neuroticism toward risk aversion (Nga & Yien, 2013). However, risk aversion and neuroticism are found to be negatively correlated (Durand et al. (2006) and Peterson (2011) which found that this type of investors will take higher risks, especially to recover from their loss.

Investment Performance

To succeed, investment needs financial knowledge and the determination to lower psychological biases (Jureviciene & Jermakova, 2012). The performance of investors commonly measured by the rate of investment return and comparing the expected return with that of the market (Phuoc Luong & Thi Thu Ha, 2011). In behavioral finance, investment preferences and behavior are affected by personality traits. This leads to the choice of investment asset which eventually determines the investment performance (Durand, Newby & Sanghani, 2008).

Several studies correlate each personality trait with investor performance. Investors with openness trait have more willingness to create innovation as they are willing to receive changes or adjustments from new information which improve their investment performance (Durand et al., 2008). Conscientiousness has the highest correlation with perceived investment performance in a negative direction with a coefficient of 0.04 at 0.05 level of significance. (Akhtar, 2017). Extraversion has a positive influence on investment performance with a coefficient of 0.01 at 0.05 level of significance. This finding implies that extroverted investors are likely to have higher portfolio returns compared to those who are not. (Pompian & Longo, 2004; Akhtar, 2017; Durand et al., 2008). Agreeableness has the second-highest correlation to investment performance after conscientiousness and the relationship is negative with a coefficient of 0.02 at 0.05 level of significance. Neuroticism is also negatively correlated with investment performance with a coefficient of -0.01 at 0.01 level of significance. (Akhtar, 2017; Durand et al., 2008).

RESEARCH FRAMEWORK

This research attempts to explore the influence of fundamental and technical analysis to investment performance with the existence of behavioral biases as a mediator variable and personality traits as a moderator variable. Traditional finance focuses only on the rational behavior of investors that use fundamental and technical analysis to achieve high investment performance. However, modern finance includes the psychological factors into the investment decision-making process, which is known as behavioral finance. Investors are not always rational, and the irrationality of investors are caused by behavioral biases. Personality traits are believed to have impacts on the relationship between fundamental and technical analysis with behavioral biases.

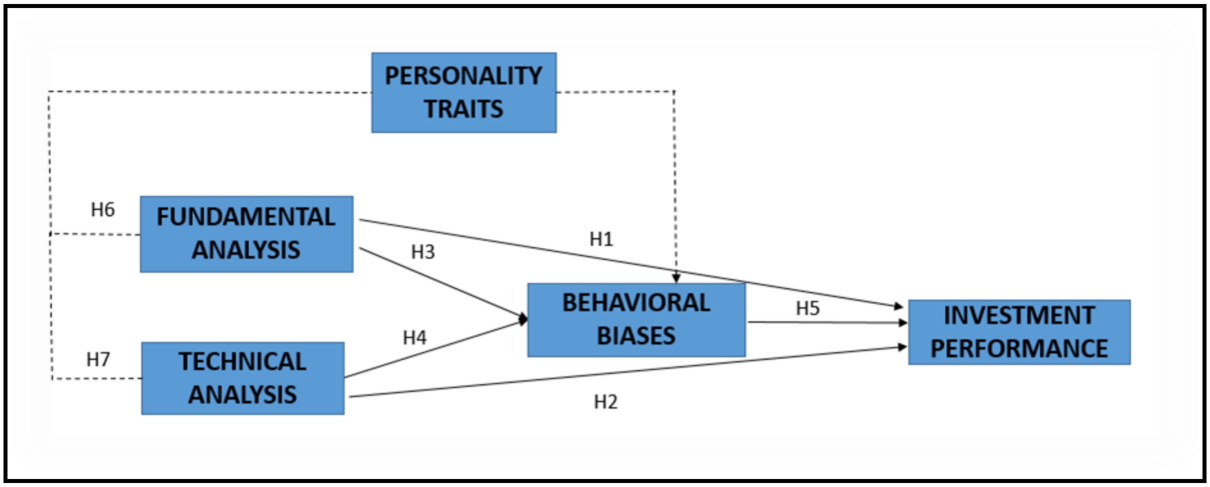

Figure 1: Research Framework (Lin, 2011; Sadi et.al., 2011)

HYPOTHESIS DEVELOPMENT

H1: Fundamental analysis is positively related to investment performance
H2: Technical analysis is positively related to investment performance
H3: Fundamental analysis is negatively related to behavioral biases
H4: Technical analysis is negatively related to behavioral biases
H5: Behavioral biases is negatively related to investment performance
H6: Personality traits have a moderating effect on the relationship between fundamental analysis and behavioral biases
H7: Personality traits have a moderating effect on the relationship between technical analysis and behavioral biases

CONCLUSION

To achieve optimal investment performance, rational investors will do investment analysis using fundamental and technical analysis. Their decisions are believed to be based on these two analyses. However, in reality, an investment decision making process involves irrationalities caused by behavioral biases. It is also believed that personality traits have a moderating role in the relationship between fundamental and technical analysis of behavioral biases. The two psychological biases, the disposition effect and availability biases, are affected by the personality traits. In addition, more details need to be explored whether behavioral biases have a mediating role in the relationship between fundamental and technical analysis and investment performance. For academicians, this research is expected to contribute to the understanding and exploring the modern theory of finance which includes the behavior of the investors.

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