Unraveling the Investment Puzzle: Do Behavioral Biases and Financial Literacy Matter?

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ABSTRACT

Considering the various investment alternatives available in the market, investors are confronted with a decision to buy, hold, or sell investment portfolios. The study examines the impact of behavioral biases on the investment decisions of Generation Y and Z investors. It measures the moderating effect of financial literacy on the impact of behavioral biases on investment decisions. The study utilized a structured survey questionnaire among Filipino retail investors in Metro Manila. The results revealed that overconfidence, herding, disposition effect, and risk aversion significantly influence Generation Y and Generation Z investors' investment decisions. Hierarchical regression results showed that adding behavioral bias indicators increases the explanatory power of independent variables on the investment decisions of Generations Y and Z investors, except for the addition of risk aversion in model 4 for Generation Z. The moderating effects of financial literacy on the impacts of behavioral biases are statistically significant for both generational groups. The results provide valuable insights among investment advisors in considering the critical role of behavioral biases in investment decision-making activities. Recognition of these behavioral biases can help investors make sound judgments about their investment portfolios.

Keywords: Behavioral Biases, Investment Decision, Financial Literacy, Moderation Effect.

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1. INTRODUCTION

The global financial landscape has significantly increased interest and participation in investing and trading activities. With the emergence of new technologies, the availability of online trading platforms, and increased accessibility to financial markets, it has become

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crucial to understand the dynamics, implications, and potential risks associated with these activities.

Financial innovation has increased drastically over the past two decades, which aligns with the speedy development of technology, internet-of-things, and cross-border transactions. Given these developments, many investors became adept at making financial decisions. Thus, financial literacy has become a significant indicator in the financial decision-making process, especially in emerging market economies where many investors have low financial literacy levels. The World Bank reported that approximately 31 percent of the adult population does not have bank accounts, and the growth of financial inclusion in emerging markets such as Indonesia, India, Nepal, China, Pakistan, and other countries has been slow (Demirgüç-Kunt *et al*., 2018, cited in Dewi *et al.*, 2020). It can driven by their existing financial condition and absence or lack of financial knowledge and skills, which can result in financial risk such as losses from investments, exposure to fraud, and making misguided or irrational decisions triggered by some cognitive and behavioral biases (Arif, 2015; *Dewi et al.*, 2020). Awais *et al*. (2016) also mentioned that investors, especially ordinary private individuals in emerging market economies, are confronted with several challenges when making investment decisions, and the value of the information provided to them is crucial.

With low levels of financial literacy, investors will make irrational investment decisions, whereas having high financial literacy could lead to more rational and improved investment decisions (Adil *et al*., 2022). Some investors may commit errors due to a lack of expertise, herding attractions, investment choice overload, or overconfidence in their abilities (Awais *et al.*, 2016; Baihaqqy et al., 2020); however, knowing investments and the investment alternatives available can encourage investment familiarity and proactive engagement through increased participation in trading activities and other passive investments. Adil *et al.* (2022) analyzed how behavioral biases influenced the investment decisions of investors based on gender. They also examined the moderating role of financial literacy on the association between behavioral biases and investment decisions. Against this backdrop, this study intends to examine the influence of behavioral biases on the investment decisions of Generation Y and Generation Z in the Philippines and determine how financial literacy moderates their relationship. The study will contribute to the investment decision-making process that individual investors will make in emerging market economies.

1.1. Objectives of the study

1. To examine the impact of behavioral biases on the investment decisions of Generation Y and Generation Z.
2. To examine the effect of financial literacy on the investment decisions of Generation Y and Generation Z.
3. To determine the moderating role of financial literacy on the relationship between behavioral biases and investment decisions among Generation Y and Generation Z.

2. LITERATURE REVIEW

2.1. Overconfidence Bias

Overconfidence bias refers to the person's propensity to overestimate his or her ability

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and knowledge to predict future information. It leads to an exaggerated confidence in making pertinent investment decisions, potential increases in market volatility, trading volume, and price distortions. Prosad *et al.* (2018) regard this as one of investors' most utilized behavioral biases. Naveed and Taib (2021) examined the influence of self-attribution and disposition biases on the Pakistan Stock Exchange investors' financial decisions. They concluded that it positively and significantly affects individual investors' investment decisions. They added that it undermined their ability to make rational and sound investment decisions, especially regarding investment risks. Syarkani and Tristanto (2022) mentioned that overconfident investors believe they possess more skills and knowledge than others and rely on their abilities and luck to make investment decisions. These findings are consistent with the findings of Adil et al. (2022), Ahmad (2021), and Almansour *et al.* (2023), which found a positive and significant effect on investment decisions. However, Almansour *et al.* (2023) and Rohim (2023) showed positive but weak effects on the Cryptocurrency investment decisions of millennials. However, the influence of behavioral biases on investment decision-making of Moroccan SME Managers by Benayad and Aasri (2023) found that overconfidence had a negative and insignificant effect.

H_{1a} Overconfidence bias significantly affects Generation Y's investment decisions.
H_{1b} Overconfidence bias significantly affects Generation Z's investment decisions.
H_{1c} Overconfidence bias adds a unique variance in predicting Generation Y's investment decisions.
H_{1d} Overconfidence bias adds a unique variance in predicting Generation Z's investment decisions.

2.2 Herding Bias

Afriani and Halmawati (2019, cited in Shabri and Sakir, 2024) mentioned that herding behavior among investors exists when investors heavily rely on information provided by many instead of relying on their intuition. Investors who lack confidence imitate the investment decisions of others (Durand *et al*., 2013, as cited in Adil *et al.*, 2022) and believe that their sentiments or decisions are correct (Dar and Hakeem, 2015, cited in Gupta and Shrivastava, 2022). Others like to learn from their experiences by relying on the future benefits of investment rather than the present (Jiang and Verardo, 2018). Dickason *et al.* (2018, cited in Almansour et al. 2023) attributed this herding behavior to the investor's desire to reduce losses, especially during uncertainties. Banerji *et al.* (2020, cited in Hussain *et al.*, 2023) added that investors herd during bearish stock trading and further increase based on the expectation of the occurrence of a financial disaster.

Rohim (2023) added that millennial investors overinvest because they are confident that they will receive gains from their investments or defer making investments due to the fear of financial losses. Halim and Satria (2023) confirmed its positive and significant effect on the investment decisions of equity investors in Riau, Indonesia, using Structural Equation Modeling. Almansour *et al.* (2023), Wibowo *et al.* (2023), Mahmood *et al.* (2024), and Rohim (2023) also found a positive and significant effect of herding behavior on the stock investment decisions of Saudi Arabian investors, Generation Z's investors in Malang, Indonesia, Cryptocurrency investors in Malang, Indonesia, and equity investors in Pakistan, respectively. Adil *et al.* (2022) found herding bias's negative and significant impact on millennial and female investors in Pakistan, while Maharani and Sari (2023)

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and Prasetyo *et al.* (2023) did not find it significant influence on the investment decisions of millennial investors in Central Java, Indonesia and Gen Z investors in Kediri City, Indonesia, respectively.

H_{2a} Herding bias significantly affects Generation Y's investment decisions.
H_{2b} Herding bias significantly affects Generation Z's investment decisions.
H_{2c} Herding bias adds a unique variance in Generation Y's predicting investment decisions.
H_{2d} Herding bias adds a unique variance in predicting Generation Z's investment decisions.

2.3 Disposition Effect

The disposition effect occurs among investors who sell high-performing stocks in exchange for more gain from the investment and defer investment in losing stocks to delay the incurrence of losses (Shefrin and Statman, 1985 cited in Zahera and Bansal, 2018). Erfan *et al.* (2021) mentioned that knowing its importance will help them understand their investment behavior. A rise in disposition effects increases the stock market's momentum since investors may not make proper decisions when faced with too many investment decisions (Zahera and Bansal, 2019). Sharma (2019) found its direct and significant effect on portfolio investment decisions using Confirmatory Factor Analysis (CFA) and Structural Equation Model (SEM). Conversely, Almansour *et al.* (2023) and Ullah *et al.* (2020) revealed its positive and weak effects. Toma *et al.* (2016, cited in Zahera and Bansal, 2018) revealed the presence of the disposition effect, overconfidence, and representative biases in the investment decisions of investors in Romania.

H_{3a} Disposition effect bias significantly affects Generation Y's investment decisions.
H_{3b} Disposition effect bias significantly affects Generation Z's investment decisions.
H_{3c} Disposition effect adds a unique variance in predicting Generation Y's investment decisions.
H_{3d} Disposition effect adds a unique variance in predicting Generation Z's investment decisions.

2.4 Risk Aversion

Risk aversion bias exists when investors avoid risk and losses or are willing to invest when they believe the expected return is higher than its corresponding risk (Sallama, 2015, cited in Rosdiana and Buana, 2020). It has a significant influence on the decision-making of a private investor in electricity generation, and it also affects market design (Petite, 2016). Almansour *et al.* (2023) and Benayad and Aasri (2023) showed risk aversion's significant and positive influence on the equity investments of Saudi Arabian investors and SME managers in Morocco, respectively. The findings of Alshamy (2019) also showed a positive and significant effect. Segel and Hatami (2023, cited in Iswari and Budioni, 2024) proved that Generation Z investors are more risk averse and rationally consider the risks involved before they make their investments compared to the Millennials. However, Mahmood *et al.* (2024) and Adil *et al.* (2022) found the negative impact of risk aversion on the investors' investment decisions.

In another study, Chiu and Wong (2018) investigated the optimal investment for insurers with correlation risk, risk aversion, and investment horizons. They revealed that those

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with high-risk aversion can make long-term investment strategies. When their level of risk aversion is insufficiently high, they make short-term equity investments compared to bond market investments. Dinarjito (2023) cited that investors tend to become risk averse when they experience gain but become risk seekers when facing financial problems, commonly called loss aversion. Hamid and Arfeen (2020) added that the level of risk associated with a mechanism such as investment is crucial in defining an investor's conduct for either taking or avoiding risk.

H_{4a} Risk aversion bias significantly affects Generation Y's investment decisions.
H_{4b} Risk aversion bias significantly affects Generation Z's investment decisions.
H_{4c} Risk aversion bias adds a unique variance in predicting Generation Y's investment decisions.
H_{4c} Risk aversion bias adds a unique variance in predicting Generation Z's investment decisions.

2.5 Financial Literacy

Financial literacy refers to the ability and skills of a person to manage his finances to decrease any potential error when making pertinent financial decisions (Satoto and Budiwati, 2019). Their study focused on how financial literacy affects financial management behavior, using self-control as an intervening indicator. They emphasized that the lack of financial literacy adversely impacts financial decisions. Susan *et al.* (2022) also confirmed this and noted that low financial literacy creates a problem among many Indonesians and has become a national issue. Awais *et al.* (2016) emphasized the essential role of financial literacy in making financial decisions, where a person exhibits his knowledge, experience, and capability to obtain valuable information and make financial investment decisions. Tabassum *et al.* (2021) revealed that financial literacy has a significant and direct effect on the investment decisions of equity investors in the Pakistan Stock Exchange. Singh (2022) examined the drivers of the investment decisions of Millennials in Thailand, and his findings revealed that financial literacy has a positive and significant effect on their investment decisions. Kumari (2020) and Subedi (2023) also corroborated this in their investigation of undergraduate students in Sri Lanka and equity investors in Nepal, as well as by Ali Seraj *et al.* (2022) among Saudi Arabian investors. However, the findings of Arif (2015) showed a negative and significant impact of financial literacy on the investment decisions of individual investors, and their financial literacy varies according to age, gender, civil status, and work activity. Priangga and Purwanto (2024) and Arianti (2018) did not find the effect of financial literacy on the investment decisions of the students in Java and Banten Province of Indonesia and equity investors in KSEI, respectively.

H_{5a} Financial Literacy significantly affects Generation Y's investment decisions.
H_{5b} Financial Literacy significantly affects Generation Z's investment decisions.

2.6 Behavioral Biases and the Moderating Role of Financial Literacy

The moderating effect of financial literacy on the influence of herding bias and overconfidence bias is negative and significant (Prasetyo *et al.*, 2023) which contrasts with the positive and significant findings of Hussain *et al.* (2023) on its moderating effect on the relationship of herding bias and loss aversion with the investment decisions of individual investors in Pakistan. It was corroborated by the findings of Ulupui and

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Buchdadi (2024) when they examined the moderating role of financial literacy on the effect of herding behavior on the investment decisions of government employees. Adil *et al.* (2022) revealed its insignificant impact on investment decisions, but it moderates the influence of herding bias on the investment decisions of female investors. Highly financially literate women are hesitant toward their herding biases and weigh in on the proposal of their broker in their decision-making process.

Ahmad et al. (2022) used financial literacy as a moderator on selected behavioral biases' impact on investment decisions and found that overconfidence has a positive and significant impact on the investment decisions of investors in Pakistan. It corroborates the findings of Naveed and Taib (2021), who state that the way investors rationalize their investments might diminish. Marie et al. (2013, cited in Zahera and Bansal, 2018) revealed a significant impact of financial literacy or education on the relationship between risk aversion and investment decisions. Stoian et al. (2021) examined the relationship between financial literacy, investment preferences, and risk aversion of young investors in Romania. The results revealed that financial literacy influences their investment preferences and their risk aversion. Financial literacy's marginal effect in making these young adults take risks is significant. Alshamy (2019), however, did not find its moderating effect on the relationship between the two. Mahmood et al. (2024) found a positive but insignificant effect of the interaction of financial literacy with overconfidence, herding, disposition, and risk aversion biases with investors' investment decisions. Tabassum et al. (2021) found no moderating effect of financial literacy on its interaction with overconfidence and herding bases, but their effects were positive. Moreover, financial literacy significantly moderates the disposition effect of investors (Ullah, 2019).

H6a: Financial literacy moderates the effect of overconfidence bias on Generation Y's investment decisions.
H6b: Financial literacy moderates the effect of overconfidence bias on Generation Z's investment decisions.
H7a: Financial literacy moderates the effect of herding bias on Generation Y's investment decisions.
H7b: Financial literacy moderates the effect of herding bias on Generation Z's investment decisions.
H8a: Financial literacy moderates the effect of disposition effect bias on Generation Y's investment decisions.
H8b: Financial literacy moderates the effect of disposition effect bias on Generation Z's investment decisions.
H9a: Financial literacy moderates the effect of risk aversion bias on Generation Y's investment decisions.
H9b: Financial literacy moderates the effect of risk aversion bias on Generation Z's investment decisions.

3. FRAMEWORK OF THE STUDY

Behavioral Theory of Financial Decision-making

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When making financial decisions, financial decision-makers are described as quasi and analytically rational while functioning as decision-makers to the organization. Among the assumptions that affect financial decision-making are heuristics, framing, and market inefficiencies. These elements contribute to non-rational decision-making, which can result in mispricing and return anomalies. According to Valaskova et al. (2019), in behavioral finance, investors, or a significant minority of them, are influenced by behavioral biases that can lead to making entirely rational financial decisions due to the application of cognitive psychology features.

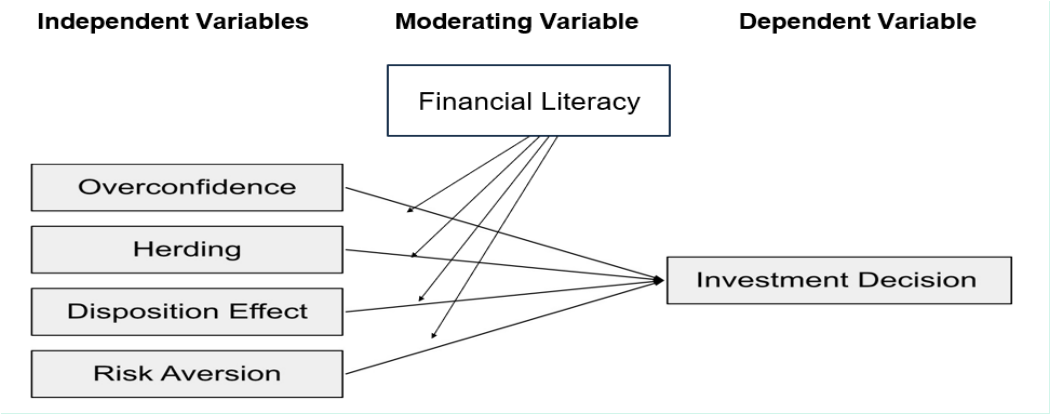
3.1 Prospect Theory

It is also referred to as a loss aversion theory. Yeh (2019) mentioned that investors consider profits and losses differently and give more importance to perceived opportunities or gains rather than perceived losses. When given two equal possibilities, an investor will choose the one with significantly more chances of profit. They habitually hold on to the dropping stocks and the associated reduction while making profits by selling soaring stocks prematurely. Such investors are vulnerable to increased vulnerability where losses have already happened, possibly leading to even more significant losses. Marjerison *et al.* (2020) mentioned that investors become reluctant when losses are incurred compared to the gains that they receive.

3.2. Conceptual Framework

The behavioral biases, used as independent variables, are broken down into four biases: (1) overconfidence, (2) risk aversion, (3) herding, and (4) disposition effect. Moreover, researchers identified the significance of financial literacy as a moderating variable in the relationship between behavioral biases and investment decisions.

Figure 1: Conceptual Paradigm



4. METHODOLOGY

4.1. Research Design

We employed a quantitative research design to analyze the data. It utilizes secondary data to establish a comprehensive understanding of the mechanisms that drive the observed

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relationships between variables by examining the effect of behavioral biases and financial literacy on the investment decisions of retail investors. Specifically, it uses explanatory research design, which, according to Benitez (2020), could explain the relationship between variables (cause-and-effect relationship between the independent and dependent variables.

4.2. Sources of Data and Sampling Design

We used primary data (an online survey questionnaire using Google Forms) and secondary data sources (e.g., online materials such as journals, books, and other articles). A total sample of 385 respondents using Slovin's formula was derived from the Stock Market Investors Profile data of the Philippine Stock Exchange, comprising 1,589,507 retail investors. 98.5 percent are local accounts, and 75.6 percent reside or work in Metro Manila.

We also employed purposive sampling in selecting respondents using these criteria:

- They should be Filipino retail investors.
- They should belong to Generation Y and Generation Z. Generation Y was born from 1980-1994, while Generation Z was born from 1995 to 2015.
- They should be residing or operating in Metro Manila, Philippines. The 2021 Stock Market Investor Profile (SMIP) Report released by the Philippine Stock Exchange (PSE) reported that most retail investors are based and concentrated in Metro Manila.

4.3 Research Instrument

We conducted the survey using Google Forms to solicit information from these investors, grouped as Generation Z and Generation Y, related to their investment decisions. The study was adopted from the study of Adil *et al.* (2022) and is subdivided into three parts. The first part includes the written consent and data privacy agreement, while the second part contains the demographic profile of the respondents. The third part contains information related to behavioral biases, financial literacy, and investment decisions. Each behavioral bias contained five questions and four questions for financial literacy. The survey questionnaire had questions or items with a single selection and questions or items with a 5-point Likert scale, with one (1) being the lowest (strongly disagree) and five (5) being the highest value (strongly agree). The questionnaire was pilot tested to ensure that the respondents understood the questionnaire and to solicit feedback from the participants to improve the instrument. To ensure the reliability of the survey questionnaire, Cronbach's Alpha was generated for the pilot test and the sample.

4.4. Method of Data Analysis

We applied the Ordinary Least Square Method and Pooled OLS in measuring the impact of behavioral biases on the investment decisions of retail investors belonging to Generation Y and Generation Z. Below is the regression formula:

$$\text{Investment Decision}_i = \beta 0 + \beta 1\ \text{OB}i + \beta 2\text{HB}i + \beta 3\text{DB}i + \beta 4\text{RAB}i + \beta 5\text{FL}i$$

Where β0 is the intercept of the regression line, $\beta 1$ to $\beta 5$ refer to the coefficients of the

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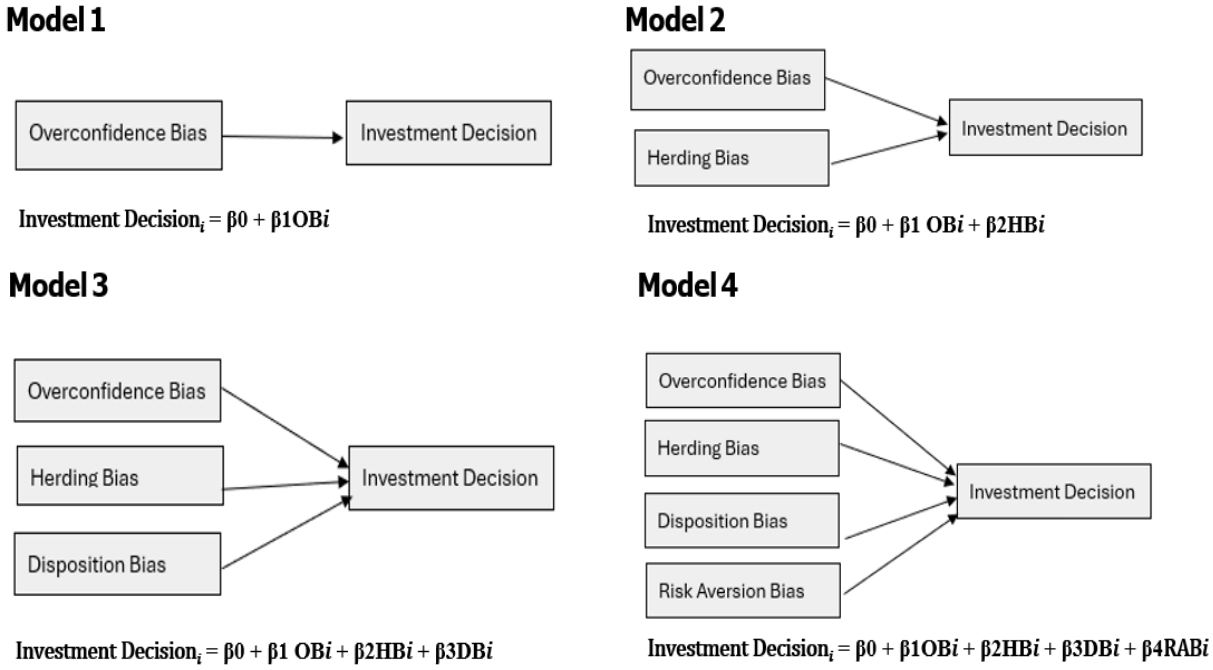
independent variables, OB refers to overconfidence bias, HB refers to herding bias, DB refers to disposition effect bias, RA refers to risk aversion bias, and FL refers to financial literacy.

Figure 2. Hierarchical Regression



To further measure its impact, hierarchical regression was applied to test the association between behavioral biases and investment decisions. The independent variables are either added to or removed from the regression model in steps to determine the predictive power of each variable used in the study as contrasted to the multiple linear regression model, where independent variables are simultaneously encoded. We used 4 Models to measure the proportion of the explained differences in investment decisions, as shown in Figure 2 below.

We compute the R^2 to determine if the newly added variable/(s) added significance to the model. The null hypothesis is rejected when the p-value ≤ 5%. Moderation analysis was used to measure the influence of the interaction term between behavioral biases and financial literacy.

5. RESULTS AND DISCUSSIONS

Table 1. Demographic Profile of Survey Respondents

	Demographic Variables	**Frequency (n)**	**Percentage (%)**
Generational Group	Millennial	196	50.3
	Generation Z	194	49.7
Gender	Male	177	45.4
	Female	213	54.6
Occupation	Employee	236	60.5
	Self-Employed	52	13.3
	Student	95	24.4

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	Unemployed	7	1.8
Educational Attainment	College Graduate	261	66.9
	College Undergraduate	99	25.4
Investment Experience	Less than a year	101	25.9
	1 to 2 years	126	32.3
	2 to 3 years	59	15.1
	3 to 4 years	45	11.5
	5 years or more	59	15.1

Note: Authors' computations

The breakdown of the characteristics of the respondents is provided in Table 1. Around 50 percent of the respondents belong to Generation Z, while 49.7% belong to Generation Y. The survey participants are predominantly female, representing 54.6 percent, and are mostly employed in a company (60.5 percent) or students (24.5 percent). This proves that the respondents are educated. This suggests that the respondents are likely to be well-educated. Most of the respondents (32.3 percent have been investing for 1 to 2 years, with 126 people (32.3%) in that category, while around 32.3, followed by those who had been investing for less than a year (25.9 percent. It proves that the respondents are likely to be a relatively new group of investors and are actively learning about the concepts and process of investing. The percentage of people who have been investing for 5 years or more is relatively low.

Table 2. Regression Results for the Influence of Four Behavioral Biases on the Behavioral Biases of Generation Y and Generation Z

	Generation Y		Generation Z	
Variables	β	Remarks	β	Remarks
Overconfidence	-0.057	H1a is not Supported	0.199**	H1b is supported
Herding	0.189***	H2a is Supported	0.213***	H2b is supported
Disposition Effect	0.155**	H3a is supported	0.199***	H3b is supported
Risk Aversion	0.245***	H4a is supported	0.027	H4b is not supported
Intercept	1.479		1.325	

Authors' computation; *** p<0.01, ** p<0.05, * p<0.1

Mixed results are generated for the influence of risk aversion and overconfidence biases on Generation Y and Generation Z's investment decisions (see Table 2). The result for overconfidence bias is negative and insignificant for Generation Y. Thus, H1a is not supported and is consistent with the findings of Benayad and Aasri (2023) on its impact on the investment decisions of Moroccan SME investors.

On the other hand, H1b is supported by Generation Z, like the findings of Adil *et al.* (2022) and Almansour *et al.* (2023). The higher the overconfidence bias among Generation Y, the higher their decision-making. For risk aversion bias's effect on the investment decisions of Generation Y, H4a is supported (p-value < 0.001), consistent with the findings of Alshamy (2019) and Rosdiana and Buana (2020). Its effect on the investment decisions of Generation Z is not significant but is positive (H4b is not supported). For both generational groups, herding bias, and disposition bias significantly and positively affect their investment decisions. The results for disposition effect bias are consistent with the results generated by Sharma (2019) while the findings on herding bias corroborate the findings of Halim and Satria (2023), Wibowo *et al.* 2023), Mahmood *et al.* (2024), and Rohim (2023).

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Table 3. Model Fit Measures Using Hierarchical Multiple Regression Model

		Generation Y				Generation Z			
Model	Predictor Variables	R	R^2	Adj. R^2	p-value	R	R^2	Adj. R^2	p-value
M1	O	0.146	0.021	0.016	0.042	0.452	0.204	0.200	<.001
M2	O + H	0.49	0.240	0.232	<.001	0.602	0.363	0.356	<.001
M3	O + H + D	0.544	0.296	0.285	<.001	0.638	0.407	0.398	<.001
M4	O + H + D + RA	0.593	0.352	0.338	<.001	0.639	0.408	0.396	<.001

Note: Authors' computation using Jamovi software; O represents overconfidence bias, H represents herding bias, D represents disposition bias, and RA represents risk aversion bias. Note: Each variable is added to each model (see Figure 2).

Table 4. Model Comparisons

Model Comparison			Generation Y			Generation Z		
			ΔR^2	F	p-value	ΔR^2	F	p-value
M1	–	M2	0.2189	55	<.001	0.1587	48.061	<0.001
M2	–	M3	0.0554	14.9	<.001	0.0447	14.467	<0.001
M3	–	M4	0.0561	16.4	<.001	0.0008	0.271	0.603

Note: Authors' computation using Jamovi software
Four models were used, as shown in Table 2. M1 = overconfidence bias; M2 = overconfidence bias + herding biases; M3 = overconfidence bias + herding bias + disposition effect bias; and M4 = overconfidence bias + herding bias + disposition effect bias + risk aversion biases

The results shown in Tables 3 and 4, generated from the hierarchical multiple regression estimation, show that the inclusion of herding bias in Model 2 accounted for 21.89 percent variance in investment decisions of Generation Y investors, higher than the 15.87 percent variance generated for Gen Z (AR2 =0.1587, p-value < 0.01). Thus, H2c and H2d are supported, as shown in the p-values generated for both generational groups (see Table 4). The inclusion of disposition effect bias in Model 3 provided an additional 5.54% variation in the investment decisions of Generation Y as opposed to the 4.47 percent variations in the investment decisions of Generation Z. Thus, the null hypothesis is rejected for both groups (H3c and H3d are supported). When risk aversion bias is added in Model 4, the results revealed 5.61 percent investment decision variations among Generation Y; thus, H4c is supported (p-value < 0.001). H4d is not supported, as the inclusion of risk aversion in Model 4 did not show a significant effect on Generation Z's investment decisions.

Table 5. Regression Results for the Influence of Financial Literacy on Investment Decisions of Generation Y and Generation Z

	Generation Y		Generation Z	
Variables	β	Remarks	β	Remarks
Financial Literacy	- 0.391*	H5a is supported	-0.091	H5b is not supported
Intercept	4.116		3.772	

Note: Authors' computation; *** p<0.01, ** p<0.05, * p<0.1

Table 5 indicates that financial literacy provided a significantly negative influence on Generation Y's investment behavior (H5a is supported). While a negative influence of

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financial literacy on the investment decisions of Generation Z, it was found that it is insignificant. With the rising investments available in the market but with low financial literacy among retail investors, the latter are likely to make many poor investment decisions.

It only proves that most of these young and middle-aged investors need to prepare to make new or more investments. It contradicts the findings of Adil *et al.* (2021), who found a positive and significant impact of financial literacy on investment decisions. However, it corroborates the findings of Al-tamimi *et al.* (2009) and Ahmad *et al.* (2022) among individual investors in the Pakistan Stock Exchange.

Table 6. Moderating Role of Financial Literacy

	Generation Y		Generation Z	
Variables	β	Remarks	β	Remarks
OB x FL	1.111**	H6a is supported	0.843	H6b is not supported
HE x FL	0.138	H7a is not supported	-0.056	H7b is not supported
DE x FL	0.696*	H8a is supported	-0.071	H8b is not supported
RA x FL	0.404	H9a is not supported	0.050	H9b is not Supported

Authors' computation using Jamovi software; *** p<0.01, ** p<0.05, * p<0.1; x represents the interaction between the predictor variables (left side) and the moderator (financial literacy); Predictor variables: O represents overconfidence bias, H represents herding bias, D represents disposition bias, and RA represents risk aversion bias. FL represents financial literacy (moderator)

As shown in Table 6, the moderating role of financial literacy on the influence of herding bias and disposition effect bias is negative and insignificant, as contrasted to the findings on the positive impact of overconfidence and risk aversion biases. The interaction term financial literacy and overconfidence bias (HE x FL) has a significant effect on Generation Y's investment decisions (H6a is supported), but it has a weak effect on Generation Z's investment decisions (H6b is not supported). The moderating effects of financial literacy on the impact of herding bias and risk aversion bias on the investment decisions of Generations Y and Z are insignificant; thus, H7a, H7b, H9a, and H9b are not supported (p-values > 0.05). The moderating effect of financial literacy on the impact of herding and disposition biases on Generation Z's investment decisions is consistent with the findings of Prasetyo *et al.* (2023), where they found these interaction terms' negative impact on the investment decisions of Generation Z in Indonesia. The results for the effect of the interaction term (HE x FL) on the investment decisions of both generational groups are contrary to the findings of Hussain *et al.* (2023), where they found positive and significant moderating effects.

H8a is supported, as the impact of the interaction term DE x FL on the investment decisions of Generation Y is significant (p-value < 0.10, $\beta = 0.696$), while H8b is not supported for Generation Z, as shown from the p-value which is less than 0.05. The results for H8a are supported by the study of Adil *et al.* (2022) and Ahmad *et al.* (2022) among Pakistani investors. Except for the results generated for the overconfidence bias (H10b), the findings on the impact of financial literacy on the relationship of herding bias, disposition effect bias, and risk aversion bias for Generation Y are consistent with the findings of Adil *et al.* (2022) where the moderating role of financial literacy on the impact of herding, disposition effect, and risk aversion biases are insignificant.

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6. CONCLUSIONS AND RECOMMENDATIONS

This study examined the effects of behavioral biases on Filipino Generations Y and Z's investment decisions and analyzed how financial literacy moderates their relationships. Herding, disposition effect, and risk aversion significantly affect their investment decisions of Generation Y's investment decisions. On the other hand, overconfidence, herding, and disposition effect biases significantly influence Generation Z's investment decisions. Using hierarchical regression, all behavioral biases (overconfidence, herding, disposition effect, and risk aversion) significantly influenced investment decisions except for the addition of risk aversion in Model 4 for Generation Z, where no significant improvement in their investment decisions was seen.

Financial literacy has a positive and statistically significant impact on the investment decisions of Generation Y. It negatively affects Generation Z's investment decisions, which proves that young Filipino retail investors have poor or low financial literacy. The interaction of financial literacy with overconfidence and disposition effect biases positively and significantly affects investment decisions. Among Generation Z, financial literacy did not moderate the impact of the disposition effect and herding biases on their investment decisions. Since many investors in emerging market economies have low financial literacy, the national governments and supervisory authorities must proactively provide basic education related to investments and financing. Investors must continue their learning process in financial literacy and develop different strategies for dealing with their investments by making sound financial decisions. It can also create a tripartite collaboration with financial institutions and academic institutions to review existing regulations and bring about improvements that will benefit investors belonging to the marginalized community.

Financial institutions must continuously improve investment products or services by enhancing and optimizing their investment processes and systems that can cater to the fast-growing market. They can provide online educational materials, showcase investors' success stories, online trading simulators (e.g., real-time stock market games), and other resources that will provide essential financial literacy concepts affecting their behavior and eventually stimulate financial skills and engagement. It will also inspire the development of new and improved investment products or services that are less risky and specifically designed to meet the investing needs of the current generations and baby boomers. It will help investors make better-informed investment decisions and reduce the likelihood of detrimental financial outcomes.

Academic institutions are essential partners in disseminating correct knowledge and information by creating basic education courses in the program's curriculum, regardless of degree program, to stimulate the financial knowledge of all university and college students, and even in junior and senior high school. The study's results provided the present situation of the effect of behavioral biases on investment decisions among Generations Y and Z and investors. Educators may include in their teachings and assessments, information and cases related to behavioral and cognitive biases to make their students understand these biases that influence investment decisions.

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