The Influence of Psychological Bias on Investment Decisions of Generation Z in Semarang City Moderated by Financial Literacy

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Abstract. The purpose of this research is to determine the influence of herding bias, disposition effect, and availability bias on investment decisions, considering financial literacy as a moderating factor. The population in this study is Generation Z investors in Semarang City. The number of samples used in this study is a minimum of 100 generation Z investors in Semarang City. The data collection method used questionnaires. The results of the study show that there is a significant influence of herding bias, disposition effect, and availability bias on investment decisions. The findings indicate that financial literacy serves as a moderating factor in the relationship between herding bias and disposition effect with investment decisions. However, it does not moderate the impact of availability bias on those decisions. Future studies are encouraged to include additional variables related to behavioural finance and investor behaviour. It is advisable to continuously enhance knowledge and skills in financial information analysis by attending accredited investment-related training or seminars. Such efforts can help investors avoid making irrational decisions that may lead to future losses.

Keywords: Investment Decisions, Herding, Disposition Effect, Availability, Financial Literacy

1. INTRODUCTION

Examining the impact of psychological biases on Generation Z's investment decisions is essential, particularly in today's context where this generation is becoming increasingly engaged in the investment market. Research shows that Gen-Z, despite having a strong interest in investing, often faces many challenges arising from psychological behavioural biases. These psychological tendencies, including overconfidence, herd behaviour, and loss avoidance, exert a considerable influence on decision patterns in investing that are not always rational. One of research examined the effects of behavioural biases, including herding and anchoring, on the investment decisions of Generation Z market actors in Jakarta, suggesting that many young market actors may not be optimistic in making rational decisions, which could potentially harm them in the long run. According to [1], investment is the activity of transferring a number of resources in an effort to obtain an expected return on asset value in the future.

In investing, there are terms that market actors must understand, called high risk, high return. [2]. Market actors generally expect substantial returns from the assets they allocate; however, before investing, they must understand the risks involved, as the level of risk corresponds directly to the potential return. This concept has led to the notion that the market consists of two categories of market actors: rational and irrational. Rational market actors are based on the assumption of traditional market theory, which states that humans should make rational decisions by examining risk and return to generate high profits, considering all available information [3].

In practice, however, there are situations where market participants are unable to process available information rationally. As a result, market mechanisms may deviate from logical principles and exhibit biased or irrational behaviour within the capital market [4]. Many market actors suffer losses due to insufficient knowledge and investment skills. When making investment decisions, they often rely solely on intuition and emotions, leading to biased and less rational outcomes [5].

A prevalent phenomenon in Indonesia is the inclination of market actors to focus on information sources considered trustworthy, such as recommendations from securities companies or discussions in investment forums, to support their stock investment decisions. However, many market actors still do not refer to valid information, which influences them to make biased decisions [6]. This occurs because market actors make decisions without being based on technical and fundamental analysis techniques, but by following the behaviour of other market actors [7]. This phenomenon may arise from the impact of behavioural finance elements affecting market actors' decision-making processes.

In addition, based on the data [8], the large dominance of market actors under 30 years of age indicates that the capital market in Indonesia is dominated by Generation Z, the generation born between 1996 and 2009 [9]. According to [10], Generation Z market actors tend to be more susceptible to behavioural biases when making investment decisions.

Behavioural finance theory explains that in making financial decisions, individuals consider not only risk and return factors but also psychological aspects. These psychological factors can lead to irrational tendencies, resulting in biased decision-making [11]. According to [12], the emergence of behavioural finance theory is to complement the shortcomings of traditional financial theory, that losses can be twice as strong, psychologically, than gains.

Herding bias is a prevalent tendency among market actors, in which rational individuals act irrationally by following the decisions or judgments of others or larger groups when making investment choices [13]. They imitate other market actors in making investment decisions without considering fundamental analysis. [14]. Herding behaviour in market actors stems from a tendency toward risk aversion, leading to a desire to minimize the risk of financial loss [15].

Furthermore, the disposition effect refers to an market actor's inclination to dispose of profitable assets prematurely while retaining unprofitable ones for an excessive duration [16]. The main motivation underlying the disposition effect is market actors' tendency to avoid feelings of

regret when realizing gains from their investments [17], resulting in poor decision patterns in investing.

In addition, availability bias also Availability bias is a significant factor influencing market actor behaviour, where market actors make decisions based on available information or the probability of events without considering accurate and relevant information [18]. Market actors rely solely on the knowledge they currently possess and do not take the initiative to seek alternative decisions [19]. Market actors susceptible to availability bias view information as a security [20].

According to [5] Knowledge of finance and investment, enables market actors to make well-considered decisions in managing and allocating their funds based on the information and competencies they have. It reflects an individual's capacity to evaluate data objectively and determine the most efficient ways to use and control financial resources [21]. Furthermore, numerous studies have demonstrated that Knowledge of finance and investment can moderate (weaken or strengthen) behavioural biases in market actor decisions, as has been demonstrated by [22], [23], [24], and [25].

In this context, Knowledge of finance and investment acts as a key moderating element. Low Knowledge of finance and investment can exacerbate the negative impact of psychological biases. The greater financial awareness helps market actors lessen the influence of biases like herding tendencies and overconfidence. Lack of understanding of financial information often makes Generation Z more susceptible to misinformation and unfounded trends, which in turn can negatively impact their investment decisions.

This study addresses the gap between individuals' financial behaviour and their decision patterns in investing. The research aims to analyze how herding bias, disposition effect, and availability bias influence investment choices, while Knowledge of finance and investment is positioned as a moderating factor. The investigation targets Generation Z market actors in Semarang City and aspires to offer theoretical insights that enrich behavioural finance literature, especially concerning financial behaviour in stock investment decisions.

2. Hypothesis Development

2.1 Herding Bias on Investment Decisions

Herding bias frequently occurs in financial markets, driven by the natural human inclination to observe, follow, and emulate the behaviour of others, especially during times of uncertainty or market instability [26]. This type of behaviour is viewed as irrational within the context of investment decisions, many market actors make investment judgments by imitating market movements rather than by analysing fundamental indicators or available financial information [27].

Several studies conducted by [28] [29] [23] have shown that [24] herding bias significantly influences investment decisions. This is consistent with research [30] indicating that market actors are inclined to make investment choices by following the actions of other market actors because they assume that others have greater knowledge or expertise.

H1: Herding bias has a significant effect on investment decisions.

2.1.1 The Influence of Disposition Effect Bias on Investment Decisions

According to [31], the emergence of the concept of bias disposition effect is based on the theory of loss aversion studied by [12], the disposition effect describes a common behavioural bias among market actors who are reluctant to sell declining assets, yet tend to realize gains too early when their investments perform well. Market actors who experience the disposition effect will behave risk avoidance behaviour or risk avoidance behaviour when faced with profitable situations and behave risk seeking behaviour or risk seeking behaviour or risk seeking behaviour when faced with losses, resulting in errors in decision making [16].

Several studies conducted by [22] [32] [24], show results that disposition effect influential significant to decision investment. This is also confirmed by Sitinjak (2013) in his research about influence disposition effect on Indonesian market actors, the results show that Indonesian market actors tend to sell fast its shares are experiencing increase and hold it when experience loss with hope that share the will experience increase again later day.

H2: Bias disposition effect influential significant to decision investment

2.1.2 The Influence of Availability Bias On Investment Decisions

Availability bias arises when individuals rely excessively on readily accessible information when making evaluations or estimates [33]. This bias appear when people are too burdensome easy information obtained [34], so that market actors only depend on available information or popular about something shares that will considered moment make decision buy or sell [35].

Several studies conducted by [36] [37] [10] research results indicated that availability bias plays a significant role in shaping market actors' decision-making behaviour. This is reinforce [38] that revealed that market actors display a strong tendency toward availability bias in their decision-making, often depending on easily accessible information without confirming its accuracy.

H3: Availability bias has a significant effect on investment decisions.

2.1.3 Financial Literacy Moderates the Influence of Herding Bias, Disposition Effect Bias, and Availability Bias on Investment Decisions

Knowledge of finance and investment encompasses one's understanding and practical skills in utilizing and managing money responsibly [22]. Market actors possessing strong Knowledge of finance and investment tend to rely on corporate information and apply their analytical abilities to make well-informed investment decisions [39]. Conversely, market actors with limited Knowledge of finance and investment tend to depend on information obtained from friends, relatives, or brokers [40].

Research [24] suggests that Knowledge of finance and investment can weaken psychological factors that cause behavioural bias in investment decisions. Furthermore, research [32] the results point out that Knowledge of finance and investment plays an important part in moderating the effects of herding and disposition tendencies on investment behaviour. In turn, market actors with sound financial knowledge are better equipped to minimize psychological distortions in their decision-making.

H4: Financial literacy serves as a moderating factor in the relationship between herding bias and decision patterns in investing.

H5: Financial literacy functions as a moderating variable affecting the link between disposition effect bias and investment decisions.

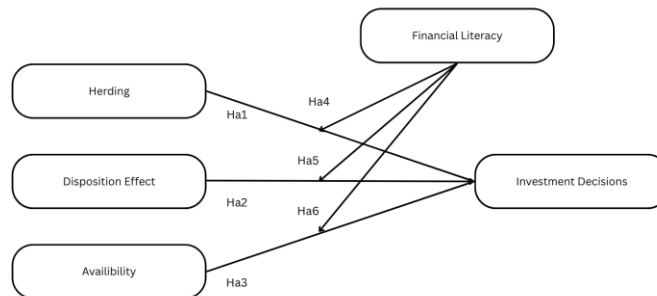*H6: Financial literacy plays a moderating role in the influence of availability bias on decision patterns in investing.*

Figure 1. Research Model
Source: Researcher modification (2025)

3. Method

This study uses a quantitative method. The population in this study is generation Z investors in Semarang City. The sampling technique uses nonprobability sampling through purposive

sampling. The sample determination uses the formula according to [41] and strengthened by [42] which then obtained a minimum sample of 100 respondents. To test the proposed hypothesis, Structural Equation Modeling Partial Least Square (SEM-PLS) analysis was used with the SmartPLS 4.0 program.

4. Result and Discussion

4.1 Descriptive Analysis of Research Respondents

Descriptive analysis of the demographics of the respondents in this study provides an overview of their characteristics, including gender, age, highest level of education, occupation, income, and investment duration. The results of this study are based on questionnaires distributed to 108 respondents. The demographic data for the study respondents are presented in Table 1.

Table 1. Respondent Demographic Analysis

No	Information	Amount	Percentage
1	**Gender**		
	Man	61	56.48%
	Woman	47	43.52%
2	**Age**		
	17	1	0.93%
	18	1	0.93%
	19	4	3.70%
	20	13	12.04%
	21	18	16.67%
	22	27	25.00%
	23	16	14.81%
	24	9	8.33%
	25	5	4.63%
	26	6	5.56%
	27	4	3.70%
	28	3	2.78%
	29	1	0.93%
3	**Education**		
	High School/Vocational School/Islamic High School	17	15.74%
	D1/D2/D3	10	9.26%
	S1	79	73.15%
	Masters/Doctoral Degree	2	1.85%
4	**Employment Status**		
	Students	67	62.04%
	Servants / Private Employees	26	24.07%
	Self-employed	14	12.96%
	Other	1	0.93%
5	**Investment Period**		

No	Information	Amount	Percentage
	< 1 Year	41	37.96%
	1-2 Years	38	35.19%
	> 2 Years	29	26.85%

Source: Research Data Processed (2025)

Based on analysis demographics respondents presented in Table 1. can described profile respondents from type sex show that respondents dominated by men as much as 56.48 % while women are as many as 43.52%.

4.2 Research Instrument Feasibility Test

4.2.1 Instrument Validity

Validity testing can be conducted using convergent and discriminant tests. An instrument is proven valid if its convergent value is determined using the outer loading value and the AVE (Average Variance Extracted) value. A research instrument is considered valid if the factor loading value is above 0.70 and the AVE value is above 0.50 [43]. Discriminant validity is determined if the outer loading value of a construct indicator is at least 0.70 or must be greater than the outer loading value of another construct.[43]

The other loading and AVE values show convergently valid results. Meanwhile, for the discriminant test, the outer loading value of each construct is greater than the other constructs, meaning that the discriminant test is also said to be valid, as presented in Table 2, Table 3, and Table 4.

4.2.2 Instrument Reliability

Test Reliability in PLS can be measured using two methods: Cronbach's alpha and composite reliability. Cronbach's alpha is used to measure the reliability limit of a construct, while composite reliability measures the actual reliability value of a construct. Rule of thumb from Cronbach's alpha and composite reliability is more from 0.70 to stated reliable [44]. Based on the test results, it is known that the results of this study are said to be reliable, which is presented in Table 5.

Table 2. *Loading Factor*

No	Variables	Indicator	*Loading Factor*	Result
1	Investment Decisions	KI 1	0.863	Valid Result
		KI 2	0.863	Valid Result

No	Variable	Item	Value	Result
		KI 3	0.832	Valid Result
		KI 4	0.880	Valid Result
		KI 5	0.870	Valid Result
		KI 6	0.867	Valid Result
		KI 7	0.884	Valid Result
		KI 8	0.865	Valid Result
		KI 9	0.877	Valid Result
		KI 10	0.860	Valid Result
		KI 11	0.874	Valid Result
2	Herding Bias	HRB 1	0.756	Valid Result
		HRB 2	0.812	Valid Result
		HRB 3	0.741	Valid Result
		HRB 4	0.874	Valid Result
3	Disposition Effect	DSE 1	0.884	Valid Result
		DSE 2	0.854	Valid Result
		DSE 3	0.873	Valid Result
		DSE 4	0.863	Valid Result
		DSE 5	0.858	Valid Result
		DSE 6	0.861	Valid Result
		DSE 7	0.874	Valid Result
		DSE 8	0.856	Valid Result
		DSE 9	0.890	Valid Result
		DSE 10	0.885	Valid Result
4	Availability Bias	AB 1	0.787	Valid Result
		AB 2	0.831	Valid Result
		AB 3	0.873	Valid Result
		AB 4	0.870	Valid Result

No	Variables	Item	Loading	Result
		AB 5	0.863	Valid Result
5	Financial Literacy	FL 1	0.857	Valid Result
		FL 2	0.844	Valid Result
		FL 3	0.862	Valid Result
		FL 4	0.879	Valid Result
		FL 5	0.872	Valid Result
		FL 6	0.864	Valid Result
		FL 7	0.863	Valid Result
		FL 8	0.869	Valid Result
		FL 9	0.866	Valid Result
		FL 10	0.867	Valid Result
		FL11	0.874	Valid Result
		FL 12	0.866	Valid Result
		FL 13	0.867	Valid Result

Source: Research Data Processed (2025)

Based on the convergent test, the *outer loading value* is said to be valid because the value is >0.70 so that the research test is fulfilled.

Table 3. *Average Value Variance Extracted*

No	Variables	*Average Variance Extracted* (AVE)
1	Investment Decisions	0.715
2	Herding Bias	0.757
3	Disposition Effect	0.636
4	Availability Bias	0.752
5	Financial Literacy	0.749

Source: Research Data Processed (2025)

Based on the convergent test, the AVE value is said to be valid because the value is >0.50 so that this research test is fulfilled and meets the criteria.

Table 5. Square Root Value of AVE

	Availability Bias	Disposition Effect	Herding Bias	Investment Decisions	Financial Literacy

Availability Bias	**0.845**			
Disposition Effect	0.696	**0.870**		
Herding Bias	0.581	0.603	**0.797**	
Investment Decisions	0.774	0.781	0.681	**0.867**
Financial Literacy	0.649	0.861	0.547	0.707	**0.865**

Based on the results of the discriminant test, this study meets the discriminant test criteria because the value of each variable is greater than the other variables so it can be said to be valid.

Table 6. *Cronbach's Value Alpha* and *Composite Reliability*

Variables	Cronbach's alpha	Composite reliability	Information
Herding Bias (X1)	0.809	0.874	Reliable
Disposition Effect (X2)	0.964	0.969	Reliable
Availability Bias (X3)	0.900	0.926	Reliable
Literacy (Z)	0.972	0.975	Reliable
Investment Decision (Y)	0.967	0.971	Reliable

Based on the reliability test in table 6, the research This proven reliable because mark *Cronbach alpha* and *composite reliability* for each variables own mark more from 0.70

4.2.3 Coefficient of Determination

The coefficient of determination ranges between zero and one ($0 < R^2 < 1$). A higher adjusted R-square (R^2) value indicates that the proposed research model has stronger predictive power. Generally, the adjusted R-square (R^2) values of 0.70, 0.45, and 0.25 are regarded as representing strong, moderate, and weak levels of explanatory ability, respectively [45].

Table 7. Value of Determination Coefficient

Variables	Adjusted R- square
Investment Decisions	0.798

Be aware results study table 7, value *adjusted R-square* (R²) of 79.8% results This show that variables study This capable explain variables decision investment, while the remaining 20.2% explained by other variables.

4.2.4 Predictive Relevance

Predictive Relevance own Q2 value > 0 indicates that the model has good predictive relevance value, whereas If Q2 value < 0, then the research model No own mark good *predictive relevance* [45].

Table 8. *Predictive* Values *Relevance*

Variables	Q- square
Investment Decisions	0.758

Source: Research Data Processed (2025)

Based on the research results in table 8, it shows a Q² value of 0.758 so it can be concluded that the model has *a predictive value.* good *relevance because the value of 0.758 has met the criteria, namely more than 0.*

4.3 Hypothesis Testing

Testing hypothesis in research This use method *Structural Equation Model Partial Least Square* (SEM-PLS) with application SmartPLS 4.0 testing hypothesis done with see mark *Original sample* and *t-statistic* . The original sample value is used to determine whether the relationship is positive or negative. A hypothesis is considered significant if it meets the criteria of a *t-statistic* > 1.96 and a *p-value* < 0.05 with a significance level of 5% [45].

Table 9. Hypothesis Testing

	Original Sample (O)	*T- statistics*	*P -values*	**Information**
Herding >> Investment Decisions	0.157	2,192	0.028	Accepted
Disposition Effect >> Investment Decisions	0.391	3,342	0.001	Accepted
Availability >> Investment Decisions	0.297	2,579	0.010	Accepted
Financial Literacy x *Herding* >>	-0.164	2,181	0.029	Accepted

	Original Sample (O)	T- statistics	P -values	Information
Investment Decisions Literacy x *Disposition Effect* >> Investment Decisions	0.242	2,354	0.019	Accepted
Financial Literacy x *Availability* >> Investment Decisions	-0.195	1,843	0.065	Rejected

Source: Research Data Processed (2025)

Based on table 9, the results of this research hypothesis are as follows:

4.4 Herding Bias on Investment Decisions

The results show that the original sample value is 0.157 , the t-statistic value is 2.192 > 1.96 and the p-value is 0.028 < 0.05. Thus, H1 which states that " Herding bias has a significant effect on investment actions" can be accepted. The results of this study are in line with [22] [28] [39] [5] [24] the statement that herding bias has a significant effect on investment actions.

4.4.1 Influence Disposition Effect on Investment Decisions

The results show that mark original sample as big as 0.391 , value t-statistic as big as 3.342 >1.96 and the value p-value of 0.001 < 0.05. Thus, H2, which states that " the disposition effect has a significant influence on investment actions," can be accepted. This research is in line with research conducted by [46] [47] [32] [48] which states that the disposition effect has a significant influence on investment actions.

4.4.2 The Influence of Availability Bias on Investment Decisions

The results show that mark original sample as big as 0.297 , value t-statistic as big as 2.579 >1.96 and the value p-value as big as 0.010 < 0.05. Thus, H3, which states that " Availability bias has a significant effect on investment actions," is accepted. This research aligns with research conducted by [1], which states that [49] [36] [50] [51] availability bias has a significant effect on investment actions.

4.4.3 Financial Literacy Moderates the Effect of Herding Bias on Investment Decisions

The results show that the original sample value is -0.164, the t-statistic value is 2.181>1.96 and the p-value is 0.029<0.05. Thus, H4 which states that "Knowledge of finance and investment moderates the effect of herding bias on investment actions" can be accepted. The results of this study

are in line with research which states that Knowledge of finance and investment can moderate the effect of [22] [48] [23] herding bias on investment actions.

4.4.4 Financial Literacy Moderates the Influence of the Disposition Effect on Investment Decisions

The results show that the original sample value is 0.242, the t-statistic value is 2.354 >1.96 and the p-value is 0.019 <0.05. Thus, H5 which states that "Knowledge of finance and investment moderates the influence of the disposition effect on investment actions" can be accepted. This research is in line with research that has been conducted by [22] [52] [53] Knowledge of finance and investment is able to moderate the influence of the disposition effect on investment actions.

4.4.5 Financial Literacy Moderates the Effect of Availability Bias on Investment Decisions

The results show that the original sample value is -0.195, the t-statistic value is 1.843>1.96 and the p-value is 0.065 <0.05. Thus, H5 which states that "Knowledge of finance and investment moderates the effect of availability bias on investment actions" can be rejected. This result is in line with research conducted by [54] [23] that Knowledge of finance and investment cannot moderate the effect of availability bias on investment actions.

5. Conclusion and Recommendations

The study reveals that herding tendencies, the disposition effect, and availability bias exert a notable impact on how investors make investment choices. Financial literacy was introduced as a moderating factor and proved effective in moderating the influence of herding and disposition tendencies on investment behaviour. Conversely, it did not demonstrate a moderating effect on the relationship between availability bias and investment decisions. These findings suggest that Generation Z investors in Semarang City are still subject to psychological biases, resulting in less rational decision-making. Overall, this research aims to explore the behavioural factors shaping investment decisions among Generation Z investors in Semarang City, emphasizing the role of financial literacy as a moderating construct.

Based on the findings of this study, it is recommended that due to the persistence of biases that are still unable to weaken or strengthen biases in decision patterns in investing, researchers suggest considering other biases that are still relevant to the realm of behavioural finance, such as adding variables such as mental accounting bias, self-attribution bias, and conservatism bias. Furthermore, demographic characteristics such as education level and gender can also be included as additional variables to enrich the analysis and broaden the scope of the study. Furthermore, investors are expected to continuously improve their knowledge and skills in managing and

analyzing financial information through participation in training, education, or seminars organized by accredited institutions. This effort aims to minimize the potential for bias in decision patterns in investing, thereby preventing irrational and potentially detrimental decisions in the future.

Thank-You Note.

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