




# The impact of disposition effect, herding and overconfidence on investment decision making moderated by financial literacy

 Priyo Prasetyo <sup>(a)\*</sup>  Sumiati <sup>(b)</sup>  Kusuma Ratnawati <sup>(c)</sup>



<sup>(a)</sup> Masters, Management Department, Faculty of Economics and Business, University of Brawijaya, Sawahan, 64475, Nganjuk, Indonesia

<sup>(b)</sup> Professor, Faculty of Economics and Business, University of Brawijaya, Dinoyo Street, 65144, Malang, Indonesia

<sup>(c)</sup> Doctor, Faculty of Economics and Business, University of Brawijaya, MT Haryono, 65145, Malang, Indonesia

## ARTICLE INFO

### Article history:

Received 21 October 2023

Received in rev. form 22 Nov. 2023

Accepted 26 November 2023

### Keywords:

Disposition Effect, Herding,  
Overconfidence, Financial Literacy

### JEL Classification:

E22, G11, G53

## ABSTRACT

*Behavioral finance elucidates how investors rationally commit errors in the process of making investment decisions as a result of cognitive and emotional biases, ultimately resulting in unfavorable investment choices. People are unable to avoid a variety of behavioral biases that have an impact on investors' investment decision-making processes. The human mind employs shortcuts and emotional filters to interpret information, leading to errors in the decision-making process. The objective of this study is to investigate and assess the impact of behavioral biases such as disposition effects, herding, and overconfidence on investment decision-making. Additionally, we will examine how financial literacy moderates these biases. The research employed a purposive sample strategy to select generation Z investors in Kediri City. The sample size of 400 respondents was determined using the Krejcie & Morgan table. This research employs the Partial Least Squares (PLS) Structural Equation Model (SEM) analysis method using the SmartPLS version 3 data processing application. The research findings indicate that the disposition effect and overconfidence exert a substantial impact on investment decision-making; however, herding does not exhibit a significant influence on investment choice-making. Financial knowledge enhances the impact of the disposition effect on investment decision-making in a positive way. Financial literacy has a negative moderating effect on the influence of herding and overconfidence on investment decision-making among Generation Z investors in Kediri City.*

© 2023 by the authors. Licensee SSBFNET, Istanbul, Turkey. This article is an open access article distributed under the terms and conditions of the Creative Commons Attribution (CC BY) license (<http://creativecommons.org/licenses/by/4.0/>).

## Introduction

Individuals and businesses must invest in the capital market in this day and age of globalization (Fedorowicz & Łopatka, 2022). Investment is defined as the act of investing in an asset or financial instrument now in order to profit later (Ahmad & Shah, 2020). The greater the level of investment in a country, the greater the company's business activity, which in turn can increase a country's GDP or economic growth (Nguyen & Trinh, 2018). Behaviour finance explains how investors logically make mistakes in the investment decision-making process due to cognitive and emotional biases, which ultimately lead to poor and harmful investment decisions (Kahneman and Tversky, 1979). This confirms that investors' investment decision-making process is influenced by various behavioural biases that individuals cannot avoid, and the human mind processes information using shortcuts and emotional filters that cause errors in the decision-making process (Elhussein & Abdelgadir, 2020).

According to the Indonesian Central Securities Depository (KSEI) in 2022, investors under the age of 30 account for 58.71% of Indonesian capital market investors. It is possible to conclude that generation Z dominates Indonesian capital market investors. Generation Z refers to people born between 1997 and 2012, who are now aged 11 to 26 (Natasya et al., 2022). Generation Z is a generation that grew up with technology and the rapid development of the internet, allowing them to more easily access financial information and directly implement it in their lives (Usriyono & Wahyudi, 2023). The significant increase in the number of

\* Corresponding author. ORCID ID: 0009-0005-8108-7527

© 2023 by the authors. Hosting by SSBFNET. Peer review under responsibility of Center for Strategic Studies in Business and Finance.

<https://doi.org/10.20525/ijrbs.v12i9.3026>

Indonesian capital market investors, particularly generation Z, indicates that the younger generation understands the importance of investing early on. The increased number of investors is also due to the advancement of increasingly advanced technology, such as the ability to open a stock account online.

In 2022, Kediri City's Office of Investment and One-Stop Integrated Services (DPMTSP) recorded investment realisation of IDR 2.355 trillion. However, many investors' investment decisions are still irrational, resulting in losses for many investors. The Kediri City Financial Services Authority (OJK) reported numerous cases of fraudulent investments, one of which is Sugih Berkah Trading (SBT). The phenomenon that occurs in Kediri City is that there are still many investment-related scams that indicate that investors' investment decisions are not rational (Radar Kediri, 2022). Finally, decision-making theory is an interesting topic to study in economics because every activity in the financial sector always ends with a decision (Candraningrat et al., 2018).

Prospect theory (Ahmad & Shah, 2020) explains the impact of investors' psychological biases on investment decision making. Prospect theory holds that a number of psychological factors influence investor decision making and cause it to deviate from rationality. This is due to the limited information available to them, cognitive limitations in their minds, and the limited time they have to make decisions. Irrational investor decision making is influenced by a number of behavioural biases, according to (Adil et al., (2022). Generation Z investors, in particular, frequently experience behavioural biases when making investment decisions, resulting in irrational and detrimental decisions. Generation Z investors are more likely to sell rapidly rising stocks and hold losing stocks for an extended period of time (disposition effect), investors follow the crowd / follow the crowd (herding bias), and investors are overconfident in their predictions or abilities (overconfidence bias) (Khalid et al., 2018; Adil, Singh, & Ansari, 2022; Usriyono & Wahyudi, 2023).

The disposition effect describes an investor's tendency to sell good-performing stocks (the winners) too soon and hold bad-performing stocks (the losers) too long (Sherfin & Statman, 1985). This is similar to the behaviour of investors who sell stocks when the price rises and hold stocks when the price falls (Z. Ahmed et al., 2022). This type of decision-making makes capital market conditions inefficient. Several previous studies, including one by Ahmed et al., (2022), have found empirical evidence that there is an influence between the disposition effect and investment decision making. Furthermore, Atif Sattar et al., 2020; Rasool & Ullah, 2020; Khan, 2020; Candraningrat et al., 2018; Alrabadi et al., 2018; Hayat & Anwar, 2016) research shows that the disposition effect has a positive and significant effect on investment decision making. Other studies, such as Adil, Singh, & Ansari, 2022 ; Madaan & Singh, 2019, show disparities in the influence of the disposition effect on investment decision making.

Furthermore, herding behaviour bias affects investors during the investment decision-making process (Bakar & Yi, 2016). Without proper direction, each individual investor in the stock market can create a herding bias (Z. Ahmed et al., 2022). Investors who herd behave irrationally in their investment decisions. In making investment decisions, they prefer to follow the beliefs and opinions of other investors. They notice that other investors have more information and sell their shares in lockstep with market participants. In the stock market, investors frequently begin selling their shares due to uncertainty and fear of loss (Z. Ahmed et al., 2022). The lack of information in the market is likely to influence herding behaviour (Ben Mabrouk, 2018).

Herding behaviour reduces an investor's capital market investment performance (Z. Ahmed et al., 2022). Herding bias has a positive and significant effect on investment decision making, according to Ranaweera & Kawshala, (2021); Madaan and Singh (2019). In addition, Bogdan et al., (2022); Yasir et al., (2022); Budiman & Patricia, (2021); Kartini & Nahda, (2021); Kyriazis, (2020); Atif Sattar et al., (2020); R. Ahmed et al., (2021) ; Robin & Angelina, (2020); Devadas & Vijayakumar, (2019); Alrabadi et al. However, contrary to the findings of Z. Ahmed et al., (2022); Singh et al., (2022); Bakar & Yi, (2016a); and Khan's research, (2020), herding has no significant effect on investment decision making.

Overconfidence behavioural biases influence investment decisions made by investors (Ahmad & Shah, 2020). According to Elhussein & Abdelgadir (2020), overconfidence occurs when individual investors do not sufficiently revise their initial assessment after receiving new information, resulting in a failure to recognise the error of their investment. According to Madaan and Singh (2019), overconfident investors overestimate their own judgement abilities and ignore risks; as a result, they make investment decisions based on their own personal signals and ignore information from the public. Overconfident investors invest more in the market and have a less diversified portfolio because they lack an understanding of the financial markets, and their investment returns are frequently lower than the market (Ranaweera & Kawshala, (2021). Bakar & Yi, (2016); Alrabadi et al., (2018); Iram et al., (2023); Jan et al., (2022); Ahmad & Shah, (2022); Ranaweera & Kawshala, (2022); R. Ahmed et al, 2021; Komang Arik & Gede Sri, (2021); Raheja & Dhiman, (2020); Adielyani & Marwadi, (2020); Elhussein & Abdelgadir, 2020; Atif Sattar et al., 2020; Madaan & Singh, 2019), shows that overconfidence has a significant effect on investment decision making. However, Singh et al., (2022); Dewi & Pertiwi, (2021) found that overconfidence has a negative and significant impact on investment decision making.

Previous research has revealed inconsistencies in research results regarding the influence of the disposition effect, herding, and overconfidence on investment decision making. This study proposes to include financial literacy as a moderating variable based on this research gap. Financial literacy, according to Marriott & Mellett (2006), is the ability of individuals to understand and analyse financial data in order to make sound financial decisions. According to Ahmad and Shah (2020), an investor's level of financial literacy is positive and can contribute significantly to increasing understanding of investment decisions. Financial literacy enables a person to effectively manage financial resources, allowing a financially savvy investor to ignore behavioural biases and make sound financial decisions (Son & Park, 2021).

A lack of financial literacy information can make decision-making less precise and increase ambiguity. These findings suggest that investors with low financial literacy make irrational and unprofitable investment decisions (Rasool & Ullah, 2020; Son & Park, 2021). Researchers discovered that investors with low financial literacy have undiversified (Fedorova et al., 2015). A high level of financial literacy is expected to weaken or reduce the bias of disposition effect, herding, and overconfidence behaviour in making investment decisions, resulting in rational investment decisions. Financial literacy is critical in mitigating the negative effects of investor behavioural biases.

Based on existing data and research gaps, this study aims to analyze the influence of "The Effect of Disposition Effect, Herding and Overconfidence on Investment Decision Making moderated by Financial Literacy."

## Literature Review

### Conceptual Background and Hypothesis Development

#### Prospect Theory

Prospect theory, first developed by Kahneman and Tversky (1979), examines a person's behaviour when making a financial decision under uncertain circumstances. Prospect theory states that people make decisions based on the weight of the difference between gains and losses, rather than the final result, and establish reference points and make decisions accordingly. Investors will be more stressed by potential losses than by potential profits. Individuals make investment decisions based on more than just logic (Adil et al., 2022). Prospect theory focuses on an investor's subjective decision, whereas expected utility or expected utility focuses on investors' rational expectations in making investment decisions (Ahmad and Shah, 2022). Prospect theory describes human behaviour in the face of uncertainty and risk when making decisions (Ullah et al., 2020). Prospect theory has been used numerous times to assess and analyse various types of phenomena related to a person's individual behaviour, particularly in decision-making processes that deviate from rationality (Z. Ahmed and colleagues, 2022).

#### Investment Decision

An investment decision is a decision or policy regarding the purchase of assets from available resources with the goal of reaping greater future benefits, or how an individual's decision to allocate his assets into productive financial instruments with the goal of obtaining greater profits in the future (Brigham & Houston, 2019). Every investor wants to make the best investment decisions possible (Sharpe, 1964). Merton, (1987) asserts that optimal and rational investment decisions are dependent on advanced financial knowledge. Standard finance presumes that people with complete information can always make rational decisions (Ben Ameer et al., 2020). Various factors influence investor decisions, including demographics, economics, social background, gender, and age (Hayat & Anwar, 2016). Investment decisions are critical because, just as a business seeks to maximise profits, an investor seeks to maximise results by making sound decisions (Khalid et al., 2018). However, some investors rely on their personal judgement, while others make decisions based on education and evidence.

#### Disposition Effect

The disposition effect describes an investor's proclivity to sell good performing stocks (the winners) too soon and hold bad performing stocks (the losers) too long (Sherfin & Statman, 1985). This relates to the behaviour of investors who sell stocks or assets when their price has increased and hold stocks or assets when their value has decreased (Z. Ahmed et al., 2022). The disposition effect can reduce the overall rate of return on investment; it is one type of investor misbehaviour that occurs in the capital market. The disposition effect describes the tendency of investor behaviour to sell their shares quickly when they are profitable, while holding these shares longer when they are losing money (Adil et al., 2022; Candraningrat et al., 2018; Khan, 2020). According to Barber & Odean (2001), the reason underlying disposition effect behaviour is the presence of psychological uncertainty, which results in non-optimal choices and irrational decisions by investors. The disposition effect can cause people to miss out on bigger profits or to hold onto stocks that have dropped in value for longer than they should. Z. Ahmed et al., (2022); Atif Sattar et al., (2020); (Ullah et al., 2020; Khan, 2020; Candraningrat et al., 2018; Alrabadi et al., 2018; Hayat & Anwar, 2016) show that the disposition effect has a positive and significant effect on investment decision making.

**H1:** Disposition effect has a significant effect on investment decision making.

#### Herding

Andrea Devenow & Ivo Welch, (1996) define herding as the psychological behaviour of investors who disregard their personal beliefs in favour of believing more in the opinions of others regardless of what happens in the future. Herding is a common phenomenon in financial markets that refers to a general human tendency to refer to, observe, and imitate the behaviour of others when making investment decisions (Madaan & Singh, 2019). Herding can increase market volatility and risk for investors. Herding behaviour is detrimental to an investor's capital market investment performance (Z. Ahmed et al., 2022). In the absence of proper guidance, any individual investor in the stock market can create herding bias (Z. Ahmed et al., 2022). Herding bias has a positive and significant effect on investment decision making, according to Ranaweera and Kawshala (2021); Madaan and Singh (2019), who studied investor behaviour in making stock market investment decisions. Several studies have analysed and tested the effect of

herding on investment decision making, including (Bogdan et al., 2022; Yasir et al., 2022; Kyriazis, 2020; Atif Sattar et al., 2020; Riaz et al., 2020; Alrabadi et al., 2018; Hayat & Anwar, 2016).

**H2:** Herding has a significant effect on investment decision making.

### Overconfidence

Overconfidence is a cognitive heuristic bias that can be defined as an unwarranted belief in one's intuitive reasoning, judgement, and cognitive abilities (Pompian, 2021). Overconfidence occurs when individual investors do not revise their initial assessments sufficiently after receiving new information, and thus do not realise how incorrect their investment assessments are. Overconfidence bias causes market inefficiencies as a result of excessive mispricing and volatility. Overconfidence can cause an individual's behaviour to act to take a risk, whereas rational investors should avoid risk and maximise profits (Ahmad & Shah, 2022). Investors who are overconfident in their investment decisions will face greater risk. According to Bakar and Yi (2016), who investigated investor behaviour in making investment decisions in the Malaysian Stock Exchange, overconfidence has a positive and significant effect on investment decision making. Furthermore, according to the findings of the study (Alrabadi et al., 2018); Ranaweera & Kawshala, 2022; R. Ahmed et al., 2021; Raheja & Dhiman, 2020; Elhussein & Abdelgadir, 2020; Atif Sattar et al., 2020; Madaan & Singh, 2019), overconfidence has a positive and significant effect on investment decision making.

**H3:** Overconfidence has a significant effect on investment decision making.

### Financial Literacy

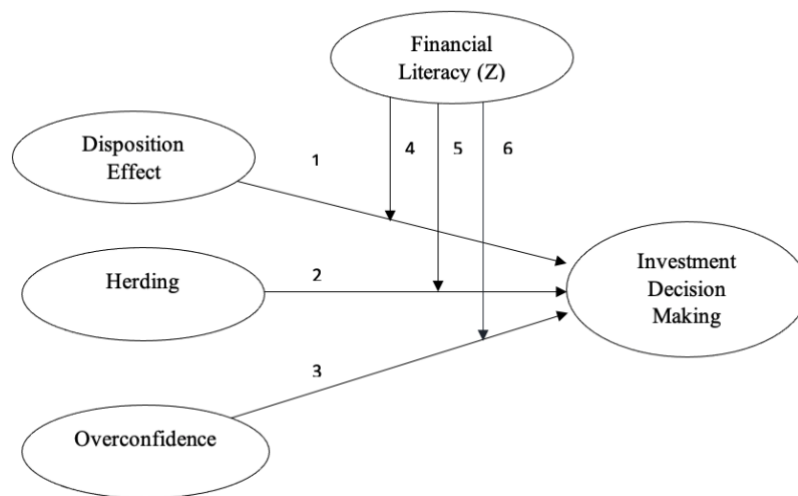
Financial literacy according to Marriott & Mellett, (2006) is the ability of individuals to understand and analyze financial data so that they can make appropriate financial decisions. Lusardi & Mitchell, (2007) define that financial literacy is knowledge of basic financial concepts and the ability to perform simple calculations. Financial literacy helps in managing financial resources effectively. The findings show that investors who have low financial literacy tend to make irrational or unprofitable investment decisions (Rasool & Ullah, 2020; Son & Park, 2021). Financial literacy helps in managing financial resources effectively. investors who have low financial literacy tend to make irrational or unfavorable investment decisions and have undiversified portfolios (Rasool & Ullah, 2020; Son & Park, 2021; Fedorova et al., 2015).

A financially savvy investor is able to ignore behavioral biases and is able to make rational financial decisions (Son & Park, 2021). Financially savvy investors are able to ignore the behavioral bias of the disposition effect. And investors do not sell their shares that experience profits too quickly, and hold shares that experience losses for too long, they are more rational in making investment decisions (Singh et al., 2022). Hayat & Anwar, (2016) state that the effect between overconfidence and individual investment decision making is negatively and significantly moderated by financial literacy. Ahmad & Shah, (2022) state that the effect between overconfidence and individual investment decision making is negatively and significantly moderated by financial literacy, financial literacy plays an important role in overcoming the negative effects of overconfidence behavioral bias. Investors who have low financial literacy tend to be overconfident and less rational about their investment decisions, while investors with high investment literacy are less confident, minimize risk and are more rational in making investment decisions.

**H4:** Financial literacy moderates the effect between disposition effect and investment decision making

**H5:** Financial literacy moderates the effect between herding and investment decision making.

**H6:** Financial literacy moderates the effect between overconfidence and investment decision making



**Figure 1:** Conceptual Model of the Study; Source: Authors 2023

## Research and Methodology

This study employs an explanatory research approach to objectively test the theory by examining the relationship between each variable using statistical procedures and a quantitative approach. This study included 14,492 generation Z investors in Kediri City in 2022. Purposive sampling was used in this study instead of non-probability sampling. Purposive sampling restricts sampling to specific people who have or meet the criteria determined by the researcher in order to provide the desired information (Sekaran & Bougie, 2014). Sample selection criteria include having a securities account in the capital market, being a generation Z investor in Kediri City between the ages of 17 and 26, and having ever made stock trading transactions. This study used 400 respondents as samples.

The data used in the study is based on survey results and documentation. A Likert scale is used in the submitted questionnaire to determine the extent to which respondents give their opinions on a predetermined scale. The structural equation modelling partial least square (SEM-PLS) method was used to analyse the data. The concept behind using PLS data analysis is to test the modified results of several research models in order to provide an overview of the variables studied (Garson, 2016). In this study, the Disposition Effect variable employs indicators from Prosad et al., 2017; Khan, 2020). Herding employs indicators from (Prosad et al., 2017); Adil et al., 2022). Furthermore, Overconfidence employs indicators from (Prosad et al., (2017); Adil et al., 2022), whereas Financial Literacy employs indicators from (Ahmad & Shah, 2022) and (Khan, 2020).

## Finding and Discussion

**Table 1:** Demographic Respondent

	Category	Frequency	%
<b>Age</b>	17 - 20 years	57	14,25
	21 - 23 years	221	55,25
	24 - 26 years	122	30,5
<b>Education</b>	Senior High School	129	32,25
	Undergraduate	251	62,75
	Graduate	20	5
<b>Inventory Length</b>	< 1 years	71	17,75
	1 - 3 years	255	63,75
	4 - 6 years	45	11,25
	7 - 9 years	29	7,25
<b>Income</b>	< Rp. 1.000.000	57	14,25
	Rp 1.000.000 - Rp. 3.000.000	235	58,75
	Rp. 3.000.000 - Rp. 5.000.000	68	17
	Rp. 5.000.000 - Rp. 10.000.000	36	9
	> Rp. 10.000.000	4	1
<b>Job Occupation</b>	ASN/TNI/POLRI	45	11,25
	Student	79	19,75
	Private Employ	243	60,75
	Self-employed	33	8,25

**Source:** Author 2023

According to the table above, the majority of respondents are between the ages of 21 and 23 (55.25%), indicating that generation Z investors in the city of Kediri are dominated by investors between the ages of 21 and 23. Then, based on education, Diploma / Bachelor (62.75%) dominates, indicating that generation Z investors in Kediri City are dominated by those with the most recent education Diploma / Bachelor. Furthermore, 1-2 years (63.75%) dominated the duration of invention. This indicates that respondents invest for a period of one to three years. Then, based on income, respondents with an income of Rp. 1,000,000 - Rp. 3,000,000 (58%), this shows that the respondent's income is Rp. 1,000,000 - Rp. 3,000,000 due to the Regional Minimum Wage (UMR) of Kediri City in 2023, which is Rp. 2,318,116. Based on Work, the majority of respondents (60.75%) work as Private Employees, indicating that the majority of respondents who invest most frequently are Private Employees.

## Descriptive Statistic and Correlation

This study uses Disposition Effect, Herding, Overconfidence, and Financial Literacy variables and can be seen in table 2 along with the results of the average value of respondents' answers equipped with the standard deviation of each variable.

**Table 2:** Descriptive Statistic and Correlation

Variable	Mean	SD
Disposition Effect	4.38	0,74
Herding	4.11	0.88
Overconfidence	4.33	0.88
Investment Decision	4.03	0.88
Financial Literacy	4.29	0.86

Source: Author 2023

### Measurement Model Analysis

This study employs convergent validity and discriminant validity tests with the constructs to be measured for the initial research scale development, with values ranging from 0.50 to 0.60 considered sufficient (Ghozali & Latan, 2015). The results of the validity and reliability tests are detailed in table 3 below.

**Table 3:** Validity Analysis

Latent Variable	Indicator	Convergent Validity		Discriminant Validity	
		Loading Factor	Result	AVE	Result
<b>Disposition Effect</b>	X1.1	0,917	Valid	0,742	Valid
	X1.2	0,881	Valid		
	X1.3	0,798	Valid		
	X1.4	0,845	Valid		
<b>Herding</b>	X2.1	0,831	Valid	0.733	Valid
	X2.2	0,860	Valid		
	X2.3	0,839	Valid		
	X2.4	0,867	Valid		
	X2.5	0,881	Valid		
<b>Overconfidence</b>	X3.1	0,881	Valid	0.739	Valid
	X3.2	0,804	Valid		
	X3.3	0,872	Valid		
	X3.4	0,878	Valid		
<b>Investment Decision</b>	Y1.1	0,777	Valid	0.659	Valid
	Y1.2	0,806	Valid		
	Y1.3	0,750	Valid		
	Y1.4	0,907	Valid		
	Y1.5	0,813	Valid		
	Y1.6	0,845	Valid		
	Y1.7	0,772	Valid		
<b>Financial Literacy</b>	Z1.1	0,906	Valid	0.659	Valid
	Z1.2	0,887	Valid		
	Z1.3	0,847	Valid		
	Z1.4	0,882	Valid		
	Z1.5	0,908	Valid		
	Z1.6	0,893	Valid		
	Z1.7	0,864	Valid		
	Z1.8	0,894	Valid		

Source: Author 2023

Based on table 5.11, it shows that the loading factor value (convergent validity) of each item is greater than 0.7, so each item on the Disposition Effect, Herding, Overconfidence, Investment Decision and Financial Literacy variables is said to be valid. So it is concluded that all items in each variable have performed their measurement functions appropriately and precisely with the SmartPLS measuring instrument.

**Table 4:** Reliability Analysis

	Cronbach's Alpha	Composite Reliability
Disposition Effect	0.883	0.920
Herding	0.909	0.932
Overconfidence	0.882	0.919
Investment Decision	0.913	0.931
Financial Literacy	0.960	0.967

**Source:** Author 2023

Based on table 4 above, it can be concluded that the data used in this study are reliable. The threshold value for reliability is 0.70 (Ghozali and Latan, 2015). In table 4 it can be seen that each variable has a Cronbach's alpha and composite reliability value greater than 0.7. So that the items used in this study are reliable.

### Structural Model Test

The purpose of testing the structural model (inner model) is to determine the suitability of a model, which can be seen from the coefficient of determination ( $R^2$ ), predictive relevance ( $Q^2$ ), and goodness of fit model (GoF). The coefficient of determination ( $R^2$ ) of the Investment Decision variable was 0.934, indicating that the investment decision variable can be explained by the disposition effect, herding, and overconfidence variables by 93.4%, with the remaining 6.6% explained by other variables not included in this research. The value of the coefficient of determination ( $R^2$ ), predictive relevance ( $Q^2$ ), and goodness of fit model (GoF). The coefficient of determination ( $R^2$ ) of the Investment Decision variable was 0.934, indicating that 93.4% of the investment decision variable can be explained by the disposition effect, herding, and overconfidence variables, with the remaining 6.6% explained by variables not included in this study.

The  $Q^2$  test results show a value of  $Q^2$  of 0.934, indicating that this research model has predictive relevance. Disposition Effect, Herding, and Overconfidence accounted for 93.4% of the total, with the remaining 6.6% attributed to other variables not included in this research model. The Goodness of Fit test attempts to assess the accuracy of a research model built on the research variables as a whole. Based on the results of the GoF calculations, it yields a value of 0.83, implying that the structural model of this study in general has strong predictive properties. The goodness of fit (GoF) above indicates that the model in this study is robust, allowing hypothesis testing.

### Hypothesis Test

This study has hypothesis testing, namely testing the direct effect and moderated effect. The direct effect test aims to test the influence between the Disposition Effect, Herding and Overconfidence on Investment Decisions.

**Table 5:** Direct Effect Test Results

	Path Coef	t-Statistic	P-Value	Result
Disposition Effect → Investment Decisions	0.144	3.900	0.002	Accepted
Herding → Investment Decisions	0.030	1.594	0.000	Rejected
Overconfidence → Investment Decisions	0.372	12.602	0.024	Accepted

**Source:** Author 2023

The table above shows that the Disposition Effect has a significant effect on Investment Decisions ( $\beta = 0.144$ ,  $t = 3.900$   $p < 0.05$ ) so that H1 is accepted. Herding has no significant effect on Investment Decisions ( $\beta = 0.030$ ,  $t = 1.594$   $p < 0.05$ ) so that H2 is rejected. In addition, Overconfidence has a significant effect on Investment Decisions ( $\beta = 0.372$ ,  $t = 12.602$   $p < 0.05$ ) so that H3 is accepted.

**Table 6:** Indirect Effect Test Results

	Path Coef	t-Statistic	P-Value	Result
Disposition Effect → Financial Literacy → Investment Decisions	0.442	7.633	0.000	Accepted
Herding → Financial Literacy → Investment Decisions	-0.225	9.592	0.000	Accepted

**Source:** Author 2023

Table 6 above explains that the indirect test or mediating role of Financial Literacy between the Disposition Effect relationship on Investment Decisions has a positive and significant effect ( $\beta = 0.442$ ,  $t = 7.633$   $p < 0.05$ ) so that hypothesis 4 is accepted. In addition, Financial Literacy also successfully mediates Herding on Investment Decisions showing negative and significant results ( $\beta = 0.225$ ,

$t = 9.592$ ,  $p < 0.05$ ) so that hypothesis 5 can be accepted. It can be concluded that hypotheses 6 and 7 in the study are accepted. This can be interpreted that Financial Literacy is a partial mediation between the Disposition Effect and Investment Decisions.

The disposition effect has a positive and significant impact on investment decisions made by generation Z investors in Kediri City. This means that the higher the disposition effect behaviour of investors, the higher the investment decision making. The findings indicate that investors, particularly generation Z in Kediri City, still experience disposition effect behavioural bias when making investment decisions, and that investors cannot act rationally when making investment decisions. When the value or price of a stock rises, individuals who suffer from disposition effect bias tend to rush to realise profits and sell the shares as soon as possible. Meanwhile, when the value or price of stocks falls, investors often delay selling in the hope that the asset's value will rise again. Individuals may miss out on greater profit opportunities as a result of the disposition effect. The disposition effect can reduce the overall rate of return; the disposition effect is a type of deviant behaviour among investors, particularly generation Z in Kediri City. The findings of this study support the findings of Z. Ahmed et al., (2022), who found that the disposition effect has a positive and significant effect on investment decision making. Furthermore, research by Atif Sattar et al., (2020), Ullah et al., 2020; Khan, 2020; Candraningrat et al., 2018; Alrabadi et al., 2018; Hayat & Anwar, 2016 shows that the disposition effect has a positive and significant effect on investment decision making.

Herding has no impact on investment decisions. This means that investors in Kediri City, particularly generation Z, do not follow the herd when making investment decisions. These findings suggest that investors do not base their investment decisions on the beliefs and opinions of other investors or stock brokers. To avoid the formation of market bubbles and irrational investment decisions. Investors use company financial reports and fundamental analysis to make rational investment decisions. The danger of herding behaviour among investors is that it can lead to increased market volatility and risk for investors. The findings of this study are consistent with the findings of Z. Ahmed et al., (2022); Singh et al., (2022); Bakar & Yi, (2016a), who found that herding has no significant effect on investment decision making. According to Khan's research (2020), herding has no significant effect on investment decision making, and investors rely more on financial publications and company reports than on the advice of family, friends, and stock brokers.

Overconfidence influences investment decisions in a positive and significant way. This means that the higher the level of investor overconfidence, the higher the level of investment decision making. The findings indicate that investors, particularly generation Z in Kediri City, still experience overconfidence behaviour bias when making investment decisions, and that investors cannot act rationally when making investment decisions. Overconfident investors overestimate their own judgement abilities, ignore risks, and make irrational investments. According to Elhoussein and Abdelgadir (2020), overconfidence occurs when individual investors do not sufficiently revise their initial assessment after receiving new information, and as a result, they do not realise the error of their investment. They believe their investment judgement is very certain, which leads to overconfidence. Overconfidence bias leads to market inefficiencies as a result of mispricing and excessive volatility, resulting in investment performance that is frequently lower than the market (Ranaweera & Kawshala, 2021). The results of this study are in line with the research of Bakar & Yi, (2016); (Alrabadi et al., 2018); (Ahmad & Shah, 2022; Ranaweera & Kawshala, 2022; R. Ahmed et al., 2021; Raheja & Dhiman, 2020; Elhoussein & Abdelgadir, 2020; Atif Sattar et al., 2020; Madaan & Singh, 2019), stating that overconfidence has a positive and significant effect on investment decision making.

Financial literacy moderates the influence of the disposition effect on investment decision making by generation Z investors in Kediri City. The findings of this study provide empirical evidence that financial literacy can be used to mitigate the disposition effect on investment decision making. The findings suggest that investors, particularly those from generation Z in Kediri City with a high level of financial literacy, can strengthen the influence of disposition effect behaviour on investor investment decision making. This means that investors with high financial literacy are more likely to exhibit the disposition effect when making investment decisions. The findings of this study support the findings of Singh et al., 2022, who found that financial literacy moderates the influence of behavioural bias on investment decision making, and that financial literacy positively moderates the influence of the disposition effect on investment decision making of individual female investors.

Financial literacy reduces the impact of herding on investment decisions made by generation Z investors in Kediri City. The findings of this study provide empirical evidence that financial literacy can be used to moderate herding and investment decision making. The findings suggest that investors, particularly generation Z in Kediri City with a high level of financial literacy, can reduce the influence of herding behaviour on investor investment decisions. The findings of this study show that generation Z investors in Kediri City with a high level of financial literacy can avoid herding behaviour bias when making investment decisions, because financial literacy reduces the influence of the positive relationship between herding behaviour bias and investment decision making. As a result, financial literacy can be regarded as the most important factor in reducing investors' herding behaviour bias, allowing investors to make more rational investment decisions. Investors base their investment decisions on the company's financial statements and fundamental analysis rather than following the advice of others. The findings of this study back up the findings of Khalid et al., (2018). An investor with a high level of financial literacy is more interested in using company financial data before making investment decisions. Meanwhile, investors with low financial literacy seek advice from family, friends, and brokers.

Financial literacy reduces the impact of overconfidence on investment decisions made by generation Z investors in Kediri City. The findings of this study provide empirical evidence that financial literacy can be used to mitigate overconfidence in investment decision



making. The findings suggest that investors, particularly generation Z in Kediri City with a high level of financial literacy, can reduce the impact of overconfidence behaviour on investor investment decision making. The findings of this study show that generation Z investors in Kediri City with a high level of financial literacy can avoid overconfidence behaviour bias when making investment decisions, because financial literacy reduces the positive relationship between overconfidence behaviour bias and investment decision making. As a result, financial literacy can be regarded as the most important factor in reducing investors' overconfidence behaviour bias, so that investors are more rational in their investment decision making and not overconfident, which can lead to investment performance that is frequently lower than the market. The findings of this study back up previous research by Hayat & Anwar, (2016); Ahmad & Shah, (2022), which found that the effect of overconfidence on individual investment decision making is negatively moderated by financial literacy, and that financial literacy plays an important role in overcoming the negative effects of overconfidence behavioural bias. Investors with low financial literacy tend to be overconfident and less rational in their investment decisions, whereas investors with high investment literacy are less confident, minimise risk, and make more rational investment decisions.

## Conclusions

Based on the findings of the above research and discussion, it is possible to conclude that the disposition effect behavioural bias influences investment decisions made by generation Z investors in Kediri City. Investors still experience disposition effect behavioural bias when making investment decisions; investors cannot act rationally when making investment decisions. Herding behaviour bias, on the other hand, has no effect on investment decisions made by generation Z investors in Kediri City. Investors use company financial reports and fundamental analysis to make rational investment decisions. Overconfidence behavioural bias influences generation Z investment decisions in Kediri City. This implies that the greater the overconfidence displayed by investors, the greater the likelihood of making an investment decision. Investors are overconfident in their decisions and have been unable to act rationally when making investment decisions. Financial literacy plays a positive moderating role in the influence of the disposition effect on investment decision making by generation Z investors in Kediri City. When making investment decisions, investors with high financial literacy tend to exhibit the disposition effect. Furthermore, financial literacy is regarded as the most important factor in reducing investor herding behaviour bias. Financial literacy is thought to be an important factor in reducing investor herding behaviour bias.

This research contributes theoretically to the development of science and is a reference material for future research. In addition, the results of the study are taken into consideration for regulators, policy makers and investors to be wiser in making investment decisions and emphasize increasing financial literacy skills for generation Z investors.

The limitations of this study include the fact that the object studied is only one type of investment instrument, namely stocks, so it does not yet describe the overall behaviour of investors in other investment instruments. In addition, the sample in this study is limited to Kediri City, so it does not cover a large sample, and thus cannot describe the overall behavior of investors when making investment decisions. Therefore, further research is needed to cover the shortcomings of this study. Expanding the object of research both in terms of research location, research subjects such as bonds, mutual funds, ETFs and other investment instruments, adding other variables to measure investor behavior bias such as loss aversion, framing bias, anchoring bias, representativeness bias and other behavioral biases and can examine investors with all age groups or investors with different generations.

## Acknowledgement

**Author Contributions:** Conceptualization, PP., S, and KR.; Methodology, PP., S Data Collection, PP., KR; Formal Analysis, PP., S, and KR.; Investigation, PP., KR.; Writing—Original Draft Preparation, S.N.; Writing—Review and Editing PP., S, and KR.

**Institutional Review Board Statement:** Ethical review and approval were waived for this study, due to the research does not deal with vulnerable groups or sensitive issues.

**Data Availability Statement:** The data presented in this study are available on request from the corresponding author. The data are not publicly available due to privacy.

**Conflicts of Interest:** The authors declare no conflict of interest

## References

- Adielyani, D., & Marwadi, W. (2020). The Influence of Overconfidence , Herding Behavior , and Risk Tolerance on Stock Investment Decisions : The Empirical Study of Millennial Investors in Semarang City. *Jurnal Maksipreneur*, 10(1), 89–101.
- Adil, M., Singh, Y., Adil, M., & Ansari, M. S. (2022). How financial literacy moderate the association between behaviour biases and investment decision? *Asian Journal of Accounting Research*, 7(1), 17–30. <https://doi.org/10.1108/AJAR-09-2020-0086>
- Adil, M., Singh, Y., & Ansari, M. S. (2022). How financial literacy moderate the association between behaviour biases and investment decision? *Asian Journal of Accounting Research*, 7(1), 17–30. <https://doi.org/10.1108/AJAR-09-2020-0086>
- Ahmad, M., & Shah, S. Z. A. (2020). Overconfidence heuristic-driven bias in investment decision-making and performance: mediating effects of risk perception and moderating effects of financial literacy. *Journal of Economic and Administrative Sciences*, 38(1), 60–90. <https://doi.org/10.1108/jeas-07-2020-0116>

- Ahmed, R., Riaz, S., Aqdas, R., Ibn, S., & Hassan, U. L. (2021). The Relationship among Overconfidence, Economic Expectation, Social Factors and Investment Decision Making Behavior with the Mediating and Moderating Effects. *Journal of Contemporary Issues in Business and Government*, 27(02). <https://doi.org/10.47750/cibg.2021.27.02.127>
- Ahmed, Z., Rasool, S., Saleem, Q., Khan, M. A., & Kanwal, S. (2022). Mediating Role of Risk Perception Between Behavioral Biases and Investor's Investment Decisions. *SAGE Open*, 12(2). <https://doi.org/10.1177/21582440221097394>
- Alrabadi, D. W. H., Al-Abdallah, S. Y., & Aljarayesh, N. I. A. (2018). Behavioral Biases And Investment Performance, Does Gender Matter? Evidence From Amman Stock Exchange. *Jordan Journal of Economic Sciences*, 5(1), 77. <https://doi.org/10.35516/1250-005-001-006>
- Andrea Devenow, & Ivo Welch. (1996). Rational herding in financial economics. *European Economic Review*, 40(3–5), 603–615.
- Atif Sattar, M., Toseef, M., & Fahad Sattar, M. (2020). Behavioral Finance Biases in Investment Decision Making. *International Journal of Accounting, Finance and Risk Management*, 5(2), 69. <https://doi.org/10.11648/j.ijafmr.20200502.11>
- Bakar, S. and, & 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](https://doi.org/10.1016/s2212-5671(16)00040-x)
- Barber, B. M., & Odean, T. (2001). Barber, Brad M. / Odean, Terrance (2001): Boys Will Be Boys: Gender, Overconfidence, and Common Stock Investment, *Quarterly Journal of Economics* 116, 261–292. *Quarterly Journal of Economics*, 116(1), 261–292.
- Ben Ameer, H., Boujelbene, M., Prigent, J. L., & Triki, E. (2020). Optimal Portfolio Positioning on Multiple Assets Under Ambiguity. *Computational Economics*, 56(1), 21–57. <https://doi.org/10.1007/s10614-019-09894-y>
- Bogdan, S., Suštar, N., & Draženović, B. O. (2022). Herding Behavior in Developed, Emerging, and Frontier European Stock Markets during COVID-19 Pandemic. *Journal of Risk and Financial Management*, 15(9). <https://doi.org/10.3390/jrfm15090400>
- Brigham, & Houston. (2019). *Fundamentals of Financial Management*. In *The Journal of Finance* (15th ed., Vol. 34, Issue 5). Cengage Learning. <https://doi.org/10.2307/2327254>
- Budiman, J., & Patricia. (2021). Pengaruh Overconfidence Bias, Herding Bias, Representativeness Bias, Loss Aversion, dan Risk perception terhadap Investment Decision di Kota Batam. *CoMBInES*, 1(1), 1979–1987.
- Candraningrat, I. R., Salim, U., Indrawati, N. K., & Ratnawati, K. (2018). Influence of Framing Information and Disposition Effect in Decision of Investment : Experimental Study on Investor Behavior at Indonesia Stock Exchange Representative on Denpasar, Bali. *Econ Journals*, 8(3), 59–68.
- Devadas, M., & Vijayakumar, T. (2019). Investment decisions, herd behaviour and retail investors. *International Journal of Innovative Technology and Exploring Engineering*, 8(10), 3291–3294. <https://doi.org/10.35940/ijitee.J1210.0881019>
- Dewi, S., & Pertiwi, T. K. (2021). Analysis of Stock Investment Decisions on Investors in Surabaya. *Budapest International Research and Critics Institute (BIRCI-Journal): Humanities and Social Sciences*, 4(2), 2748–2759. <https://doi.org/10.33258/birci.v4i2.1984>
- Elhussein, N. H. A., & Abdelgadir, J. N. A. (2020). Behavioral Bias in Individual Investment Decisions: Is It a Common Phenomenon in Stock Markets? *International Journal of Financial Research*, 11(6), 25. <https://doi.org/10.5430/ijfr.v11n6p25>
- Fedorova, E. A., Nekhaenko, V. V., & Dovzhenko, S. E. (2015). Impact of Financial Literacy of the Population of the Russian Federation on Behavior on Financial Market : Springer, 26(4), 394–402. <https://doi.org/10.1134/S1075700715040036>
- Fedorowicz, K., & Łopatka, A. (2022). The importance of investment in the development of enterprises in Poland in 2009–2018. *Procedia Computer Science*, 207, 4171–4179. <https://doi.org/10.1016/j.procs.2022.09.480>
- Hayat, A., & Anwar, M. (2016). Impact of Behavioral Biases on Investment Decision Making with Moderating Role of Financial Literacy. *Jinnah Business Review*, 6(2), 34–41. <https://doi.org/10.53369/rkxa7855>
- Iram, T., Bilal, A. R., & Ahmad, Z. (2023). Investigating The Mediating Role of Financial Literacy on The Relationship Between Women Entrepreneurs' Behavioral Biases and Investment Decision Making. *Gadjah Mada International Journal of Business*, 25(1), 93–118. <https://doi.org/10.22146/gamaijb.65457>
- Jan, N., Jain, V., Li, Z., Sattar, J., & Tongkachok, K. (2022). Post-COVID-19 investor psychology and individual investment decision: A moderating role of information availability. *Frontiers in Psychology*, 13(January 2020), 1–12. <https://doi.org/10.3389/fpsyg.2022.846088>
- Kahneman and Tversky. (1979). Prospect Theory: An Analysis of Decision under Risk. *Econometrica*, 47(March), 263–291.
- Kartini, K., & Nahda, K. (2021). Behavioral Biases on Investment Decision: A Case Study in Indonesia. *Journal of Asian Finance, Economics and Business*, 8(3), 1231–1240. <https://doi.org/10.13106/jafeb.2021.vol8.no3.1231>
- Khalid, R., Javed, M., & Shahzad, K. (2018). Impact of Behavioral Biases on Investment Decision Making with Moderating Role of Financial Literacy. *Jinnah Business Review*, 6(2), 34–41. <https://doi.org/10.53369/rkxa7855>
- Khan, D. (2020). Cognitive Driven Biases, Investment Decision Making: The Moderating Role of Financial Literacy. *SSRN Electronic Journal*, 1–25. <https://doi.org/10.2139/ssrn.3514086>
- Komang Arik, S. N. L., & Gede Sri, A. L. (2021). The effect of overconfidence and optimism bias on stock investment decisions with financial literature as moderating variable. *Eurasia: Economics & Business*, 14(1), 1–13.
- Kyriazis, N. A. (2020). Herding behaviour in digital currency markets: An integrated survey and empirical estimation. *Heliyon*, 6(8), e04752. <https://doi.org/10.1016/j.heliyon.2020.e04752>

- Lusardi, A., & Mitchell, O. S. (2007). Scholarly Commons Financial Literacy and Retirement Preparedness: Evidence and Implications for Financial Education Programs Financial Literacy and Retirement Preparedness: Evidence and Implications for. *Business Economy*.
- Madaan, G., & Singh, S. (2019). An analysis of behavioral biases in investment decision-making. *International Journal of Financial Research*, 10(4), 55–67. <https://doi.org/10.5430/ijfr.v10n4p55>
- Marriott, N., & Mellett, H. (2006). Accounting Education : an Health care managers ' financial skills : measurement , analysis and implications Health care managers ' financial skills : measurement , analysis and implications. March 2015, 37–41. <https://doi.org/10.1080/09639289600000006>
- Merton, R. C. (1987). A Simple Model of Capital Market Equilibrium with Incomplete Information. *The Journal of Finance*, 42(3), 483–510. <https://doi.org/10.1111/j.1540-6261.1987.tb04565.x>
- Natasya, Kusumastuti, D. H., Alifia, W., & Leon, F. M. (2022). The Effect Between Behavioral Biases and Investment Decisions Moderated by Financial Literacy on the Millennial Generation in Jakarta. *The Accounting Journal of Binaniaga*, 7(1), 113–126. <https://doi.org/10.33062/ajb.v7i1.502>
- Nguyen, C. T., & Trinh, L. T. (2018). The impacts of public investment on private investment and economic growth. *Journal of Asian Business and Economic Studies*, 25(1), 15–32. <https://doi.org/10.1108/jabes-04-2018-0003>
- Pompian, M. M. (2021). Behavioral Finance and Your Portfolio: A Navigation Guide for Building Wealth. In *Quantitative Finance* (Vol. 22, Issue 7). Wiley & Sons Ltd, The Atrium, Southern Gate, Chichester, West Sussex PO19 8SQ, England,. <https://doi.org/10.1080/14697688.2022.2077231>
- Prosad, J. M., Kapoor, S., & Sengupta, J. (2017). Qualitative Research in Financial Markets Article information :A Meta- Analysis. *Qualitative Research in Financial Markets*, 9(1), 34–47. <http://dx.doi.org/10.1108/QRFM-06-2016-0018>
- Raheja, S., & Dhiman, B. (2020). How do emotional intelligence and behavioral biases of investors determine their investment decisions? *Rajagiri Management Journal*, 14(1), 35–47. <https://doi.org/10.1108/ramj-12-2019-0027>
- Ranaweera, S. S., & Kawshala, B. A. H. (2021). Influence of Behavioral Biases on Investment Decision Making with Moderating Role of Financial Literacy and Risk Attitude: A Study Based on Colombo Stock Exchange. *South Asian Journal of Finance*, 2(1), 56. <https://doi.org/10.4038/sajf.v2i1.32>
- Rasool, N., & Ullah, S. (2020). Financial literacy and behavioural biases of individual investors : empirical evidence of Pakistan stock exchange. 25(50), 261–278. <https://doi.org/10.1108/JEFAS-03-2019-0031>
- Robin, & Angelina, V. (2020). Analysis of the Impact of Anchoring, Herding Bias, Overconfidence and Ethical Consideration Towards Investment Decision. *JIMFE (Jurnal Ilmiah Manajemen Fakultas Ekonomi)*, 6(2), Inpress. <https://doi.org/10.34203/jimfe.v6i2.2558>
- Sekaran, U., & Bougie, R. (2014). Reaearch Methods for Business. In Wiley (7th ed.). Wiley & Sons Ltd, The Atrium, Southern Gate, Chichester, West Sussex PO19 8SQ, England,. [https://doi.org/10.1007/978-94-007-0753-5\\_102084](https://doi.org/10.1007/978-94-007-0753-5_102084)
- Sharpe, W. F. (1964). Capital asset prices: a theory of market equilibrium under conditions of risk. *The Journal of Finance*, 19(3), 425–442.
- Sherfin, H., & Statman, M. (1985). The Disposition to Sell Winners Too Early and Ride Losers Too Long: Theory and Evidence. *The Journal of Finance*, 40(3), 777–790. <https://doi.org/10.1111/j.1540-6261.1985.tb05002.x>
- Son, J., & Park, J. (2021). Effects of Financial Education on Sound Personal Finance in Korea. 0–2. <https://doi.org/10.1111/ijcs.12486>
- Usriyono, E., & Wahyudi, S. (2023). The investment decision of millennial generation: An analysis using financial literacy and financial behavior. *Corporate Governance and Organizational Behavior Review*, 7(2), 8–14. <https://doi.org/10.22495/cgobrv7i2p1>
- Yasir, A., Safdar, U., & Javaid, Y. (2022). Herd behaviour in foreign exchange market. *Journal of Economic Structures*, 11(1). <https://doi.org/10.1186/s40008-022-00270-y>

**Publisher's Note:** SSBFNET stays neutral with regard to jurisdictional claims in published maps and institutional affiliations.



© 2023 by the authors. Licensee SSBFNET, Istanbul, Turkey. This article is an open access article distributed under the terms and conditions of the Creative Commons Attribution (CC BY) license (<http://creativecommons.org/licenses/by/4.0/>).

*International Journal of Research in Business and Social Science* (2147-4478) by SSBFNET is licensed under a Creative Commons Attribution 4.0 International License.