

Understanding Investment Decisions Through the Lens of Behavioral Biases: A Moderated Mediation Approach

Maryam Tanveer¹, Maryam Fatima², Esha Tofeeq³, Khadija Asim Khan⁴ and Javaria Asim⁵

<https://doi.org/10.62345/jads.2025.14.2.70>

Abstract

With an emphasis on the moderating influence of financial literacy and the mediating role of risk tolerance, this study examines the relationship between behavioral biases – specifically, impulsivity and herding – and investment decisions. Purposive and snowball sampling were used to select 300 financially independent investors in Lahore, Pakistan, between the ages of 20 and 45, and structured questionnaires were used to gather quantitative data. The moderated mediation effects were examined using Process Hayes Model 58. The results reflect that with high-risk tolerance, impulsivity and herding both have a significant impact on investing behaviors. On the other hand, financial literacy acts as a potent moderator, lowering impulsive decision-making and unreasonable risk-taking. These findings demonstrate how critical financial literacy is as a behavioral and cognitive guard when making financial decisions. Policymakers, educators, and financial advisors who want to create intervention strategies that promote sensible investing practices can benefit from the study's practical implications. It closes a significant gap in the behavioral finance literature by being one of the first to empirically show a double moderated mediation pathway involving these behavioral constructs in a developing country setting.

Keywords: Financial Literacy, Behavioral Biases, Risk Tolerance, Investment Decisions.

Introduction

Investment decisions are a cornerstone of financial success, contributing not only to the formation of personal portfolios but also to the formation of the economic landscape and market trends of an entire economy (Yoganandham, 2025). Investment decisions, at their very essence, consist of the primary activities of allocating capital towards those factors or projects deemed to be productive enough to yield benefits over a specific time (Rexhepi et al., 2024). The importance of these decisions is not simply about immediate benefit – they shape the type of innovations that are developed, the entrepreneurs that come forward, and even how the economy of the nation grows. Wise investments can spur whole industries, provide jobs, and ignite technological innovation, while unwise investments can cause inflation, bubbles, and economic crises (Ansar et al., 2016). In this present complex global economy- flooded with information, chaos induced by digitalization and dynamic uncertainty, it has become not just important but imperative to explore this from every lens for not only societal and economic well-being but also the future trajectory (Sood et al., 2025).

The investment decisions are pretty complicated and capture a changing balance between understanding, emotion, and bias, where each heavily determines the choices of the investors. The two most paramount being herding and impulsivity, significantly distort investor judgement and market trends (Altaf & Jan, 2023; Gulzar & Ali, 2023). Despite behavioral finance's advancement

¹Business Studies Department, Kinnaird College for Women University Lahore, Pakistan.

²Business Studies Department, Kinnaird College for Women University Lahore, Pakistan.

³Business Studies Department, Kinnaird College for Women University Lahore, Pakistan.

⁴Business Studies Department, Kinnaird College for Women University Lahore, Pakistan.

⁵Business Studies Department, Kinnaird College for Women University Lahore, Pakistan.

Corresponding Author Email: javaria.asim@kinnaird.edu.pk



and popularity, gaps remain to broaden the spectrum of this issue by investigating for more biases and how financial literacy intercepts and risk tolerance mediates their impact on investment decisions (Khan & Butt, 2024), particularly in developing economies, where intervention strategies are critically understudied (Mittal, 2022; Sathya & Gayathiri, 2024). This interplay among these factors also catalyzes their produced effects, and hence are important to be studied together to build a logical connection (Hussain & Rasheed, 2023; Lusardi & Mitchell, 2023). Addressing these gaps, this study examines how the bias-driven risk behavior is moderated by financial literacy, offering practical insights for individual investors, strategists, policymakers and all other stakeholders. It underscores the crucial need for awareness, education and structured intervention through the system to help investors make sound and wise financial decisions aligned with their long-term goals and actual risk capacity, overcoming all potential psychological distortions.

Literature Review and Hypotheses Development

This chapter explores the existing literature, empirical studies, and theories to explicate the nature and interaction of the variables under study- widening the horizon of comprehension, identifying research gaps, and informing our research questions (Ebidor & Ikhida, 2024).

Underpinning Theories

Prospect theory, which was developed by Kahneman and Tversky (1979), describes how individuals judge outcomes in terms of gains or losses relative to a reference point, which affects risk behaviour. In gains, they are risk-averse; in losses, risk-seeking (Ali & Asri, 2019). Hence, its identification of inadequate risk assessment as the root of irrational decision choices supports the proposed hypotheses that financial literacy can help investors minimize the influence of biases by encouraging a more rational assessment of risks and gains, helping them resist tendencies like herding and impulsivity (Harahap et al., 2022). Regulatory theory, introduced by E. Tory Higgins in 1997, posits that individuals self-regulate by aligning the risk standards to their goals to achieve them with either a prevention or a promotion focus.

Investment Decisions

Analysing and deciding the amount of resources to allocate to generate greater and more efficient financial returns in the future is termed investment decision-making. Businesses and individuals focus on capital budgeting with specific objectives, which are essential parts of investment decision-making processes. Strategic investing creates market patterns and tips the investor's scale of optimism or pessimism (Kaur & Kaur, 2019). Since the buying and selling of stocks and investments are done in sync with others at a particular time, it influences the decision-making of financial investors. (Altaf & Jan, 2023). However, due to numerous factors, investors do not always make the most rational and optimal choices when it comes to investment decisions. Several investment heuristics exist that formulate behavioural biases in the minds of financial investors and institutions that drive them into making less optimal choices.

Herding and Investment Decisions

Herding behaviour, in the realm of behavioural finance, is characterized by the propensity of individuals to follow the decisions and actions of a larger group while frequently ignoring their private information or analysis, being a notable deviation from rational investment decision-making (Komalasari et al., 2022). Psychological biases such as the "bandwagon effect" and "fear of missing out" (FOMO) encourage investors to follow the herd, particularly when markets are volatile, which results in impulsive rather than thoughtful decisions (Kaur et al., 2024). Only a disciplined investment approach well equipped with financial knowledge can help individuals resist the pressure of collective behaviour, enabling them to achieve long-term financial stability by making informed decisions based on concrete calculations (Rasool & Ullah, 2020). When

individuals exhibit high-risk tolerance influenced by biases, they may engage in excessive risk-taking without proper evaluation (Kasoga, 2021). Herding bias can amplify risk tolerance, leading investors to make numerous investment decisions without thorough risk assessment, potentially resulting in irrational and limitless risk-taking behaviours.

Financial literacy, the ability to understand financial concepts and manage financial resources effectively, is important in making sound financial decisions. The relationship between herding behaviour and investment decisions is moderated by financial literacy, which channels such autonomy in the investor. Otherwise, decisions are just inspired by the mood of the masses. While its moderation of the relationship between herding and risk tolerance helps minimize the effect of herding bias, which otherwise might have amplified the risk tolerance irrationally, it helps improve the investment choices of the investors by also moderating the relationship between risk tolerance and investment decisions.

This interplay forms a moderated mediation model, where risk tolerance is regulated by the level of financial literacy, thereby contributing to optimal investment outcomes. In the absence of moderation, the mediation effect enhances, and thus, behavior becomes erratic such that investments take a divergent path of uncertainty. Notably, when financial literacy comes in place, this reshapes risk-taking, so it diversifies investors' portfolios towards the more favourable and well-educated options (Abdulridha & Hussin, 2023).

Hence, on the basis of the reasoning provided above, it is hypothesized that:

H1: Financial literacy moderates the indirect effect of herding on investment decisions through mediation by risk tolerance; when financial literacy is high, the indirect relationship between herding and investment decisions is weakened.

Impulsivity and Investment Decisions

Impulsivity is a higher preference for immediately available rewards at the expense of larger long-term rewards (Delaney, 2018). Impulsive investors who believe they can outmanoeuvre market trends may overestimate their expertise or prediction ability. Extremely impulsive people, on the one hand, could overestimate their risk tolerance, feeling overconfident and ready to make speculative bets that carry significant risks but promise rapid profits. This tendency may lead to rash financial choices when investors driven by immediate rewards, frequently disregard the potential for loss, leading to higher risk tolerance (Nicholson et al., 2005).

The effect of risk tolerance on impulsivity shows that an increase in tolerance is due to the significant impact of behavioural bias on investment decisions. The investors are able enough to steer clear of emotionally motivated and potentially harmful financial habits by forming goal-oriented, organized plans that complement their long-run financial well-being due to high financial literacy. When financial literacy is high, impulsivity diminishes and influences risk tolerance, resulting in more measured investment choices. This conditional indirect effect suggests that financial literacy serves as a buffer that reduces the likelihood of impulsive individuals becoming excessively risk-tolerant investors (Xiao & O'Neill, 2016). Financial literacy operates as a conditional moderator that influences the strength and direction of the mediation by risk tolerance in the relationship between impulsivity and investment decisions. In this way, financial literacy partially overcomes the impact of behavioural bias and impulsivity in making sound investment decisions (Hayes, 2013).

Hence, hypothesized:

H2: Financial literacy moderates the indirect effect of impulsivity on investment decisions through mediation by risk tolerance; when financial literacy is high, the indirect relationship between impulsivity and investment decisions is weakened.

Methodology

This study investigates the relationship between risk tolerance, financial literacy and behavioural biases in investment decisions using a quantitative methodology based on deductive reasoning. Financially independent individual investors in Lahore, Pakistan, from the ages 20 to 40 and

above, including household investors, faculty and staff with financial expertise and finance university students, served as the unit of analysis. Using a cross-sectional design, data was gathered all at once using Google Forms and emails of the study participants. In addition to demographic questions, a five-point Likert scale measuring herding, impulsivity, investment decision-making, financial literacy and risk tolerance was employed in a self-administered online survey. To reach the target population, purposive and snowball sampling techniques were used. A minimum of 170 responses were needed, according to Item Response Theory and Kline (2015); however, 300 were gathered to improve generalizability, as suggested by DeAyala (2009). SPSS and the Process Hayes Model 58 were used for data analysis in order to test the effects of the moderated mediation. Along with reliability and descriptive statistics to evaluate internal consistency and data distribution, regression and correlation analyses were used to look at relationships. According to the study participants' demographic profiles, the majority 68% were between the ages of 20 and 25, followed by 6.7% who were between the ages of 26 and 30, 6% who were between the ages of 31 and 35, 6.3% who were between the ages of 36 and 40 and 13% who were over 40. The gender distribution was 37% male and 63% female. A bachelor's degree was held by 69% of the participants, followed by a master's degree by 18.3% and other educational qualifications by 12.7%.

Data Analysis

Descriptive Analysis

Descriptive statistics is a fundamental method of data measurement that provides insights about patterns, trends or outliers in the key variables with the help of mean and standard deviation. (Reddy & Pulluru, 2024). The table 1 below shows the descriptive statistics of the sample taken into account for this study:

Table 1: Descriptive Statistics

	Mean	Standard Deviation
Financial Literacy	3.817	0.727
Herding	3.227	0.753
Impulsivity	2.897	0.857
Investment Decisions	3.371	0.635
Risk Tolerance	3.262	0.690

Financial literacy with the highest mean (3.817) indicates an overall well understanding of financial concepts with moderate variability (0.727) attributed to differences in education, background and interests (Garg & Singh, 2018). Herding behavior shows an overall moderate tendency (mean 3.227) but dispersed (0.753) attributed to social pressures and lack of confidence due to limited personal investing experience (Ahmad & Wu, 2022; Sari & Nughroho, 2019). Impulsivity, shows the lowest mean (2.897) and highest variability (0.857)- typical in self-reported psychological constructs (Hasegawa et al., 2019), and younger age groups in their emotional and cognitive transitional stages (Bezdjian et al., 2011; Sihotang & Pertiwi, 2023)- though most displayed planned financial behavior. Investment decisions show a consistent mean (3.371) with minor variation (0.635), indicating this convergent area of competence as a shared baseline. Lastly, risk tolerance with a mean of 3.262 varies moderately (0.690), influenced by personal traits, experiences, economic context (Wang & Hanna, 1997) and time orientation (Ryack & Sheikh, 2016) leading to diverse and sometimes inconsistent financial attitudes (Yousaf et al., 2018).

Reliability Analysis

Their liability of the scales used to measure various construct of this study was evaluated using the Cronbach's Alpha which is a measure of internal inconsistency that assesses how well the items

in a set measure the underlying concept (Vicente & Ruiz, 2009). The table below shows the reliability scores for each construct.

Table 2: Reliability

	Number of Items	Cronbach's Alpha
Financial literacy	4	0.79
Herding	3	0.70
Impulsivity	3	0.71
Investment Decisions	3	0.70
Risk tolerance	4	0.63

The reliability score for financial literacy (0.79), herding (0.70), investment decisions (0.70), and impulsivity (0.71) is interpreted as a 'good' score (Hair et al., 2019), indicating a strong internal consistency whereby the items in these constructs measure the intended concept very effectively and the scale is hence, reliable. On the other hand, risk tolerance with a 4-item scale though achieved a slightly low yet acceptable and moderate score of 0.63 for reliability. Hence, this comprehensive reliability analysis accredits the study's construct. Each scale showing acceptable and moderate to good levels, supports the robustness of the data collected for further analysis.

Model 58: Moderated Mediation Analyses Model Description and Hypothesis Testing:

The outputs presented below shows the results for model 58 (SPSS process hayes), a moderated mediation model where the dependent variable (Y) is investment decision ID, independent variable (X_1) is herding H and the independent variable (X_2) is Impulsivity I, mediator (M) is risk tolerance RT and financial literacy FL (W) is the moderator. The sample size taken is 300 whereas confidence interval is 95%. The p-values should be less than 0.10 and LLCI (Lower Limit Confidence Interval) and ULCI (Upper Limit Confidence Interval) should have same sign and no zero to verify the significance and reject H_0 . Moreover, t-value indicates whether it is a positive or a negative relation.

Herding

Table 3: Model 58 with Herding

Path	Coeff.	SE	t	p	95% CI	Sig.
H→RT	1.126	0.243	4.625	<0.001	[0.724,1.527]	Yes
FL→RT	0.846	0.179	4.709	<0.001	[0.549,1.142]	Yes
H×FL→RT	-0.236	0.06	-3.939	<0.001	[-0.335,-0.137]	Yes
RT→ID	0.646	0.236	2.735	0.006	[0.256,1.036]	Yes
H→ID(Direct)	0.089	0.047	1.896	0.059	[0.011,0.167]	Yes
RT×FL→ID	-0.124	0.059	-2.091	0.037	[-0.222,-0.026]	Yes

Note: H: Herding; FL: Financial Literacy; RT: Risk Tolerance; ID: Investment Decisions

Table 4: Conditional Indirect Effects of Herding (H) on Investment Decisions (ID) via Risk Tolerance (RT)

FL Level	Indirect Effect	Boot SE	95% CI	Sig.
3.0 (Low)	0.113	0.045	[0.042, 0.188]	Yes
4.0 (Moderate)	0.026	0.013	[0.008, 0.050]	Yes
4.5 (High)	0.005	0.008	[-0.006, 0.019]	No

The above results verify a significant positive relationship between herding and investment

decisions ($t=1.896$, LLCI= 0.011, ULCI=0.167), mediated by risk tolerance which has a significant positive relation with both herding ($t=4.625$, LLCI=0.724, ULCI=1.521) and investment decisions ($t= 2.735$, LLCI= 0.256, ULCI= 1.036). It furthermore, supports the hypothesis proposed that financial literacy moderates this indirect relationship completely, as is evident by both significant interaction terms which are negative, signifying how financial literacy mitigated this impact of herding bias on investment decisions by first moderating the relationship between herding and risk tolerance ($t=-3.939$, LLCI= -0.335, ULCI= -0.137), followed by moderation of the relationship between risk tolerance and investment decisions ($t=-2.091$, LLCI= -0.222, ULCI= -0.026).

Hence, the model is accepted as moderated mediation exists which tells that FL is moderating in both ways i.e., high FL tends to mitigate the effect of herding and also lowers the impact of RT influenced by herding and results in taking rational ID while low FL causes irrational ID as the bias H becomes higher that makes RT high as well. In this way FL has lowered the risk of irrational ID.

Impulsivity

Table 5: Model 58 with Impulsivity

Path	Coeff.	SE	t	p	95% CI	Sig.
IMP→RT	0.649	0.23	2.818	0.005	[0.269,1.029]	Yes
FL→ RT	0.566	0.165	3.427	<0.001	[0.293,0.839]	Yes
IMP× FL→RT	-0.114	0.056	- 2.009	0.045	[-0.208, -0.021]	Yes
RT→ID	0.638	0.233	2.737	0.006	[0.253,1.023]	Yes
IMP→ID (Direct)	0.098	0.04	2.412	0.016	[0.031,0.165]	Yes
RT×FL→ID	- 0.125	0.058	- 2.131	0.033	[-0.222,-0.028]	Yes

Note:IMP:Impulsivity;FL:FinancialLiteracy;RT:RiskTolerance;ID:InvestmentDecisions

Table 6: Conditional Indirect Effects of Impulsivity (I) on Investment Decisions (ID) via Risk Tolerance (RT)

FL Level	Indirect Effect	Boot SE	95% CI	Sig.
3.0 (Low)	0.080	0.035	[0.025, 0.140]	Yes
4.0 (Moderate)	0.026	0.013	[0.008, 0.050]	Yes
4.5 (High)	0.010	0.011	[-0.003, 0.033]	No

The results output confirms a significant direct positive relationship between IMP and ID ($t=2.412$, LLCI=0.031, ULCI=0.165) a significant and positive relationship between IMP and RT ($t=2.818$, LLCI=0.269, ULCI=1.029) and between RT and ID($t=2.737$, LLCI=0.253, ULCI= 1.023); hence, validating the mediation. Furthermore, the moderation by FL signified by the interaction term provides evidence on how it helps mitigate the impact of IMP on RT ($t=-2.009$, LLCI=-0.208, ULCI=-0.021) and then that of RT on ID ($t=-2.131$, LLCI=-0.222, ULCI=-0.028) as both are significant and negative.

Lastly, the moderated mediation as a whole by FL is significant with conditional indirect effects showing that low and moderate FL leads to a stronger indirect effect, while high FL diminishes the effect (Boot LLCI=0.025, ULCI=0.140 at FL=3.0; Boot LLCI=-0.003, ULCI=0.033 at FL = 4.5). Hence, the model is accepted as moderated mediation exists which proves that FL is moderating in both ways i.e., high FL tends to overcome IMP which lowers RT impact and results in more rational ID while low FL enhance the impact of impulsivity, increasing RT and causes irrational ID. In this way FL has lowered the risk of irrational ID.

Overall, the results serve as a strong empirical support for the hypothesized relationships, reflecting that FL has an important stabilizing role, reducing the influence of biases by moderating RT, reducing irrational choices and promoting financial well-being.

Discussion on Findings

The above data results of this study revealed how investors are significantly influenced by herding bias as they tend to get swayed away by pressures of social conformity to where the grass seems greener in fear of missing out, depicting crowd psychology. They believe that others have superior information than them and without any technical analysis, jump on the bandwagon. This aligns with earlier studies, which found herding to be a typical psychological inclination, especially under unpredictable financial situations (Spyrou, 2013; Kumar & Goyal, 2015). This reckless risk-taking of unthinkingly following the herd highlights the amplified risk tolerance due to herding, as has also been concluded by numerous reliable studies (Apochi et al., 2024; Hussain & Rasheed, 2023), which is then projected onto poor and suboptimal investment choices when the herd's consensus turns out to be not so wise. Hence, while the frequency of investments is increased, the quality, unfortunately, is compromised when investors resort to heuristics only, which conforms to the findings of many recent studies (Ali et al., 2024; Mansoor et al., 2023). The same trend has been revealed in the case of the second bias, i.e., impulsivity, conforming to the established findings in the literature (Dehart et al., 2016; Katauke et al., 2023). Impulsive investors seem to overreact and instantly make abrupt decisions without taking into consideration their own long-term goals and risk-taking capacity, as has also been recognized in by findings of other notable works (Martin & Potts, 2009; Nicolosi et al., 2009; Mukhti et al., 2024). In this thirst for immediate gratification, they sometimes craft their misfortune (Kanagasabai & Aggarwal, 2020). This also leads them to an amplified risk tolerance that results in uncalculated risky and irrational decision choices, topped, unfortunately, with a desert of post-decision regret, as reported by many investors.

However, intervention by financial literacy in this decision-making offers new insights. Financial literacy has been examined to fully moderate this relationship between biases and investment decisions mediated through risk tolerance. First, financial literacy moderates the relationship between herding and risk tolerance, which corresponds to the results of several recent studies (Babar, 2023; Rana, 2024; Apochi et al., 2024; Butt et al., 2023) as well as impulsivity and risk tolerance which too has also been identified in some notable prior findings (Butt et al., 2023; Katauke et al., 2023). It empowers the investors with confidence by making them well-equipped with financial knowledge and technical skills, which mitigates the impact of biases as investors become more aware of them, recognize them and learn how to tackle these pressures and rationally evaluate information to make informed decisions- which aligns to results of other available studies too (Statman's, 2019). Then, financial literacy moderates second time this mediated pathway by interacting with risk tolerance and reducing its impact on investment decisions, which corresponds to the analysis of various other research (Rooije et al., 2011; Lusardi & Mitchell, 2014). It is important to understand that even if the biases are moderated, they cannot be eliminated, and their residual effect is still pronounced through amplified risk tolerance. Moreover, even if there is no bias, it is crucial to identify the nature of risk tolerance. It is a polarized trait with extreme orientations and tendencies that keep one jammed in their perceptions and approaches, as recognized in psychology, too (Mukhdoomi & Shah, 2023). Risk-aversers are very likely to miss out on many opportunities because they tend to be on the safe side and conservative in their choices.

On the other hand, risk-takers are very likely to ignore all warning signs because they tend to take excessive and reckless risks in pursuit of gains. The argument here is that either orientation will lead to uncalculated risks and irrational decision choices by keeping the investors limited and tied to it. Financial literacy, thus, helps investors understand long-term strategic aspects and better assessment of risk and return, which allows them to avoid taking excessive or uncalculated risks and instead assess risks in alignment with their own long-term goals and actual risk-taking capacity, as shared with similar research findings in the literature (Mohta & Shunmugasundaram, 2023; Rehmat et al., 2023).

This model holistically looked at a bias at a collective level, i.e. herding and a bias at an individual bias, i.e. impulsivity, and moderated the mediation pathway as a whole but twice to cater to both

extrinsic and intrinsic aspects that may contribute to poor investment decisions, i.e. biases being sprouted by external pressures and risk tolerance being the intrinsic behavioural trait. This dual role of financial literacy as a buffer against biases and a regulator of risk tolerance in a sequential manner has not yet been examined before to the best of our knowledge. The existing literature in behavioural finance focuses more on the mitigation of biases and external pressures. However, it often overlooks the fact that risk tolerance is not just a reactive mediator but an active polarized trait which can, without any bias, also hinder investors from being flexible in their strategic decision choices. If not regulated, these internal tendencies hinder investors from becoming flexible, adaptable and responsive in every situation, and a lack of these three key skills is a guarantee of failure and misfortune in the longer run for any investor. Hence, financial literacy helps investors become more informed, aware, and capable of making sound, rational and strategic decisions without being swayed away by any bias and by regulating their behavioural traits. More objective decision-making is made possible by financially knowledgeable investors' propensity to challenge cognitive biases and their decreased reliance on emotional responses or social proof. These results, too, match the findings of other researchers (Gulzar et al., 2024; Shaikh & Khan, 2025). Overall, the concept presented in this moderated mediation model is accredited by the postulation prospect theory (1979), the self-regulator theory (1997), and the theory of planned behaviour (1985).

Conclusion

The results of this research emphasize the complex interaction between cognitive influences and behavioural biases informing investment decision-making. Assessment of the moderated mediation model reaffirms the central role played by financial literacy in countering the negative impact of biases like herding and impulsivity to promote more rational and knowledgeable investment behaviour. In addition, the descriptive statistical analysis shows a moderate mean and low variability for financial literacy, meaning that the respondents have a reasonably good grasp of financial concepts—mainly young, educated adults with a higher percentage of female respondents. These findings enrich the current literature in behavioural finance and reinforce the imperative for incorporating thorough financial literacy courses within educational frameworks and public policy agendas to encourage sound and efficient investment practice. Moreover, the research is constrained by the limited age range, two behavioural biases of interest, and the use of self-reported data, which could lower accuracy and generalizability. Future research should investigate interactions between more than one bias and a more representative age range to increase applicability. Longitudinal experimental studies are also suggested to improve understanding of the long-term influence of financial literacy on investment choices, as well as studies examining biases with respect to the influence of recent advancements in the Fintech domain.

References

- Abdulridha, F., & Hussin, N. (2023). Determinants of individual investment decisions making for Iraqi investors, the role of financial literacy and fundamental market anomalies. *International Journal of Academic Research in Business and Social Sciences*, 31(10), 2332- 2347.
- Ahmad, M., & Wu, Q. (2022). Does herding behavior matter in investment management and perceived market efficiency? Evidence from an emerging market. *Management Decision*, 60(8), 2148–2173.
- Ali, M., & Asri, M. (2019). Prospect theory: Overcome risk disaster in emerging market. *In IOP Conference Series: Earth and Environmental Science*, 235(1), 012010.
- Ali, M. H., Bakar, A., Tufail, M. S., & Mazhar, F. (2024). Behavioral biases in investment: Overconfidence, disposition effect, and herding behavior. *iRASD Journal of Economics*, 6(2), 555-566.
- Altaf, H., & Jan, A.(2023). Generational theory of behavioral biases in investment behavior. *Borsa Istanbul Review*, 23(4), 834-844.
- Ansar, A., Flyvbjerg, B., Budzier, A., & Lunn, D. (2016). Does infrastructure investment lead to

economic growth or economic fragility? Evidence from China. *Oxford Review of Economic Policy*, 32(3), 360-390.

- Apochi J.G., Ahmed N.M., Okpanachi J., & Agbi S.E (2024). Herding bias and financial risk tolerance on individual investment performance in Nigeria: Moderated by financial literacy. *International Journal of Business and Management Review*, 12(3), 1-17.
- Babar, F. K. (2023). Impact of Herding Behavior on Investment Decision in an emerging Stock Market with Mediation-Moderation Effect. *International Journal of Economics and Management Sciences*, 2(1), 143- 167.
- Bezdjian, S., Baker, L.A., & Tuvblad, C. (2011). Genetic and environmental influences on impulsivity: A meta-analysis. *Clinical Psychology Review*, 31(7), 1209–1223.
- Butt, H., Sajjad, A., Awan, K. Z., & Shakil, M. H. (2023). The role of behavioral factors on investment decision making: Moderating role of financial literacy. *Pakistan Journal of Humanities and Social Sciences*, 11(4), 4533-4547.
- Delaney, D., Stein, L. A. R., & Gruber, R. (2018). Facebook addiction and impulsive decision making. *Addiction Research & Theory*, 26(6), 478-486.
- DeHart, W. B., Friedel, J. E., Lown, J. M., & Odum, A. L. (2016). The effects of financial education on impulsive decision making. *PloS one*, 11(7), 1-16.
- Ebidor, L. L., & Ikhide, I. G. (2024). Literature review in scientific research: An overview. *East African Journal of Education Studies*, 7(2), 211-218.
- Garg, N., & Singh, S. (2018). Financial literacy among youth. *International Journal of Social Economics*, 45(1), 173–186.
- Gulzar, T. I. & Ali, N. (2023). The influence of behavioral biases on investment decisions: Moderating role of emotional stability. *Journal of Development and Social Sciences*, 4(2), 692-708.
- Gulzar, T. I., Javed, N., Ali, N., & ul Hasan, S. S. (2024). Influence of behavioral biases on investment decisions: Moderating role of financial literacy and emotional stability in the new normal. *Kurdish Studies*, 12(3), 35-43.
- Hair Jr., J., Page, M., & Brunsveld, N. (2019). *Essentials of Business Research Methods* (4th ed.). Routledge. <https://doi.org/10.4324/9780429203374>
- Harahap, S., Thoyib, A., Sumiati, S., & Djazuli, A. (2022). The impact of financial literacy on retirement planning with serial mediation of financial risk tolerance and saving behavior: Evidence of medium entrepreneurs in Indonesia. *International Journal of Financial Studies*, 10(3), 66.
- Hassan Al-Tamimi, H.A., & Anood Bin Kalli, A. (2009). Financial literacy and investment decisions of UAE investors. *The journal of risk finance*, 10(5), 500-516.
- Hasegawa, A., Somatori, K., Nishimura, H., Hattori, Y., & Kunisato, Y. (2019). Associations between self-reported impulsivity and a latent variable of impulsive action constructed from three laboratory tasks. *Journal of Experimental Psychopathology*, 10(3), 1-12.
- Hayes, A. F. (2013). *Introduction to mediation, moderation, and conditional process analysis: A regression-based approach* (1st ed.). The Guilford Press.
- Hussain, S., & Rasheed, A. (2023). Risk tolerance as mediating factor in individual financial investment decisions: A developing-country study. *Studies in Economics and Econometrics*, 47(2), 185-198.
- Kanagasabai, B., & Aggarwal, V. (2020). The mediating role of risk tolerance in the relationship between financial literacy and investment performance. *Colombo Business Journal*, 11(1), 83-104.
- Kasoga, P. S. (2021). Heuristic biases and investment decisions: Multiple mediation mechanisms of risk tolerance and financial literacy—a survey at the Tanzania stock market. *Journal of Money and Business*, 1(2), 102-116.
- Kaur, M., Jain, J., & Sood, K. (2024). All are investing in Crypto, I fear of being missed out: Examining the influence of herding, loss aversion, and overconfidence in the cryptocurrency market with the mediating effect of FOMO. *Quality & Quantity*, 58(3), 2237- 2263.
- Kaur, P., & Kaur, R. (2019). Effects of strategic investment decisions on value of firm: Evidence from India. *Global Business Review*, 20(2), 1–14.
- Katauke, T., Fukuda, S., Khan, M. S. R., & Kadoya, Y. (2023). Financial literacy and impulsivity: Evidence from Japan. *Sustainability*, 15(9), 1-14.
- Khan, H. A., & Butt, A. S. (2024). Behavioral biases and investment decisions: The mediating role of

risk perception through the lens of Prospect Theory. *Journal of Business and Management Research*, 3(3), 772–782.

- Komalasari, P. T., Asri, M., Purwanto, B. M., & Setiyono, B. (2022). Herding behaviour in the capital market: What do we know and what is next? *Management Review Quarterly*, 72(3), 745–787.
- Kumar, S., & Goyal, N. (2015). Behavioural biases in investment decision making—a systematic literature review. *Qualitative Research in financial markets*, 7(1), 88–108.
- Lusardi, A., & Mitchell, O. S. (2014). The economic importance of financial literacy: Theory and evidence. *American Economic Journal: Journal of Economic Literature*, 52(1), 5–44.
- Mansoor, M., Sohail, A., & Syed, N. (2023). Dynamics of decision-making: Financial & herding behavior effects on retail investors' investment choices: the moderated mediation approach. *Journal of Social Research Development*, 4(3), 609–621.
- Martin, L. E., & Potts, G. F. (2009). Impulsivity in decision-making: An event-related potential investigation. *Personality and Individual Differences*, 46(3), 303–308.
- Mittal, S. K. (2022). Behavior biases and investment decision: theoretical and research framework. *Qualitative Research in Financial Markets*, 14(2), 213–228.
- Mohta, A., & Shunmugasundaram, V. (2023). Millennials' financial literacy and risk behavior: evidence from India. *International Review of Economics*, 70(4), 419–435.
- Mukhdoomi, A. M., & Shah, F. A. (2023). Risk Tolerance in Investment Decisions: Are Personality Traits the Real Triggers? *NMIMS Management Review*, 31(4), 256–264.
- Mukti, A. H., Sastrodiharjo, I., & Hariyanto, O. I. (2024). Financial Literacy, Financial Management, Social Legitimacy and Being FOMO on Impulsive Buying: Evidence on Leisure Activity Coldplay Concert Euphoria on Indonesian Gen Z Generation. *Atestasi: Jurnal Ilmiah Akuntansi*, 7(1), 639–660.
- Nicolosi, G., Peng, L., & Zhu, N. (2009). Do individual investors learn from their trading experience? *Journal of Financial Markets*, 12(2), 317–336.
- Pérez-Vicente, S., & Ruiz, M. E. (2009). Descriptive statistics. *Allergologia et immunopathologia*, 37(6), 314–320.
- Rana, B. (2024). Impact of herding behavior on investment decisions in the Nepalese stock market with mediation and moderation effects. *International Research Journal of MMC*, 5(2), 64–77.
- Rasool, N., & Ullah, S. (2020). Financial literacy and behavioral biases of individual investors: Empirical evidence of Pakistan stock exchange. *Journal of Economics, Finance and Administrative Science*, 25(50), 261–278.
- Reddy, D., & Pulluru, K. (2024). *Principles Of Statistics & Research Methodology*. Academic Guru Publishing House.
- Rehmat, I., Khan, A. A., Hussain, M., & Khurshid, S. (2023). An examination of behavioral factors affecting the investment decisions: The moderating role of financial literacy and mediating role of risk perception. *Journal of Innovative Research in Management Sciences*, 4(2), 1–16.
- Rexhepi, B. R., Murtezaj, I. M., Xhaferi, B. S., Raimi, N., Xhafa, H., & Xhaferi, S. (2024). Investment decisions related to the allocation of capital educational administration. *Theory and Practice*, 30(6), 513–527.
- Ryack, K., & Sheikh, A. (2016). The relationship between time perspective and financial risk tolerance in young adults. *Financial Services Review*, 25(2), 157–180.
- Sari, M., & Nugroho, L. (2019). Impact of risk tolerance and demographic factors on financial investment decision. *International Journal of Economics and Financial Issues*, 9(6), 1–7.
- Sathya, N., & Gayathiri, R. (2024). Behavioral biases in investment decisions: An extensive literature review and pathways for future research. *Journal of Information and Organizational Sciences*, 48(1), 117–131.
- Shaikh, A., & Khan, M. U. (2025). An assessment of risk-taking behavior of individual investors: Role of financial literacy and emotions. *International Journal of Economics and Financial Issues*, 15(1), 139–147.
- Sihotang, P. T., & Pertiwi, S. R. (2023). Analysis of the effect of impulsive buying and financial literacy on financial behavior. *Jurnal Ilmiah Manajemend an Bisnis*, 24(1), 67–76.
- Sood, K., Pathak, P., & Gupta, S. (2025). How do the determinants of investment decisions get prioritized? Peeking into the minds of investors. *Kybernetes*, 54(4), 2175–2203.
- Spyrou, S. (2013). Herding in financial markets: a review of the literature. *Review of Behavioral*

Finance, 5(2), 175-194.

- Statman, M. (2019). *Behavioral finance: The second generation*. CFA Institute Research Foundation.
- Van Rooij, M., Lusardi, A., & Alessie, R. (2011). Financial literacy and stock market participation. *Journal of Financial economics*, 101(2), 449-472.
- Wang, H., & Hanna, S. D. (1997). Does risk tolerance decrease with age? *Financial Counseling and Planning*, 8(2), 27-31.
- Xiao, J. J., & O'Neill, B. (2016). Consumer financial education and financial Capability. *International Journal of Consumer Studies*, 40(6), 712-721
- Yoganandham, G. (2025). Mastering economic and financial sources with reference to budgeting, savings, early investing, debt management and the power of financial planning- A comprehensive analysis. *Degres Journal*, 10(1), 19-33.
- Yousaf, I., Ali, S., & Shah, S. Z. A. (2018). Herding behavior in Ramadan and financial crises: The case of the Pakistani stock market. *Financial Innovation*, 4(1), 1-14.