The Bigger is the Better: Investor Heuristics Bias during Covid-19 Pandemic in Indonesia Stock Exchange

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ABSTRACT: This paper aims to study investor's decision making behaviour during Covid-19 Pandemic. It focuses on investor's decision to stay on invest on stock during pandemic rather than withdraw off. It explains the factors related to the decision. By using representativeness heuristics theory, this study tries to show two factors (size and age) which believed to be the stereotypes that investors use as their simple judgment on their decision. The study aims to expand the domain of decision behaviour study during pandemic by including positive framework of decision, than normally found in the study during pandemic.

The results showed that investors were still think positive about the prospect of investing in stock during pandemic. As the correlation between size and trading days is significant, the result showed that investors decided which stock is prospective, based on the size of the company. The bigger the company, the more investors were willing to invest. But, ages of the company was not the stereotype for the investor to choose their stock.

KEYWORDS: Investor Behaviour, Corona Pandemic, Representativeness Heuristics, Decision Making Behaviour

I. INTRODUCTION

Decision-making behaviour has long been a topic that attracts many researchers to study it. This includes investment decision-making behaviour in emerging market [1] [2][3] [4] [5]. Research on investment decision-making behaviour is considered important because security exchange performance influence the progress of the economy. Thus, investor's choices on securities exchanges play a vital role in deciding market development, which then affect the economy [6].

Decision-making behaviour that has been highlighted by many researchers is decision-making under high uncertainty condition. Tversky and Kahneman[7] [8] are phenomenal in their study on this behaviour. Considering the existence of a pandemic condition since 2020, the theme of research with the topic of decision making in high uncertainty is becoming increasingly relevant. As already known, the pandemic condition is a different condition from crises that have occurred in the world before and has a high degree of uncertainty. Study on investor decision-making behaviour during a pandemic will be the crucial part of the process of understanding and explaining investor behaviour during a pandemic.

Many studies have concluded that there were bias behaviour on investor's decision making during pandemic [9] [10] [11] [12] [13] [4] [5]. But unfortunately, the study of behaviour during the pandemic in relation to investment decision making is dominated by studies of how the pandemic effects on investors' reactions in a negative light. Their emphasis are more on explaining how fear dominates investor decisions during the pandemic (for example: [14] [15] [12].

There has been no research with positive side of the pandemic which studied the behaviour of investors who were staying on investing during the pandemic. Actually the positive side of the investor's behaviour during pandemic is very important because the results of the study is beneficial in understanding and explaining investors' decisions to stay on investing during pandemic. For investors, the results are very important in understanding their own behaviour during pandemic. For stock exchange regulators, the study give them information about factors that correlating with the investor's decision to continue investing during a pandemic. For Indonesian government, the results are crucial to support good atmosphere for capital market development during pandemic.
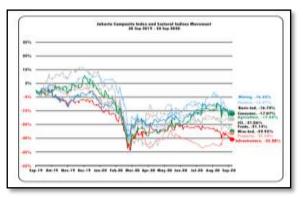
The study focused on investor reaction in Indonesian Stock Exchange during two first months in pandemic period in Indonesia. Same as in all country in the world, Indonesian Stock Exchange

also was great affected by pandemic virus in early 2020. During March, it has a deep fall of stock price, as shown in graph 1 below [16]. But, interestingly, there was an increasing price phenomena after downfall trend on March 2020. This phenomena showed investor's optimistic behaviour during early stage of pandemic. [13] and[17] investigated that investor could still benefit from investing in stocks in Indonesian Stock Exchange during pandemic. The behaviour is interesting to be studied because it arouse in its early of pandemic, when uncertainty is relatively still higher than later period of pandemic. Further, investor reaction during pandemic is varies in each country because it is influenced by the degree of independence in that country [18]. [19] showed that the effect of a pandemic in emerging markets is greater than that in developing capital markets. [12]claimed that their results are generalizable to other emerging stock markets such as India, Indonesia, Korea and Malaysia. This study tried to confirm their claim that heuristic bias on Pakistan's investor behaviour could be found in Indonesian's.

Representativeness Heuristics of Tversky and Kahnemen (1974) [20] is the theoretical bases to study investors' behaviour during pandemic. Many researches showed that representativeness heuristics bias has occurred in high uncertainty condition, such as on pandemic. Representativeness Heuristics bias is the human tendency to make judgments based on the level of similarity of a stimulus or event with other stimuli, events or categories related to the stimuli being compared. This study hypothesized there are two stimuli used by investors, company size and company age.

Different from previous studies which used classroom experimental methods to examine the effect of heuristic behaviour on investor decision making ([4], [21], [22], [23]), this study used the documentation method, with stock prices as the proxy of investor behaviour. Secondary data-based research that uses psychological theory to interpret the results of their research is still very rare [24]. In fact, testing psychological theory with secondary data is completing existing primary data-based research.   The test provides evidence of whether psychological theory-based predictions hold true under real market conditions.

Graph 1
Jakarta Composite Index and Sectoral Indexes Measurement
(Source: BEI, 2021)

II. REPRESENTATIVENESS HEURISTICS IN INVESTMENT DECISION MAKING

The study of heuristic behaviour in decision making stems from one of the studies in the financial sector, the study of financial behaviour, which developed due to dissatisfaction with the assumptions developed in traditional finance studies or also called standard financial studies [25] [26]. The conventional financial behavioural study that is criticized by the Prospect Theory is the Expected Utility Theory [8]. Utility theory assumes that decision makers have a rational nature, the ability to access and process information fully and have preferences in accordance with what is conveyed in utility theory [25].

Disagreement on the assumptions built by traditional financial studies, behavioural finance studies hold a very different assumption. The assumption used in the study of behavioural finance is that humans are not creatures who always act rationally, have limited ability to process information, and have preferences that are not in

line with utility theory. These assumptions lead to the study of financial behaviour, using many theories in psychology and sociology. [26]stated that behavioural financial studies are interdisciplinary studies between the fields of psychology, sociology and finance.

Research conducted by Herbert Simon in the 1950s showed that human decision-making is fraught with cognitive limitations, although he is encouraged to make rational decisions [27]. These cognitive limitations are caused by humans naturally having limited time, limited information and human ability to process information, to be able to analyse the benefits and costs of each option from all available options. There are many types of biased behaviour. [28] show 7 types of bias that commonly occur, namely Representativeness, Regret (loss aversion), Disposition Effect, Familiarity bias, Worry, Anchoring and Self-attribution bias. All of these biases stem from the human tendency to use some of the ability and information to produce a decision

Heuristic behaviour [20], in the first studied, introduced 3 heuristic behaviours, i.e. representativeness, availability, and anchoring-adjustment heuristics. The representativeness heuristic is a form of bias by giving more weight to an option that is considered to have a relationship with something that is considered to have the characteristics we want. So, the location of the representativeness heuristics bias is in the association between something and something else that is our choice based on the degree of similarity between these things. In other words, the more similar/same, the greater the probability of one is being a representation of the other.

Availability heuristics bias is a bias in determining the degree of probability of something happening based on the ease of getting data in our minds. This bias is closely related to the frequency of occurrence. The more frequency data enters our mind, the easier it is to retrieve it in our mind. Meanwhile, Adjustment and Anchoring Bias are biased because the estimation of something is based on a certain initial value, and then adjusted to get the final estimation decision. This adjustment process causes a bias from the initial determination value.

Decision making is basically the selection of the options that a person has. It is in the process of weighting these options that the representativeness heuristics bias behaviour emerges. An option is given different weights because the option is considered to be related to something else, namely in terms of the similarity or resemblance of an option to something else. If A is considered to have a lot in common with B, then A

is considered a representation of B. The more similar/equal, the greater the probability of one being is a representation of the other. And vice versa, if there are more differences, A does not come from B[20].

In the context of investment decision making, [28]exemplify the behaviour of investors who are labelling good investments depending on their recent performance. This explains the behaviour of investors who tend to buy stocks that have increased in price, even though the shares are below their intrinsic value. This trend is motivated by the expectation that the behaviour of the stock price increase in the past will continue into the future, or investors perceive that the stock price will continue to rise, as a representation of the performance of the stock in the past.

Heuristic behaviour in investment decision making has been widely studied, for example [4], [1], [21], [22], [23] and [12]. All of them show a signifiant negative relationship between the behaviour of heuristics and decision making by investors. In conditions of high uncertainty, such as during a pandemic, it is strongly suspected that investors will engage in representativeness heuristics in making investment decisions..

III. RESEARCH METHOD

The data used is daily stock price data downloaded from the IDX website, the first month period of the pandemic is the period March- April 2020. The use of secondary data in the form of stock prices as an object of analysis, is based on the assumption that stock prices are a reflection of investor attitudes or beliefs .The behaviour of investors analysed is in the unit group of investors who transact within a certain day. The proxy used is the movement of stock prices, so the group in question is the group that dominates and moves the price on a certain day which causes the price to be at a certain point.

Testing the existence of heuristic behaviour in decision making during the pandemic is done by doing a correlation between the decision to invest as X1, with the factors that are allegedly chosen by investors as the image/representative/label used by investors in deciding their investment, as X2.

The X1 variable, investment decisions (investing or buying shares), is operated by using the number of days with stock prices increasing from the previous day. This is motivated by the fact that when the number of investors who decide to buy is more than those who sell, there will be an increase in stock prices.

The factors that are allegedly chosen by investors as representatives in deciding their

investment (X2) are company's age and company's size.

1. Age of the company. The age of the company is correlated with the viability of the company. The image obtained by a company with a long life shows its ability to endure many situations in the past. So, with this ability in the past, they will be able to do the same thing, still be able to survive during the pandemic. Company age is measured by calculating the number of years the company was founded until 2020.

2. Company assets. Company assets are related to the company's financial capacity. The bigger the assets, the more a company can be guaranteed is able to continue the company's operations. The greater the assets owned by the company, the image of the company's strength guarantees during the pandemic. Company assets are measured using data on the total number of assets in the balance sheet as of December 31, 2019. The 2020 balance sheet data is not used because at that time the company's balance sheet has not been issued. So, latest data of company asset data is taken from Balance Sheet on December 31, 2019.

IV. RESULTS AND DISCUSSION

The sample used is the reaction of investors in the period March and April 2020. These periods were the early days of the pandemic, when investors were in a phase of feeling uncertainty and high risk because they were dealing with conditions that had never been experienced before. The reactions that appear in this phase are expected to show the nature of decision making in real terms in conditions of high uncertainty and risk.

Decision making is proxied by stock price movements. Stocks used as research data are company stocks that experienced movement during the study period, so that company stocks that slept or did not experience movement at all during the study period were excluded from the analysis. A summary of the number of shares with the above criteria is presented in table 1 below.

Table 1

Research Sample

Total companies with shares listed on the IDX in 2020	681
Companies with shares that were not actively traded during the study period	(104)
Companies with actively traded shares	577

After obtaining all actively traded shares, we calculate daily price change, and differentiate between negative change and non-negative change. Negative price change reflects investors' pessimism to invest during pandemic, and non-negative price change reflects investors' confidence to continue investing during pandemic. Table 2 below shows the number of non-negative days in each industry sector and its proportion to total sector's trading days.

On average, all sectors experienced more than 25% non-negative days. This means that all sectors are still considered prospective by investors even during the pandemic. The Consumer Goods sector is the sector that is most in demand by investors even during the pandemic, with the largest proportion, which is 35.7%, more than a quarter of the observed period. This results confirmed by [29]. They showed that consumer goods sector provides significant positive abnormal return throughout the study period (during pandemic). This optimism of the investor, based on representativeness heuristics theory, correlates with factors which are believed by the investor represents the prospect of the company. To test the factors, the number of non-negative days in each sector correlated with company's age and total assets. Before correlating those factors, all data is filtered with certain criteria suits with the objective of each correlation test, as presented in table 3 and table 4 below.

Correlation test result
A.   Trading days and Asset-Correlation
Significant test results, as shown in table 5, for the entire industry show that investors perform representativeness heuristics by basing their decisions on the number of assets owned by the company even though the correlation value is weak (0.261).

Table 5
Trading days and asset correlation test

		TD	ASSET
TD	Pearson Correlation	1	.261[**]
	Sig. (2-tailed)		.000
	N	487	487
ASSET	Pearson Correlation	.261[**]	1
	Sig. (2-tailed)	.000	
	N	487	487

**. Correlation is significant at the 0.01 level (2-tailed).

However, if viewed one by one, the behavior of representativeness heuristics does not occur in all sectors. Investors who use company size as a reliable benchmark for company performance are investors in the Consumer Goods Industry, Infrastructure, Finance, and Services and Investment Trade sectors. With conditions full of uncertainty during the pandemic, investors decided to keep investing in these sectors because investors believe in the strength of the assets owned by these companies to be a guarantee in the future for these companies to be able to survive during the pandemic. The correlation test for each type of industry is presented in table 6 below.

Table 2
Proportion of positive days in each sector from total positive trading days

Industrial Sector	Number of non-negatif days trading	Total days of trading in each sector*	Proportion of non-negative days from total trading days in each sector
Consumer Goods	660	1.850	35,7%
Plantation	218	666	32,7%
Mining	422	1.295	32,6%
Basic and chemical industry	786	2.664	29,5%
Infrastructure, utilities & transportation	637	2.294	27,7%
Finance	803	3.108	25,8%
Property, real estate & construction	620	2.368	26,2%
Trade, Service and Investment	1345	5.476	24,6%
Miscellaneous Industry	469	1.628	28,8%
Consumer Goods	660	1.850	35,7%
Plantation	218	666	32,7%

Table 3
The number of samples of companies in the correlation test between
Number of Trading Days with Total Assets

Type of industry	Miscellaneous Industry	Consumer Goods	Trade, Service and Investment	Basic and chemical industry	Infrastructure, utilities & transportatio	Finance	Plantation	Mining	Property, real estate & construction	All industries

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Raw data	44	50	148	72	64	84	18	35	64	577
Incomplete data	6	0	10	0	2	3	0	3	3	24
In Dollar unit	12	0	7	14	19	0	1	18	0	53
Data processed	28	51	131	58	42	81	17	14	61	487

Table 4
The number of samples of companies in the correlation test between
Number of Trading Days by Company Age

Type of industry	Miscellaneous Industry	Consumer Goods	Trade, Service and Investment	Basic and chemical industry	Infrastructure, utilities & transportation	Finance	Mining	Plantation	Property, real estate & construction	All industries
Raw data	44	50	148	72	64	84	18	35	64	577
Incomplete data	3	7	24	8	10	4	1	2	9	66
Data processed	41	43	124	64	54	80	17	33	55	511

Tabel 6
Trading days and asset correlation test in industrial sector

		Miscellaneous Industry	Consumer Goods	Basic and chemical industry	Infrastructure, utilities & transportation	Finance	Mining	Plantation	Property, real estate & construction	Trade, Service and Investment
TD	Pearson Correlation	.294	**.343**[*]	.073	**.507**[**]	**.352**[**]	**.584**[*]	.378	.208	**.192**[*]
	Sig. (2-tailed)	.129	**.013**	.582	**.001**	**.001**	**.028**	.134	.105	**.028**
	N	28	**52**	59	**43**	**81**	**14**	17	62	**131**

Among the five industrial sectors that are still considered prospective by looking at their assets, the Infrastructure, Utilities & Transportation sector and the Mining sector are those with the greatest correlation. With a correlation number above 0.5, the two sectors are quite believed by investors to be strong enough to survive during the pandemic because of their large assets.

A.   Correlation Test of Active Trading Days with Company Age

Table 7
Result of Correlation Test of Active Trading Days with Company Age

Correlations

		TD	AGES
TD	Pearson Correlation	1	$.100^*$
	Sig. (2-tailed)		.023
	N	516	516
AGES	Pearson Correlation	$.100^*$	1
	Sig. (2-tailed)	.023	
	N	516	516

*. Correlation is significant at the 0.05 level (2-tailed).

The second factor that is tested is the age of the company. The test results show a significant correlation, but with a very weak correlation value of 0.100. This weak correlation is also shown by the correlation per industry sector which shows that there is no significant one. This shows that investment decisions during the pandemic are not based on age as a way of assessing an investment. The longer the company operates, it does not make investors more confident to invest in the company.

Investors' disbelief in past achievements in the form of long life may be related to the pandemic conditions that investors perceive as having high uncertainty. Past survival achievements do not automatically make investors assume that these achievements will continue during the pandemic. Age is not a stereotype used by investors in determining their investment during pandemic. Correlation test per type of industry is presented in table 8 below

Table 8
Correlation Test Results of Active Trading Days with Company Age by Each Industry

Correlations

		Miscellaneous Industry	Consumer Goods	Basic and chemical industry	Infrastructure, utilities & transportation	Finance	Mining	Plantation	Property, real estate & construction	Trade, Service and Investment
TD	Pearson Correlation	-.068	.078	-.016	.127	.179	.286	-.221	.208	.127
	Sig. (2-tailed)	.672	.614	.898	.351	.113	.107	.394	.105	.161
	N	41	44	65	56	80	33	17	62	124

V. CONCLUSION AND IMPLICATION

Investors in conditions of high uncertainty such as pandemic, need information that they believe can be used as a benchmark or guide in making investment decisions in these uncertain situation. This study showed that investor believed to company's size as their base decision to stay on investing during pandemic. The size of the company has significant relationship with investor's decision to invest. This means that investor has representativeness heuristics bias when making their investment decisions at the beginning

of the first two monthsin pandemic. Different from [12] which revealed the presence of behavioral heuristics and biases negatively impacted decisions of investors of Pakistan during COVID-19, this study showed the biases had positive impact on investor's decision. Believe that big asset can assure their investment, investors decided to keep on trading (buying stock instead of selling) after few days of covid-19 panic period.

This study also showed that investor did not use age of the company as the representation of the company performance during pandemic, as shown by insignificant correlation between positive trading days and number of age of the companies. This means that investor did not believe to the company ability to survive during pandemic,even though the company has many years of life before.

This study showed that investor has representative heuristic bias in their investment decision during pandemic. It will contribute to behavioral finance literature in developing countries as it has revealed the impact of COVID-19 on the emerging stock market like Indonesia. Practically, this study is beneficial to investor to understand their own behaviors during pandemic. For stock exchange regulators, the study give them information about factors that correlating with the investor's decision to continue investing during a pandemic. For Indonesian policy makers, the results are crucial to support good atmosphere for capital market development during pandemic.

The limitation of this study is that the data used is limited to only the first two monthsduring pandemic, in order to capture investor reactions during uncertainty period in Indonesia. On the one hand, it showed the purity of investor reactions that emerged as a result of the pandemic before they began to get used to the new normal situation. But on the other hand, the available data is limited that it could not be generalized to other situation. The stereotype which are chosen in this study, is bringing other limitation. The stereotypes are only two, that need future research to explore other stereotype might be used by investor in their investment's decision

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