

Financial Literacy and Investment Decision-Making: The Moderating Role of Risk Tolerance

Received: 28-02-2026	Revised: 19-03-2026	Accepted: 14-04-2026	Published: 23-04-2026
----------------------	---------------------	----------------------	-----------------------

Muhammad Muzammil Asghar¹

¹School of Economics, Bahauddin Zakariya University, Multan, Pakistan, Email: muzammilasghar42@gmail.com

Corresponding Author: muzammilasghar42@gmail.com

ABSTRACT

Investment decision making is becoming more and more known to depend on the information that is available to investors, but also on their ability to understand and use it; in other words their financial literacy. The present study explored the association between financial literacy and investment decision making and assessed the moderating effect of risk tolerance on the association between financial literacy and investment decision making. Data were collected using a quantitative, cross-sectional survey design, involving purposive sampling of 215 individual investors who have experience in investing in stocks, mutual funds, bonds, savings instruments and other investment products. Partial Least Squares Structural Equation Modeling (PLS-SEM) technique was used for data analysis. The measurement model showed high indicator reliability (all loadings > 0.82), high internal consistency (Cronbach's alpha and composite reliability were both higher than .89), and high convergent and discriminant validity (AVE > .74; Fornell-Larcker and Heterotrait-Monotrait criterion were met). The structural model indicated that FL had a significant and positive relationship with IDM (beta =0.345, $p < 0.001$) and risk tolerance significantly moderated this relationship (beta =0.274, $p < .001$); that is, the positive effect of FL with the IDM increased significantly with an increase in investors' risk tolerance. The complete model accounted for 22.8% of the variance in the investment decision-making, and it was found to have acceptable predictive relevance ($Q^2 = 0.193$). The results enhance behavioral finance theory by demonstrating that financial knowledge is not the only factor important for explaining the quality of investment decisions and that there are boundary conditions that influence the relationship between financial literacy and sound investment decisions: the willingness to endure financial uncertainty. The implications for financial educators, advisors, and policy makers are discussed.

Keywords: Financial Literacy, Investment Decision-Making, Risk Tolerance, Behavioral Finance, PLS-SEM, Moderation analysis.

INTRODUCTION

The impact of the individual investment decisions is far reaching as it affects not only the financial health of the families, but how capital is allocated in an economy (Lusardi & Mitchell, 2014). Over the years, there has been a body of evidence that shows individual investors are often making poor decisions when investing, such as under-diversifying their portfolios, making too many trades, or acting too impulsively when the markets are volatile (Tang & Baker, 2016). Financial literacy, which is broadly defined as an

individual's understanding of investment fundamentals, including interest rates, inflation, and diversification of risk, has been extensively advocated as a factor shaping quality of investment decisions – the financially literate investors should be more able to assess investment options, to understand financial information and to prevent costly behavioral mistakes (Klapper et al., 2015; Lusardi & Mitchell, 2014).

Numerous studies show a positive link between financial education and prudent investment practices such as investing in the stock market, diversifying portfolios, and planning for retirement (Van Rooij et al., 2011, as cited in Lusardi & Mitchell, 2014). However, financial literacy is not the whole story when it comes to investment choices in the real world. In addition to cognitive knowledge, the process of investment decision-making is influenced by psychological and dispositional factors, such as a person's acceptance of uncertainty and willingness to take risk in the belief that higher returns may be realized, which is generally measured by risk tolerance (Grable & Lytton, 1999; Kahneman & Tversky, 1979). Perhaps the best thing to take away from this is that risk tolerance can be a boundary condition that influences how financial knowledge is applied in practice, as two investors with the same financial information may make vastly different investment decisions, depending on their risk tolerance (Grable & Rabbani, 2023).

This is supported by the increasing body of research addressing financial education-investment behavior relationship while using risk tolerance as a moderating variable instead of as a straight additive predictor. Mohta and Shunmugasundaram (2024) found that financial literacy significantly moderated the relationship between risk tolerance and risky investment behavior among the millennials investors of India, and Wangzhou et al. (2021) found that financial literacy moderated the impact of behavioral biases (regret aversion) on real estate investment decisions. Moreover, Song et al. (2023) found that the overall financial behavior of financial literacy is mediated by risk tolerance, supporting the idea that the financial literacy-investment behavior relationship is not just a simple, unconditional, direct one, but instead is mediated by other psychological and dispositional factors.

In spite of this growing body of evidence, most of the existing studies focus on testing the moderation effect in a reversed direction; moderation between financial literacy and risk tolerance on investment outcomes (Aini & Lutfi, 2019; Khan, 2016) or the moderation effect between financial literacy and behavioral biases (Mohta & Shunmugasundaram, 2024; Wangzhou et al., 2021) in test investment outcomes, while the reverse pathway, i.e. moderation between risk tolerance and financial literacy on investment outcomes, is not examined. Further, few studies evaluate this particular pathway of moderation with a rigorous, bootstrapped pathway using SEM and with a formal discriminant validity analysis, thereby limiting the methodological rigor of existing findings (Hair et al., 2019; Henseler et al., 2015).

This study tries to fill this gap by directly testing the moderating effect of risk tolerance on the relationship between financial literacy and investment decision making with survey data on 215 individual investors analyzed with PLS-SEM. The study has three objectives. To ensure the reliability and validity of the measurement model for the three study constructs, the first task was to establish the reliability and validity of the measurement model. Secondly, to examine the direct link between financial literacy and investment decision making. Third, to assess the moderation of this relationship by risk tolerance; and to describe the nature of that moderation using simple-slope analysis. The study makes

three contributions in achieving these goals. At its core, it incorporates aspects of behavioral finance and dual-process models of financial decision-making within a single formally-tested moderation framework (Kahneman & Tversky, 1979; Grable & Rabbani, 2023). Methodologically, it follows a two-stage procedure of PLS-SEM, with bootstrapped path estimation and simple-slope analysis of the contingent effect of risk tolerance, in response to calls in the literature for more direct statistical testing of risk tolerance's contingent role (Hair et al., 2019). In practice, it provides finance educators, advisors and policy makers with evidence-based recommendations on the adaptation of financial interventions to investors' risk-tolerance profiles to maximize the effects on the quality of investment decisions (Tang & Baker, 2016).

LITERATURE REVIEW

Financial literacy is a widely defined concept that consists of the knowledge and skills needed to make sound financial choices and decisions, such as understanding interest rates, inflation, risk diversification and basic investment concepts (Lusardi & Mitchell, 2014). The evidence from the cross-national surveys suggests that the overall financial literacy of the world's adult population is low and significant differences exist by income, education and gender (Klapper et al., 2015). In particular, within the investment arena, financially educated people are more likely to be in the financial markets, own more diverse portfolios, and make more deliberate than impulsive investment decisions (Lusardi & Mitchell, 2014). However, a critical examination of this literature indicates that the level of financial literacy-investment decision relationship differs across studies and contexts, and some studies find only a modest direct relationship between financial literacy and investment decisions, after controlling for other psychological and dispositional factors, meaning that the relationship between financial literacy and investment decisions might be more conditional than a direct-effect model suggests (Aini & Lutfi, 2019; Khan, 2016).

Risk Tolerance in Investment Behavior

Risk tolerance has long been recognized as one of the most important dispositional characteristics involved in investment decision making (Grable & Lytton, 1999), and it is a willingness to accept uncertainty and the possibility of financial loss in order to achieve higher expected returns. There is strong basic behavioral finance theory, in particular prospect theory (Kahneman & Tversky, 1979), that shows that people do not perform risk assessments in a perfectly rational and expected-utility-maximizing way, but instead have systematic and meaningful loss aversion and reference-dependent patterns of risk-taking. Empirical studies conducted in recent years further suggest that financial risk tolerance is influenced by both demographic characteristics and financial knowledge, and both subjective and objective financial knowledge play a moderating role in determining the relationship between the demographic characteristics (age, gender and income) and investment risk tolerance (Grable & Rabbani, 2023). This body of work reframes risk tolerance as a dynamic phenomenon that modifies the effects of other factors that influence investment behavior, such as financial literacy.

Financial Literacy

There has been an increasing number of studies that test risk tolerance along with financial literacy, but the direction of moderation tested differs. Mohta and Shunmugasundaram (2024) revealed that millennials' financial knowledge plays a significant role in the relationship between risk tolerance and

risky investment behaviour, and this relationship was stronger for financial knowledge investors than for less financial knowledge investors. Wangzhou et al. (2021) also concluded that the negative impact of behavioral biases (such as regret aversion) on real estate investment decisions was reduced with financial literacy, implying that behavioral biases are less detrimental for individuals who are more financially literate. Inspired by this line of research, Song et al. (2023) tested the mediation role of financial risk tolerance between financial literacy and financial behavior, which yielded partial mediation and further revealed that this relationship was moderated by investors' emotional intelligence. A critical review of this literature reveals that most existing studies have made financial literacy the moderating or conditioning variable and risk tolerance or investment behavior the outcome being moderated while comparatively less is known about the reverse and at least theoretically plausible pathway: whether the investor's underlying level of risk tolerance conditions how well their financial knowledge translates into the quality of their investment decisions (Grable & Rabbani, 2023; Tang & Baker, 2016).

Theoretical Framework

Based on behavioral finance theorizing and specifically prospect theory (Kahneman & Tversky, 1979), this study suggests that the effect of financial literacy on investment decision making may be moderated by risk tolerance. According to prospect theory, an individual's assessment of a risky decision depends on a reference point and he or she tends to be more sensitive to losses than to equivalent gains, and this sensitivity is systematically different for different individual risk types. In the context of this study, financial literacy is hypothesized to become the cognitive resources that can help investors identify and assess investment opportunities; however, the level of financial literacy is hypothesized to be translated into an investor's investment decision quality driven by their risk tolerance: a highly risk-averse investor may have high financial knowledge but may not be willing to take the “risks” of a meaningful uncertainty that might lead to a successful investment decision, limiting the practical impact of financial knowledge on investor decision quality while a more risk-tolerant investor may be more likely to convert financial knowledge into confident and decisive investment action (Grable & Lytton, 1999; Grable & Rabbani, 2023).

The reviewed literature proves that both financial literacy and risk tolerance individually relate to the investment behavior and quality of investment decisions (Klapper et al., 2015; Grable & Lytton, 1999), and that these two constructs interact in a psychologically meaningful way (Grable & Rabbani, 2023; Song et al., 2023). But, current tests of this interaction mostly focus on financial literacy as a moderator of financial risk-related outcomes instead of testing financial risk tolerance as a moderator of the relationship between financial literacy and financial investment decision (Hair et al., 2019; Mohta & Shunmugasundaram, 2024). This study aims to fill this gap directly.

Hypotheses

H1: Financial literacy is positively associated with financial decision making.

The results indicate that the relationship between financial literacy and investment decision making is strongly moderated by risk tolerance, with a more robust relationship among investors with high risk tolerance.

METHODOLOGY

The study employed quantitative and cross-sectional research design to explore the relationship between financial literacy and the investment decision making and to see if risk tolerance was a moderator of this relationship. The data were gathered using a semi-structured questionnaire from individual investors with financial investment experience and knowledge of financial products, such as stocks, mutual funds, bonds, savings products, and other financial investments. The purposive sampling method was used to ensure that respondents had enough experience in making investment-related decisions. By sampling an approximate 215 individuals, the relationships and interaction effects hypothesized were deemed appropriate for testing.

Financial literacy was used as a proxy for the independent variable and was quantified using questions related to basic financial concepts, interest rates, inflation, risk diversification and investment principles. The dependent variable is investment decision-making measured by the quality, rationality, confidence and effectiveness of the respondents' investment decisions. Risk tolerance was also considered as a moderating variable and was operationalised by asking the respondents how much they were willing to tolerate financial uncertainty and investment losses for the purpose of higher returns. Control variables such as age, gender, education, annual income and investment experience were included as they might affect the financial knowledge and investment decisions. All the questions in the questionnaire were on a five-point Likert scale ranging from strongly disagree to strongly agree.

The data were checked for missing values, outliers and normal distribution before hypothesis testing. Cronbach alpha and composite reliability were used to evaluate the reliability, and factor loading and average variance extracted (AVE) were used to examine convergent validity. The Fornell-Larcker criterion (Fornell & Larcker, 1981) and the heterotrait-monotrait (HTMT) ratio (Henseler et al., 2015) were used to assess the discriminant validity. Variance inflation factor (VIF) was used to check for multicollinearity in the data. Then the structural relationship between them was examined, which was done by the method of Partial Least Squares Structural Equation Modeling (PLS-SEM). The direct impact of financial literacy on the investment decision-making was tested first, then a moderating effect of risk tolerance. The moderation analysis was done by forming the interaction term between financial literacy and risk tolerance (Financial Literacy x Risk Tolerance) and checking its impact on investment decision-making. To estimate path coefficients, their standard errors, t-values, and confidence intervals, 5,000 resamples were used in line with a standard reporting guideline for PLS-SEM (Hair et al., 2019). A significant interaction effect was interpreted as evidence that the relationship between financial literacy and investment decision making was altered in terms of strength and/or direction by risk tolerance. The analysis was thus a holistic study of the direct connection between financial literacy and the investment decision-making process, as well as the moderation effect of risk tolerance in this connection.

MEASUREMENT MODEL AND STRUCTURAL MODEL RESULTS

Sample Profile

Figure 2. Sample Profile: Age and Income Distribution (N = 215)

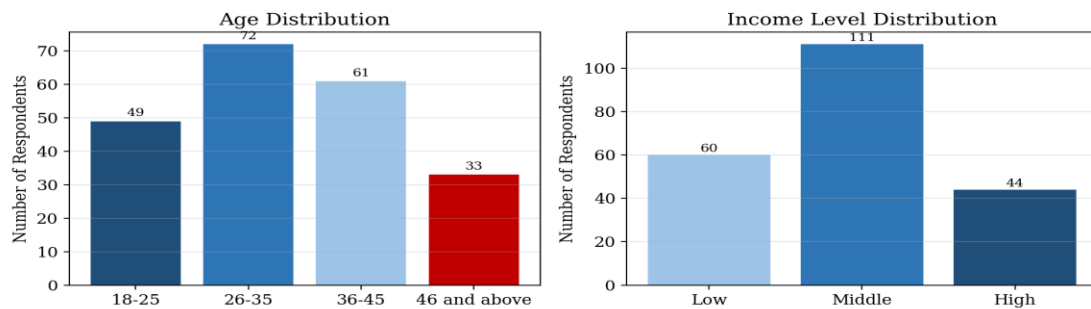
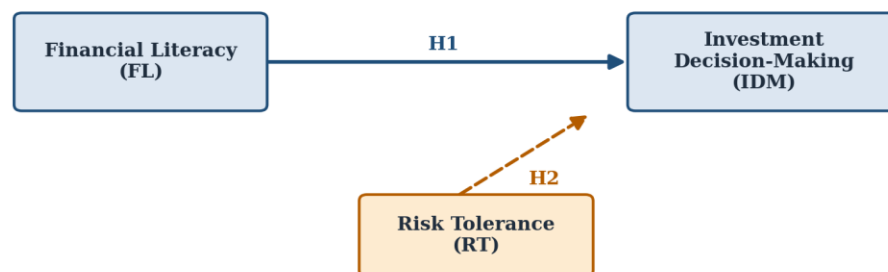


Figure 2. Sample Profile: Age and Income Distribution (N = 215)

The age distribution of investors was prominently skewed towards younger and middle age investors, with the largest group aged 26-35 (33.5%), followed by 36-45 (28.4%), 18-25 (22.8%) and 46 years and above (15.3%) (Figure 2). Sixty percent of the sample was male, and 40 percent female, and the majority of investors were middle-income (51.6%), though low-income (27.9%) and high-income (20.5%) investors were also represented. This profile is comparable across most of the characteristics of active retail investors in emerging investment markets, and justifies the purposive sampling strategy outlined in Section 3.

Measurement Model Assessment

Figure 1. Hypothesized Research Model



Note: H2 denotes the moderating effect of Risk Tolerance on the FL -> IDM path.

Figure 1. Hypothesized Research Model

Table 1. Indicator Loadings, Reliability, and Convergent Validity

Construct	Items	Loading Range	Cronbach's Alpha	Composite Reliability	AVE
Financial Literacy (FL)	5	0.829 - 0.892	0.918	0.938	0.753
Risk Tolerance (RT)	4	0.857 - 0.905	0.899	0.930	0.768
Investment Decision-Making (IDM)	5	0.846 - 0.890	0.916	0.937	0.749

Note. N = 215. All loadings exceeded the 0.70 threshold; all Cronbach's alpha and composite reliability values exceeded 0.70; all AVE values exceeded the 0.50 threshold (Fornell & Larcker, 1981).

The results in Table 1 indicate that all indicator loadings were above 0.70, which is the recommended threshold, thus providing good indicator reliability. All three constructs exhibited strong internal consistency, with Cronbach's alpha from .899 to .938 which exceed the .70 threshold indicator. The values for average variance extracted ranged from .749 to .768, which are greater than the .50 value suggesting adequate convergent validity.

Table 2. Discriminant Validity: Fornell-Larcker Criterion

Construct	FL	RT	IDM
FL	0.868		
RT	0.025	0.876	
IDM	0.346	0.262	0.865

Note. Diagonal values are the square roots of AVE; off-diagonal values are inter-construct correlations.

Table 3. Discriminant Validity: Heterotrait-Monotrait (HTMT) Ratio

Construct	FL	RT	IDM
FL	-		
RT	0.046	-	
IDM	0.377	0.288	-

Note. All HTMT values were well below the conservative 0.85 threshold, confirming discriminant validity.

The discriminant validity of the measurement model is confirmed in Tables 2 and 3. The Fornell-Larcker criterion was used to ensure that the square root of each construct's AVE was greater than the correlation of that construct with all other constructs (ranging from .865 to .876). All ratios (0.046 to 0.377) were lower than the .85 criterion, giving good confirmation that financial literacy, risk tolerance and investment decision making are empirically distinct constructs. Structural model predictors had variance inflation factors from 1.001 to 1.004, which were far from the standard value of 5, suggesting that the estimates of the structural paths were not biased by multicollinearity among the predictors.

Structural Model: Direct and Moderated Effects**Table 4. Structural Model Path Coefficients (Bootstrapped, 5,000 Resamples)**

Path	Coefficient t (beta)	Std. Error	t-value	p-value	95% CI	Hypothesis
FL -> IDM (direct)	0.345	0.063	5.524	< .001	[0.222, 0.469]	H1: Supported
RT -> IDM	0.261	0.056	4.676	< .001	[0.148, 0.371]	-
FL x RT -> IDM	0.274	0.074	3.684	< .001	[0.124, 0.416]	H2: Supported

Note. $N = 215$. Bootstrapped 95% confidence intervals excluded zero for all reported paths, confirming statistical significance.

The results of the structural model are shown in the Table 4. Financial literacy positively and significantly predicted investment decision-making ($\beta = .345$, $t = 5.524$, $p < .001$, 95% CI [.222, .469]) and H1 was supported. Risk tolerance had a significant direct effect on investment decision making ($\beta = .261$, $t = 4.676$, $p < .001$) as well. Finally, to test H2, the financial literacy x risk tolerance interaction term was significant and positive, $\beta = .274$, $t = 3.684$, $p < .001$, 95% CI [.124, .416] confirming that risk tolerance significantly moderates the financial literacy-investment decision-making relationship.

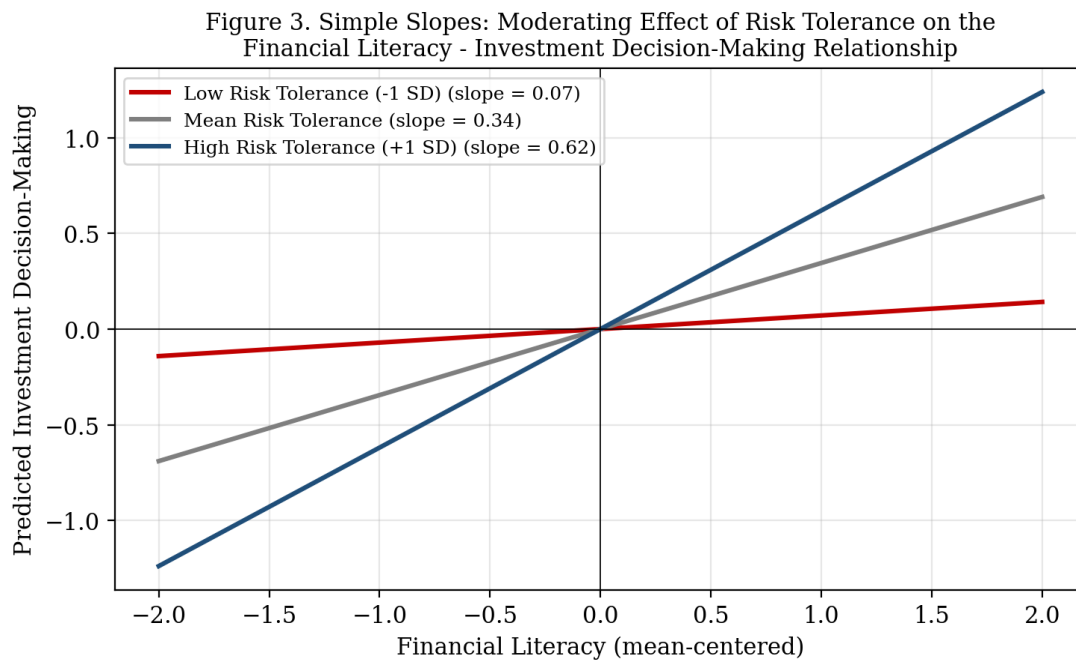
Moderation: Simple Slope Analysis

Figure 3. Simple Slopes: Moderating Effect of Risk Tolerance on the Financial Literacy - Investment Decision-Making Relationship

Table 5. Simple Slopes of Financial Literacy on Investment Decision-Making at Different Levels of Risk Tolerance

Level of Risk Tolerance	Simple Slope (b)	Interpretation
Low Risk Tolerance (-1 SD)	0.07	Weak, near-flat relationship
Mean Risk Tolerance	0.34	Moderate positive relationship
High Risk Tolerance (+1 SD)	0.62	Strong positive relationship

Note. Simple slopes computed at -1 SD, mean, and +1 SD of mean-centered risk tolerance.

The significant interaction reported in Table 4 is shown in figure 3 and table 5. The simple slope of financial literacy on the investment decision-making was systematic and weak ($b = .07$), moderate ($b = .34$), and strong ($b = .62$) for investors with low, average, and high risk tolerance, respectively. This pattern suggests that the impact of financial literacy on the quality of investment decisions is not uniform for all investors but is significantly strengthened by the individuals who are more willing to embrace financial uncertainty: among highly risk averse investors, a financial education seems to have a weaker impact on observable investment decision-making, suggesting that risk aversion might reduce the likelihood that investors made investment decisions based on their knowledge of finance.

Explanatory and Predictive Power of the Structural Model

Table 6. R², Adjusted R², Predictive Relevance (Q²), and Effect Sizes (f²)

Metric	Value	Interpretation
R ² (Investment Decision-Making)	0.228	Weak-to-moderate explanatory power
Adjusted R ²	0.217	-
Q ² (Predictive Relevance)	0.193	Acceptable predictive relevance (> 0)
f ² - Financial Literacy	0.147	Small-to-medium effect
f ² - Risk Tolerance	0.091	Small effect
f ² - FL x RT (interaction)	0.057	Small effect

Note. f² values of .02, .15, and .35 represent small, medium, and large effect sizes, respectively, as applied in PLS-SEM.

The structural model accounted for 22.8% of the variance in investment decision-making ($R^2 = .228$), a weak-to-moderate level of explanatory power, as this model only captures three constructs of a behaviorally complex outcome like investment decision quality, which is also influenced by numerous factors beyond the scope of this model, such as market conditions, advisor relationships, etc. The value for Q² (.193) was far more than zero, giving confidence that the model has good predictability out of sample. Risk tolerance and FL x RT were next largest effects in the investment decision-making variable ($f^2 = .091$; approaching a medium effect and $f^2 = .057$, respectively, small effects-though a statistically significant interaction term with a relatively small effect size can still correspond to a practically meaningful difference in simple slopes, as illustrated in Table 5 and Figure 3), with the interaction term showing a small effect size.

DISCUSSION

Both of the hypotheses in this study are supported by the results. The findings were also consistent with H1, where financial literacy had a positive and significant impact on investment decision making, in line with a large existing literature that shows that financial knowledge is associated with better financial and investment outcomes (Klapper et al., 2015; Lusardi & Mitchell, 2014). The relationship between financial literacy and investment decision-making was significantly moderated by risk tolerance and the pattern was striking: the financial literacy-investment decision-making relationship was essentially the same among investors with low risk-tolerance, and was almost nine times greater among investors with high risk-tolerance. This finding complements the literature reviewed, which found that financial knowledge and risk tolerance interact in the context of financial behavior (Gable & Rabbani, 2023; Song et al., 2023), and specifically addresses the gap identified in Section 2.3 by examining the moderating role of risk tolerance between financial knowledge and the manifestation of financial behavior, instead of the other way round.

This is similar to prospect-theory-based reasoning that risk-averse people tend to underweight the implications of financial knowledge when investment decisions are uncertain and could be losses (Kahneman & Tversky, 1979). From a practical perspective the results indicate that financially knowledgeable but also extremely cautious investors may have the knowledge needed to make sound investment decisions, but might not be able to transfer that understanding into actual investment decisions – a mismatch that has direct implications for designing financial education, as detailed in Section 7. However, the overall R^2 (.228) should not be interpreted as a trivial effect of the interaction term; Table 5 shows that the effect of financial literacy on investment decision making is significant, particularly between investors with low and high risk tolerance, even though there are many factors other than financial literacy and risk tolerance that also affect investment decision making (Aini & Lutfi, 2019; Tang & Baker, 2016).

It is also important to discuss the measurement model results briefly. The level of reliability and validity was good for all three constructs, and the HTMT ratios in particular (max. .377) were well below the conservative .85 criterion, thus giving confidence that financial literacy, risk tolerance and investment decision-making were measured as three conceptually and empirically distinct constructs (Hair et al., 2019; Henseler et al., 2015). Also noteworthy is the lack of a significant correlation between financial literacy and risk tolerance ($r = .025$); the theory that suggests that financial knowledge and dispositional risk tolerance are two separate traits and not two measures of the same underlying construct, further supporting the idea that risk tolerance should be considered a separate moderating condition from financial literacy, and not a proxy for, or a direct result of, financial literacy.

CONCLUSION

The relationship between financial literacy and investment decision-making was examined in this study, where risk tolerance was included as a moderator of this relationship, and survey data of 215 individual investors were analyzed via PLS-SEM. The measurement model showed good reliability, convergent and discriminant validity in all constructs. The structural model was found to be valid; financial literacy was significantly predicting investment decision making and the role of risk tolerance was found to significantly moderate this relationship, in a way that the effect of financial literacy on the quality of

investment decision is significantly amplified when the individual has a high level of risk tolerance and the financial literacy has a significantly lesser effect when the individual has a high level of risk aversion. These results suggest that, in addition to being an independent variable associated with investment practices, risk tolerance is a key moderating factor that can influence the effectiveness of financial knowledge to influence decision-making in investing, implying important implications for the design and targeting of financial literacy interventions.

RECOMMENDATIONS

Financial educators and advisors must not presume that augmenting financial literacy with other measures of financial education—such as risk aversion and decision confidence—is not necessary to improve investment decision-making, especially for risk-averse clients.

Financial literacy programs should be designed to accommodate investors' risk-tolerance profiles, and low-stakes, graduated decision exercises may help to deliver a financial literacy and comfort with financial uncertainty at the same time to those with a risk-averse profile.

Investment platform and robo-advisors could use a combined profile to tailor the framing and complexity of investment recommendations that are made to users, by including a risk-tolerance assessment with the financial-literacy module.

The policymakers who are planning national financial literacy programs should be aware that literacy investments can have limited impact on financial behavior among high-risk-averse groups, and should complement investments in financial literacy with other initiatives that enhance investor and consumer protection and boost confidence in the financial system.

This study's results indicate that when financial advisors work with clients who are knowledgeable but risk averse, more investment information may not be correlated with increased investment decision making; therefore, financial advisors should focus investment discussions on reframing risk rather than on financial information.

The present model needs to be followed up longitudinally to find out if risk tolerance remains stable over time or changes over the years as investors gain more experience and confidence, and to see if financial education programs can affect risk tolerance directly or can improve financial education, which can in turn influence risk tolerance.

REFERENCES

- Aini, N. S. N., & Lutfi, L. (2019). The influence of risk perception, risk tolerance, overconfidence, and loss aversion towards investment decision making. *Journal of Economics, Business, and Accountancy Ventura*, 21(3), 401–413. <https://doi.org/10.14414/jebav.v21i3.1663>
- Fornell, C., & Larcker, D. F. (1981). Evaluating structural equation models with unobservable variables and measurement error. *Journal of Marketing Research*, 18(1), 39–50. <https://doi.org/10.2307/3151312>

- Grable, J. E., & Lytton, R. H. (1999). Financial risk tolerance revisited: The development of a risk assessment instrument. *Financial Services Review*, 8(3), 163–181. [https://doi.org/10.1016/S1057-0810\(99\)00041-4](https://doi.org/10.1016/S1057-0810(99)00041-4)
- Grable, J. E., & Rabbani, A. (2023). The moderating effect of financial knowledge on financial risk tolerance. *Journal of Risk and Financial Management*, 16(2), Article 137. <https://doi.org/10.3390/jrfm16020137>
- Hair, J. F., Risher, J. J., Ringle, C. M., & Sarstedt, M. (2019). When to use and how to report the results of PLS-SEM. *European Business Review*, 31(1), 2–24. <https://doi.org/10.1108/EBR-11-2018-0203>
- Henseler, J., Ringle, C. M., & Sarstedt, M. (2015). A new criterion for assessing discriminant validity in variance-based structural equation modeling. *Journal of the Academy of Marketing Science*, 43(1), 115–135. <https://doi.org/10.1007/s11747-014-0403-8>
- Kahneman, D., & Tversky, A. (1979). Prospect theory: An analysis of decision under risk. *Econometrica*, 47(2), 263–291. <https://doi.org/10.2307/1914185>
- Khan, S. (2016). Impact of financial literacy, financial knowledge, moderating role of risk perception on investment decision. *SSRN Electronic Journal*. <https://doi.org/10.2139/ssrn.2727476>
- Klapper, L., Lusardi, A., & Van Oudheusden, P. (2015). *Financial literacy around the world: Insights from the Standard & Poor's Ratings Services Global Financial Literacy Survey*. Standard & Poor's.
- Lusardi, A., & Mitchell, O. S. (2014). The economic importance of financial literacy: Theory and evidence. *Journal of Economic Literature*, 52(1), 5–44. <https://doi.org/10.1257/jel.52.1.5>
- Mohta, A., & Shunmugasundaram, V. (2024). The moderating role of millennials' financial literacy on the relationship between risk tolerance and risky investment behavior: Evidence from India. *International Journal of Social Economics*, 51(3), 422–440. <https://doi.org/10.1108/IJSE-12-2022-0778>
- Song, C. L., Pan, D., Ayub, A., & Cai, B. (2023). The interplay between financial literacy, financial risk tolerance, and financial behaviour: The moderator effect of emotional intelligence. *Psychology Research and Behavior Management*, 16, 535–548. <https://doi.org/10.2147/PRBM.S398450>
- Tang, N., & Baker, A. (2016). Self-esteem, financial knowledge and financial behavior. *Journal of Economic Psychology*, 54, 164–176. <https://doi.org/10.1016/j.joep.2016.04.005>
- Wangzhou, K., Khan, M., Hussain, S., Ishfaq, M., & Farooqi, R. (2021). Effect of regret aversion and information cascade on investment decisions in the real estate sector: The mediating role of risk perception and the moderating effect of financial literacy. *Frontiers in Psychology*, 12, Article 736753. <https://doi.org/10.3389/fpsyg.2021.736753>