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The Effect of Financial Literacy on Investment Decisions Through Risk Tolerance and Overconfidence

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Abstract---*Investment decision is the process of allocating funds into specific investment instruments to generate future returns. Despite the rapid growth of Generation Z (Gen Z) participation in Indonesia's capital market—with investors aged 30 or below accounting for 54.12% of all registered accounts—the quality of their investment decisions remains suboptimal, partly due to psychological biases. This study examines the effect of financial literacy on investment decisions through risk tolerance and overconfidence as mediating variables among 170 Gen Z investors affiliated with the Indonesia Stock Exchange (IDX) Investment Gallery at universities in Denpasar, Bali, in 2026. Proportional stratified random sampling was employed, and data were analyzed using Partial Least Squares–Structural Equation Modeling (PLS-SEM) via SmartPLS 4. Results demonstrate that financial literacy positively influences risk tolerance ($\beta = 0.592$, $p < 0.001$) and investment decisions ($\beta = 0.284$, $p < 0.001$), while exerting a significant negative effect on overconfidence ($\beta = -0.439$, $p < 0.001$). Risk tolerance positively affects investment decisions ($\beta = 0.427$, $p < 0.001$), whereas overconfidence negatively affects investment decisions ($\beta = -0.324$, $p < 0.001$). Both risk tolerance (VAF = 42.66%) and overconfidence (VAF = 43.83%) partially mediate the financial literacy–investment decision relationship. The model explains 65.0% of the variance in investment decisions ($R^2 = 0.650$). Findings extend Prospect Theory and Financial Behavior Theory to a Gen Z context, highlighting that among novice investors, financial knowledge reduces—rather than amplifies—overconfidence, leading to more rational investment behaviour. Practical implications for IDX Investment Galleries and financial regulators are discussed.*
Keywords---*financial literacy, risk tolerance, overconfidence, investment decisions*

Introduction

Investment is a strategic decision in financial management oriented towards asset growth and future economic value creation (Inrawan et al., 2022; Tandelilin, 2017). In Indonesia, the investment trend has accelerated dramatically with the expansion of financial technology (fintech), which lowers barriers for retail investors, including Generation Z (Nugraha et al., 2025; Jameaba, 2020). The total number of registered investors through the Indonesia Central Securities Depository (KSEI) grew from 10.3 million in 2022 to approximately 18.0 million by August 2025 - a 74.75 percent increase in three years—with investors aged 30 or below now comprising 54.12 percent of all individual accounts (KSEI, 2025).

Generation Z, defined as individuals born between 1997 and 2012 (Qurrota, 2025) grew up in the digital age with fast access to information through social media and online platforms (Rohyati et al., 2024). In Denpasar, approximately 33 percent of Bali's 330,331 registered investors are concentrated, making it the province's capital market hub (Otoritas Jasa Keuangan, 2025a). Nationally, the financial literacy index for the 18–25 age cohort increased from 70.19 percent in 2024 to 73.22 percent in 2025, while financial inclusion for the same cohort reached 89.96 percent (Otoritas Jasa Keuangan, 2024, 2025b). The resulting gap between inclusion and literacy suggests that

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many young investors actively use financial products without commensurate knowledge, a pattern consistent with estimates that 70–90 percent of retail investors fail within their first three years of investing (Efendi, 2025; Topan, 2025).

Various factors have been identified as drivers of investment decisions. Financial literacy is recognised as a primary determinant, enabling individuals to objectively evaluate investment risks and benefits (Kumar et al., 2023). Individuals with higher levels of financial literacy tend to make more rational and informed investment decisions (Dewi & Wiagustini, 2022; Febriansyah et al., 2023b; Gunawan & Wiyanto, 2022; Uttari & Yudantara, 2023). Risk tolerance is defined as the degree to which an individual is willing to accept potential losses in pursuit of future gains (Darmayanti et al., 2023) also plays a central role. Gen Z investors generally exhibit a higher propensity for risk-taking than previous generations (Darmayanti et al., 2023; Gunawan & Wiyanto, 2022). Additionally, overconfidence, the tendency to overestimate one's own knowledge or predictive ability, is a well-documented behavioural bias that can distort investment decision quality (Barber & Odean, 2001; Barno et al., 2020; Jusuf et al., 2023).

Theories used in the study of investment behaviour include the Financial Behavior Theory (Nofsinger, 2001; Xiao, 2008) and Prospect Theory (Kahneman & Tversky, 1979). Financial Behavior Theory explains how individuals make financial decisions under the influence of psychological, social, and cognitive factors, departing from the classical assumption of full rationality. Prospect Theory describes how investors perceive potential losses and gains asymmetrically, with losses looming larger than equivalent gains, making risk tolerance a central psychological mediator. Based on these theories, the present study examines whether risk tolerance and overconfidence mediate the relationship between financial literacy and investment decisions.

Various studies have been conducted to understand Gen Z investment decisions, but research gaps remain. Most prior work examines direct effects only, without testing psychological mediators simultaneously (Mubaraq et al., 2021; Prabowo et al., 2023). Furthermore, evidence on the financial literacy–overconfidence relationship is mixed: several studies report a positive link (Glaser & Weber, 2007; Jameel & Siddiqui, 2019; Malini, 2025; Pratama & Setyawati, 2026), while Financial Behavior Theory would predict that overconfidence is reducible through improved understanding of market risk. No study has simultaneously tested both risk tolerance and overconfidence as mediators within a Gen Z investor sample in Indonesia.

To address these gaps, this study focuses on Generation Z investors who are active members of the IDX Investment Gallery at universities in Denpasar in 2026. This research is expected to provide new insights for academics studying young investor behaviour, as well as for financial regulators, capital market institutions, and financial educators seeking to enhance financial inclusion and the quality of Gen Z investment decisions.

Literature Review

Financial Behavior Theory

Financial Behavior Theory, as synthesised by Xiao (2008), integrates psychological and cognitive elements to explain individual financial decision-making. Nofsinger (2001) defines financial behaviour as the study of how human psychology actually influences financial decisions at individual, corporate, and market levels. Departing from classical finance's rationality assumptions, this theory acknowledges that decisions are often shaped by emotion, cognitive biases, and social pressures. Ratnawati et al. (2024) and Buana & Amalia (2026) demonstrate that better financial behaviour supported by adequate literacy improves investment outcomes, while biases such as overconfidence can systematically impair decision quality.

Prospect Theory

Prospect Theory Kahneman & Tversky (1979) describes how individuals make decisions under conditions of uncertainty by weighting potential losses more heavily than equivalent gains, a phenomenon termed loss aversion. In investment, this asymmetry implies that investors' willingness to accept risk (i.e., their risk tolerance) depends not only on objective probabilities but on subjective framing. Investors with higher risk tolerance are more prepared to accept volatility and, accordingly, more willing to commit to equity instruments with higher potential returns (Darmayanti et al., 2023; Hartati & Syarifudin, 2025).

Investment Decision

An investment decision is the process of allocating a certain amount of funds into specific investment instruments to generate returns over a defined period (Logitama et al., 2021). Such decisions are influenced by internal factors including financial literacy, risk perception, confidence, and income, as well as external factors such as market

conditions and interest rates (Novita & Pamikatsih, 2022). In this study, investment decisions are measured using five indicators adapted from Ullah (2015), Moueed et al. (2015), and Dewi & Wiagustini (2022): investment allocation, investment safety, investment return, investment risk, and portfolio monitoring.

Financial Literacy

According to the U.S. Government Accountability Office (2024), financial literacy is the ability to make informed judgements and take effective action regarding the use and management of money. The Otoritas Jasa Keuangan (2024) further defines it as the knowledge, skills, and beliefs that shape attitudes and behaviour to improve financial decision quality and achieve financial well-being. Financial literacy has been found to positively influence investment decisions directly in multiple studies (Fadila et al., 2022; Febriansyah et al., 2023a; Hendarto et al., 2021; Sawitri et al., 2025; Uttari & Yudantara, 2023). In this study, financial literacy is operationalised through five indicators: money management, knowledge of the risk–return relationship, knowledge of inflation effects, knowledge of time value of money, and knowledge of diversification (Cameron et al., 2014; Mardikaningsih & Darmawan, 2023).

Risk Tolerance

Risk tolerance is defined as the highest level of uncertainty an individual can accept in financial decision-making related to a desired goal (Darmayanti et al., 2023). Investors with high risk tolerance are prepared to accept financial uncertainty in exchange for higher potential returns (Rizkia et al., 2023). Research consistently links risk tolerance positively with investment decisions (Darmayanti et al., 2023; Koma & Jatiningsih, 2024; Mubaraq et al., 2021; Soraya et al., 2023). Risk tolerance is measured using four indicators: willingness to borrow for investment, willingness to accept larger financial risks, readiness to face potential loss, and boldness in uncertain ventures (Darmayanti et al., 2023).

Overconfidence

Overconfidence is a pervasive cognitive bias in which investors overestimate their knowledge, skills, or predictive accuracy regarding financial markets (Barno et al., 2020; Jusuf et al., 2023). Overconfident investors tend to engage in excessive trading, underestimate risks, and make decisions based on inflated self-assessments, ultimately reducing portfolio performance (Barber & Odean, 2001; Glaser & Weber, 2007; Inghelbrecht & Tedde, 2024). Overconfidence is measured using three indicators: over-estimation, over-placement, and over-precision (Sudirman & Pratiwi, 2022). Based on the theoretical review and prior empirical evidence, this study formulates the following hypotheses:

H1: Financial literacy has a positive effect on risk tolerance.
H2: Financial literacy has a positive effect on investment decisions.
H3: Financial literacy has a positive effect on overconfidence.
H4: Risk tolerance has a positive effect on investment decisions.
H5: Overconfidence has a positive effect on investment decisions.
H6: Risk tolerance mediates the effect of financial literacy on investment decisions.
H7: Overconfidence mediates the effect of financial literacy on investment decisions.

Based on the hypotheses above, the conceptual research framework is illustrated in Figure 1

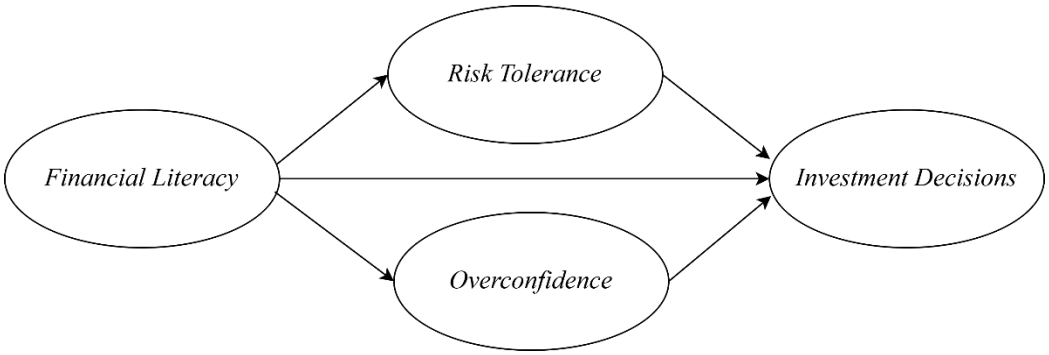

Figure 1. Research Framework

Research Methodology

Sample and Sampling Method

The population in this study comprised Generation Z investors (born 1997–2012) who are active members of the IDX Investment Gallery at universities in Denpasar, Bali, in 2026. The total population was 515 members across ten active galleries. Following Hair et al. (2019), the minimum sample size was set at ten times the number of research indicators (17 indicators), yielding 170 respondents. Proportional stratified random sampling was employed to ensure balanced representation across galleries. Sample allocations per gallery were computed as $n_i = (N_i / N) \times n$, producing allocations such as 53 respondents from Universitas Udayana (31.2%), 40 from Universitas Warmadewa (23.5%), and 32 from Universitas Ngurah Rai (19.4%).

Data Collection and Analysis Procedure

This research adopted a quantitative, associative-causal design. Data were collected via an online questionnaire (Google Form) using a five-point Likert scale (1 = strongly disagree, 5 = strongly agree). All instruments were pre-tested on 30 pilot respondents using IBM SPSS Statistics 29; all indicators exceeded the r-table threshold of 0.361, and all variables returned Cronbach's alpha values above 0.70, confirming validity and reliability. The full sample of 170 respondents was then collected.

Structural Equation Modeling based on Partial Least Squares (PLS-SEM) was performed using SmartPLS 4 to evaluate measurement and structural models. Significance was assessed at $\alpha = 5\%$ (t-statistic > 1.96, $p < 0.05$) using the bootstrapping procedure with 5,000 sub-samples. Mediation was assessed using the Variance Accounted For (VAF) criterion: VAF > 80% = full mediation; 20–80% = partial mediation; < 20% = no mediation (Hair et al., 2019).

Table 1
Source of Questionnaire Indicators

Construct	Number of Items	Source
Investment Decision	5	Dewi & Wiagustini, (2022); Moueed et al. (2015); Ullah (2015)
Financial Literacy	5	Cameron et al. (2014); Darmayanti et al. (2023)
Risk Tolerance	4	Darmayanti et al. (2023)
Overconfidence	3	Sudirman & Pratiwi (2022)

Results and Discussions

Descriptive Analysis

Descriptive analysis provides an overview of the 170 Generation Z investors who are members of the IDX Investment Gallery at Denpasar-area universities in 2026. The majority of respondents were born in 2006 (54.7%) and 2005 (28.2%), representing the youngest cohort of Gen Z active investors. Gender distribution was 56.5% female and 43.5% male. In terms of investment experience, 65.9% had been actively investing for less than one year and 32.9% for one to three years, indicating that most respondents were novice investors. Regarding income, 59.4% reported monthly income below IDR 1,000,000, consistent with student status.

Mean scores for investment decisions (3.68/5.00) and financial literacy (3.92/5.00) were in the 'agree' range, indicating reasonable literacy levels and positive investment orientations. Risk tolerance scored 3.18/5.00 (moderate), while overconfidence scored the lowest at 2.61/5.00, suggesting that respondents were cautious about overrating their own investment abilities, a notable characteristic for a predominantly novice sample.

Inferential Statistical Analysis (PLS-SEM Analysis)
a. Evaluation of the Measurement Model (Outer Model)

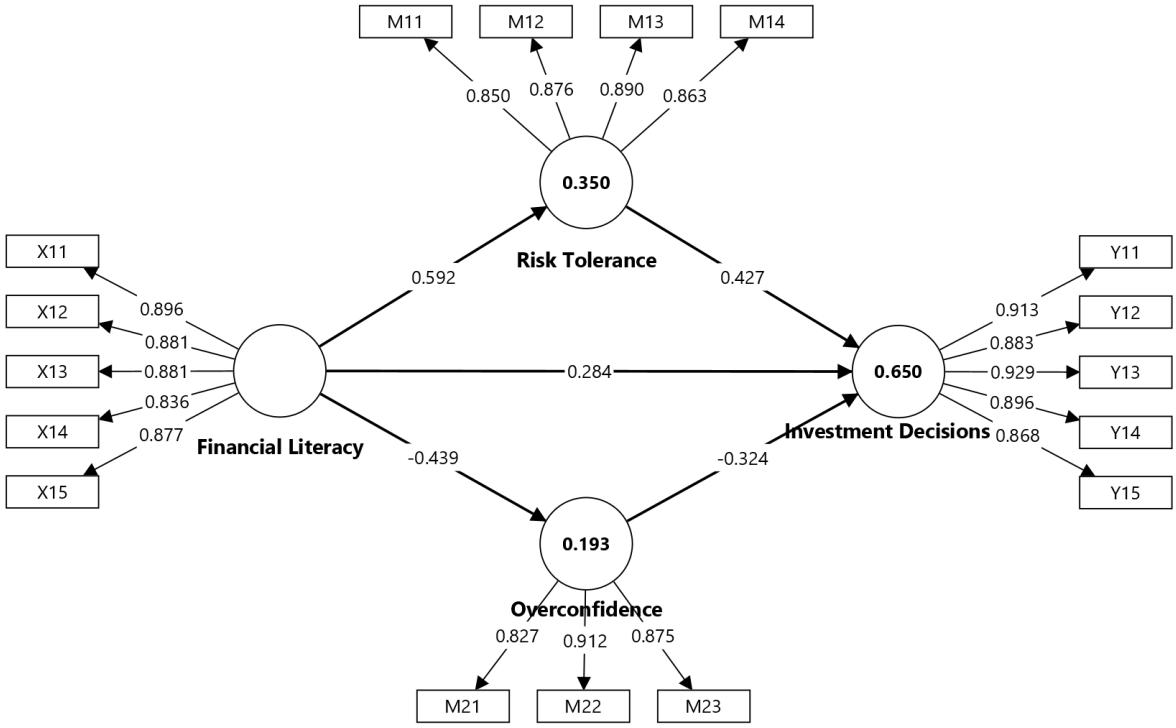

Figure 2. Result of Evaluation of the Measurement Model

Based on the results of the measurement model analysis, all latent variables met the composite reliability value ≥ 0.70 and AVE ≥ 0.50, confirming convergent validity. All outer loadings exceeded 0.70, satisfying individual indicator reliability requirements (Hair et al., 2019). Full results are presented in Table 2.

Table 2
Result of Convergent Validity and Reliability

Construct	AVE	CR (ρc)	Cronbach's α	Item	Loading	Description
Investment Decision (η_1)	0.807	0.941	0.940	Y11	0.913	Investment Allocation
				Y12	0.883	Investment Safety
				Y13	0.929	Investment Return
				Y14	0.896	Investment Risk
				Y15	0.868	Portfolio Monitoring
Financial Literacy (ξ_1)	0.765	0.925	0.923	X11	0.896	Money Management
				X12	0.881	Risk-Return Knowledge
				X13	0.881	Inflation Knowledge
				X14	0.836	Time Value of Money
				X15	0.877	Diversification
Risk Tolerance (η_2)	0.757	0.895	0.893	M11	0.850	Willingness to Borrow

Construct	AVE	CR (ρc)	Cronbach's α	Item	Loading	Description
				M12	0.876	Accepting Larger Risks
				M13	0.890	Readiness for Loss
				M14	0.863	Boldness in Uncertainty
Overconfidence (η_3)	0.760	0.869	0.844	M21	0.827	Over-Estimation
				M22	0.912	Over-Placement
				M23	0.875	Over-Precision

Source: Processed data (2026)

Discriminant validity was assessed using the Fornell–Larcker criterion. Based on Table 3, all √AVE values exceeded their correlations with other constructs, confirming discriminant validity.

Table 3
Result of Discriminant Validity

	Investment Decision	Financial Literacy	Overconfidence	Risk Tolerance
Investment Decision	0.898			
Financial Literacy	0.679	0.875		
Overconfidence	−0.537	−0.439	0.872	
Risk Tolerance	0.662	0.592	−0.207	0.870

Note. Diagonal values (bold) are √AVE. Source: Processed data (2026).

b. Structural Model Evaluation (Inner Model)
Based on the validity assessment, all constructs are valid and reliable, so structural model analysis proceeds. Table 4 shows the goodness-of-fit results.

Table 4
Evaluation Result of Goodness of Fit Model

	R Square	R Square Adjusted
Investment Decision	0.650	0.644

Source: Processed data (2026)

Table 4 shows that the structural model explains 65.0% of the variance in investment decisions ($R^2 = 0.650$, adjusted $R^2 = 0.644$) and 35.1% of the variance in risk tolerance ($R^2 = 0.351$). The Q^2 value of 0.738 indicates strong predictive relevance, confirming that the model has adequate explanatory and predictive power.

Hypothesis Testing
Hypothesis testing was conducted using the bootstrapping method (5,000 sub-samples) to determine the magnitude of T-statistics and p-values at a significance level of α = 5% (t-table = 1.96). Direct effect results are presented in Table 5 and indirect (mediation) effects in Table 6.

Table 5
Direct Path Coefficients Results

Path	Original Sample (β)	Sample Mean	Std Dev	T-stat	P-value
Financial Literacy → Risk Tolerance	0.592	0.594	0.042	14.019	0.000
Financial Literacy → Investment Decision	0.284	0.283	0.061	4.636	0.000
Financial Literacy → Overconfidence	−0.439	−0.442	0.054	8.092	0.000
Risk Tolerance → Investment Decision	0.427	0.428	0.053	8.036	0.000
Overconfidence → Investment Decision	−0.324	−0.325	0.050	6.444	0.000

Source: Processed data (2026).

Table 6
Indirect Effect (Mediation) Test Results

Indirect Path	Original Sample	T-Statistics	P-values	VAF
Financial Literacy → Risk Tolerance → Investment Decision	0.253	7.275	0.000	42.66%
Financial Literacy → Overconfidence → Investment Decision	0.142	5.073	0.000	43.83%

Note. VAF = Variance Accounted For. Medium mediation: 20%–80%. Source: Processed data (2026).

Discussion

H1: The Effect of Financial Literacy on Risk Tolerance
The results showed that financial literacy has a positive and significant effect on risk tolerance, with a t-statistic = 14.019 and p-value = 0.000. The path coefficient of 0.592 indicates that every one-unit increase in financial literacy increases risk tolerance by 0.592. This finding is consistent with Prospect Theory, which predicts that investors who better understand the risk–return trade-off will be more comfortable with investment uncertainty. Investors with adequate knowledge of diversification, time value of money, and inflation are better equipped to evaluate potential losses rationally, thereby raising their willingness to tolerate risk. This result is supported by Hamurcu et al. (2025), Nadhifah & Anwar (2021), Permanasari et al. (2020), and Ramadhani et al. (2024).

H2: The Effect of Financial Literacy on Investment Decisions
The results showed that financial literacy has a positive and significant effect on investment decisions, with a t-statistic = 4.636 and p-value = 0.000. The path coefficient of 0.284 indicates that higher literacy leads to better investment decisions. Financial Behavior Theory underpins this finding: financially literate investors more deliberately evaluate allocation strategies, risk levels, and portfolio performance. Descriptively, respondents with higher literacy scores showed greater commitment to goal-based allocation (mean score 3.71) and regular portfolio monitoring (3.61). These findings align with Dewi & Wiagustini (2022), Febriansyah et al. (2023b), Hendarto et al. (2021), and Uttari & Yudantara (2023).

H3: The Effect of Financial Literacy on Overconfidence
The results showed that financial literacy has a significant **negative** effect on overconfidence, with a t-statistic = 8.092 and p-value = 0.000 (beta = -0.439). Hypothesis H3 is therefore **rejected**: the direction is opposite to that hypothesised. This novel finding diverges from studies reporting a positive literacy-overconfidence relationship (Glaser & Weber, 2007; Jameel & Siddiqui, 2019; Malini, 2025; Pratama & Setyawati, 2026). A key explanation lies in the sample's novice profile: 65.9% of respondents had less than one year of active investing experience. For

beginner investors, higher financial literacy may primarily raise awareness of market complexity and risk, inducing epistemic humility rather than overconfidence. This interpretation is supported by the descriptive finding that the overconfidence mean was only 2.61/5.00, with most respondents disagreeing that their predictions were consistently accurate.

H4: The Effect of Risk Tolerance on Investment Decisions
Risk tolerance has a positive and significant effect on investment decisions, with a t-statistic = 8.036 and p-value = 0.000 (β = 0.427). Investors more willing to accept financial uncertainty commit more decisively to equity instruments, consistent with Prospect Theory. Descriptively, the risk-matching indicator ('the risk level of capital market investment is in line with my risk tolerance') scored the highest mean of 3.82, indicating that respondents calibrate investment choices to their personal risk profiles. These findings are in line with Darmayanti et al. (2023), Koma & Jatiningsih (2024), Mubaraq et al. (2021), Soraya et al. (2023), and Zahida (2021).

H5: The Effect of Overconfidence on Investment Decisions
Overconfidence has a significant **negative** effect on investment decisions, with a t-statistic = 6.444 and p-value = 0.000 (beta = -0.324). H5 is therefore **rejected**. Rather than stimulating investment activity as Barber & Odean (2001), Darmayanti et al. (2022), and Widiastuti et al. (2024) anticipated, overconfidence reduces investment decision quality in this Gen Z sample. For novice investors with limited capital and analytical experience, excessive self-confidence untempered by market experience may lead to impulsive, under-researched decisions. This result is also consistent with Inghelbrecht & Tedde (2024), who note that overconfidence raises trading costs without improving returns, ultimately worsening decision quality.

H6: Mediation of Risk Tolerance on Financial Literacy–Investment Decision
The indirect effect of financial literacy on investment decisions through risk tolerance is significant (β = 0.253, t = 7.275, p = 0.000), with VAF = 42.66%, confirming medium mediation. H6 is supported. This finding shows that beyond its direct information effects, financial literacy improves investment decisions by expanding investors' psychological capacity to tolerate risk. Investors who understand the risk–return relationship and diversification principles are more confident in accepting market volatility, which translates into more committed and rational investment choices. This mediation chain is consistent with Awais et al. (2016), Croy et al. (2010), and Hamurcu et al. (2025).

H7: Mediation of Overconfidence on Financial Literacy–Investment Decision
The indirect effect of financial literacy on investment decisions through overconfidence is also significant (β = 0.142, t = 5.073, p = 0.000), with VAF = 43.83%, confirming medium mediation. H7 is supported. Because financial literacy has a negative direct effect on overconfidence, and overconfidence has a negative direct effect on investment decisions, the indirect pathway is positive: financially literate investors are less overconfident, and lower overconfidence is associated with better decision quality. This chain literacy → overconfidence → investment decision quality—represents a meaningful behavioural mechanism. This finding is supported by Barber & Odean (2001), Inghelbrecht & Tedde (2024), and Widiastuti et al. (2024), and aligns with Financial Behavior Theory's emphasis on bias-correcting cognition.

Conclusion

The results of this study show that financial literacy has a positive and significant effect on both risk tolerance and investment decisions, while exerting a significant negative effect on overconfidence among Generation Z investors in Denpasar. Risk tolerance positively and significantly predicts investment decisions. Overconfidence, contrary to initial expectations, has a negative effect on investment decisions—suggesting that for novice investors, inflated self-confidence impairs rather than enhances decision quality. Both risk tolerance (VAF = 42.66%) and overconfidence (VAF = 43.83%) partially mediate the financial literacy–investment decision relationship, together accounting for approximately 86% of the total indirect effect. The structural model explains 65.0% of the variance in investment decisions ($R^2 = 0.650$).

Theoretically, this study contributes to the development of Financial Behavior Theory and Prospect Theory by introducing the novel finding that financial literacy reduces overconfidence among Gen Z novice investors in an emerging market context, rather than amplifying it as observed in more experienced investor samples. This

underscores the importance of sample-specific moderators, particularly investor experience, in studies of the literacy overconfidence relationship.

From a practical perspective, the IDX Investment Gallery and financial institutions should intensify financial education programmes that not only improve literacy content but also explicitly address risk tolerance calibration and overconfidence bias. Investors should be encouraged to benchmark their predictions against actual market outcomes to develop more calibrated self-assessments. Future research should incorporate variables such as herding behaviour, financial self-efficacy, financial attitude, and fear of missing out (FOMO) to more comprehensively capture the determinants of Generation Z investment behaviour

Limitation

This study is limited by its focus on financial literacy, risk tolerance, and overconfidence as determinants of investment decisions. The R^2 of 0.650 implies that 35% of the variance is explained by variables outside the model. Future research should explore additional psychological and social factors, including financial socialization, herding behaviour, and investment self-efficacy, to extend the explanatory scope of the model. The cross-sectional design also limits causal inference; longitudinal studies tracking Gen Z investors over time would strengthen conclusions.

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