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Factor Analysis of Investor Behavior in Indonesian Stock Exchange during COVID-19 Pandemic

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Abstract: This study analyzes the behavioral factors of investors in deciding stock in-vestments in the Indonesia Stock Exchange during the Covid-19 pandemic. This research uses factor analysis to explain behavioral factors considered by individual investors in making investment decisions by conducting literature studies, distributing questionnaires to investors, conducting analysis, and discussing research results. The results showed that individual investors considered eight factors in making investment decisions, namely a combination of prospect theory, market, herding, and heuristics. From the eight factors, it can be concluded that the factors considered in making investment decisions are avoidance, following, experience, learning orientation, locus of control, beliefs revision, careful, do not want to lose. This study was to obtain an overview of behavioral factors that individual investors consider in making stock investment choices in companies listed at the Indonesia Stock Exchange during the Covid-19 pandemic. The number of studies that use behavioral finance for frontier and emerging markets, such as in Indonesia, is far less than those conducted in developed markets. Behavioral finance studies that discuss investor behavior in choosing stocks in pandemic conditions are still limited, especially in the Covid-19 conditions.

Keywords: COVID-19 pandemic, behavioral finance, investment decisions.

冠狀病毒病-19 大流行期间印尼证券交易所投资者行为的因素分析

摘要: 本研究旨在分析投资者在大流行期间决定在印度尼西亚证券交易所进行股票投资的行为因素。本研究采用因子分析法，通过文献研究、向投资者发放调查问卷、分析、讨论研究结果等方式来解释个人投资者在进行投资决策时所考虑的行为因素。结果表明，个人投资者在做出投资决策时考虑了八个因素，即前景理论、市场、羊群和启发式的组合。从这八个因素可以得出，投资决策考虑的因素是回避、跟随、经验、学习取向、控制点、信念修正、谨慎、不想失去。本研究旨在概述个人投资者在 Covid-19 大流行期间在印度尼西亚证券交易所上市的公司做出股票投资选择时考虑的行为因素。将行为金融用于前沿和新兴市场（例如在印度尼西亚）的研究数量远远少于发达市场的研究数量，行为金融研究讨论大流行条件下投资者选择股票的行为方面仍然有限，尤其是在 冠狀病毒病-19 条件下。

關鍵詞：冠狀病毒病-19 流行病、行为金融学、投资决策。

1. Introduction

At the end of 2019, there were cases of coronavirus infection (COVID-19) in China. The President delivered the announcement of the first Covid-19 case in Indonesia, namely on March 2, 2020 [1]. Along with the development of deadly infectious diseases in the world, on March 11. 2020, the World Health Organization (WHO) declared a deadly infectious disease called COVID-19 (coronavirus disease 19) as a pandemic [1]. The COVID-19 disease is one of the most significant challenges faced by the modern world [2]. The COVID-19 disaster can disrupt economic activity globally, including disrupted production processes, global supply chains, and transportation [3]. The impact on the economy, which fell by about 80% in several large countries, occurred due to flight restrictions or stoppages [4]. The impact on significant countries also shook and caused investor panic.

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Indonesia is inevitably affected by the current condition of the world economic crisis in 2020, which COVID-19 causes. In the second quarter and third quarter of 2020. Indonesia experienced negative economic growth of -5.32% and -3.49%, respectively. This condition can affect the funds invested, especially for risky assets such as stock instruments traded on the capital market.

An investor's behavior that can damage the equilibrium of the stock market price is panic investor behavior [5]. This is supported by the behavior of investors who have high-profit expectations without paying attention to other factors that could be detrimental [6].

An epidemic of contagious disease causes some investors to decide to sell shares at low prices because they feel pessimistic about their investment [7]. The decisions made by investors are still tricky for several financial analysts to understand. Many analyzes from securities companies and financial institutions on a global scale provide recommendations that sometimes do not "match" the reality. Forecasting methods based on conventional financial theory do not provide satisfactory results to explain stock price movements.

Personal characteristics and risk-facing behavior primarily determine the level of willingness to accept risk from each investor and decisions taken by a person throughout his life [8]. The characteristics of investors in this study include gender, age, family status, education, type and length of work, length and value of the investment, and income.

The characteristics of rational investors will consider all problems; on the other hand, irrational investors follow certain traditions aimed at avoiding risk, so they do not use rational reasons [9–11]. Investors changed their perceptions of risk tolerance when trading portfolios. Investors' perceptions fluctuated significantly during the crisis. Overall, despite the economic crisis, investors continued to trade stocks actively and did not reduce the risk of their investment portfolios during the crisis. A survey was conducted to determine behavior changes during a crisis, stock market return expectations, risk tolerance, and investors' risk perceptions, and data were collected from the brokers. This uncertainty and volatility can permanently change investors' perceptions of the stock market. In this study, it was found that investors did not try to reduce risk by shifting from risky investments to cash.

Conversely, investors used the crisis as an excellent opportunity to enter the stock market. It is hoped that it can contribute to behavioral financial theory during the COVID-19 pandemic. Individual cognitive profiles have different interactions based on the limited information they have. The existence of a high level of uncertainty supports investor behavior. The high availability of information with a low number of transactions indicates that not public information gets the same attention from investors so that investors can make mistakes in making decisions. One of the most important decisions during the Covid-19 pandemic is the purchase or sale of shares. Investors can misinterpret the actual stock price to the detriment of investors. Capital market players in assessing company performance through stocks can utilize the practical contribution of this research by utilizing available information during the COVID-19 pandemic.

The finding that caught the attention of investors was an increase in stock purchases during the pandemic. In theory, when market conditions are unstable, investors do not dare to make purchases. The novelty of this research is that the approach adopted takes the dimensions of a non-financial approach in favor of the behavioral theory of finance and focuses on investor profiles. So far, the approach that is relied upon is the investor approach with a financial achievement orientation. The current research results have ignored the conditions of the COVID-19 pandemic in investor behavior towards policies to buy or sell shares. This is what makes this research unique, where the results of this study can prove that non-financial factors, namely pandemic conditions, change the level of risk tolerance in stock decisions. Thus, this research has a practical novelty by making investor behavior a determining factor for stock transactions.

This strongly reinforces the fact that they need to explore behavioral factors that affect the decision-making process of individual investors. There are three reasons why behavioral finance is essential and exciting to be applied at the Indonesia Stock Exchange. First, behavioral finance is still accepted as a feasible model to explain the behavior of investors in the capital market in making investment decisions, and subsequently, this decision affects the capital market [12]. Second, behavioral finance studies are well known in developed markets such as Europe and America [12], including emerging markets and frontier markets [13, 14]. However, the number of studies that use behavioral finance for frontier and emerging markets, such as Indonesia, is far less than developed markets. Third, behavioral finance studies that discuss investor behavior in choosing stocks in pandemic conditions are still limited. Based on these three reasons, the specific purpose of this study was to obtain behavioral factors that individual investors consider in making stock investment choices in companies listed at the Indonesia Stock Exchange during the COVID-19 pandemic.

2. Literature Review

2.1. Behavioral Finance vs. Traditional Finance

In an ideal perspective, the stock price is worth 'fundamental value', so investment decisions become rational. 'Fundamental value' reflects the sum of the discounted value of the expected future cash flows [15], where an investor is assumed to be able to process

all relevant and accurate information, including discount rates consistent with the specification of preferences received by investors [16]. The Efficient Markets Hypothesis (EMH) supports the opinion that the actual price reflects the 'fundamental value', wherein in an efficient market, all market participants receive the same information so that no investor will get an abnormal return regardless of the investment strategy applied [15]. In contrast to EMH's assumptions, behavioral finance believes that at one time, the capital market does not have informational efficiency [17], and the capital market overreacts to information [18].

Because humans are not always rational, financial decisions can also be driven by behavioral preconceptions. Thus, the study of behavioral finance has an important role in finance, where cognitive psychology aims to understand human behavior, including investor behavior. Several behavioral biases influence individual investors. Many researchers [19] and [20] tested this behavioral bias, which provides empirical events other than asset valuation. In addition, several empirical studies show that individuals use the element of ratio in making decisions and involves emotional and behavioral elements [16]. This is to say that behavioral finance considers financial phenomena that can be explained using a model with several agents that are not entirely rational [21, 22]. Conventional financial theory pays less attention to how people make decisions and different investment decisions [23].

2.2. Investor Behavior

There is still very limited research on investment behavior in Indonesia. Other fields are needed to facilitate understanding to define investor behavior. Analyzing events in the capital market is divided into two perspectives, namely rational and irrational. Rational investors prefer mathematical or statistical calculations before making risky investment decisions. Investors who are not rational deposit investment capital based only on instinct go along with it, are not accustomed to analyzing the details of the situation and conditions of the sector, and even believe in the mystical aspects of the investment being offered [9–11]. If decisions are made solely on irrational considerations, then the benefits or losses obtained are also irrational.

2.3. Behavioral Factors

According to [19], behavioral finance is based on psychological aspects, where the human decision-making process is aimed at several cognitive illusions, which are divided into two groups: illusions that cause heuristic decision processes [14] and illusions that are rooted in the adoption of mental frames are grouped in prospect theory [24]. Meanwhile, external environmental factors consist of two categories, namely herding and market factors.

2.3.1. Heuristic Theory

Heuristics are defined as the main rule that makes decision-making easier, especially in complex and uncertain environments, and how to reduce this complexity using probability and to predict value using simple assessment methods [14]. Heuristics is useful when time is limited but sometimes creates bias [17]. In this study, the heuristics factor consists of five components: gambler's fallacy, overconfidence, availability bias, anchoring, and representativeness to measure their influence on the decision-making by individual investors.

2.3.2. Prospect Theory

Prospect theory focuses on the effect of subjective decision-making by the value system of investors, where the expected utility theory (EUT) is concentrated on investors' rational expectations [25]. EUT is a normative model of rational choice and a descriptive model of economic behavior that dominates the analysis of decision-making under risk. Those interested in insurance and gambling have criticized this theory. People tend to weigh less than the likelihood of outcomes compared to losses. This study used three elements from the prospect theory dimension, namely: loss aversion [25], regret aversion [20], and mental accounting [24], to measure their effect on individual investor investment decision making.

2.3.3. Market Factors

If the behavioral finance perspective is correct, it is believed that investors could have over or under-reacted to price changes or news; extrapolation of past to future trends; gaps in attention to the fundamentals of the underlying stock; focus on popular stocks and seasonal price cycles. In this study, the factors used to identify markets that can influence investors in making decisions are price changes, market information, past trends of stocks, customer preference, over-reaction to price changes, and fundamentals of underlying stocks. In line with [14], this study treated market factors fairly as behavioral factors influencing individual investors' decisions on the stock market.

2.3.4. Herding Effect

Herding effects in financial markets are identified as the tendency of investor behavior to follow the actions of other investors [26]. Buying and selling decisions are significantly influenced by other decisions and herding behavior, which can help investors make decisions [20]. This study explored the effect of herding on stock investment decisions to obtain information about the factors that influence these decisions.

2.4. Stock Trading Decisions

In principle, there are two critical things in stock trading: selling and buying because these two decisions have connectivity with a series of other decisions. Previous research has shown that naturally, investors sell fewer than purchase because investors can choose potential stocks [14]. It is difficult to demonstrate this phenomenon in a rational nature. The outbreak is considered a negative signal that has led to a decline in stock markets worldwide, and the stock market has become increasingly inefficient. One of the decisions to sell shares is to get capital gains. Pressure to sell stocks the first time around can slowly reduce the share price. Henceforth it will create a higher return.

Conversely, shareholders will decide to sell if shareholders experiment for capital losses when the expected price has been reached at a certain number. In this condition, the price will increase, preceding lower returns for a later date. The decision to buy is the behavior of investors interested in buying several shares [27]. Usually, investors buy attractive stocks, and the most significant source of attention is to look at past performance, whether good or bad. In the viewpoint of behavioral finance, investor behavior affects selling decisions and buying decisions at different levels.

Furthermore, it has an impact on general returns from the Market as well as individual investment performance. In pandemic conditions, worries about falling share prices have led some investors to sell their shares. However, several other investors, namely investors who dare to take risks (risk takers), consider this situation an opportunity to buy shares. The assumption used is that a pandemic is a temporary condition so that when it ends, the stock price increases.

3. Research Methods

This research was a descriptive study because it aimed to understand the behavioral factors that individual investors consider when making investment choices in stocks listed at the Indonesia Stock Exchange during the Covid-19 pandemic. Based on the approach, this research was quantitative / positivism research.

3.1. Variables and Operational Definitions

3.1.1. Heuristic

Heuristics are defined as the main rule that becomes the basis for individual investors' easier decision-making on stocks listed on the Indonesia Stock Exchange during the COVID-19 pandemic. The following statements are statements about the heuristics component:

Representative is measured by:

1. Buying hot stocks and avoid bad performing stocks in the past.
2. Using trend analysis from several representative stocks to make own stock investment decisions.

Overconfidence is measured by:

1. Believing that own stock market skills and knowledge can help outperform the market.

Anchoring measured by:

1. Relying on previous experience in the Market for future investments;
2. Predicting future stock price changes based on current stock prices.

Gambler's fallacy is measured by:

1. Anticipating good or bad market returns on the Indonesia Stock Exchange shares.

Ability bias is measured by:

1. Preferring to buy local stocks over international stocks because information on local stocks is more readily available;
2. Considering information from close friends and relatives as a reliable reference for investment decisions.

3.1.2. Prospect

Prospect theory focuses on the effect of subjective decision-making by the value system of individual investors in stocks listed on the Indonesia Stock Exchange during the COVID-19 pandemic. This study used three elements, namely: Loss aversion, Regret aversion, and mental accounting.

Loss aversion is measured by:

1. After a prior gain, looking for risk than usual;
2. After a prior loss, accepting of the risk.

Regret aversion is measured by:

1. Avoiding selling stocks that are depreciating in value and immediately selling stocks that are increasing in value;
2. Feeling more regretful about holding onto losing stocks longer than selling winning stocks earlier.

Mental accounting is measured by:

1. Tending to treat each element of investment separately;
2. Ignoring the relationship between different investment possibilities.

3.1.3. Market

Market measurements include:

1. Considering the change in the price of the stocks want to invest in;
2. Overreacting to changes in stock prices;
3. Important market information for own stock investment;
4. Paying attention to past trends in stocks under-investment judgment;
5. Analyzing the preferences of the company's customers before investing in company stocks;
6. Studying the market fundamentals that underlie stocks before making investment decisions.

3.1.4. Herding

Herding effects on financial markets are identified as the tendency of individual investor behavior to follow or imitate the actions of other investors on shares on the Indonesia Stock Exchange during the COVID-19 pandemic. Four components, namely measure herding:

1. The decision to choose another investor's stock type has an impact on own investment decision;
2. Other investors' share volume decisions have an impact on their decisions;
3. The decision to buy and sell shares of other investors has an impact on own decision;
4. Reacting quickly to changes in other investors 'decisions and follow other investors' reactions.

The target population was individual investors who made investment decisions in shares at the Indonesia Stock Exchange during the COVID-19 pandemic. The sampling technique in this study was non-probability sampling because the population under study could not be identified. The sampling methods used were convenience sampling and snowball sampling. The sample in this study was selected as many as 210 individual stock investors listed at the Indonesia Stock Exchange during the COVID-19 pandemic.

4. Result and Discussion

4.1. Respondent Profile

The questionnaire was distributed to 210 respondents as individual stock investors listed at the Indonesia Stock Exchange in February 2021. Two hundred ten questionnaires obtained met the characteristics of respondents in February 2021. The data were then processed with factor analysis using SPSS 18.0 software. The target characteristics were respondents as individual investors who owned shares listed at the Indonesia Stock Exchange. All respondents had matched the characteristics, namely individual investors who were shareholders listed at the Indonesia Stock Exchange. The results of the data processing of respondents are presented in Table 1.

Table 1 Distribution results of respondent (Authors' calculations based on primary data)

Category	Selection	Freq.	%
Gender	Men	130	62%
	Woman	80	38%
Age	18-25	74	35%
	26-35	65	31%
	36-45	27	13%
	46-55	13	6%
	Over 55	32	15%
Status	Not yet married	120	57%
	Married	84	40%
	Divorce	6	3%
Education	SMA / SMK	32	15%
	DIPLOMA	13	6%
	Bachelor degree	99	47%
	Master (S2)	55	26%
	Ph.D. degree (S3)	13	6%
Profession	Government employees	34	16%
	Private employees	50	24%
	Entrepreneur	50	24%
	Professional	27	13%
	Others	48	23%
Length of work	Under 5 years	124	59%
	1-10 years	36	17%
	More than 10 years	50	24%
Income per month	Below 1 million	21	10%
	1-3 million	38	18%
	4-8 million	71	34%
	Above 8 million	80	38%
Duration of stock investment	Less than 1 year	67	32%
	1-2 years	63	30%
	3-4 years	23	11%
	5-10 years	25	12%
	More than 10 years	32	15%
Have Attended Training	Yes	116	55%
	Never	95	45%
Total money invested	Below 2 million	50	24%
	2-4 million	21	10%
	5-10 million	36	17%
	10-20 million	27	13%
	21-30 million	11	5%
	More than 30 million	65	31%
The total amount of money invested in 2020	Below 2 million	48	23%
	2-4 million	21	10%
	5-10 million	38	18%
	10-20 million	17	8%
	21-30 million	13	6%
	More than 30 million	74	35%

Based on gender, if it is related to investor behavior, men invested more than women did in countries characterized by emerging market capital markets. Based on the age distribution of the respondents, it can be seen that the most dominant respondents were in the age range 18-25 years because the risk tolerance for respondents aged less than 35 was higher than those of respondents aged over 35. The education level of bachelor's degree shows that understanding the world of investment in Indonesia was mostly received during college years so that it is mature to invest in groups at bachelor degree level of education. This is also a positive thing because investors have sufficient knowledge in investing.

The lowest income of respondents was below 1 million rupiahs with the smallest percentage at 10% and the total money invested 24% below 2 million. There is the fact that Indonesian people still tend to be consumptive, so that the funds for investment still do not show the appropriate amount.

Some argue that the income they receive each month must be used first for daily needs, which sometimes tend to be consumptive, after which the remaining funds are used for secondary purposes, namely as savings, emergency, or investment funds. Someone's awareness that it is better to set aside for savings, emergency, or investment funds before the income is used for consumptive needs is still relatively rare or very low. The distribution of total investment in

2020 and 2021 was more than 30 million, increasing in 2021.

4.2. Descriptive Analysis

The research questionnaire consisted of two parts. The first part was identifying the respondent to show the respondent's profile and the second part was the statements related to the behavior factors of stock investors. Individual stock investor behavior factors were grouped into four parts: heuristic, prospect, Market, and herding.

Validity is used to measure the accuracy and accuracy of a measuring instrument in performing its measuring function. A test is said to have high validity if the tool performs its measuring function or provides results following the intent or purpose of the measurement in question. A valid measuring instrument has a slight error variance. In comparison, the reliability test measures the extent to which the results of a measurement can be trusted.

The measurement results can be trusted only if, several times, the implementation of measurements on the same subject, the results are relatively the same, as long as the aspects measured in the subject have not changed. By taking data from 210 respondents (n = 210) to test the reliability and validity. Table 2 presents the mean and standard deviation values.

Table 2 Descriptive variable (Authors' calculations based on primary data)

Variable	Indicator	Min	Max.	Mean	Std. Deviation
Heuristics	Representativeness 1	1	6	4.820	1.163
	Representativeness 2	1	6	4.950	1.081
	Overconfidence	1	6	4.780	0.983
	Anchoring 1	2	6	4.960	0.896
	Anchoring 2	1	6	4.720	1.094
	Gamblers fallacy	1	6	4.200	1.240
	Ability bias 1	1	6	4.960	1.121
	Ability bias 2	1	6	4.420	1.235
Prospect Theory	Loss aversion 1	1	6	4.540	1.202
	Loss aversion 2	1	6	3.730	1.463
	Regret aversion 1	1	6	4.670	1.226
	Regret aversion 2	1	6	4.440	1.365
	Mental accounting 1	1	6	4.420	1.232
	Mental accounting 2	1	6	3.760	1.339
Market	Price changes	1	6	4.860	0.973
	Market information	1	6	3.580	1.460
	Past trend	2	6	5.200	0.810
	Fundamentals	2	6	4.900	0.830
	Customer preference	1	6	4.500	0.999
	Overreaction	1	6	4.700	1.116
Herding	Herding 1	1	6	4.350	1.066
	Herding 2	1	6	4.250	1.228
	Herding 3	1	6	4.300	1.195
	Herding 4	1	6	4.030	1.371

Note: bold = highest value, italicized = lowest value

Heuristics are defined as the main rule that makes decision-making easier, especially in a complex and uncertain environment, namely investing in stocks listed on the Indonesian Stock Exchange. Based on Table 2, the heuristics variable gets the highest average value of 4.96 in the two statements of Anchoring1 and Ability bias1. At the same time, the lowest average value is 4.20 in the Gamblers fallacy statement.

The value of standard deviation or deviation from the mean value that is greatest, namely 1.240. is found in the Gamblers fallacy statement. While the lowest deviation value, namely 0.896. is in the Anchoring1 statement. Based on the descriptive statistics of Heuristic Factors, the highest average is paired with the lowest standard deviation. The opposite applies to the lowest average with the highest standard deviation. Overall, all of the Heuristic Factors dimensions have a total average value above four with quite a variety of answers.

Prospect theory focuses on subjective decision-making by the value system of stock investors listed at the Indonesia Stock Exchange. This study used three elements from the prospect dimension, namely: loss aversion, regret aversion, and mental accounting, which were used to measure the level of influence on investment decision making as well as the investment performance of individual investors in stocks listed at the Indonesia Stock Exchange.

The highest average value was 4.670 on regret aversion1 with the highest standard deviation of 1.463 on the loss aversion2 statement. The loss Aversion2 statement had the lowest average value of 3.73 and the lowest standard deviation of 1.202 in the loss aversion1 statement. The results of descriptive statistical analysis of Prospect Factors showed the opposite. Namely, the highest average was paired with the lowest standard deviation. The opposite applies to the lowest average with the highest standard deviation. However, if investigated further, it can be concluded that descriptive statistical analysis on Heuristic Factors and Prospect Factors has the same pattern, namely, the trade-off theory applies. The different pattern of pairs on Prospects Factors was due to using statements that

used words with negative or opposite meanings, namely in a statement using the word “separately.”

Meanwhile, statement 5 used the word “you ignore.” Therefore, if the words are made positive in meaning, the result of the pairing will be the same as the Heuristic Factors. The results of Market and herding are the same as prospect theory, which has the opposite, namely the highest pairs with the lowest.

In this research, the reliability testing technique was carried out using confirmatory factor analysis. Confirmatory factor analysis aims to identify any relationship between variables by conducting a correlation test and testing the instrument's validity and reliability.

By testing the validity and reliability of instruments or questionnaires, valid and reliable research data would be obtained with confirmatory factor analysis. After testing with SPSS 18 for windows, the results can be seen in the following table. After processing the data for the validity and reliability of the questionnaire, some invalid indicators were eliminated or discarded. All dimensions were valid so that they could be used in this study.

4.3. Factor Analysis

One of the goals of factor analysis is to reduce the number of variables similar to grouping variables. Exploratory factor analyses used in this study, where the researcher made a set of behavioral factors, were operationalizing theories and indicators regarding behavioral factors. Researchers wanted to identify some factors that existed in a set of behavioral factors. The results of the factor analysis were indicated by KMO and Bartlett's Test and Analysis variable extraction.

Table 3 KMO and Bartlett's test (Authors’ calculations based on primary data)

Kaiser-Meyer-Olkin Measure of Sampling Adequacy		0.746
Bartlett's Test of Sphericity	**Approx. Chi-Square**	1.801.442
	df	276
	Sig.	0.000

Table 3 shows the Keizer-Meyer-Olkin Measure of Sampling Adequacy number of 0.746. greater than 0.5 and sig. 0.00, meaning that the set of variables can be processed further. Table 4 shows that all variables or dimensions were extracted into eight factors only: the variance of the first factor was 21.895%, the second was 12.293%, the third was 7.940%, the fourth was 6.194%, the fifth was 5.307%, the sixth was 4.769%, the seventh was 4.696%, and the eight was 4.396%. The eight new factors can explain 67.491% of the variability of the 24 factors. The eigenvalues were still above one in the fifth extraction.

Table 4 Total variance explained above 60% (Authors’ calculations based on primary data)

Comp.	**Initial Eigenvalues**			**Extraction Sums of Squared Loadings**		
	Total	**% of Var**	**Cum %**	**Total**	**% of Var**	**Cum %**
1	5.255	21.895	21.895	5.255	21.895	21.895
2	2.950	12.293	34.189	2.950	12.293	34.189
3	1.906	7.940	42.128	1.906	7.940	42.128
4	1.487	6.194	48.322	1.487	6.194	48.322
5	1.274	5.307	53.629	1.274	5.307	53.629
6	1.145	4.769	58.399	1.145	4.769	58.399
7	1.127	4.696	63.095	1.127	4.696	63.095
8	1.055	4.396	67.491	1.055	4.396	67.491

The figures in Table 5 are the loading factor or the magnitude of the correlation between a variable with factors 1, 2, and 3 so that these variables can be included in one of the factors that have the strongest relationship. Because several variables do not have significant differences with other factors, `namely with a loading value or a correlation value of less than 0.5, these variables cannot be included in one of the variables by looking at the correlation size. This was because it was necessary to do a factor rotation to clarify the position of these variables.

Table 5 Component matrix (Authors’ calculations based on primary data)

Var.	**Component**							
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**
1	0.55							0.50
2	0.50		-0.43					
3		0.53					-0.41	
4		0.60						
5			0.45		-0.40			
6		0.40						
7				0.41	0.46			
8	0.50							
9				0.47				
10		-0.40				0.43		
11			-0.47	0.48				
12	0.48				-0.47			
13		0.45						
14	0.53							
15	0.53							0.44
16	0.51	-0.44	0.42					
17		0.50					0.42	
18	0.45	0.48						
19	0.46							
20		0.49				0.421		
21	0.74							
22	0.72							
23	0.77							
24	0.60		0.54					

Table 6 shows the change in the composition of the variance contribution of each factor which is the result of factor rotation with the variance of the first factor was 11.884%, the second was 11.621%, the third was 9.154%, the fourth was 8.616%, the fifth was 7.266%, the sixth was 7.196%, the seventh was 6.148%, and the eight was 5.606%.

Table 6 Rotation sums of square loading (Authors’ calculations based on primary data)

Factor	**Total**	**% of Variance**	**Cumulative %**
1	2.852	11.884	11.884
2	2.789	11.621	23.505
3	2.197	9.154	32.659
4	2.068	8.616	41.275
5	1.744	7.266	48.541
6	1.727	7.196	55.737
7	1.475	6.148	61.885

8	1.345	5.606	67.491

4.4. Factor Equation

The figures in Table 7 Rotated Component Matrix are the loading factor values or values that indicate the magnitude of the correlation between a variable and the factors formed after the variables have been rotated to be entered into one of the strongest factors correlation.

The Component Matrix resulting from the rotation process (Rotated Component Matrix) showed a clearer and more realistic distribution of the variables than if the rotation was not done. Table 8 Component score coefficient matrix shows the amount of beta or coefficients used in the function. Each beta was obtained from the greatest value of its score coefficient.

Table 7 Rotated component matrix (Authors' calculations based on primary data)

	Component							
Var.	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**
1						0.726		
2				0.598		0.475		
3					0.749			
4			0.596					
5								
6					0.730			
7								-0.776
8	0.708							
9				0.573	0.458			
10	0.622							
11				0.747				
12				0.424				0.431
13			0.407	0.426				
14								0.413
15						0.700		
16	0.763							
17			0.729					
18			0.810					
19							0.696	
20							0.705	
21		0.792						
22		0.791						
23		0.772						
24	0.709							

Based on Table 8, the equation for the five factors is as follows:

Factor 1 (avoidance) = 0.297 Ability bias 2 + 0.290 Market information + 0.250 Herding 4

Factor 2 (following) = 0.311 Herding 1 + 0.323 Herding 2 + 0.290 Herding 3

Factor 3 (experience) = 0.254 Anchoring 1 + 0.423 Past trend + 0.449 Fundamentals

Factor 4 (learning orientation) = 0.277 Representativeness 2 + 0.098 Ability bias 1 + 0.300 Loss aversion 1 + 0.412 Regret aversion 1 + 0.187 Mental accounting 1

Factor 5 (locus of control) = 0.491 Overconfidence + 0.456 Gamblers fallacy

Factor 6 (beliefs revision) = 0.509 Representativeness 1 + 0.468 Price changes

Factor 7 (careful) = 0.287 Loss aversion 2 + 0.514 Customer preference + 0.495 Overreaction

Factor 8 (don't want to lose) = 0.240 Anchoring 2 + 0.328 Regret aversion 2 + 0.302 Mental accounting 2

Table 8 Component score coefficient matrix (Authors' calculations based on primary data)

	Component							
Var.	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**
1						0.509		
2				0.277				
3					0.491			
4			0.254					
5								0.240
6					0.456			
7				0.098				
8	0.297							
9				0.300				
10							0.287	
11				0.412				
12								0.328
13				0.187				
14								0.302
15						0.468		
16	0.290							
17			0.423					
18			0.449					
19							0.514	
20							0.495	
21		0.311						
22		0.323						
23		0.290						
24	0.250							

4.5. Factors of Stock Investor Behavior

Result on the process of the factors that individual investors have taken in making investment decisions in stocks listed at the Indonesia Stock Exchange, where the results of factor analysis have been reduced to eight factors as follows: avoidance, following, experience, learning orientation, locus of control, beliefs revision, careful, do not want to lose. The first factor is avoidance. Regret forms many aspects of the decision-making process, from avoidance of decisions to transfer of responsibility for decisions to framing alternative decisions and motivating the search for information about alternatives decisions and motivating choice switching. However, complex emotions seem to have paradoxical consequences. It can help guide thoughts and behavior but can also lead to decision-making. In that case, there are various ways to avoid investing illegally to not repeat the same mistakes in investing, namely: Seeking information about the investment products offered. Before starting investing, an investor must find various information about these investment products, such as the law's legality, the company's history, the development of investment products from years to the year, and an intelligent investor before starting an investment activity.

The second factor is the follow-up factor: herding 1, herding 2, and herding 3. It contains one dimension, namely herding. This factor's analysis shows that the follow-up factor is very dominant, and the dimensions used to measure the herding variable are almost all accepted, namely herding 1, 2, and 3. This is in line with what happened in practice. Among others, fund managers or financial analysts carry out subjective evaluations by making comparisons to their peers. In this condition, herding can contribute to the evaluation of professional performance because professional low-ability mimics the high-ability behavior of peers in

building a professional reputation. This finding contrasts with rational and informed investors who will ignore the flow of the masses, making the Market efficient, herding reverses, causing inefficient market conditions. The more confident investors are, the more dependent on private information for investment decisions to engage in herding behavior. When investors put a certain amount of capital into an investment, the individual investor tends to follow the actions of other investors to reduce risk.

The third factor is experience. It shows that experience on the historical performance of stocks becomes the basis for making investment decisions from individual investors in the future. Overreaction causes investors to get returns above-average [27]. These market factors influence investors to make decisions on the stock market. Changes in market information, the basis for the underlying stock, and stock prices may change. This change empirically proves that there is a strong influence on the behavior of investors in making decisions. These investors depend on the quality of information about the Market or stocks held when making investment decisions. Past stock trends are explored to influence the behavior of individual investors in making investment decisions through trend analysis of past stocks using technical analysis methods before determining investment. [27] conducted research supporting this dimension, who stated that investors generalize past and exaggerated stock performance in the stock market. In addition, investors will be more interested in stocks that have observed an increasing pattern in the past. Evidence suggests that financial analysts are slow to revise corporate valuations, even though strong indications prove these assessments are incorrect. Typical overconfidence is an investor who can select or sell stocks. These investors use information that is more personal and rely less on diversification.

The fourth factor is the learning orientation factor, consisting of Representativeness 2, Ability bias 1, Loss aversion 1, Regret aversion 1, and mental accounting 1. Research conducted by [19] shows that mental accounting allows investors to manage portfolios into separate account accounts. Mental accounting is needed in terms of investment security. Respondents will feel safe in investing when considering the cost and benefit factors in the instruments investment selected. Respondents who already know the costs and benefits will find it easier to determine which investment to choose.

The fifth factor is the locus of control when someone believes that the desired result occurs by its ability. Conversely, it is called a locus of external control if one thinks the positive result is due to external factors, such as luck, chance, fate, and other strong people. However, an investor generally has a strong soul on investment decision making, which is why they may not behave rationally, so emotion and soul are the main factors that cause bias in investment decision making. Investors will be highly motivated towards certain decisions if they think that the situation is in their control. Locus of control is a behavioral factor important and included in influencing investment decisions and consumer purchasing decisions.

The sixth factor is belief revision points out that those beliefs define retrieval behavior decisions in taking action because of interpretation of information. Through the center understanding of information processing from cognitive like memory, attention, perception, thought, knowledge and consideration occur mental discounting process for investors to estimate the return from securities of his interest. Every investor gives different results due to different knowledge and beliefs. Information accounting contains information if it helps investors to make confidence revisions for initial stock in the retrieval process decisions buying or selling shares. Newly published information the company is concerned about will help change the original belief regarding the earning expectations he wants. Changes in belief are proxied by changes in price and trading volume stock.

The seventh factor is very careful. The momentum of investors prefers stocks that are performing well now while rational investors tend to sell loss stocks, which can help investors postpone taxes. When the investor is in a situation that requires choosing the type of investment and the value of the investment, the following reactions become more dominant due to psychological factors and subjectivity compared to other factors.

The eighth factor is the non-loss factor. Respondents feel safe when investing their funds in companies or investment instruments that are performing well. Companies or investment instruments that have a good performance will certainly have a greater opportunity to provide benefits. Based on the research by [20], availability bias when investors have excessive availability of information, then in the area of stock trading, this bias manifests itself through the preference of investing in local companies where investors are accustomed to obtaining information easily.

An individual investor will consider the eight behavioral factors above in making decisions (selling or buying) stock investments in companies listed at the Indonesia Stock Exchange during the Covid-19 pandemic. In selling decisions, the outbreak is considered a negative signal that has led to a decline in stock exchanges worldwide and increasingly inefficient stock markets. The contagious disease epidemic has caused some investors to decide to sell stocks at low prices because they feel pessimistic about their investments. One of the decisions to sell these shares is to get capital gains. Selling pressure can first slowly reduce the stock price and then create a higher return.

Conversely, if shareholders experiment for capital losses, shareholders will decide to sell when the expected price has been reached at a certain number. In this condition, the price will increase, preceding lower returns for a later date. During SARS and the Covid-19 pandemic, investors experienced such panic that they unwisely sold assets for very low prices.

In a pandemic condition, the falling share prices have led some investors to sell their shares. However, several other investors, namely investors who dare to take risks (risk takers), consider this an opportunity to buy shares. The assumption used is that a pandemic is a temporary condition so that when the stock ends, the price increases. During the worst months of the crisis, risk tolerance and return expectations decreased while risk perceptions increased. Towards the end of the crisis, investor perceptions were recovering. This research found that overall, individual stock investors continued to trade actively and did not reduce the risk of their investment portfolios during the crisis. In addition, it was found that the characteristics of respondents who have income in the middle high-income category do not change their financial decisions regarding ownership of risky assets.

5. Conclusion

Based on the research and discussion that has been carried out, it is concluded that an individual investor considers eight factors in making stock investment decisions during pandemic conditions. Namely, avoidance, following, experience, learning orientation, locus of control, beliefs revision, careful, do not want to lose. The first factor is avoidance. Regret forms many aspects of the decision-making process, from avoidance of decisions to transfer of responsibility for decisions to framing alternative decisions and motivating the search for information about alternatives decisions and motivating choice switching. The second factor is the follow-up factor: herding 1, herding 2, and herding 3. It contains one dimension, namely herding. The third factor is experience. It shows that experience on the historical performance of stocks becomes the basis for making investment decisions from individual investors in the future.

The fourth factor is the learning orientation factor, which consists of Representativeness 2, Ability bias 1, Loss aversion 1, Regret aversion 1, and mental accounting 1. The fifth factor is the locus of control when someone believes that the desired result occurs by its ability. The sixth factor is belief revision. It points out that beliefs define retrieval behavior decisions in taking action because of the interpretation of information. The seventh factor is very careful. The momentum investor prefers stocks that are performing well now, while rational investors tend to sell loss stocks, which can help investors postpone taxes. The eighth factor is the non-loss factor. Respondents feel safe when investing their funds in companies or investment instruments that are performing well.

The novelty in this research lies in the results. The results of this study can prove that non-financial factors, namely pandemic conditions, change the level of risk tolerance in stock decisions. Thus, this research has a practical novelty by making investor behavior a determining factor for stock transactions.

The practical limitation of this research lies in behavioral factors that ignore the condition of state financial factors that have not been exposed in depth so that the behavior of investors in this study ignores these factors. In the future, investor behavior can be linked to state financial factors.

Several recommendations are proposed. Namely, individual investors who wish to invest at the Indonesia Stock Exchange can consider these eight factors, each with its advantages and disadvantages. The limitation of this study is that it cannot explain the magnitude of the influence of each of these factors on investment decisions so that the effect of these factors on performance cannot be measured by the investment of stock investors in Indonesia Stock Exchange.

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