Article Type: Research Paper

Herding behavior, information type, and overconfidence bias: an experimental study on novice investors' investment decisions

Etik Kresnawati*, Lina Sofia, and Evy Rahman Utami

AFFILIATION:
Department of Accounting, Faculty of Economics and Business, Universitas Muhammadiyah Yogyakarta, Special Region of Yogyakarta, Indonesia

*CORRESPONDENCE:
etikkresnawati@umy.ac.id

JAI Website:

Abstract

Research aims: By the end of 2023, Indonesian Central Securities Depository data revealed a significant increase in the number of investors dominated by millennial investors (56.41%). They are categorized as novice investors who have distinctive characteristics from professional investors. This study, thus, aims to examine whether herding behavior dominates the characteristics of novice investors and whether information type and overconfidence bias affect the herding behavior of novice investors.

Design/Methodology/Approach: This study used a quasi-experimental 2x2 mixed design on 42 student participants who were members of the Capital Market Study Group. The data obtained were then tested using non-parametric statistics.

Research findings: The test results uncovered that herding dominated the investment behavior of novice investors. This behavior was supported by the information type that participants paid attention to in making decisions. However, testing for overconfidence demonstrated that this variable was not the cause of novice investors' herding behavior.

Theoretical contribution/Originality: The results of this study contribute theoretically to the investment behavior of novice investors by strengthening the argument that they tend to behave herding when making stock investment decisions. Testing with an experimental design allows researchers to confirm that such herding behavior is reinforced by the preference for the information type they use in decision-making. The results also provide insight into the fact that the overconfidence level of novice investors may be different from that of professional investors.

Practitioner/Policy implication: The tendency of herding behavior of novice investors needs attention from the Financial Services Authority as a regulator to consider protection for novice investors who dominate the number of investors in the capital market.

Research limitation/Implication: The tests in this study employed non-parametric statistics, which are not as good as parametric tests, so the study results should be understood wisely. Future research needs to consider the adequacy of the sample and use capital market groups in several universities to improve sample quality.

Keywords: Herding Behavior; Information type; Overconfidence bias; Investment decision; Novice invest

Introduction

In 2019, data from the Indonesian Central Securities Depository exhibited that the number of investors in the Indonesian capital market was 2.4 million. Of these, 43.28% were young investors (millennials). By the end of 2023, the number of investors continued to increase to 12.16 million, with 56.41% being millennial investors. The substantial percentage of millennial investors signifies an increase in investment interest by the millennial generation. This is inseparable from the collaboration between the Indonesia Stock Exchange and universities, such as forming capital market study groups to study portfolio analysis and making it easy for students to create stock accounts.

Theoretically, millennial investors are classified as novice investors who have different characteristics from professional investors. This is due to different levels of capital, knowledge, and experience in the capital market (Paramita & Isbanah, 2018). These differences can cause differences in obtaining and processing information used to help make investment decisions, especially in considering return and risk (Anggraeni & Almilia, 2017).

Information commonly used by investors, especially novice investors, is fundamental information and technical information of the company. Fundamental information provides data on the company's financial performance and news that describes the company's value. Meanwhile, technical information presents an overview of stock price patterns and trends based on price movements made by domestic and foreign investors (Brilliand et al., 2016). Novice investors' low level of ability to obtain and process information can result in irrational decision-making (Paramita & Isbanah, 2018). This is because novice investors tend to trust the information they get too much by verifying it based on stock movements in the market. The impact of irrational decisions is the existence of herding behavior and bias in the capital market.

Herding behavior is a description of the collective behavior of individuals in making investment decisions on a stock in a particular industry (Chen et al., 2012). In addition, herding behavior refers to the behavior of a group of individuals who trade in the same direction within a certain period, which is caused by acquisition and market information that is correlated between investors so that investors come to interrelated conclusions in making stock decisions (Hirshleifer et al., 1994). Research conducted by Aslam et al. (2022) and Enow (2023) indicates that herding behavior occurs in Asian, European, and African capital markets.

Further, Ramli et al. (2016) found that information mastery affects the behavior of Indonesian capital market investors when the global economic crisis occurs. Domestic investors perform herding behavior by following foreign investors in choosing to exit or enter a stock industry. This is due to the assumption that foreign investors have more capital, knowledge, and mastery of information compared to domestic investors due to crisis conditions, which cause a lot of unfavorable market information. A study carried out by Wibowo (2019) uncovered that herding behavior occurs in Indonesian stocks that have high price fluctuations (idiosyncratic volatility). This is because the company's

fundamental information is less able to describe the company's value. This behavior causes the stock value to deviate from the actual stock value based on the fundamental value of the company so that the stock experiences underpricing or overpricing conditions.

Apart from herding behavior, this condition is also caused by investor overconfidence, which is an overconfidence bias when investors commit self-deception by looking for information that is closer to the results of their analysis than the actual market conditions (Kufepaksi, 2008) or because of the success that has been achieved by relying on feelings (Merkle, 2017). Moreover, investors who perform herding behavior and experience emotional bias have an aggressive nature in transactions because they will respond quickly to information that affects the value and safety margin of transactions in the market (Ormos & Joó, 2014).

These characteristics have something in common with novice investors, who are mostly fast and expect a quick return based on information formed in the market or circulating issues. The increase in the number of novice investors, especially during a pandemic, is an interesting phenomenon to study. Novice investors, proxied by college students, are thought to range to herding behavior due to their inability to hire investment consultants as professional individuals and institutional investors do. They perform herding behavior by following the movements of large investors in the capital market to reduce the risks faced and respond quickly to good and bad information in the market by following market movements (Al-Shboul, 2012; Choi & Sias, 2009).

Research related to the investment behavior of novice investors has been conducted by Rahman and Gan (2020) in Malaysia. The results revealed that overconfidence bias exerted a negative impact on decisions made by novice investors in Malaysia. This bias caused novice investors in Malaysia to trust their judgment more than doing more analysis to get projections about market conditions, thus causing a negative influence on investment decision-making. The negative effect of the decision is that novice investors did not get accurate information about stock conditions, causing unknown risks to occur. In Indonesia, testing of the investment behavior of novice investors has also been carried out. The findings demonstrated that novice investors' investment decisions are influenced by overconfidence bias (Setiawan et al., 2018) but not by herding behavior (Fathmaningrum & Utami, 2022; Setiawan et al., 2018). However, another research by Afriani and Halmawati (2019) actually disclosed that the behavior of novice investors is not influenced by overconfidence bias but by herding behavior.

Investors' investment decision-making behavior is also strongly influenced by the information they obtain. Hence, in this study, Information types, namely fundamental and technical information, are added to ensure the herding behavior of novice investors. The information available in the market can affect the level of rational decisions taken by investors in transactions (Afriani & Halmawati, 2019). Investors who get negative information about company fundamentals will tend to analyze the movement of stock price trends, which are not influenced by the company's reporting value but by the law of supply and demand so that they follow market movements (Abidin & Hidayat, 2016).

Investors believe more in information that is validated by many people and experience narcissism than the signals they get (Macenczak et al., 2016). A study by Utami and Kartini (2016) also exhibited that information obtained by novice investors through capital market community online discussion forums and social media could affect their confidence in making decisions to trade in the capital market.

Therefore, this study aims to test whether herding behavior occurs among novice investors and whether information type and overconfidence bias have an impact on the herding behavior of novice investors in investing. In contrast to Rahman and Gan (2020), Setiawan et al. (2018), and Fathmaningrum and Utami (2022), who used a survey research design, or Ramli et al. (2016), Aslam et al. (2022), and Enow (2023) who employed intraday stock trading data, this current research used a 2x2 between-subject experimental design on novice investors. This experimental design is expected to explain the results of research that does not support the existence of herding behavior Setiawan et al. (2018); Fathmaningrum and Utami (2022) and overconfidence (Afriani & Halmawati, 2019) in novice investors.

Through experiments, testing herding behavior and overconfidence is highly likely to produce different results. By using real subjects who are familiar with stock trading activities, namely students who are members of the Capital Market Group, and the use of trading software that has features similar to the software utilized by the subjects, the experimental design is expected to lead to strong internalization of the work and outcomes to be obtained (Nahartyo, 2012). This internalization will form patterns of behavior in the form of responses to manipulations made by researchers. This aspect cannot be captured with secondary data or survey research methods.

Literature Review and Hypotheses Development

Efficient market hypothesis

The efficient market hypothesis (EMH) was introduced by Fama (1970), explaining the relationship between stock prices and information available in the market. According to EMH, stock market prices reflect all information available in the market, both fundamental information and information added by insider information. This theory divides market efficiency into three, namely weak market efficiency, semi-strong market efficiency, and strong market efficiency.

In price formation, weak market efficiency claims that all past stock prices are reflected in current stock prices, so stock prices are not related to past data owned by the company. The data cannot predict the current stock price so investors will do a random walk. Semi-strong market efficiency in price formation is based on all published information, including additional information other than financial statements, some of which are not published. Meanwhile, the strong form of market efficiency fully elucidates price formation through information obtained from financial statement information, previous stock prices, and disclosed confidential information.

Herding behavior

Herding behavior is the behavior of investors who tend to follow market consensus and the behavior of other investors who determine individual investment portfolio returns. Hudson et al. (2020) reported that the UK capital market occurs after considering market fundamentals, size, value, macroeconomics, and other factors that explain group behavior, which significantly influences individual investors. Meanwhile, herding behavior affects investors' decisions in stock trading, such as entry and exit in the industry, thereby affecting the movement of the number of shares or the increase in the active fund of shares.

Herding behavior is also influenced by the mood and movement of institutional investors. Investment managers who experience profits will tend to be higher in herding in the capital market because they have higher active funds (Gavriilidis et al., 2020). In addition, herding behavior carried out by non-professional investors is a form of response to fluctuations in the capital market caused by information asymmetry between professional investors and non-professional investors (Komalasari, 2016).

This information asymmetry causes novice investors to follow the decisions of professional investors who rely on intuition in making decisions individually (Jiang & Verardo, 2018). Herding in the Indonesian capital market has a high intensity when the market is in normal conditions. Investors in the capital market tend to follow trend movements that occur, most of which adopt positive feedback strategies, and some negative feedback strategies follow the direction of investment management (Eduardus Tandelilin et al., 2013)

Overconfidence bias

Overconfidence bias is a form of emotional bias related to the tendency of investors to overestimate their knowledge and stock market conditions so that the information obtained is less accurate and causes errors in decision-making because it ignores other supporting information. Indications of investors who experience overconfidence are making mistakes in estimating their true quality (overestimation), their quality compared to others (over placement), and considering themselves to know the truth of news (over precision) (Moore & Schatz, 2017). Research conducted by Bakar and Yi (2016) found that investors who experience overconfidence in making decisions to invest are based on past profit experiences that have succeeded in increasing investor confidence.

This behavior has a negative impact on investors. This is because in making purchases, investors only try to find valuable information about the shares taken (good news) to produce the desired analysis results. In contrast to the position when selling, investors will look for news that tends to be negative (bad news) related to the shares to be sold (Supramono & Wandita, 2017). This behavior indicates that investors are not objective in making decisions and behave irrationally, thus causing misjudgment and increasing the risk of loss.

Herding Behavior in Novice Investor Investments

Herding behavior is caused by inadequate information processing. It is not based on financial information or company fundamentals, so investors choose to follow the trading direction of other investors, known as herding behavior, which influences Indonesian stock returns and influences investor decisions in the market (Wijaya & Meirisa, 2019). A study by Eduardus Tandelilin et al. (2013) uncovered herding behavior in the Indonesian capital market, where institutional investors used a positive feedback strategy while non-institutional investors used a negative feedback strategy. Another research on herding behavior was conducted by Ramli et al. (2016), revealing that herding behavior in the capital market was caused by information asymmetry in the Indonesian capital market and market conditions that were experiencing pressure in the form of an economic crisis.

Information asymmetry and crisis pressure caused domestic investors to panic and choose to follow the movements of foreign investors in making decisions about buying and selling shares. Here, foreign investors can guide domestic investors, especially individual investors, because of the assumption that foreign investors have better knowledge of capital markets and information networks than domestic institutional and individual investors.

Furthermore, EMH elucidates that investors will respond to the latest information on the market. Market prices will move to a new price equilibrium that reflects all information at that time (Fama, 1970). Indirectly, EMH expects that irrational behavior such as herding may occur to obtain abnormal profits when the market is in semi-strong market conditions. These abnormal profits are obtained by following the same price movements to gain fast profits. This is due to the fact that some information is not published to the general public, and only certain actors know about it (Wijaya & Meirisa, 2019).

This aligns with the characteristics of novice investors who often expect high returns by trading shares that are widely traded, and their mastery of information is still not high due to a lack of funds to employ an analyst. These characteristics cause novice individual investors to choose to follow the movements of large investors, thereby ignoring the results of financial information analysis that depicts the company's value. Therefore, the following hypothesis is derived:

H_1: There is herding behavior in the investment decisions of novice investors.

The Influence of Information Types on Investment Decisions by Novice Investors

Technical and fundamental information are essential components in investor decision-making. In addition, the information available in the market can influence the level of rationality of decisions taken by investors in transactions (Afriani & Halmawati, 2019). Investors who receive negative information about company fundamentals will tend to

analyze stock price trend movements, which are not influenced by the company's reporting value but rather by the law of supply and demand so that they follow market movements (Abidin & Hidayat, 2016). This happens because investors believe more in information that is validated by many people and experience narcissism in the signals they get (Macenczak et al., 2016). Research conducted by Rahardjo (2015) found that negative market information could influence the behavior of other investors. This is influenced by the psychological condition of investors who want to avoid losses (Manurung, 2012). In line with research conducted by Brooks and Byrne (2008), in making decisions, humans will respond and behave in dealing with information with consideration and calculation to maximize the benefits obtained.

This condition strengthens the EMH theory, which states that in inefficient market conditions, naive investors will act following other investors because they cannot explore information about the market other than the fundamental and technical information presented, some of which is unpublished (Fama, 1970). This situation gives rise to the belief that technical information provides a better picture of market information, which naive investors may not know. This theory is also supported by studies by Ramli et al. (2016) and Afriani and Halmawati (2019), which demonstrated that the imbalance of information held by each investor provided a positive impact on investment decisions. The positive influence of information imbalance on herding behavior can be seen from investors who choose to follow stock movements in the market and verify it by observing the players behind the stock. Based on the statement above, a hypothesis is proposed:

H_2: Information type influences novice investor's herding behavior.

The Influence of Overconfidence Bias on Investment Decisions by Novice Investors

Overconfidence is a bias that causes investors to overestimate the knowledge, abilities, and accuracy of the information they have or to be too optimistic about the future and their ability to control it. Research conducted by Utami and Kartini (2016) revealed that overconfidence is not influenced by knowledge and experience, so overconfidence can occur in novice investors who still lack practical experience and knowledge in the capital market.

A study conducted by Kartini and Nugraha (2015) reported that overconfidence behavior yielded a positive relationship with investment decisions. This denotes that the more investors have a high level of overconfidence, the more frequently they will make decisions in the market and will dare to take risks in making price offers to enter or exit the market.

This research is in line with the research of Alquraan et al. (2016), which explains that overconfidence has a significant influence on investors' investment decisions. This indicates that investors overestimate their abilities and apply them in decision-making. Another study with the same results is research by Bakar and Yi (2016). Their research

explains that investors experience overconfidence in the decisions they make and consider the decisions they make to be the correct ones. Aside from that, these investors also use profit as a benchmark

This explanation is in accordance with the efficient market hypothesis theory that since a semi-strong market condition is a market condition that is not yet efficient, decision-making is susceptible to bias, especially self-confidence, in making decisions based on ability and past profit experience (Ritter, 2003). This kind of situation is faced by many novice investors. The investments they make are due to input or suggestions from professionals without knowing the success and risks involved and trusting this information without conducting studies and re-analysis (Utami & Kartini, 2016).

H₃: Overconfidence bias has a negative effect on novice investor's herding behavior.

Research Method

Sample and data

The subjects who participated in this research were students as novice investors who were members of the Capital Market Study Group at Universitas Muhammadiyah Yogyakarta. The criteria for novice investors in this research were those who had approximately one year of experience in transactions in the capital market.

This research employed a quasi-experimental 2x2 mixed design (between-within subjects). While the between-subject design was used for assignments related to overconfidence bias, the within-subject design was for market information assignments. The experimental model is depicted in Table 1.

Table 1 Quasi-Experimental 2x2 Mixed Design Model

Market Information	Emotional Bias (Fin. Literacy)	
	Overconfidence	Underconfidence
Technical (Good); Fundamentals (Good)	Case 1	Case 2
Technical (Good); Fundamentals (Not Good)	Case 3	Case 4

Table 1 reveals that each experimental group received different cases. Case 1 is a case obtained by participants who experienced overconfidence and obtained market information in the form of good technical and fundamental information. Case 2 is intended for participants who experienced conditions of underconfidence and received good technical and fundamental information. Case 3 shows that the participant experienced a condition of overconfidence and received positive technical information and negative fundamentals, while case 4 indicates that the participant experienced a condition of underconfidence and received positive technical information and negative fundamentals.

The dependent variable in this research was herding behavior. Herding behavior is the behavior of following other people's assessments to make decisions to buy or sell shares. Individual investors follow the decisions of large investors, noise traders, or the behavior of large company analysts, who underestimate their personal information and follow market movements to maintain their reputation (Kumar & Goyal, 2015). In this research, the herding behavior variable was measured by novice investors' decisions to sell or buy shares. The decision to sell or buy was seen from the investor's reaction to the information and analysis that novice investors had. On the other hand, herding behavior was gauged by the price given by investors based on investors' decisions to buy, sell, or hold the shares they owned.

Furthermore, for the independent variables, this research used the information type and overconfidence bias variables. In practice, in the capital market, the information used by investors is technical and fundamental. Fundamental information is about a company's income, risks, and growth, which can influence stock (Lev & Thiagarajan, 1993). Meanwhile, technical information is obtained based on stock price movement trends (Abidin et al., 2016). In this research, market information was grouped into two groups, namely the good technical information group - good fundamentals and the good technical information group - poor fundamentals. While fundamental information was reflected in the issuer's financial statements, technical information was represented in the issuer's share price movements. In addition, the researchers used real cases of issuers on the IDX for the purpose of creating software that is more realistic in the stock price movement menu (technical information).

Lastly, overconfidence is defined as a feeling of excessive self-confidence experienced by an investor. Overconfidence occurs when investors overestimate their ability to predict investment and ignore the impact that will occur, such as risk. Overconfident investors will often make bold decisions in investing, such as determining prices far from the opening price or market price, and these investors trust the results of their analysis more than market price movements (Jaiyeoba & Haron, 2016). In this study, the level of participant overconfidence was measured by six financial instrument questions using a 1-5 Likert scale adopted by Xia et al. (2014). Scale 1 describes a state of no self-confidence, and scale 5 shows high self-confidence.

Experiment stages

The experiment was carried out using stock trading simulation software, which was designed to be similar to the software usually used by participants in stock trading. The menu in this software was modified slightly for research purposes. The experimental stages in this research are as follows:

1) Stage of assigning participants to experimental groups. Assignment of participants to the experimental group was conducted in two stages. In the first stage, potential participants were asked to answer financial literacy questions, determining the group of participants in the research. Then, prospective participants filled out a statement of availability to take part in an online stock trading simulation via G-Form, which was

sent via the WhatsApp application. Participants who were willing to take part in the stock trading simulation would receive a username and password for the account they used in the trading simulation. The second stage was the assignment to market information groups, which was carried out randomly.

2) Trading software introduction and learning stage. Participants were asked to open the application using the ID and password provided in the Practice menu with different cases. The training was carried out online because it was difficult to balance participants' time.

3) Assignment stage. Participants made stock price expectations based on the information available in the trading software, namely, issuer stock trading charts, running trades, and information related to financial reports. In-app features other than those required in the simulation had been turned off to mitigate information bias. Each would be assigned a different company case depending on the randomization carried out by the researchers. At the end of the assignment, participants estimated stock prices. The results of this estimation would determine the reward that participants received as if they were getting a return if they carried out trading actions on the stock exchange. If the participant's estimate has the maximum profit probability when compared with the analyst's estimate range, he will receive a reward of IDR 50,000. Otherwise, he will get a reward of IDR 25,000.

4) Manipulation check. After carrying out the assignment, participants were asked to fill out a questionnaire regarding the assignment they had carried out. Participants who did not pass the manipulation check were removed from the test sample.

5) Debriefing. The researchers said that the assignment carried out was part of the research. The researchers also expressed thanks and presented rewards to the participants.

Research instrument

This research utilized modified trading software. In the original software, stock movements are running, but in the modified software, they were replaced with screenshots of stock movements of 300 issuers. Surveys were also conducted on participants to ensure that the data presentation based on still images did not have a substantial impact on decisions in selecting shares. The survey results of six students who were members of the Capital Market Study Group community showed that running trades and information on stock price movements presented in an on or off display exerted no impact on decision-making.

Furthermore, two types of cases were used in conducting experiments. The first case was the case used to determine participants in the overconfidence group, while the second case was a case containing assignments to participants to determine share price estimates and the actions they would take (sell, buy, or hold) based on technical and fundamental information. Determination of experimental rewards was carried out by comparing participant and analyst estimates. The cases to be used in the experiment had been assessed by NNAL, a sales admin practitioner at First Asian Capital Securities, to ensure whether the issuer's shares had been correctly grouped into assignment groups as well as estimated share prices based on NNAL's experience in practice.

As stated before, at the end of the experiment, participants received rewards based on their stock price estimates. If the estimate has a maximum profit probability and falls within the analyst's estimate range, they will get a reward of IDR 50,000. Otherwise, they will get a reward of IDR 25,000. The amount of this reward follows Aditya's (2019) experiment results and is considered material enough for students who were research subjects.

This study also used non-parametric tests, consisting of the chi-square test, Kolmogorov-Smirnov, and Mann-Whitney test, to test the relationship between variables. The research could not use the parametric ANOVA test as designed because the research data did not meet the assumptions of normality and homogeneity.

Result and Discussion

Results

Participants in this research were divided into two groups, namely those who experienced overconfidence and underconfidence. In this research, 42 participants were members of the Capital Market Study Group, Universitas Muhammadiyah Yogyakarta. The involvement of these members is considered to represent novice investors.

Table 2 Characteristics of Participants

Description	Descriptive	Total	%
Investment experience	1 to 2 years	33	79.5
	More than 2 years	9	20.5
	Total	42	100
Characteristics of investors	Underconfidence	20	47.6
	Overconfidence	22	52.4
	Total	42	100

Based on Table 2, it can be seen that of the 42 participants, 79.5% had one to two years of experience, while 20.5% had more than two years of experience. The characteristics of the participants who participated in this research were that 47.6% of participants experienced underconfidence bias, while 52.5% experienced overconfidence bias.

After participants who were willing to take part in the experiment were grouped based on their characteristics, randomization was carried out using account codes to access the trading software. After randomizing the participants, the next step was for participants to get a link to access the trading software and get a code to enter the account sent via WhatsApp. Furthermore, the implementation of this research was divided into three stages, namely trading software introduction, task implementation, and manipulation checking.

The research procedure was divided into three stages, and in the final stage, the researchers conducted a briefing by explaining the research objectives. In the first stage, researchers provided training in utilizing the trading software so that participants could

understand the features of the software used. The second stage was carrying out assignments, where participants first carried out exercises in predicting stock prices based on the information available in the application using the training code provided. After the practice session was complete, participants entered the actual trading simulation stage using the code sent. In the final stage, after participants estimated the issuer's share price, they filled out a questionnaire containing questions about share price expectations and manipulation checks.

Table 3 Manipulation Checking

Description	Total		Percentage	
	True	False	True	False
Question 1	42	0	100	0
Question 4	42	0	100	0
Question 5	42	0	100	0

From the data in Table 3, 42 participants answered the manipulation check questions correctly on questions 1, 4, and 5, with a percentage of 100%. This percentage denotes that participants could understand their tasks correctly when carrying out trading simulations.

Table 4 Statistic Descriptive

Variable	N	Min	Max	Mean	SD
Price	42	-0.1322	0.2414	0.0095	0.0519
TI	42	0	1	0.52	0.505
EB	42	0	1	o.52	0.505
Herding Behavior	Y: 35				
	N: 7				

Table 4 presents data that 42 participants, or all data, passed the manipulation check questions. Of the 42 data, 35 participants did herd, while seven participants did not herd. Thus, when processing data for the second and third hypotheses, only 35 data were used, which were declared to be herding.

Next, the first hypothesis was tested on 41 data based on theoretical results, namely that investors most likely chose to trade and hold shares but carried out technical analysis. This hypothesis detected herding behavior in the investment decisions of novice investors. Because the data showed that it was not normally distributed, the test was carried out using the chi-square test.

Table 5 Chi-Square Test

	Herding
Chi-Square	20.512
Df	1
Asymp. Sig	0,000

Table 5 displays the results of herding behavior in making investment decisions for novice investors. Thirty-five investors carried out herding with the researchers' hope of a

uniform distribution, which was in line with expectations, namely 20.5, so there was a difference of 14.5 (bigger than expected). Asym Value. Sig. from the chi-square test of 0.000 was smaller than 0.05. Thus, it can be concluded that, statistically, the hypothesis was accepted. In other words, there was herding behavior in novice investors' investment decisions.

The results of this statistical test corroborate with the efficient market hypothesis theory, putting forward that in semi-strong market conditions, the information distribution is still uneven, and naive investors tend to gain abnormal profits. This research is also in line with research by Ramli et al. (2016) and Afriani and Halmawati (2019), asserting that the imbalance of information obtained by each investor makes them make decisions based on results validated by many people, so they tend to follow the movements of other investors.

Studies by Alquraan et al. (2016) and Qasim et al. (2019) also explain that differences in information obtained cause investors to follow the directions of institutional investors more because of the assumption that institutional investors have greater control over information compared to retail investors. This herding behavior is caused by investors' level of sensitivity to losses so that, by following market movements, they hope to provide large portfolio returns and demonstrate the success of their portfolio (Umboh & Atahau, 2019).

Next, the second hypothesis tested information type on the investment herding behavior of novice investors. Tests were carried out on 35 samples that were declared herding detected so that further testing, namely the information type on the herding behavior of novice investors, was conducted. This hypothesis predicts that differences in the information types obtained by novice investors influence the decisions they make in investing. If investors receive negative information, they will follow market movements. The testing was performed using the Kolmogorov-Smirnov test.

Table 6 Hypothesis Testing Results with the Kolmogorov-Smirnov Test

		Price
Most Extreme Differences	Absolute	0.717
	Positive	0.150
	Negative	-0.717
Kolmogorov-Smirnov Z		2.098
Asymp. Sig. (2-tailed)		0.000

The results of the second hypothesis in Table 6 show that the Asymp Sig. 2 tailed was 0.000, smaller than 0.05. Thus, it can be concluded that the second hypothesis was supported statistically, indicating an influence of information type on herding behavior. This hypothesis follows the efficient market hypothesis that there is still information that has not been spread in the market, and only investors or analysts have insider information about the company. This research is also in accordance with research by Macenczak et al. (2016), which stated that in making their investments, investors pay less attention to the company's fundamental information if it is in a negative condition.

Investors prefer to follow circulating news and information recommended by investor community groups by verifying the stock's technical information.

Apart from that, the test results of this research strengthen the results of research conducted by Wijaya and Meirisa (2019), who found that negative information influences novice investors' investment decisions to follow stock price movements. Information gaps in the market also influence the investment decisions of novice investors in the market (Yu et al., 2018). The conditions of this research illustrate that there is an information gap where one group of investors gets positive technical information and positive fundamentals, and another group of investors gets positive technical information and negative fundamentals.

Finally, the third hypothesis investigated the influence of overconfidence bias on the investment herding behavior of novice investors. Tests were carried out on 35 samples that were detected to be herding so that further testing, namely overconfidence in the herding behavior of novice investors, was performed. This hypothesis predicts that the differences in emotional bias, namely overconfidence and underconfidence, possessed by novice investors influence the decisions they make in investing, where the assessment made of a stock will be too excessive. They will trust the results of the analysis. The testing was carried out using Mean-Whitney.

Table 7 Hypothesis Test Results with Mann-Whitney

	Price
Mann-Whitney U	138.000
Wilcox W	258.000
Z	-0.402
Asymp. Sig. (2-tailed)	0.688
Exact Sig. [2*(1-tailed Sig.)]	0.705

From Table 7, the Asymp Sig. (2-tailed) value was 0.688, higher than 0.05. Therefore, it can be said that the second hypothesis was rejected. Statistically, there was no influence of overconfidence bias on herding behavior. The test results also revealed that this hypothesis is not in accordance with the efficient market hypothesis theory, proposing that a semi-strong market condition is a market condition that is not yet efficient, so decision-making is susceptible to bias, especially confidence in making decisions based on one's abilities and profitable experiences in the past.

Nevertheless, the results reinforce a study by Wulandari and Iramani (2014), showing that overconfidence does not cause investors to underestimate the investment risks they face. This is because overconfidence is not a factor in decision-making, so this self-confidence only refers to perceptions in managing and taking action. Other research that supports this hypothesis is the research of Afriani and Halmawati (2019), who found that knowledge and skills were not used in making investment decisions. Decision-making is based on circulating information recommendations from stockbrokers, friends, and family. Thus, the third hypothesis was rejected.

Conclusion

This research aims to detect the existence of herding behavior among novice investors and the influence of the information type and overconfidence bias, which are thought to influence this behavior. The examination was carried out by students who were members of the Capital Markets Study Group. The results of this research indicate that novice investors exhibited herding behavior in investment decision-making. This behavior was influenced by the type of information used in making decisions. However, overconfidence bias did not affect the herding behavior of novice investors due to overconfidence bias. This denotes that for novice investors, the level of overconfidence did not dominate investment decisions. This might be due to the inherent nature of this group, namely, lack of experience and the fact that investment activities are not the main activity in their real life.

The results of this research provide input for regulators, in this case, the Financial Services Authority, to pay more attention to the characteristics of novice investors. Regulators need to conduct investment learning outreach activities from practitioners more frequently so that the herding behavior inherent in novice investors can be properly directed.

For its limitations, the testing in this study used non-parametric statistical tests, which was due to the number of participants not being too large. The power of the test is not as good as the parametric test, so the research results need to be understood wisely. As such, future research needs to consider sample adequacy and use capital markets groups at several universities to improve sample quality.

References

Abidin, S., & Hidayat, R. R. (2016). Pengaruh Faktor-Faktor Teknikal Terhadap Harga Saham (Studi Pada Harga Saham IDX30 di Bursa Efek Indonesia Periode Tahun 2012-2015). Brawijaya University.

Afriani, D., & Halmawati, H. (2019). Pengaruh Cognitive Dissonance Bias, Overconfidence Bias Dan Herding Bias Terhadap Pengambilan Keputusan Investasi. *Jurnal Eksplorasi Akuntansi, 1*(4), 1650-1665. https://doi.org/10.24036/jea.v1i4.168

Al-Shboul, M. (2012). Asymmetric effects and the herd behavior in the Australian equity market. *International Journal of Business and Management, 7*(7), 121. https://doi.org/10.5539/ijbm.v7n7p121

Alquraan, T., Alqisie, A., & Al Shorafa, A. (2016). Do behavioral finance factors influence stock investment decisions of individual investors? (Evidences from Saudi Stock Market). *American international journal of contemporary research, 6*(3), 159-169.

Anggraeni, A., & Almilia, L. S. (2017). Model belief adjustment dalam pengambilan keputusan investasi berdasarkan informasi nonakuntansi. *Jurnal ekonomi dan bisnis, 20*(1), 30-49. https://doi.org/10.24914/jeb.v20i1.923

Aslam, F., Ferreira, P., Ali, H., & Kauser, S. (2022). Herding behavior during the COVID-19 pandemic: A comparison between Asian and European stock markets based on intraday multifractality. *Eurasian Economic Review, 12*(2), 333-359. https://doi.org/10.1007/s40822-021-00191-4

Bakar, S., & Yi, A. N. C. (2016). The impact of psychological factors on investors' decision making in Malaysian stock market: a case of Klang Valley and Pahang. *Procedia Economics and Finance, 35*, 319-328. https://doi.org/10.1016/S2212-5671(16)00040-X

Brilliand, D. P. E., Hidayat, R. R., & Darmawan, A. (2016). Analisis Fundamental dalam Penilaian Harga Saham dengan Menggunakan Metode Dividen Discounted Model dan Price Earning Ratio (Studi Pada Perusahaan Multinasional Sub Sektor Semen yang terdaftar di Bursa Efek Indonesia Periode 2013-2015). *J. Adm. Bisnis, 37*.

Brooks, M., & Byrne, A. (2008). Behavioral finance: Theories and evidence. The Research Foundation of CFA Institute. University of Edinburgh.

Chen, Y. F., Yang, S. Y., & Lin, F. L. (2012). Foreign institutional industrial herding in Taiwan stock market. *Managerial Finance, 38*(3), 325-340. https://doi.org/10.1108/03074351211201442

Choi, N., & Sias, R. W. (2009). Institutional industry herding. *Journal of financial economics, 94*(3), 469-491. https://doi.org/10.1016/j.jfineco.2008.12.009

Eduardus Tandelilin, S., Hartono, J., & Hanafi, M. M. (2013). Detecting the existence of herding behavior in intraday data: Evidence from the Indonesia stock exchange. *Gadjah Mada International Journal of Business, 15*(1), 27-44. https://doi.org/10.22146/gamaijb.5399

Enow, S. T. (2023). Detecting the Herding Behaviour in the South African Stock Market and its Implications. *International Journal of Economics and Financial Issues, 13*(2), 88-92. https://doi.org/10.32479/ijefi.13996

Fama, E. F. (1970). Efficient capital markets: A review of theory and empirical work. *The journal of finance, 25*(2), 383-417. https://doi.org/10.32479/ijefi.13996

Fathmaningrum, E. S., & Utami, T. P. (2022). Determinants of Investment Decisions in the Capital Market During the COVID-19 Pandemic. *Journal of Accounting and Investment, 23*(1), 147-169. https://doi.org/10.18196/jai.v23i1.13408

Gavriilidis, K., Kallinterakis, V., & Öztürkkal, B. (2020). Does mood affect institutional herding? *Journal of Behavioral and Experimental Finance, 26*, 100290. https://doi.org/10.1016/j.jbef.2020.100290

Hirshleifer, D., Subrahmanyam, A., & Titman, S. (1994). Security analysis and trading patterns when some investors receive information before others. *The journal of finance, 49*(5), 1665-1698. https://doi.org/10.1111/j.1540-6261.1994.tb04777.x

Hudson, Y., Yan, M., & Zhang, D. (2020). Herd behaviour & investor sentiment: Evidence from UK mutual funds. *International Review of Financial Analysis, 71*, 101494. https://doi.org/10.1016/j.irfa.2020.101494

Jaiyeoba, H. B., & Haron, R. (2016). A qualitative inquiry into the investment decision behaviour of the Malaysian stock market investors. *Qualitative Research in Financial Markets, 8*(3), 246-267. https://doi.org/10.1108/QRFM-07-2015-0027

Jiang, H., & Verardo, M. (2018). Does herding behavior reveal skill? An analysis of mutual fund performance. *The journal of finance, 73*(5), 2229-2269. https://doi.org/10.1111/jofi.12699

Kartini, K., & Nugraha, N. F. (2015). Pengaruh illusions of control, overconfidence dan emotion terhadap pengambilan keputusan investasi pada investor di Yogyakarta. *Asian Journal of Innovation and Entrepreneurship (AJIE), 4*(2), 114-122. https://doi.org/10.20885/ajie.vol4.iss2.art6

Komalasari, P. T. (2016). Information asymmetry and herding behavior. *Jurnal Akuntansi dan Keuangan Indonesia, 13*(1), 4. https://doi.org/10.21002/jaki.2016.04

Kufepaksi, M. (2008). Overconfident Behavior in a Security Market, the Implication of Self Deceptive Behavior in Price Discovery Processes–a Market Experiment. *Jurnal Ekonomi dan Bisnis Indonesia, 23*(1), 77-97.

Kumar, S., & Goyal, N. (2015). Behavioural biases in investment decision making–a systematic literature review. *Qualitative Research in Financial Markets, 7*(1), 88-108. https://doi.org/10.1108/QRFM-07-2014-0022

Lev, B., & Thiagarajan, S. R. (1993). Fundamental information analysis. J*ournal of accounting research, 31*(2), 190-215. https://doi.org/10.2307/2491270

Macenczak, L. A., Campbell, S., Henley, A. B., & Campbell, W. K. (2016). Direct and interactive effects of narcissism and power on overconfidence. *Personality and Individual Differences, 91*, 113-122. https://doi.org/10.1016/j.paid.2015.11.053

Manurung, A. H. (2012). *Teori perilaku keuangan (Behaviour finance).* Economics of Management, 41(4), 1-13.

Merkle, C. (2017). Financial overconfidence over time: Foresight, hindsight, and insight of investors. *Journal of Banking & Finance, 84*, 68-87. https://doi.org/10.1016/j.jbankfin.2017.07.009

Moore, D. A., & Schatz, D. (2017). The three faces of overconfidence. *Social and Personality Psychology Compass, 11*(8), e12331. https://doi.org/10.1111/spc3.12331

Nahartyo, E. (2012). *Desain dan implementasi riset eksperimen.* Yogyakarta: UPP STIM YKPN.

Ormos, M., & Joó, I. (2014). Are Hungarian investors reluctant to realize their losses? *Economic Modelling, 40,* 52-58. https://doi.org/10.1016/j.econmod.2014.03.018

Paramita, R., & Isbanah, Y. (2018). Bias Kognitif Dan Kepribadian Individu: Studi Perilaku Investor Muda di Surabaya. *Jurnal Riset Manajemen Sains Indonesia (JRMSI), 9*(2). https://doi.org/10.21009/JRMSI.009.2.03

Qasim, M., Hussain, R., Mehboob, I., & Arshad, M. (2019). Impact of herding behavior and overconfidence bias on investors' decision-making in Pakistan. *Accounting, 5*(2), 81-90. https://doi.org/10.5267/j.ac.2018.7.001

Rahardjo, S. S. (2015). Trading behavior of foreign vis a vis local investors in the Indonesian stock market. *Gadjah Mada International Journal of Business, 17*(1), 47-64. https://doi.org/10.22146/gamaijb.6149

Rahman, M., & Gan, S. S. (2020). Generation Y investment decision: an analysis using behavioural factors. *Managerial Finance, 46*(8), 1023-1041. https://doi.org/10.1108/MF-10-2018-0534

Ramli, I., Agoes, S., & Setyawan, I. R. (2016). Information asymmetry and the role of foreign investors in daily transactions during the crisis; A study of herding in the Indonesian Stock Exchange. *Journal of Applied Business Research (JABR), 32*(1), 269-288. https://doi.org/10.19030/jabr.v32i1.10178

Ritter, J. R. (2003). Behavioral finance. *Pacific-Basin finance journal, 11*(4), 429-437. https://doi.org/10.1016/S0927-538X(03)00048-9

Setiawan, Y. C., Atahau, A. D. R., & Robiyanto, R. (2018). Cognitive dissonance bias, overconfidence bias dan herding bias dalam pengambilan keputusan investasi saham. AFRE (Accounting and Financial Review), 1(1). https://doi.org/10.26905/afr.v1i1.1745

Supramono, S., & Wandita, M. (2017). Confirmation bias, self-attribution bias, dan overconfidence dalam transaksi saham. *Jurnal Keuangan Dan Perbankan, 21*(1), 25-36. https://doi.org/10.26905/jkdp.v21i1.1224

Umboh, J. E., & Atahau, A. D. R. (2019). Investment interest and consumptive behaviour of student investors: between rationality and irrationality. *JDM (Jurnal Dinamika Manajemen), 10*(1), 14-31. https://doi.org/10.15294/jdm.v10i1.16837

Utami, L. D., & Kartini, K. (2016). Faktor demografis, personality traits, dan overconfidence (Survey terhadap investor saham di Yogyakarta). *Jurnal Siasat Bisnis, 20*(2), 181. https://doi.org/10.20885/jsb.vol20.iss2.art6

Wibowo, B. (2019). Idiosyncratic Volatility and Herd Behavior: Indonesia Stock Market Case. *Jurnal Bisnis dan Manajemen, 20*(1), 49-58. https://doi.org/10.24198/jbm.v20i1.275

Wijaya, T., & Meirisa, F. (2019). Pengaruh Perilaku Herding dan Volatilitas IHSG terhadap Return Pasar di Bursa Efek Indonesia. *Jurnal Inspirasi Bisnis dan Manajemen, 3*(2), 91-104. https://doi.org/10.33603/jibm.v3i2.2513

Wulandari, D. A., & Iramani, R. (2014). Studi experienced regret, risk tolerance, overconfidance dan risk perception pada pengambilan keputusan investasi. *Journal of Business & Banking, 4*(1), 55-66. https://doi.org/10.14414/jbb.v4i1.293

Xia, T., Wang, Z., & Li, K. (2014). Financial literacy overconfidence and stock market participation. *Social indicators research, 119*, 1233-1245. https://doi.org/10.1007/s11205-013-0555-9

Yu, H., Dan, M., Ma, Q., & Jin, J. (2018). They all do it, will you? Event-related potential evidence of herding behavior in online peer-to-peer lending. *Neuroscience Letters, 681*, 1-5. https://doi.org/10.1016/j.neulet.2018.05.021

About the Authors

Etik Kresnawati (E.K.) – is a lecturer at Faculty of Economics and Business of Universitas Muhammadiyah Yogyakarta, Indonesia. Email address: etikkresnawati@umy.ac.id

Lina Sofia (L.S.) – is a graduate student at Faculty of Economics and Business of Universitas Muhammadiyah Yogyakarta, Indonesia, Indonesia. Email address: linasofia899@gmail.com

Evy Rahman Utami (E.R.U.) – is a lecturer at Faculty of Economics and Business of Universitas Muhammadiyah Yogyakarta, Indonesia. Email address: evy.rahman@umy.ac.id

Author Contributions

Conceptualisation, E.K.; Methodology, E.K.; Investigation, L.S.; Analysis, E.K.; Original draft preparation, L.S.; Review and editing, E.K.; Visualization, E.R.U.; Supervision, E.R.U.; Project administration, E.R.U.

Conflicts of Interest

The authors declare no conflict of interest. The funders had no role in the design of the study; in the collection, analyses, or interpretation of data; in the writing of the manuscript, or in the decision to publish the results.