



Herding behavior, disposition effect & investment decision: Testing the role of risk perception

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ABSTRACT

This study explores how herding behavior, disposition effect, and risk perception affect the investment decisions of college students, with risk perception as a moderating variable. The survey involved selecting 210 respondents using a purposive sampling technique. This research examined the association between independent and dependent variables using AMOS and SPSS to test the hypotheses. The Structural Equation Model (SEM) test results show that risk perception is not a moderating factor in the relationship between herding behavior and investment decisions. How individuals perceive risk can impact how the disposition effect influences investment decisions. The study's findings indicated that herding behavior, the disposition effect, and risk perception strongly impact investment decisions.

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1. INTRODUCTION

Due to some students' continued reliance on their parents, the lack of income is a common financial issue in student life (Margaretha & Pambudhi, 2015). According to Sabri et al. (2008) in Margaretha & Pambudhi (2015), most students manage their funds for the first time while attending college.

The most miniature scale of sound financial management is personal financial management, which controls income and expenses (Muttaqiin et al., 2018). Setting long- and short-term goals is a crucial step in financial direction (Gie, 2020; Dita Anjani et al., 2022). "personal finance" refers to budgeting, investing, and money management (Dita Anjani et al., 2022). Future economic stability is what financial and investment management aims to achieve. It's become popular to invest in the fourth industrial revolution. Stock investments, equity funds, and capital markets are a few of these. Based on data from KSEI Individual Investor Demographics in August 2023, there is a decrease in the number of investors with the student criteria of 2.38% from August 2022. This raises concerns about students' understanding of investment.

Allocating resources to earn sizable returns while paying for the investment over a medium- to long-term period is known as investing. Apart from financial means, other resources such as materials and human resources are also used. Investment outcomes are uncertain due to the influence of financial and economic surroundings on the investments (Avram et al., 2009; V Agnes, 2013).

Investment involves allocating funds to generate greater returns in the future (Afriani et al., 2019). When an individual invests, the product is used with the expectation that its value will rise over time, thus raising its value (Alfianto, 2016; Jovianto et al., 2023).

The simplicity of investing has impacted specific individuals who mistakenly believe that investing is a way of making a profit quickly and with significant amounts of money. When novel technologies like trading robots and investment hackers develop, individuals are aware of them (Jovianto et al., 2023).

According to early investment theory, investors make rational decisions based on maximizing profits while minimizing risk. Recent ideas, however, contradict these hypotheses and assumptions. Because the human mind is incapable of rational thought, the market always operates effectively. While rational thought says that stock market investing is ideal for some types of investors, psychological elements like greed and human fear can affect a person's decision to invest. However, the fear of financial loss and the exposure to a partner's financial loss in the stock market can impact investment decisions (Budhiraja K et al., 2018; Jovianto et al., 2023).

An investor must determine whether to invest now, even when he does not have enough information about future returns, or whether to wait until he has more information about the unknowable. An investor may lose money if he chooses to stay for additional information, which would be bad for him.

The decision about investing can be made through purchasing real estate, supplies, stocks, deposits, and other things. Human conduct might exhibit rational or irrational views when investing. A decision-making method based on calculated choices with maximal outcomes is known as rationality. In other words, rationality attempts to benefit or have an advantageous effect on investors. Irrational perception fails to assess information and decide among available options (Al Mamun et al., 2015). Investors frequently hesitate to make the best and most methodical investment decisions because of the irrationality of their choices brought on by behavioral biases (Siraji et al., 2021; Jovianto et al., 2023).

Madaan & Singh (2019) argue that the theory of rationality is based on two pillars: rational rules and rational action. Under conditions where there are well-defined rules of behavior, people can modify their efforts to achieve the most significant benefit. People's decision-making styles can be characterized as either rational or irrational. According to this theory, human decision-making is flawed due to cognitive biases and limitations (M Ahmad Zamri et al., 2017; Madaan & Singh, 2019).

Although people's emotions and gut feelings may affect their financial decisions, rational factors are the primary determinant of their economic behavior. This is evident in the fact that individuals often need more awareness of the influence of rules and concepts on their finances (Malini & Nilam, 2022). Strategy is necessary for making investments. The basis for a decision is often determined by evaluating reasonable hypotheses. However, at this moment, investors occasionally make irrational decisions (Normalasari et al., 2022).

The investment choice made by an investor is based on personal judgment and may vary from one investor to another. By investing at a level with a bias toward risk, investors have a risk-averse mentality (Douglas & Wildavsky, 1982; Ahmed et al., 2022), risk perception (Weber et al., 2008), and risk propensity (Combrink & Lew, 2020). Investors usually maintain a consistent level of risk tolerance, although their perception of risk can fluctuate depending on the circumstances. Perception of risk hurts investor sentiment towards the stock market (Ahmed et al., 2022). Ahmed et al. (2022) argue that because they act on behalf of others, all investors have unique perspectives and behaviors that are equally valued.

Financial behavior theory is a concept that investors use to make the best investment decisions for the highest returns since behavioral theory supports investor irrationality (Hirshleifer, 2015; A. Nur et al., 2020). Financial behavioral theory research has examined how psychological factors influence markets and financial decision-making (Madaan & Singh, 2019). Due to the problems of traditional finance, a new phenomenon called behavioral finance theory has developed. This theory describes financial situations in which individuals are not rational (Barberis, 2002; M. Geetika & S. Sanjeet, 2019). According to economic behavioral theory, a variety of behavioral biases influence how investors make investing decisions, encouraging them to deviate from rationality and make decisions that are irrational (Niehaus & Shrider, 2014; Aden Dirir, 2022)

This study extensively examines behavioral bias in individual financial decisions (Taffler et al., 2017; A. Sadik, 2022). This study will use two significant behavioral biases to examine the

effects on investing decisions as a framework. Herding behavior and the disposition effect are two biases that significantly influence individual investor decision-making (Madaan & Singh, 2019).

In financial markets, it's usual to observe herding behavior. According to Ourda, El Bouri, & Bernard (2013) and Wendy (2021), Herding behavior, which is a shortcut used by people, can be defined as the act of copying or imitating the actions of another. Herding behavior explains situations where a rational individual begins to behave irrationally as a result of imitating the opinions of others when making decisions. As a result of their tendency to imitate the actions of larger groups or traders, individual investors frequently show herd behavior (Kumar & Goyal, 2015). A study using an improved definition of herd behavior found that individuals can influence a game's network structure and outcome when they can choose their partners strategically. Such effects are called herding behavior (Aden Dirir, 2022a).

The disposition effect also constitutes an essential behavioral tendency. Investors often sell promising stocks prematurely and retain underperforming ones for extended periods (Rau, 2014; Wendy, 2021). The disposition effect occurs when investors tend to sell stocks that have appreciated in value and retain those that have depreciated in value. The two-point disposition effect is explained by the idea that an investor's gains and losses matter, a concept from prospect theory. Investors evaluate gains and losses in comparison to several benchmarks. The stock's market opening price is referred to as a reference point. They also strive to make a profit while avoiding losses. They also avoid out of risks (Parveen et al., 2018; Robin & Angelina, 2020). According to Madaan & Singh (2019), Investors are reluctant to sell assets that have lost value, even if it means continuing to lose money. The researchers' findings suggest that the disposition effect is a more deeply ingrained cognitive bias than previously believed (H.-J. Lee et al., 2008; Wierzbitzki et al., 2019).

As previously said, the two behavioral biases mentioned above are especially useful to investors because they may help identify and correct mistakes. The research project will examine how herding behavior and disposition effects among Indonesian students with varying moderation risk perceptions affect investment decision-making. This research has advantages for investors, particularly for students who may learn more about behavioral bias as an indicator of the validity of financial decisions. Additionally, this research can be utilized to raise awareness of behavioral biases, including herding behavior and disposition effects, as well as how all factors influence individuals' decisions about investing (Zhang and Zheng, 2015; Robin & Angelina, 2020).

According to Santoso et al. (2022) and Jovianto et al. (2023), herd behavior within the stock market pertains to investors' inclination to mimic others' actions rather than form independent judgments. Herding behavior can be described as a blind man following another blind man from an unreasonable point of view. This tendency develops due to interactions among many people with the same opinions and methods of conveyance (Wendy, 2021). In financial markets, herding behavior is an investor's tendency to imitate other investors (B. Iman, 2021). Herding behavior can contribute to price fluctuations in securities (Hwang & Salmon, 2014; Puspawati & Yohanda, 2022). The idea that other people have more accurate knowledge influences herding behavior. As a result, market prices may become distorted, and risk evaluation may suffer (M. Sari & Nugraha, 2016; Falah et al., 2023).

Investors who are afraid of missing out, imitate the actions of others, and react impulsively to market movements are exhibiting herding behavior (T. Purwanti, 2022; Falah et al., 2023). Investors should be able to make well-informed investment decisions without relying too much on the opinions of others. Investors who perform analysis are more likely to be mindful of their reputation and may collect their own past experiences/decisions or imitate others who they believe have a good track record to avoid making bad investment decisions (Kumar & Goyal, 2015).

According to Zahera & Bansal (2018) and Jovianto et al. (2023), the disposition effect is a behavior that aims to obtain as much profit as possible to maximize losses. This concept is regarded as an impact attitude, that is, the tendency of financial backers to avoid disasters in the financial markets on the assumption of yielding profits (Odean et al., 2010; Madaan & Singh, 2019). Many investors tend to sell their successful investments prematurely while holding on to their losing investments for an extended period of time (H. Shefrin & M. Statman, 1985; F. Fahmi & A. Nadia, 2023). Rika & Sakir (2019) cited in F. Fahmi & A. Nadia (2023), the disposition effect represents a

prevalent behavioral bias observed in investors, leading to irrational choices, such as prematurely selling profitable stocks, and persisting with underperforming stocks for extended periods. This contrasts with the rational behavior of capital markets. When stock prices fall, investors expect future prices to recover. This behavior is not in the best interests of investors and can make the stock market less efficient (T. Odean, 1998; F. Fahmi & A. Nadia, 2023). Disposition effect behavior is closely related to psychological biases such as regret of commission and regrets of omission. Regret of omission is regret for not taking action, while regret of commission means regret for taking action.

According to Rika & Sakir (2019) and F. Fahmi & A. Nadia (2023), the disposition effect is likely caused by investors' need to rebalance their portfolios and their belief that asset prices will eventually return to their average. The disposition effect is characterized by quickly selling winning stocks, holding onto losing stocks for too long, avoiding losses, and fearing loss of money. Disposition effects hurt individual investments because low-value investments usually perform poorly, while higher-value investments tend to perform better (Aspara & Hoffman, 2015; Geetika & Sanjeet, 2019). Even when the researchers changed the expected future gains or losses of investments, the disposition effect remained the same (H.-J. Lee, Park, Lee, & Wyer, 2008; Geetika & Sanjeet, 2019).

Perception is a mental process that involves interpreting the information we receive from our senses, which are influenced by our prior knowledge and experiences. The recipient of information can use it to understand the consequences of that information (Rogers, 2017; Nur Aini & Lutfi, 2019).

According to Ahmad & Shah (2022) investors' perceptions of financial asset risk are influenced by past experiences and concerns. If an individual perceives investment as risky, they exercise caution.

Investment decisions, according to Asadov (2021) and B. Iman (2021), are the act of an investor making an investment decision based on all available options. Investing is selecting an investment from various possibilities, frequently influenced by previous investment performance and anticipated future returns (Subash, 2012; Kartini, 2021). Budiarto & Susanti (2017) and W. Faris & A. Nadia (2019) define investment decisions as policies taken from various capital-plantage alternatives in the hope of gaining future profits. Investors make investment decisions by considering past performance and expected future returns (R. Subash, 2012; F. Fahmi & A. Nadia, 2023). The more investors in the capital market, the more combinations of investment decisions will be made and selected (Budiarto & Susanti, 2017; W. Faris & A. Nadia, 2019).

Investors can be divided into two categories: rational and irrational. Rational investors make decisions based on facts and analysis, while irrational investors' decisions are influenced by their emotions and biases. It is essential to consider long-term investment decisions, such as capital preservation (Sutrisno, 2012; F. Fahmi & A. Nadia, 2023). According to E. Vijaya (2014), cited in F. Fahmi & A. Nadia (2023), Investors base investment decisions on past experiences and future expectations. Investment decisions affect a business's profits and cash flow. Managers decide how much money their business needs and what kind of assets to invest in, such as current assets and fixed assets. To improve how healthy assets are used, assets no longer profitable or necessary are reduced, removed, or replaced. When making investment decisions, investors consider various factors, such as company finances, market trends, emotions, and the economy (Lee et al., 2011; B. Iman, 2021). Indicators that can influence investment decisions are return rate, risk-return, and time factor (A. S. Marsis, 2017; F. Fahmi & A. Nadia, 2023).

Research by P. Dewita & R. Alfandi (2021) Investors make independent investment decisions, not influenced by others. B. Iman (2021) Investors who follow the crowd make poor investment decisions. Research conducted by M. Geetika & S. Sanjeet (2019), has discovered that the tendency to follow the crowd (herding behavior) plays a significant role in making investment decisions in the field of research A. Nur & D. Surya (2020), herding behavior does not significantly impact investment decision-making.

In the research of S. Atif et al. (2020 in Jovianto 2023), the disposition effect has been found to considerably influence investing decisions. This statement is also confirmed by F. Fahmi &

A. Nadia (2023). However, different results were found in the study of P. Dewi & R. Alfandi (2022). Their research discovered that the disposition effect did not affect investing decisions.

Multiple studies have been performed to examine how investor risk perception influences the investment decisions they make. Chen et al. (2018) investors' risk assessment is vital for making accurate predictions about stock return and holds substantial importance in making investment decisions. In the realm of investment decisions, risk perception and loss aversion play a fundamental role (Abul, 2019; Holzmeister et al., 2020). Khairunizam and Yuyun (2019) found no impact between risk perception variables on investment decisions. According to various research results presented by Almansour et al. (2023), the perception of risk by investors strongly affects their investment decisions.

Risk perception refers to an individual, community, or society's belief about the likelihood, magnitude, and timing of a risk, which may be rational or irrational (Haryanto, 2022). According to Biais & Weber (2009) in Ademola et al. (2019), Risk perception refers to an investor's evaluation of financial risks, which is influenced by personal concerns and experiences. Financial risk management research is primarily concerned with the relationship between how investors perceive risk and the risk associated with their investments. Risk perception was chosen as a moderating variable because previous research has been inconsistent.

Overall, this research has the potential to significantly impact the financial system by promoting investor education, improving risk management practices, and developing more ethical and transparent financial products and services. The findings can inform the actions of various stakeholders, including investors, financial institutions, and policymakers, ultimately leading to a more efficient, stable, and fair financial system.

2. RESEARCH METHOD

The causal approach is adopted as the principal methodology to collect the primary data. The main source of data is a questionnaire with a set of questions. The population for the current study is students from all over Indonesia. Thus, purposive sampling is needed to obtain the most suitable sample for the study. The criteria set is to find individuals who desire or have invested in the capital market, are Indonesian citizens (WNI), and are active students with a minimum diploma program for the recent study; The questionnaire employs a 7-point Likert scale. Using a 7-point Likert scale can minimize measurement errors and result in more precise measurements. The Likert scale used in this study is (1) disagree, (2) not agree, (3) not entirely agree, (4) neutral, (5) entirely agree, (6) agree, (7) agree. To ensure control over the variables, this study will consider gender, domicile, and current education.

This research develops two research models, each of which is described in two econometric equations. Each equation model shows the relationship between variables and how they are measured. These relationships are presented systematically in the following section:

$$ID = \alpha + \beta_1.HB + \beta_2.DE + \beta_3.RP + \epsilon \dots\dots\dots \text{Model (1)}$$

$$ID = \alpha + \beta_4.HB + \beta_5.DE + \beta_6.(HB*RP) + \beta_7.(HB*RP) + \epsilon \dots\dots\dots \text{Model (2)}$$

Description:

ID = Investment Decision
HB = Herding behavior
DE = Disposition effect
RP = Risk perception
 ϵ = Residual

The analysis technique used is the Structural Equation Model (SEM) using AMOS 22 and SPSS 26 software. The Partial Least Squares approach, used in Structural Equation Modeling, simultaneously tests variable relationships using a variance-based method. Before testing data with 210 samples, the researchers ensured the validity and reliability of the questionnaire's statement item through a pre-test. The correlation analysis and structural equation models are straightforward and easy to understand.

3. RESULTS AND DISCUSSIONS

Respondent Characteristics

Based on the following demographics, this survey's respondents' profiles were analyzed:

Table 1. Characteristics of Respondents

Category	Item	f	%
Gender	Men	82	39
	Women	128	61
Total		210	100
Formal Residence	Kalimantan	47	22,4
	Jawa	98	46,7
	Sumatra	33	15,7
	Sulawesi	11	5,2
Total		210	100
Current Education	Associate's Degree	26	12,4
	Bachelor's Degree	159	75,7
	Master's Degree	25	11,9
Total		210	100

The profile of the respondents in Table 2 displays that most respondents are female (61%), with the dominance of the home island of Java (46.7%). Based on these results, respondents in this study have a good education level. Adequate education is expected to give good results in this research because it aligns with their knowledge about investment.

Measurement Models

Table 2. Goodness of Fit Index

Goodness of Fit Index	Cut off Value	Results
χ^2	Expected to be low	321.734
Df		127
χ^2 - Significance Probability	≥ 0.05	0.000
CMIN/DF	≤ 3.00	2.533
RMSEA	≤ 0.08	0.085
RMR	$< 0,05$	0.075
NFI	≥ 0.90	0.965
IF	≥ 0.90	0.979
TAG	≥ 0.90	0.974
CFI	≥ 0.90	0.979

The results presented in Table 3 show that the model satisfies the conformance requirements and can be declared as conformant. Five measurements suggest a good fit. If there are 3-4 measurements with a good level of agreement or above the cut-off value, the study model configuration can be declared adequate and accepted.

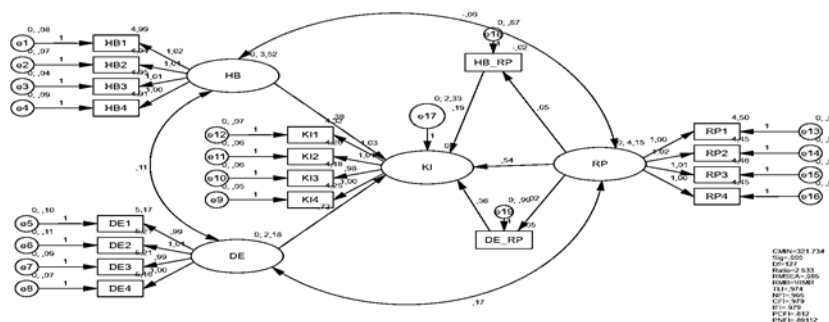


Figure 1. Full model testing

Table 3. Test Results of Research Models

No	Variable	CR	AVE	Model-1	Model-2	Explanation
1	Constanta			-14,953	-14,686	

	<i>P-value</i>			(0,000)***	-	
2	ID	0,985	0,942			
3	HB	0,982	0,932	0,375	-	H1
	<i>P-value</i>			(0,000)***	-	(Accepted)
4	DE	0,977	0,914	0,722	-	H2
	<i>P-value</i>			(0,000)***	-	(Accepted)
5	RP	0,979	0,920	0,538	-	H3
	<i>P-value</i>			(0,000)***	-	(Accepted)
6	HB*RP			-	0,742	H4
	<i>P-value</i>			-	(0,121)	(Rejected)
7	DE*RP			-	1,446	H5
	<i>P-value</i>			-	(0,001)***	(Accepted)
8	F			82,564	55,737	
	<i>P-value</i>			(0,000)***	(0,000)****	
	Adjusted R ²			0,544	0,565	

*Additional Information: Dependent Variable = KI; *** sig. 1% ; ** sig. 5% ; * sig. 10%*

Based on Table 4, validity and reliability test results show that the indicators of the constructed model meet valid and reliable criteria. Existing indicators have standardized loading factor (SLF) values above 0.50. This indicates that all metrics are sufficient to measure the entire model. The Construct Reliability (CR) test score is over 0.70. This indicates that all instruments can consistently and reliably measure the structure of the constructed model.

Table 4 presents the test results for both models tested in this research. Model 1 examined the impact of herd behavior, investment disposition, and risk perception on investment decisions. Model 2 tested moderation with risk perceptions as moderation variables.

Model-1 test results in Table 4 above show that HB, DE, and RP positively and significantly influence KI (significant on 1%). The research model also has an excellent goodness of fit test with a significance rate of one percent on its test-F. In addition, on the determination coefficient side, the test results also support the F-test, where the value of Adj-R² is 50 percent (54.4%). These findings confirm the three hypotheses developed in this study, namely H1 (herding behavior has a positive influence on investment decision-making), H2 (disposition effect has a positive influence on investment decisions), and H3 (risk perception has a positive influence on investment decision-making).

Model 2 explains the results of testing the effect of moderation of risk perception (RP). Risk perception is positioned as moderation in explaining the influence of free variables (HB and DE) on investment decisions (KI). Model validity testing through determination coefficients and F-tests showed that after involving RP, the research model remained consistent with good results. The determination factor increased to 56.5% of the previous one (54.4%), while the F-test results still supported a parsimonious and worthy model (significant on 1%). These results simultaneously confirm that the level of goodness of fit model test for the interaction model is excellent.

The test for moderation effects shows no moderation of the relationship between investment decisions and herding behavior by risk perception. On the fifth hypothesis, there is a different finding. Variable risk perception was found to moderate the relationship between the disposition effect and the investment decision; the p-value obtained is 0.001, which is less than 0.05.

Before considering risk perception, herding behavior significantly impacts investment decisions. The outcome varied in the test that included the moderation variable of risk perception. During the testing of the effect of risk perception interaction, it was observed that the herding behavior variable did not significantly influence the investment decision. This is because the p-value of 0.121 had crossed the significance limit of 0.05, and H4 was rejected. Moderation weakens the relationship between herding behavior and investment decisions as it reduces its impact. Someone with herding behavior may avoid investment risks, making risk perception irrelevant.

The disposition effect remains significant even after controlling for risk perception. It shows that risk perception interacts with bias disposition effects in explaining investment decisions. This phenomenon arises due to investors' inclination to promptly sell the stock that has performed well while persistently retaining the underperformed, which can be disastrous to the funders.

4. CONCLUSION

The research examines how risk perception moderates the connection between herding behavior, disposition effect, and investment decision-making. The analysis revealed that herding behavior, disposition effect, and risk perception strongly influence investment decision-making. The findings of this investigation are consistent with the previous research that has been conducted by Kartini (2021), Candraningrat (2019), and Eko Harry Saputro et al. (2019). Risk perception moderates the relationship between disposition effects and investment decisions but not herding behavior and investment decisions.

This research uses questionnaire surveys in the collection of observational data. The study findings are based on the perceptions of individuals who haven't made investment decisions yet. This fact is a constraint in generalizing the result of research. The limitation needs to be discussed and investigated by future research in this subject of the study. Further research should consider students with experience making investment decisions as research objects. The design of experiments should consider risk perception as a moderating factor. The use of experimental design can reveal unobservable behavior. The research findings are valuable for future investment decisions. The results also provide valuable information for further research and can be used as input to further research.

This research provides valuable insights into the complex interplay of herding behavior, disposition effect, risk perception, and their combined influence on investment decisions. The findings have significant practical and theoretical implications for various stakeholders in the financial system and contribute to the development of a more informed and ethical financial landscape.

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