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Investor Behavior in Decision Making: Experimental in Indonesia

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Abstract:
Background: *The younger* generation *is given a great opportunity by the Indonesian capital market* to be *able to plunge into* the *world of investment. The Indonesian Central Securities Custodian (KSEI) explained that* the total number of *investors or* single investor identification *(SID) in* the capital market until *the end of March 2021 amounted to 4,848,954 people. This number increased from2020 and* is *dominated by investors from among the young. Investors in Indonesia* are *increasingly famous among the* Indonesian *population, as evidenced by* the emergence *of* securities *companies and corner exchanges in high-rise companies that support students to invest. Investors* when *making decisions must master the initial concept* of *investment* that is used *as the basis of decision-making guidelines. The concept* is an *explanation of the desired return relationship* as *well as investment risk. When investors experience risk* there *are several factors, one of* which *is emotions that affect their decision making. The use of emotions when making decisions can make investors* behave *irrationally.*
Materials and Methods*: Research is conducted using experimental methods. The experimental* method is *done by providing treatment on herding variables. Participants who were the subject* of *the experiment amounted to 82 people with a strata-1 (S1) education level at STIE YKPN Yogyakarta with subject criteria, namely subjects following* the *capital market student activity unit or taking capital* markets *courses. The subject will* act *as an investor. This experimental* design *uses a factorial design of 2x1 between subject.*
Results: *Results from this study show that herding and experience influence investment decision making. Then experiential engagement makes a difference between subjects with herding behavior* and *no herding behavior. In addition, experience weakens* the *influence* of *herding on investment decision making significantly but upon further testing does not support that direction.*
Conclusion: *Herding behavior* can *still be* experienced *by investors, especially at* the age *of 20-30years, but if* the *investor strengthens the analysis by reanalyzing each of* their *transaction* options *this will cause* more *and more* of *them* to *be made and* as a *result, they can appropriately make investment decisions.*
Keyword: *Herding; Experience; Investment decision making; Experiment.*

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I. Introduction

The younger generation is given a great opportunity by the Indonesian capital market to be able to plunge into the world of investment. This condition has brought a breath of fresh air to the domestic capital market amid global financial market uncertainty caused by the Covid-19 pandemic. Indonesian Central Securities Custodian (KSEI) in the capital market until the end of March 2021 amounted to 4,848,954. This number increased by 24.95% compared to 2020 and is dominated by young investors. Investors from among the younger generation have become the drivers of the current exchange. The younger generation in question is the generation with the birth of 1991-2001. Investors when making decisions must master the initial concept of investment that is used as the basis of decision-making guidelines. The concept is an explanation of the desired return relationship and investment risk. The higher the expected yield*(return)* the higher the risk faced*(risk)*or investors call it "high risk high return". When investors experience risk there are some objectivity, emotions, and psychological factors that affect their decision making. The use of emotions when making decisions can make investors behave irrationally. So that investors are required to be smart in making investment decisions because the investment has benefits and long awkward effects. One cannot make decisions just by relying on one's personal resources. Decision making without certain planning can be fair but may not end well. An investor's mental approach to making investment decisions is different. Investors who want to invest in the capital market must update themselves in various areas of analysis in order to get the desired results. It is

important to understand that in today's competitive global perspective, investors must acquire the ability to get the best out of their investments. Decision making is the art of coping with complex situations. It is the cognitive process of choosing alternatives among several possible alternative scenarios. One cannot make decisions just by relying on one's personal resources. Decision making without certain planning can be fair but may not end well. An investor's mental approach to making investment decisions is different. Investors who want to invest in the capital market must update themselves in various areas of analysis in order to get the desired results. It is important to understand that in today's competitive global perspective, investors must acquire the ability to get the best out of their investments.

Investors differ from each other in different aspects and demographic factors i.e., socioeconomic, educational, gender, race, experience, and age. Investor attitudes that are influenced by cognitive factors as well as emotions make investors unable to interpret the data clearly so that investors become irrational. Decisions based solely on irrational considerations will create irrational outcomes. When investors build an investment portfolio, they need to consider risk tolerance, *return levels,* market conditions, and other constraints. Investors who are different in understanding and reacting to the information available in the market are called Financial *Behavior.* It is not necessary that all investors behave rationally or that they predict in the same and unbiased way. That is why financial conduct gives importance to investor behavior that leads to several market anomalies.

Research conducted by Muchnik et al., (2013); Arisanti & Asri (2018); David S Scharfstein and Jeremy C. Stein (2000); Muchnik et al., (2013); Safithri &siregar (2010)found a hereditary behavior bias, which is when an individual or group of people performs actions on the basis of actions performed by others. *Herding can* play a lot in investment decision making especially in market conditions that tend to fluctuate. Even if investors are well aware of the latest information or have done research or have done fundamental and technical analysis before investing their money, they can still behave irrationally because of the fear that is always in the investor's mind about future losses. Several studies have resulted in findings that conclude that *herding* are biased toward decision-making. Research conducted by supports the statement that *herding can* influence decision making. However, contrary to the research which said that *herding bias* has no effect on decision making. Investing is closely related to decision making. The greater the number of investors in the capital market, the greater the investment decisions made. There are several factors that can affect decision making, one of which is the experience of investing. Experience is the length of time trading experience that investors have. High investment experience enhances excellent investment decisions. Investors with long trading experience, make investors more skilled in decision making, because with experience, investors can make investment decisions in accordance with the consideration of risks that will be experienced in the future. In decision theory, investors who have high investments tend to produce the right investments, so they prefer a more challenging portfolio with the considerations they have. Shows that experience influences investment decision making.

In this study the experience variable acted as a moderation variable because in previous studies it had not considered experience as a moderation variable. In addition, the study also wanted to see if experience *weakened biased behavior* in investment decision making because previous research mostly examined the direct influence of experience variables on investment decision making because previous research majority examined the direct influence of experience variables on investment decision making this research is conducted on the basis of the financial theory of behavior and the prospect theory that investors not only behave rationally but investors also behave irrationally. Not only done on the basis of both theories, this study also wants to prove what the decision theory explains that the longer an investor's experience, the more expert the investor is in making decisions so that the investor tends to behave rationally. This research is also conducted by experimental methods by way of researchers directly testing the experimental subject who is assumed that the subject has known / performed the investment transaction procedure. It is expected that this research can contribute to related institutions or individual investors to know the characteristics of herding *bias.* So that the relevant institutions and investors can take precautions or ways to deal with the bias in investment decision making so that there are no losses in investing.

II. Literature Review

2.1. Behavioral Finance Theory

Financial experiments are are latively new field that seeks to combine behavioral and cognitive psychological theory with conventional economics and finance to provide explanations for why people make irrational financial decisions. This theory helps to understand why people buy or sell stocks without doing analysis and being irrational in investment decisions. Investors are rational beings who will always act to maximize their financial profits. In the financial world, investors sometimes base their decisions on irrelevant

numbers and statistics. Financial correctness explains many reactions in financial markets that seem to contradict conventional theory and thus can contribute to improving performance. Financial behavior describes the behavior of investors and management in decision making, it is illustrated from the results of interactions between investors and managers in financial and capital markets, because decision making is the art of dealing with complex situations and investor making irrational decisions during investing. Financial conduct does not claim that every investor will suffer from the same illusions/biases, but rather takes the necessary initiative to avoid such illusions. It affects the decision-making process, especially when making investments.

2.2. Prospect Theory

In decision making, investors are faced with various alternatives in the world of capital markets. Individual behavior in accounting for as well as sorting out alternative capricious and irrational decisions. Kahneman and Tversky developed a prospect theory that explains decision-making under uncertainty. Prospect theory explains that people value profits and losses differently, and they will in turn make investment decisions based on what they perceive as profit is not loss.

2.3. Decision Theory

Everyday we have to make a decision. Simple/easy decisions as well as long-term decisions. Siegel decision-making has a relationship with thinking, managing and solving problems. Decision making is the process of choosing among many alternative actions that will affect the future. Investment decisions can be said to be the most important decision when making an investor's decision in achieving his goal is to maximize profits.

2.4. Investment Decision Taking

Decision making is the most important factor in an investor's life. Investors should be able to make a decision whether they will buy a stock or not, or maybe they will hold the stock in order to get a bigger profit or hold the stock so as not to lose. Much of an investor's success in investing depends on the decision she makes, because his decisions will have an impact on the results obtained.

2.5. Herding

Herding are behaviors that occur when a person or group of people acts based on actions committed by others. Herding is the tendency on the part of investors to imitate the actions of larger groups, without thinking independently whether the action is rational or not. Ad some of the causes of the emergence of this behavior include the first ang, there may be social pressure from conformity. Second, there is a common reason that large groups cannot be wrong.

2.6. Experience

Experience is an event or past event experienced by an individual that is made from the impulses received from the surrounding environment and gives certain effects to the individual. Decision-making based on experience has use full benefits for practical knowledge, because an individual's experience can be estimated under a state of something, can calculate profit and loss to the resulting decision.

2.7. Hypothesis Development

Herding is interpreted as follow-up behavior because investors are not too good at the field of investment that wants to be invested. The influence of herding is thought to be able to influence changes in investment decision making. This herding behavior corresponds to an explanation of the prospect theory that explains that people rate profits and losses differently. The attitude of herding can be seen from the actions of investors who follow investment decisions on the cloud or their list, investment partners, expert investors, and many more. Investors who have herding behavior will certainly be different from investors who do not have the behavior. Such behavior will arise if the experience that the investor has is not enough or the investor has a sense of confidence in him. According to herding behavior is a behavior of participating between investors for all kinds of reasons and conditions. This behavior is one of the wrong behaviors/negative accruals of the tendency of individuals to follow a group in making decisions. Investors who have high investment experience will not see or consider their investment decisions. Investors who get good and bad experience in making investments indicate that the investor has enough experience in investing. The more investment experiences a person will have, the better the competence they have to consider the risks that will occur. From the description, the hypothesis can be formulated as follows:

Hypothesis 1: Herding influences investment decision making

Hypothesis 2: Influential experience in investment decision making
Hypothesis 3: The involvement of experience in investment decision making differs between the presence of herding and the absence of herding
Hypothesis 4: Experience weakens the influence of herding on investment decision making

III. Research Method

3.1. Place and Time of Research

This research was conducted in Yogyakarta, Indonesia using the help of zoom application and google form. The study will be conducted in June2021. Data collection and data processing from the research began on June 20, 2021.

3.2. Population and Sample

In this study, researchers took the population of all students who studied at STIE YKPN Yogyakarta. The study used students as experimental subjects. Researchers used purposive sampling for the retrieval of experimental subjects. The criteria used in this study were subjects aged between 18-30 years, the subject was a undergraduate student at STIE YKPN Yogyakarta. The subject is pursuing capital market subjects or subjects who are following unique activities of capital market students. Subjects have experience in transacting in the capital market or who study how to transact in the capital market. In the experimental design, it will be divided into two experimental groups, namely the group that gets scenario 1 and the group that gets scenario 2. The experimental group is a group of students of STIE YKPN Yogyakarta who take Capital Market courses or students who follow unique student activities (SMEs) of the capital market. STIE YKPN Yogyakarta student group is made a research subject because in capital market courses are given knowledge of fundamental and technical analysis to make investment decisions and taught how to invest. So that they can understand the case given. In addition, students who follow the capital market SME are used as the subject of experiments also because they are considered able to take investment decisions. In SME Capital Market, given knowledge how to lyse data. And required to have an *account* because the *account* is used to access investment applications and also to analyze the investment instruments to be selected. The taking of the number of experimental subjects refers to Nahartyo (2012). Nahartyo explained that the minimum of participants who can be used for experimental research amounted to 10 people per experimental group. So that the total participants are at least 20 people with a total scenario group of 2 (10 people each per experimental group).

3.3. Experimental Design and Procedure

This research was conducted using experimental methods. Experiments are the design of research for. Examine a phenomenon by manipulating circumstances or condition switch certain procedures and then observing the results of such manipulation and representation. This study uses between-subject design. Between-subject is an experiment in which independent variables are treated and randomly applied to the subject. Experiments with two treatment conditions had two groups, with each group receiving one of two treatment conditions. This study uses factorial design. Factorial design is an experimental design that pays attention to the presence of moderation variables that affect variables independent to dependent variables. This study uses a 2x1 factorial design that indicates there is 1 independent variable that has2 levels /conditions. Here's the experimental design shown in Figure 1.

Figure 1 Experimental Design

TREATMENT		EXPERIENCE
HERDING	There's Herding	Scenario 1
	There is no herding	Scenario 2

Experiments are conducted by creating a scenario/case. Case used in this study contains about the company/shares to be bought/sold by the experimental subject. Cases are used at posttest. Experimental scenarios consist of demographic data, manipulation questions, and cases and questions. The stages that will be carried out in this exhibition can be seen in Table 1 below:

Table 1 Experimental Procedure

No.	Step

1	Researchers will conduct *a group discussion*(FGD) forum.
2	The researcher will begin his experiments with the subject that has been determined. Subjects will be collected in forums *(WhatsApp groups)*to provide information related to the schedule to conduct experiments and provide Zoom Meeting *IDs.*
3	Researchers explained briefly related to the research that will be conducted, the researchers call the study as an investment simulation, because participants will conduct investment simulations.
4	Researchers provide *Zoom* IDs in the forum as well as rules/regulations made during investment simulations.
5	Subjects attend *zoom meetings,* where the platform is where investment experiments/simulations are conducted.
6	Researchers will conduct self-introductions and explain the purpose of the investment experiment/ simulation.
7	Give the case to the subject of the experimental group / investment simulation by looking at the last digit nim subject, if the last digit is even then get case 1 and if the last digit is odd then get case 2.
8	The results of the case answered by the subject will be tested to see if it has an effect or not or it can be said whether the results of the experiment are successful or not.
9	Retest the case with a different test, so that you can see if there is a difference or not.
10	Determine whether experience weakens *biased herding* behavior in investment decision making or not.

Before starting the experiment, researchers first *avoided forum group discussion* (FGD). FGD is a discussion with the number of participants is 7 to 12 people. FGD was conducted by researchers online through the researcher *zoom* application with 12 graduate students of STIE YKPN Yogyakarta who were FGD participants. FGD aims to see and assess the cases used in this experiment already understood and understood by prospective experimental subjects and how they affect other variables in a described manner. FGD is done by way of researchers presenting cases that will be filled by FGD participants. Then the researcher gives the opportunity to FGD participants to provide advice, input, or *feedback* on the case presented.

3.4. Data Analysis

This study uses descriptive statistical analysis then also performs a normality test, homogeneity test, randomization test, and then performs a hypothesis test.

IV. Result and Discussion

4.1. Results of Analysis

4.1.1. Demographic Characteristics of Research Subjects

The subjects of this study amounted to 82 STIE YKPN students who participated in this experiment. The demographic data used in the experiment were grouped based on 4 characteristics: gender, age, education, and experience. Of the 82 experimental subjects, 43 were male and the remaining 39 were female. In addition, the age characteristics shown by the experimental subjects were that they were between20-30 years old. The education that is being pursued by the subject of the experiment is strata 1 (S1). In the characteristic experience of investing experimental subjects showed that there were 17 people who were not investors, experience under 1 year amounted to 25 people, experience between 1-3 years amounted to 29 people, and the experience over 3 years amounted to11 people.

4.1.2. Results of Forum Group Discussion (FGD)

Almost all FGD participants understood the case presented and they gave quite good *feedback* on the presentation of the case. They argued that the case was in accordance with the purpose of the experiment. Such cases can lead participants to *herding* bias if they have no knowledge of investments and/or have the knowledge to analyze those investments. In addition, FGD participants also explained the analysis and news used in accordance with the desired conditions, namely there is *a herding* and there is no *herding.* They argue that

fundamental analysis and true technical analysis should be provided so that the experimental subject can take the decision of investing with analysis rather than by participating or even guessing. In addition to good *feedback,* FGD participants also provide advice and input for researchers related to cases and experimental procedures that will be carried out later on the subject of the experiment. One of them is related to the time / duration of the experiment. They argue that the time given is quite long which is about 10-20 minutes. They feel saturated when filling out cases due to long cases. Duration is very important, because the lam the experiment is done, it could be that the experimental subjects feel saturated and result in answers only participating or second-guessing, even though researchers want answers on the basis of treatment*(treatment)*given.

One of the foundations of investment decision making is experience. According to participants, experience is very important, especially in investment decision making, they should be able to analyze to see if they should buy or sell their shares. They also feel the importance of the science of analysis before investing so that they do not lose when making decisions. The way they have/understand the analysis will determine their experience. The more often they analyze those investments, the more experience they gain in those analyses and as a result they can make informed decisions. Experience is considered to play an important role in investment decision making. When participants had longer experienced, participants felt their decision-making was right and caused them to better reanalyze external choices/information or experts. After the subjects read the case in the scenario and discussed, FGD participants were asked to assess the level of clarity of presentation of the scenario on a scale of 1 to 10. Such measurements were once applied by Qimyatussa'adah et al., (2013). From the data, showing the average FGD participant gave a value of 7.7, it means that the presentation of the experimental case is quite clear. Next, the researchers conducted a hypothesis test.

4.1.3. Manipulation Check Results

The number of participations in the experiment was 82. There are 80 experimental subjects who answered the manipulation check correctly and there are 2 experimental subjects who answered the manipulation check incorrectly. They will not be included for testing further.

4.1.4. Descriptive Statistics

Of the 80 experimental subjects, researchers divided the subjects into 2 groups, namely scenario group 1 with a total of 42 experimental subjects and scenario group 2 as many as 38 experimental subjects. The average in scenario group 1 is 70.2 and the average for scenario group 2 is 43.4. Judging from the average of the two groups showed that the average experimental subject tended to be herding.

4.1.5. Normality Test

Table Normality Test

	Sig.
Standardized Residual for PKI	0.537

Source: Primary data processed, 2021

A normality test is a test to see if existing data is normal or abnormally distributed. The requirement that the data be distributed normally if the sig value is more than 0.05. The results showed that the sig value for the normality test was 0.537, so it can be concluded that the data used is normal distribution.

4.1.6. Homogeneity Test

Table Test homogeneity

Dependent Variable: PKI	
	Sig.
Based on Mean	0.230

Source: Primary data processed, 2021

A homogeneous test is a test to see if the data used is homogeneous or not. The requirement for the data to be homogeneous is that if the sig based on mean value is higher than 0.05 then the data is homogeneity. The table above shows the value of sig based on mean is 0.230, it can be interpreted that the value is higher than 0.05 then the data variant used is homogeneous.

4.1.7. Randomization Test

Table Randomization Test

Dependent Variable: PKI	
	Sig.
Gender	0.725
Divestment Experience	0.697

Source: Primary data processed, 2021

The randomization test is used to check the effect of a subject's characteristics on dependent variables. The randomization test requirement is met if the significance value is greater than 0.05. The table shows the significance value of the gender section of 0.725 and for the divestment experience section by 0.697. Based on the value of such significance it can be concluded that there is no difference in investment decision making (PKI) based on the characteristics of gender and the characteristics of the experience of investing. Therefore, the randomization process successfully controls the characteristic variables.

4.1.8. Hypothesis Test

4.1.8.1. Herding and Decision Making

Table Hypothesis 1

	Sig.
Herding	0.000

Source: Primary data processed, 2021

The results of testing on hypothesis 1 shown in the table above suggest that herding affect investment decision making is received because based on the table is known the value of the significance of 0.000 is smaller than 0.05.

4.1.8.2. Experience and Investment Decision Making

Table Hypothesis 2

	Sig.
Experience	0.000

Source: Primary data processed, 2021

The results of testing on hypothesis 2 which states that experience affects investment decision making is accepted, because based on the table above known significance value of 0.000 more small from 0.05.

4.1.8.3. Experience Engagement on Herding Differences for Investment Decision Making

Table Hypothesis 3

GROUP	**MEAN**	**MEAN DIFFERENCE**	**SIG.**
There's Herding	70.24	27.35	0.000
There is no herding.	42.89		

Source: Primary data processed, 2021

The table above shows that there is a statistical difference in decision-making affected by herding and those not affected by manipulation of independent variables (sig < 5%). The results showed in the average value of the group there was a larger herding than the group of no herding which is as low as 70.24 with an average difference of 27.35.

4.1.8.4. Experience Weakens Herding for Investment Decision Making

Table Hypothesis 4

	Sig.
Herding * Experience	0,033
GROUP	MEAN
Experience	68,26

No experience	42,35

Source: Primary data processed, 2021 ***Source: Primary data processed, 2021***

The table above shows that hypothesis 4 experiences weakening the influence of herding on investment decision making turned out to be significant. It is evident that the value of significance is less than 0.05 (0.033 < 0.05). After that there searchers conducted further tests to see the direction of the study whether weakening or not. After further tests, it turned out that the results showed that the experience did not weaken the herding variable, it was seen from the average experience group higher than the average group had no experience of 68.26.

4.2. Discussion

The first hypothesis in the research of consistent with research Arisanti & Asri (2018); and prospect theory. This result confirms that the behavior of the herding will make the results of an investor's decision to be biased because they only follow what is informed from the external party without re-analyze whether the decision is true to harm or harm investors in the future. In addition, this behavior makes investors less likely to believe in their choices, and results in them not being confident in the choices they choose themselves or they do not believe in. Will analyze them. These results are also in line with FGD results with some FGD participants. Most FGD participants said that if investors had no knowledge of the investment or how to analyze it, they would be less likely to believe in the capabilities. They have and these behaviors make it easier for investors to be exposed to herding behavior. With less analytical skills, investors will tend to behave in the future and that could be detrimental to their behavior in the future.

The results of this study prove that the length of experience will make decisions taken by investors more appropriate because the experience makes investors will think carefully and deeply about decisions. The one he took. This result is also in accordance with the results of FGD that FGD participants think that experience plays an important role in investment decision making, especially the experience of making invest or more accustomed to and understand how to analyze correctly so that the results are right. FGD participants argued that if they lacked experience then they could not make the right decisions. So, in conclusion the longer experience that investor has will cause investors to increasingly understand and improve the ability to analyze those investors and they will do the analysis. Repeat the choice of the external/expert is right or not.

In this case, millions of investors between the ages of 20-30 years are still potentially affected by herding. Such results have been explained in the prospect theory where multiple choices can influence individuals in making investment decisions. In addition, these results also represent that the purpose of successful execution where the provision of treatment on independent variables (herding) is successful. The involvement of experience will make an investor can avoid herding, but investors can also be exposed to herding. One of the reasons is the experience of an investor. In this study it was seen that the experience of experimental subjects averaged less than 3 years which caused the subject to still be affected by herding. One FGD participant said that the more often they analyzed in investing the more experience they gained from the results of the analysis and made them you can make the right decision about your investment.

In line with the decision theory that states that the more experienced investors are, the more appropriate in investment decision making. Market participants must have a lot of experience because market participants need quick decision making so as not to lose the opportunity to collect profits. Experience can help investors in decision making. That is, investors who have a lot of experience about divestment, will not be affected by biased herding. Experience with a duration of 1-3 years can be the cause of investors can still be affected by herding, because the duration is still considered short to get experience that makes the subject understand the analysis and make the right decision. In addition, the duration is not necessarily the subject invests everyday, because it may be the activity of the subject who is still busy with his lectures. In addition, investors are also not so focused or may be they do not do a re-analysis in filling cases/scenarios, can be sued from the duration of the case. Charging is supposed to fill approximately 7-10minutes, but some fill it under 5 minutes.

V. Conclusion

Of the four hypotheses put forward by the authors, the three hypotheses are accepted, namely hypotheses 1,2, and 3 while hypothesis 4 is significant but not supported, where *herding* and experiences influence investment decision making. In addition, there are also differences in decision making with people who are affected by *herding* and not *herding*. Lastly, experience becomes one of the important factors in investment decision making if the experience has been a lot / long or it can be said that the experience may be more than 3 years, it can weaken the behavior of *herding* for an investor. Therefore, researchers concluded that *herding* behavior can still be experienced by investors, especially at the age of 20-30 years, but if the investor

strengthens the analysis by analyzing each option of their transactions will cause more and more experience and consequently, they can appropriately make investment decisions.

In this study there are some suggestions for the next researcher, the first if doing the experiment can use the subject, namely direct investors. Furthermore, investors selected to conduct experiments have more than 3 years of experience, because the longer the experience they have the more experts they have in investment decision making. Further research may add other independent variables, one of which is literacy variables and may also use other variables as moderation in order to see what variables can be weakening the influence of herding in investment decision making.

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