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Impact of Behavioral Factors among Indonesian Individual Investor towards Investment Decisions during Covid-19 Pandemic

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Abstract:
The COVID-19 pandemic has caused various economic upheavals around the world, especially in the financial sector. During the pandemic, the stock market in Indonesia showed high volatility mainly due to unpredictable market conditions and unexpected investor behavior. Investors must show their rationality where their financial behavior should not be influenced by behavioral bias factors. Some of the behavioral bias factors that are of concern in this study are the presence of heuristic, prospect, market, and herding biases that affect investment decisions among individual investors in Indonesia during the COVID-19 pandemic.
In this study begins with the basis of behavioral finance theory and then the formulation of the hypothesis is tested through the collection of questionnaires which have been obtained 295 respondents. Data were analyzed using a structural equation model (CB-SEM) with the help of LISREL 8.80 software.
The results identify that heuristic and market behavioral bias have a positive influence on individual investors' investment decisions, while behavioral bias factors such as prospects and herding negatively influence individual investors' investment decisions during the COVID-19 pandemic in Indonesia.
Key Word*: behavioral bias; investment decisions; financial behavior; COVID-19; Indonesian Stock Exchange.*

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I. Introduction

The paradigm of financial economic theory assumes that individuals behave rationally when receiving all available information based on their beliefs in making a normative decision-making process (Barberis & Thaler, 2005). However in reality (Bashir, et al, 2013) investors do not behave rationally as described. Bernstein (1996) states that there is evidence that shows patterns of irrationality, inconsistency, and incompetence in how humans make decisions, especially when faced with conditions of uncertainty. This is reinforced by the findings of Lin (2011), Carpentier & Suret (2012), Danarti et al. (2019), and Mushinada (2020), where there is empirical evidence linking rational decision making with irrational investor behavior.

Indonesian stock market during COVID-19 experienced sharp volatility, marked by the fall in the Indonesian Composite Stock Price Index (IHSG) on March 18, ytd, falling 31.1% to its lowest level at 4,330.67 it recovered again with same level before pandemic on January 2021 at the level of 6,428 as at the beginning of 2020 where COVID-19 did not yet exist in Indonesia (idx.co.id, 2020). The recovery level of the IHSG is not in line with increasing number of active COVID-19 cases. Until December 2020, the number of cases in Indonesia reached 743,198 infected people (Worldmeters.info, 2020) nonetheless, local investors are dominated stock trading activities with the frequency of selling and buying shares reached 82.47%, which means that Indonesian investors were very active in the stock market during the COVID-19 pandemic even tough market still have high volatility.

Surge growth of individual investors in Indonesia had a significant increase in the number of investors seen from the number of Single Investor Identification (SID) shot up to 4.16 million compared to the previous year's 2.48 million (Kompas, 2020). The shift in technology adoption in the industrial era 4.0, especially in the field of finance and technology (fintech) where the many online trading platforms contributed to the surge in the number of investors in the midst of the COVID-19 pandemic, with many people still working from home, as well as some experiencing work disruptions, business and income, they begin to realize the importance of the value of investing (thejakartapost.com, 2020).

This market anomaly can be explained by the financial sector, namely behavioral finance. financial behavior affects how individuals act as investors where the behavior tries to understand how investors' emotions and cognitive affect of individual investors (Kengatharan, 2014). But in reality, this assumption is not fulfilled,

investors are considered not completely rational and even irrational. Therefore, many researchers (Waweru et al, 2008, Carpentier & Suret, 2012, Danarti, 2019, and Mushinada, 2020) believe that studying investor behavior in financial markets, especially behavioral bias, is the basis for understanding the phenomena that occur in the stock market today.

Carpentier & Suret (2020) argues that individual investors generally tend to be less rational than institutional investors in making decisions. Individual investors are considered traditional investors, who make decisions based solely on financial statement information and intuition rather than conducting careful analysis before investing. This is reinforced by the findings (Carpentier & Suret, 2012, Bakar & Yi, 2016, Sochi, 2018, and Danarti et al, 2019) that individual investors tend to be more influenced by behavioral bias factors in making investment decisions than institutional investors such as studied by Waweru et al. (2008).

This research is expected to help individual investors to understand themselves better so that they are aware of the impact of psychological factors in their investment decision making so that individual investors can take preventive action in controlling behavioral bias factors that interfere with the decision-making process to make an investment.

II. Literature Review and Research Methods

Behavioral finance is a science that studies how humans respond and react to information used to make decisions to optimize return (utility) of investment decisions by taking into account the risks in it (Murbarani 2019). Expected utility theory is a theory published by Neumann & Morgenstern (1947) which states that theory is a normative behavioral theory, which aims to provide explicit assumptions or axioms underlie rational decision making. In expected utility theory, decision makers or investors have knowledge or information, beliefs, and skills regarding the analysis of opportunities and consequences in investments.

According to Waweru et al. (2008) behavioral finance tries to explain human behavior in the stock market based on the theory of social behavior where the behavioral economics study describes how people behave, learn and make economic decisions, but what happens in reality is he assumes that everyone is irrational all the time. Behavioral finance emphasizes that rationality cannot be considered as something that everyone should pay attention to, rather that irrationality that should be minimized or eliminated in a competitive market. Various studies have found amount of evidence regarding irrational behavior and repeated mistakes that often occur when making decisions. Psychological factors are considered to cause investors to do things that are irrational and unpredictable. Sometimes emotions, traits, knowledge, preferences, and various kinds of things inherent in humans underlie the emergence of decisions in action. This causes them to lose control of themselves, where they either become overconfident or overly pessimistic.

People make decisions, by simplifying the choices presented to them, usually using only a subset of the available information and discarding some (usually complex but potentially good) alternatives to make them simpler. They are quite satisfied in finding a "good enough" solution rather than looking for a more optimal solution. In doing so they may (unintentionally) be biased in the decision-making process. This bias can lead to irrational behavior and wrong decisions, especially in the stock investment (Pompian, 2012).

According to Ritter (2003) in Sochi (2018), financial behavior is explained by psychological factors which explain that the human decision-making process is subject to several cognitive illusions. These illusions are divided into two groups, namely illusions caused by heuristic decision processes and illusions rooted in mental adoption which are grouped in prospect theory (Waweru et al., 2008). This research refers to the behavioral theory proposed by Waweru et al (2008) as a basis and is developed in such a way based on the study and findings of further research in the following years on the theory. This study also tries to develop the theory which is adapted to the phenomena that have been explained against the background of the problem in accordance with the current conditions in the midst of the COVID-19 pandemic in Indonesia. The behavioral bias variables that affect investment decisions are divided into four groups: heuristics, prospects, market, and herding effects which can be seen in table 1 below.

Table 1: Behavioral factors that influence investment decisions

Group	***Variabel Perilaku***
Heuristic Theory	*- Representativeness* *- Overconfidence* *- Anchoring* *- Gambler's fallacy* *- Availability bias*
Prospect Theory	*- Loss aversion*

	- Regret aversion *- Mental accounting*
Market Factor	*- Price changes* *- Market information* *- Past trends of stocks* *- Fundamentals of underlying stocks- Customer preference* *- Over-reaction to price changes*
Herding Effect	*- Buying and Selling decisions of other investors* *- Choice of stock to trade of other investors* *- Volume of stock to trade of other investors* *- Speed of herding*

this model reflects almost all behavioral factors that can impact investors' decisions on the stock market. Therefore, this model can be used to identify the behavior of individual investors in the stock market in Indonesia amid COVID-19 pandemic. The framework used in this research can be seen in Figure 1 below.

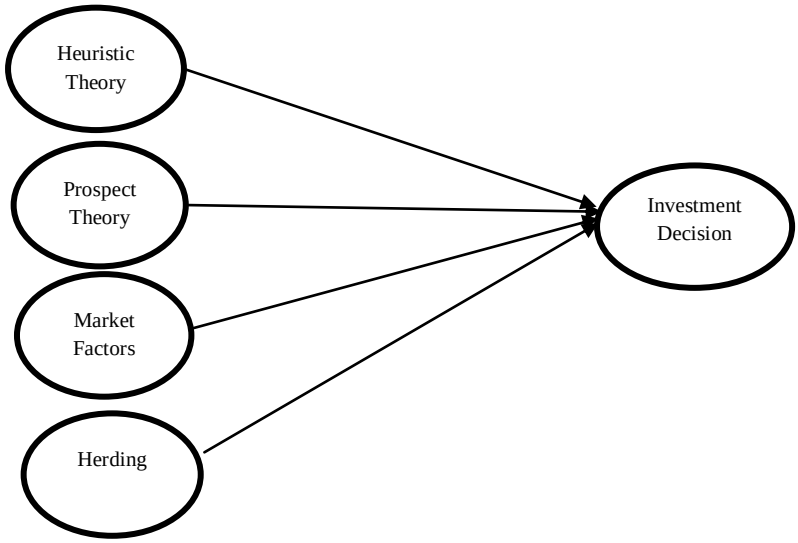

Figure 1: Research Framework

Based on the above framework, several hypotheses are summarized in table 2 below.

Table 2: Behavioral factors that influence investment decisions

No	Research Hypothesis
H1	Heuristic factors significantly influence individual investor investment decisions during the COVID-19 pandemic
H2	Prospect factors significantly influence individual investor investment decisions during the COVID-19 pandemic
H3	Market factors significantly influence individual investor investment decisions during the COVID-19 pandemic The effect of behavioral bias factors on individual investment
H4	Herding factors significantly influence individual investor investment decisions during the COVID-19 pandemic

The survey was conducted to obtain primary data obtained by creating questionnaires distributed to individual investors in Indonesian Stock Exchange Index (IHSG). Through the internet by utilizing available online form, which is then distributed through several groups/communities of stock investment platforms such as the Stockbit community is the most significant stock platform mobile application in Indonesia to discuss, analyze, and investing. Other platforms such as telegram/whatsapp investment groups are commonly visited and used by individual investors according to the scope of research.

The questionnaire consisted of three parts. First, the respondent's identity includes demographic indicators. second, screening questions to find out the demographic of respondents in general and ensure that respondents are individual are active investors. Third, it contains statements or closed questions that respondents will fill as respondents' assessment of behavioral bias indicators that influence investment decisions. 5-point likert scales are used in this study where this scale requires respondents to agree or disagree regarding statements that express good or no attitude towards objects. It is used to have individual investors evaluate the level of understanding of behavioral factors on their investment decisions. 295 sample respondent are collected from july until september 2021 amid second wave of COVID-19 rising cases all over Indonesia. Data was analyzed with structural equation model (CB-SEM) using LISREL version 8.80 were used in this study to process and analyze the collected data.

III. Result

Descriptive statistical analysis is a statistic used in analyzing data by describing the data that has been collected. This analysis aims to provide an overview or describe the data in variables seen from the average (mean), minimum, maximum and standard deviation. The impact of the influence of behavioral bias variables on individual investors' investment decisions during the COVID-19 pandemic can be identified by calculating the sample mean (mean) for each variable. The mean value of these variables can determine how much impact they have on investment decisions with reference to Pimentel (2019), namely the range is calculated by 5-1=4 then divided by the largest value, namely 5 (4÷5=0.80) After that, the number the one which is the smallest value on the scale is added to identify the maximum category.

Table no 3: Descriptive Statistic

	N	Mean	Std. Deviation
Heuristic	295	3,948	1,159
Prospect	295	3,679	1,260
Market Factor	295	3,875	1,094
Herding	295	3,223	1,226

From table 3 above, the behavioral variables with heuristic dimensions that affect investment decisions consist of representativeness, overconfidence, gambler's fallacy, anchoring, and availability bias have a high influence with a mean value of 3.948. While the prospect variables consisting of loss aversion, regret aversion, and mental accounting are representative of the variables that influence individual investors' investment decisions, which have a high influence with a mean value of 3,679, market factors or market factors represented by indicators such as Fundamentals of underlying stocks. and Market information has a high influence with a mean value of 3.875. This means that individual investors during the COVID-19 pandemic in Indonesia tend to carefully consider information from the current stock market and how the fundamental condition of the stock to be invested in before they make their investment. The herding factor has the smallest effect compared to other factors, which is indicated by a mean value of 3,223 with a moderate effect.

Structural Equation Model (SEM) was used to analyze the behavioral bias factors that influence individual investors' investment decisions on the Indonesian stock exchange amid COVID-19 pandemic. This method aims to test existing theories and to measure variables that cannot be measured directly, but through the indicators and to estimate causality between latent variables and observed variables as indicators. The first test was conducted using confirmatory factor analysis (CFA) to determine the validity and reliability of the research instrument. The result incicate that all observed variable have Loading Factor score above 0.50 (>0.50) and Composite Reliability >0,60 aresummarized in table 4 below.

Table no 4: Composite Reliability

Variable	**Composite Reliability**	**Cut Off Value**
HEU	0,849	≥0,60

PRO	0,855	≥0,60
MF	0,831	≥0,60
HERD	0,838	≥0,60
INV	0,893	≥0,60

After the indicators of each latent variable have been tested, the next step is to analyze the full structural model as a whole and assess the feasibility of the model using the Goodness of Fit (GoF) test. The following are the results of research based on the model used in the structural model test using the LISREL 8.80

Table no 5: Goodness of Fit

Criteria	Cut off Value	Output	Description
GFI	>0,90	0,94	Good Fit
RMSEA	<0,05 - <0,08	0,066	Good Fit
CFI	>0,90	0,98	Good Fit
IFI	>0,90	0,98	Good Fit
NFI	>0,90	0,97	Good Fit
RFI	>0,90	0,95	Good Fit
RMR	<0,08	0,075	Good Fit

Testing Hypothesis testing is done by looking at the t-value in the structural equations and from the output image of the structural model. The following is the t-value obtained in the measurement of the structural model with LISREL 8.80 in Figure 2 below.

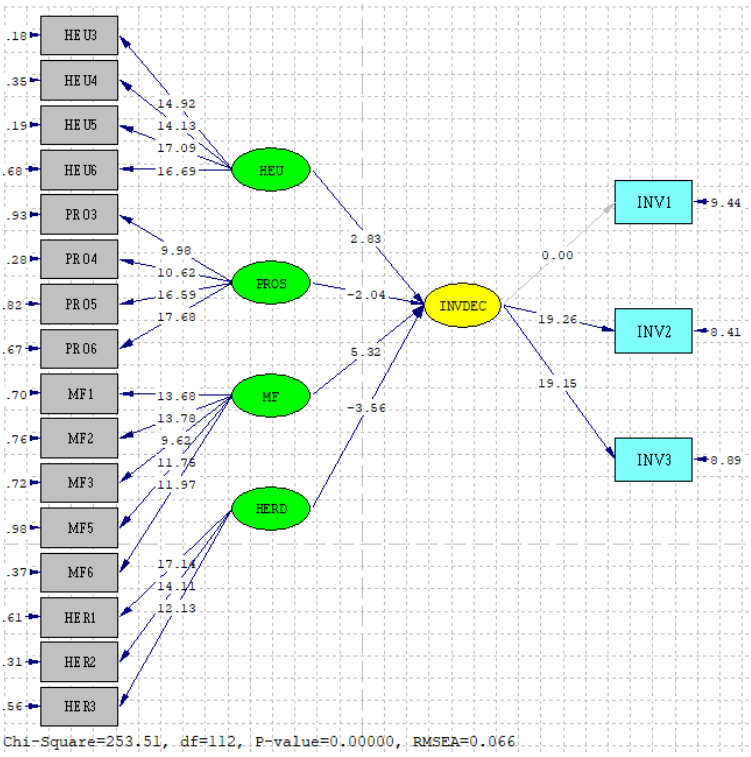

Figure 2: Structural Model Estimation

Based on the results of the model test on the structural equation above, a summary of the results of hypothesis testing based on the t-value can be seen in table 6 below.

Table no 6: Hypothesis Testing Result

Hubungan Variabel	*t-value*	Conclusion
HEU → INVDEC	2,83*	Hypothesis Accepted
PROS → INVDEC	-2,04*	Hypothesis Accepted

Hubungan Variabel	*t-value*	Conclusion
MF → INVDEC	5,32*	Hypothesis Accepted
HERD → INVDEC	-3,56*	Hypothesis Accepted

The first hypothesis examines whether the heuristic factors affect the investment decision. The test results show that the value of the t-statistical coefficient is 2.83, so from these results it can be stated that the first hypothesis is accepted because the t-statistical value is >±1.96. Thus it proves that the heuristic factor has a significant positive effect on investment decision.

The second hypothesis examines whether the prospect factor has an effect on investment decision. The test results show that the t-statistical coefficient value is -2.04 so that from these results it can be stated that the second hypothesis is accepted because the t-statistic value is >±1.96. Thus it proves that the prospect factor is proven to have negative significant effect on investment decisions.

The third hypothesis examines whether market factors affect investment decisions. The test results show that the t-statistical coefficient value is 5.32, so from these results it can be stated that the third hypothesis is accepted because the t-statistical value is >±1.96 and. Thus it proves that the market factor is proven to have significant positive influence on investment decisions.

The fourth hypothesis examines whether the herding factor has an effect on investment decisions. The test results show that the value of the t-statistical coefficient is -3.56, so from these results it can be stated that the fourth hypothesis is accepted because the t-statistic value is >±1.96. Thus it proves that the herding factor is proven to have negative influence on investment decisions.

The coefficient of determination (R-square) is used to measure how much influence the independent variable has on the dependent variable. Chin (1998) states that the R-square value of 0.67 and above has a strong effect, whereas if the value is 0.33-0.67 then it is included in the moderate category, and if the result is 0.19-0.33 then it is in the weak category. The following are the results of testing the coefficient of determination which can be seen in the following table 7 below.

Table no 7: Coefficient of determination

Variable	R-Square
INVDEC	0,85

Based on table 7, the R-square value of the investment decision variable is 0.85. The obtained value explains that the percentage of the investment decision variable explained by the heuristic, prospect, market factor, and herding variables is 85%, while the remaining 15% is explained by other variables not included in this study. This value is included in the category with a strong level of influence.

IV. Discussion

Decisions related to investment are a complex matter. All investors face conditions of financial instability and uncertainty during the current COVID-19 pandemic. This instability makes the decision-making process more complex than usual. Especially with the situation that is developing more rapidly, it is difficult to take advantage of available opportunities and better resources to make the right investment decisions using all available information so that the decisions taken are as rational as possible. However, by the time the decision is made, chances are that the opportunity will no longer exist and is usually irrelevant.

Heuristic Factors on Investment Decision

Heuristic theory is an important rule of thumb in decision making in uncertain conditions. Individuals who fail to assess the ideal probability because of limited time and information will tend to be heuristic in making decisions. As a result, individuals will collect all available information so that the decision-making process will become easier, simpler and more efficient (Wijaya & Zunairoh, 2021). In this study, the dimensions of the heuristics consist of: representativeness, overconfidence, anchoring, and availability bias. The findings from this study confirm that individual investors in Indonesia during the COVID-19 pandemic behave irrationally in making investment decisions that are influenced by heuristic bias. The results showed that the heuristic factor had a significant positive effect on individual investor investment decisions in Indonesia during the COVID-19 pandemic. These findings are consistent with Shah & Malik (2021) who revealed that representativeness, overconfidence, availability of information, and price anchoring are significant predictors of heuristic behavior that affect investment decisions and performance of NSE investors.

This study provides empirical evidence of the impact of representativeness bias on investment decisions. Psychologically, this means that representative bias speeds up the decision-making process of

individual investors. Most people only make decisions based on past events and current trends, so they ignore other factors that may directly or indirectly contribute to rational decisions (Irshad et al., 2016). When people rely on representativeness in making judgments, they tend to misjudge due to the fact that something that is more representative does not necessarily reflect the actual situation (Tversky & Kahneman, 1974). During the COVID-19 pandemic, investors in Indonesia tend to only follow the trend of stock price movements, when a market crash occurs, investors would have panic buying by ignoring other factors such as sample size and the average return of a stock. Kim & Byun (2011) argue that investors see a small sample as representative of the entire population by ignoring the entire population and ignoring the law of probability where individual investors invest in stocks that have high abnormal returns in the near future and these investors choose these stocks because of representative bias (Dhar & Kumar, 2001). The results of this study are similar to those of Waweru et al. (2008), Irshad et al. (2016) and Khan et al. (2020).

The overconfidence factor also influences investment decisions. This can be interpreted that individual investors in Indonesia during the COVID-19 pandemic were affected by overconfidence bias. Investors who are too confident tend to make inappropriate or risky investments and carry out excessive trading activities which can have a negative impact on their returns. This is evidenced during the pandemic that market conditions have quite high volatility, when viewed from data on the Indonesian stock exchange (idx.co.id, 2020) there is a surge transactions per day in Q2-Q3 2020. Many investors take advantage of this condition by making fast transactions, of course. accompanied by a high risk. The results of this study are consistent with Waweru et al. (2008), Alquraan et al. (2016), and Bakar & Yi (2016).

Similarly, the availability and anchoring bias that play a role in influencing investment decisions are consistent with Waweru et al. (2008) and Le Luong & Thi Thu Ha (2011) who found that availability and anchoring bias had a significant influence on investment decisions. Nofsinger & Varma (2013) explained that availability bias might cause investors to tend to focus only on stocks they know. During the COVID-19 pandemic individual investors have been reluctant to seek information on other markets' stock exchanges. According to research by Fauziyyah & Ersyafdi (2021) it was revealed that countries in Asia, including Indonesia, were more severely affected than the European market. Despite the greater availability of information on the stock market, the effect of the availability bias on individual investors in Indonesia during the COVID-19 pandemic remains strong.

Prospect factors on Investment Decision

The prospect factor is proven to have a significant negative effect on investment decisions. This can be interpreted that individual investors in Indonesia during the COVID-19 pandemic find it difficult to make a decision when faced with a risk in the available investment options. Individual investors are faced with unprecedented stock market conditions that have been affected by the COVID-19 pandemic, so that previous investment experience cannot be the basis for individual investors in making investment decisions during the COVID-19 pandemic.

Individual investors who have bought a stock before tend to avoid selling the stock and hold on to it hoping the trend will reverse or plunge deeper. The results of this study are consistent with Rajeshwaran (2020), Lehenkari & Perttunen (2004) and Sefrin & Statman (1985). Research on investment behavior suggests that people are more confident in their abilities which leads to hasty decisions.

The condition of the stock market in Indonesia during the COVID-19 pandemic is still uncertain in its direction where an investor who made a profit from the previous sale will seek more profit by investing more money. Conversely, when they are faced with a loss, they will be depressed and feel hesitant to make decisions quickly. An investor should consider carefully in making a decision, but too much caution can lead to slow action, so that they may miss out on good opportunities for investment and reduce their chances of achieving high profits.

Market factors on Investment Decision

Market factors are proven to significantly influence investors' investment decisions. This means that individual investors in Indonesia during the COVID-19 pandemic tend to focus on popular stocks, volatility of stock price changes, company fundamentals and news that can attract attention to the stock market, all of which rely on information from the stock market (Waweru et al., 2008). The factor of market information being crucial for the stock market in Indonesia during the COVID-19 pandemic, this is indicated by the Indonesian stock exchange regulatory agency which requires all companies whose names are listed on the stock exchange board to issue full qualitative and quantitative disclosure guidelines regarding the risks involved. faced by entities affected by the economic impact of COVID-19 in the company's operations as an obligation to shareholders and investors.

Individual investors who are interested in market information, especially financial news and participate in discussions related to finance, can have an impact on higher stock trading activity when facing outlier events

such as the COVID-19 pandemic (Talwar et al., 2021). This is evidence proven by data on the Indonesian stock exchange where the volume of share buying and selling transactions during the COVID-19 pandemic in Indonesia has increased (RTI infokom, 2021). The obvious reason behind this finding is that they were interested in market information about various financial developments and identified that when COVID-19 the stock market crashed it provided an opportunity to buy good stocks with attractive valuations. However, along with the increase in activity, it also causes investors to churn their ownership more frequently, thereby exacerbating the already fragile market volatility (Shantha, 2019).

The results of this study are consistent with Waweru et al. (2008), Ghalandari & Ghahremanpour (2013), and Cao et al. (2021) who found that market factors influence investment decisions. These investors rely entirely on the quality of market information or shares they have when making investment decisions.

Herding Factors on Investment Decision

The herding factor is proven to have a significant negative effect on investment decisions. This means that individual investors in Indonesia during the COVID-19 pandemic tend to be hesitant to make an investment decision when there are large stock price fluctuations and high market volatility. The effect of herding is caused by the lack of knowledge possessed by investors, where the available information is difficult to process quickly, especially by individual investors compared to institutional investors which in the end they become doubtful whether they choose to use their own decisions or choose to imitate the decisions of other investors who may be more influential in investing environment (Qasim et al., 2019). This finding is in line with the results of research conducted by Rajeshwaran (2020), Zhao et al. (2021), and Mishra (2021).

Kaminsky et al. (1999) asserted that during the 1997-1998 crisis, Asian countries, especially in developing markets, seemed to be driven by herding behavior. However, it is different from the crisis in 1998 where information disclosure is still very limited. During the current COVID-19 pandemic, data and information disclosure in the Indonesian capital market is very easy to access from anywhere, anytime, and by anyone, so the market can pay close attention and investors can be better educated (Kompas, 2020). However, other sources of information are also increasing, an individual who can influence and dominate a stock price, leading other investors to try to follow suit. (Lutje, 2009). Therefore, during the ongoing COVID-19 pandemic, herding behavior can negatively affect the ability of investors' investment decisions during the pandemic period (Shehzad et al., 2021) and can cause stock prices to become chaotic (Sihombing et al., 2021). In this condition, individual investors in Indonesia should consider the impact of herding behavior bias more carefully before making investment decisions

V. Conclusion

The novel coronavirus COVID-19 outbreak caused turmoil around the world including in the national economic sector. This study found the presence of behavioral bias represented by heuristic, prospect, market, and herding variables that influenced the investment decisions of individual investors in Indonesia during the COVID-19 pandemic. Based on the results of the study identified that: There is a positive influence of heuristic behavior bias on individual investors' investment decisions during the COVID-19 pandemic. This positive influence shows that the heuristic behavior bias will help individual investors effectively in the investment decision-making process during the COVID-19 pandemic. market factor have positive impact on individual investors' investment decisions. This positive influence shows that the behavioral bias of market factors will effectively encourage individual investors in the investment decision-making process during the COVID-19 pandemic. Prospect factor negatively influence individual investors' investment decisions during the COVID-19 pandemic. This indicates that the behavioral bias of the prospect factor will interfere with individual investors in the investment decision-making process during the COVID-19 pandemic. While herding behavior bias negatively influence individual investors' investment decisions. It shows that herding bias will interfere with individual investors in the investment decision-making process during the COVID-19 pandemic.

This research is still limited to individual investor respondents in Indonesian stock market who have a very wide demographic profile range, both from gender, age, education, and different investment experiences. So that the the impact of behavioral bias that accepted by each investor is different because of personality traits. It is recommended for further research to be more specific in classifying individual investors according to their demographic profile so that the determinants of behavioral bias factors will be explored further. This research was conducted during the COVID-19 pandemic in Indonesia, if possible in the future, research will be carried out in the post-pandemic or new-normal period so that the results of this study can be used as a reference for future research.

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