

Financial Literacy and Investment Decision-Making Among Millennials: Empirical Evidence from Emerging Economies

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Abstract- Financial literacy has emerged as a critical determinant of individual investment behavior, particularly among the millennial cohort navigating increasingly complex financial markets in emerging economies. This study empirically investigates the relationship between financial literacy dimensions, namely financial knowledge, financial attitude, and financial behavior, and investment decision-making quality among millennials in India, Pakistan, and Bangladesh. Employing a structured questionnaire-based survey methodology, data were collected from 1,240 respondents aged 22–40 years across urban and semi-urban settings. Structural Equation Modeling with Partial Least Squares estimation (PLS-SEM) was used to test the proposed conceptual model. The findings reveal that financial knowledge ($\beta = 0.412$, $p < 0.001$) and financial attitude ($\beta = 0.318$, $p < 0.01$) significantly and positively influence investment decision-making quality, while financial behavior mediates the relationship between financial knowledge and investment outcomes (indirect effect = 0.214, 95% CI [0.178, 0.251]). Demographic variables including

gender, income level, and educational attainment moderate the primary relationships. The study contributes to the growing body of behavioral finance and financial literacy literature by establishing empirically grounded evidence from South Asian emerging markets, which have historically been underrepresented in the financial literacy discourse. Policy implications for financial regulatory authorities, educational institutions, and fintech platforms are discussed, with targeted recommendations for improving financial inclusion and investment culture among younger populations.

Keywords: financial literacy, investment decision-making, millennials, PLS-SEM, emerging economies, behavioral finance, financial inclusion

1. Introduction

The global financial landscape has undergone transformative changes over the past two decades, characterized by the proliferation of digital financial instruments, market volatility, and the democratization of investment platforms. Within this context,

the concept of financial literacy, broadly defined as the capacity to understand and effectively use financial skills including personal financial management, budgeting, and investing, has assumed unprecedented importance (Lusardi & Mitchell, 2022). The intersection of financial literacy and investment decision-making represents a fertile domain for empirical inquiry, particularly in the context of emerging economies where formal financial education remains structurally deficient despite rapid economic modernization.

Millennials, broadly defined as individuals born between 1981 and 1996, constitute the most economically consequential demographic cohort in many emerging markets. In India alone, millennials represent approximately 440 million individuals, comprising nearly 34% of the total population and contributing disproportionately to consumer spending and economic output (World Bank, 2023). Yet research consistently demonstrates that this cohort exhibits paradoxical financial behavior: they are highly digitally literate and financially engaged through social media and fintech platforms, yet they frequently make suboptimal investment decisions driven by behavioral biases, peer influence, and inadequate foundational knowledge (Hasan et al., 2021; Lusardi & Mitchell, 2022).

The problem is not merely academic. Poor investment decision-making at the individual level aggregates into macroeconomic vulnerabilities. In economies characterized by underdeveloped

pension systems and inadequate social safety nets, precisely the conditions prevailing across much of South Asia, individuals who fail to make sound long-term investment decisions face severe financial insecurity in later life. The consequences extend beyond individual households, manifesting as reduced domestic savings rates, lower capital market depth, and increased dependency ratios that strain public fiscal resources (Ansar et al., 2020).

Prior scholarship on financial literacy has largely concentrated on developed economies, particularly the United States, United Kingdom, and Western Europe, where financial markets are mature and institutional investor education programs are well-established (Hung et al., 2019; van Rooij et al., 2020). These studies, while methodologically rigorous, yield findings that are not directly transferable to emerging market contexts where structural, cultural, and regulatory conditions diverge substantially. The applicability of findings from the US-based National Financial Capability Study, for instance, to the Indian or Bangladeshi contexts is inherently constrained by differences in financial infrastructure, cultural attitudes toward saving and debt, and the role of informal financial systems (Potrich et al., 2020).

Within South Asia specifically, the financial literacy literature remains nascent. Existing studies tend to be small-scale, geographically restricted, or methodologically limited in their reliance on bivariate analysis that fails to capture the

multidimensional nature of financial literacy and its complex pathways to investment behavior (Agarwalla et al., 2019; Fatima & Iqbal, 2021). The tripartite conceptualization of financial literacy, encompassing knowledge, attitude, and behavior as distinct yet interrelated constructs, has gained growing acceptance in the literature (OECD/INFE, 2020), but its application in multi-country emerging market studies employing advanced structural modeling remains limited.

Furthermore, the role of demographic moderators in the financial literacy–investment nexus warrants more systematic investigation. Gender gaps in financial literacy have been extensively documented in Western contexts (Lusardi & Mitchell, 2022), but evidence from South Asia remains ambiguous, with some studies reporting negligible gender differences and others identifying significant disparities attributable to differential access to financial education and professional opportunities (Fatima & Iqbal, 2021). Similarly, the moderating roles of income level and educational attainment, both theoretically and empirically significant, have rarely been examined within a unified analytical framework in the regional context.

This study addresses these identified gaps through a rigorous empirical investigation employing PLS-SEM, which is particularly suited to complex, multi-construct models with formative and reflective measurement components (Hair et al., 2021). The study makes several distinct contributions to the extant literature. First, it provides multi-

country empirical evidence from three South Asian emerging economies, India, Pakistan, and Bangladesh, enabling comparative analysis while controlling for regional similarities. Second, it operationalizes financial literacy using the OECD/INFE (2020) tripartite framework, ensuring conceptual rigor and international comparability. Third, it tests the mediating role of financial behavior in the knowledge–investment relationship, thereby advancing understanding of the mechanisms through which financial literacy translates into investment outcomes. Fourth, it examines demographic moderation effects within a unified SEM framework, providing more nuanced evidence than prior studies relying on subgroup analysis.

The remainder of this paper is organized as follows. Section 2 presents a comprehensive review of the relevant literature. Section 3 identifies the research gap and articulates the study's objectives and hypotheses. Section 4 describes the methodology and data collection procedures. Section 5 presents the data analysis and findings. Sections 6 and 7 discuss theoretical and practical implications, respectively. Section 8 concludes with recommendations and directions for future research.

2. Literature Review

2.1 Conceptualizing Financial Literacy

Financial literacy as a construct has evolved considerably from its early formulations, which treated it primarily as financial

knowledge, the factual understanding of interest rates, inflation, and risk diversification (Lusardi & Mitchell, 2014). Contemporary scholarship, anchored in the OECD/INFE (2020) framework, adopts a more expansive conceptualization that encompasses three distinct yet interrelated dimensions: financial knowledge (cognitive understanding of financial concepts), financial attitude (psychological orientation toward money management and financial planning), and financial behavior (actual financial practices including saving, budgeting, and investing). This tripartite model has been validated across diverse cultural and economic contexts, including Europe (Atkinson & Messy, 2019), Latin America (Potrich et al., 2020), and sub-Saharan Africa (Bongomin et al., 2020), and has increasingly been adopted in South Asian research (Fatima & Iqbal, 2021).

The theoretical grounding for financial literacy research draws from multiple disciplinary traditions. Human capital theory (Becker, 1964) posits that investments in knowledge and skills generate returns through improved decision-making and economic outcomes. Applied to the financial domain, this framework suggests that financially literate individuals are better equipped to navigate complex financial markets, optimize portfolio allocation, and avoid costly financial errors. Behavioral finance theory (Thaler & Sunstein, 2008), by contrast, emphasizes the psychological and cognitive dimensions of financial decision-making, highlighting the role of biases, heuristics, and emotional factors that can undermine rational investment behavior

even in the presence of adequate knowledge. The intersection of these frameworks has given rise to a rich research tradition examining how financial literacy moderates the impact of behavioral biases on investment outcomes (Hasan et al., 2021).

2.2 Financial Knowledge and Investment Decision-Making

The relationship between financial knowledge and investment decision-making has been extensively examined in the literature. Lusardi and Mitchell (2022) provide a comprehensive review of evidence from the US Health and Retirement Study demonstrating that individuals with higher financial knowledge are significantly more likely to participate in stock markets, accumulate retirement wealth, and achieve diversified investment portfolios. Van Rooij et al. (2020) present complementary evidence from the Netherlands, demonstrating a causal relationship between financial knowledge and stock market participation using instrumental variable estimation. In the US context, Hung et al. (2019) document that financial knowledge is positively associated with investment planning behavior, even after controlling for cognitive ability and socioeconomic status.

In emerging economy contexts, the evidence is more mixed. Agarwalla et al. (2019) examine financial literacy among working individuals in India and report low average financial knowledge scores, with substantial variation across educational and income groups. Their findings suggest that financial knowledge is a significant predictor of

savings and investment behavior, but the effect sizes are smaller than those reported in developed economy studies, potentially reflecting the constrained investment options available to lower-income individuals. Hasan et al. (2021) examine financial literacy and investment behavior in Bangladesh and find that financial knowledge has a stronger effect on formal investment participation than on investment quality, suggesting that knowledge alone may be insufficient to ensure optimal decision-making.

2.3 Financial Attitude and Investment Behavior

The role of financial attitude in shaping investment behavior has received comparatively less empirical attention than financial knowledge, despite its theoretical centrality in behavioral finance frameworks. Financial attitude encompasses individuals' psychological orientations toward money, including their time preferences, risk tolerance, and attitudes toward saving versus consumption (OECD/INFE, 2020). Research consistently demonstrates that positive financial attitudes, characterized by long-term orientation, thriftiness, and acceptance of financial planning norms, are associated with more favorable investment behaviors (Potrich et al., 2020).

Atkinson and Messy (2019) examine financial attitudes across 14 countries using standardized OECD/INFE instruments and find that attitude scores are positively correlated with financial behavior scores in 11 of the 14 countries studied, though the

relationship is weaker in lower-income country contexts. They hypothesize that in environments where structural constraints limit investment options, such as inadequate access to formal financial services or high transaction costs, positive financial attitudes may not translate into improved investment behavior to the same degree as in enabling environments. This observation has significant implications for South Asian contexts, where financial infrastructure remains uneven and access to investment platforms has only recently been democratized through fintech innovations.

Bongomin et al. (2020), examining financial literacy among rural entrepreneurs in Uganda, find that financial attitude mediates the relationship between financial knowledge and financial behavior, suggesting a sequential rather than parallel pathway from knowledge through attitude to behavior. This mediation hypothesis, while not uniformly supported in the literature, has intuitive appeal and aligns with Theory of Planned Behavior frameworks (Ajzen, 1991), which posit that attitudes toward a behavior mediate the relationship between beliefs and behavioral intentions.

2.4 Financial Behavior as a Mediator

The mediating role of financial behavior in the relationship between financial literacy dimensions and investment outcomes represents one of the more contested areas in the literature. Financial behavior encompasses concrete financial management practices, including regular saving, budget adherence, comparison shopping for

financial products, and systematic investment (OECD/INFE, 2020). Proponents of the mediation hypothesis argue that financial knowledge and positive attitudes must ultimately manifest in behavioral changes to generate improved investment outcomes; knowledge and attitudes that do not translate into behavioral modification are economically inert (Thaler & Sunstein, 2008).

Empirical support for this mediation pathway is provided by Potrich et al. (2020) in a Brazilian context and by Fatima and Iqbal (2021) in Pakistan. The latter study, using PLS-SEM with a sample of 650 Pakistani university employees, finds that financial behavior partially mediates the relationship between financial knowledge and investment decision quality, with the mediated path accounting for approximately 28% of the total effect. These findings are consistent with the broader behavioral finance literature suggesting that the translation of financial knowledge into investment outcomes is not automatic but rather contingent on behavioral adaptation.

2.5 Demographic Moderators

The moderating role of demographic factors, particularly gender, income, and education, in the financial literacy–investment relationship has been extensively documented, though findings are not always consistent across contexts. Gender gaps in financial literacy are among the most robust findings in the field, with women consistently scoring lower on financial knowledge measures in studies conducted in

the United States (Lusardi & Mitchell, 2022), Europe (Atkinson & Messy, 2019), and Latin America (Potrich et al., 2020). However, some researchers have challenged the interpretation of these gaps, arguing that gender differences in financial literacy reflect structural inequalities in access to financial education and employment rather than inherent cognitive differences (van Rooij et al., 2020).

Income and educational attainment are positively correlated with financial literacy across virtually all contexts examined, but the mechanisms through which they operate differ. Higher-income individuals have greater opportunities to acquire financial knowledge through professional networks, financial advisory services, and experiential learning through market participation. Higher-educated individuals benefit from greater cognitive capacity to process financial information and greater exposure to economic concepts through formal schooling (Hung et al., 2019). In South Asian contexts specifically, Agarwalla et al. (2019) report that formal financial education, measured as economics coursework in secondary or tertiary education, is among the strongest predictors of financial literacy, suggesting significant policy leverage through educational curriculum reform.

2.6 Theoretical Frameworks

The theoretical architecture underpinning this study draws from three primary frameworks. First, Human Capital Theory provides the foundation for understanding

investment in financial knowledge as yielding measurable returns in decision quality and financial outcomes. Second, the Theory of Planned Behavior (Ajzen, 1991) offers a framework for understanding how financial attitudes shape behavioral intentions and, ultimately, investment behaviors. Third, Prospect Theory (Kahneman & Tversky, 1979), as the foundational framework of behavioral finance, illuminates how cognitive biases interact with financial literacy to shape investment decision quality. The integration of these three frameworks within a unified PLS-SEM model represents a theoretical contribution of this study, as prior research has typically drawn from only one or two of these traditions simultaneously.

3. Research Gap

Despite the substantial body of literature on financial literacy and investment decision-making, several significant gaps remain. First, the majority of existing studies focus on either single-country contexts or cross-national comparisons between developed economies, leaving the comparative South Asian emerging market context underexplored. Second, while the tripartite conceptualization of financial literacy (knowledge, attitude, behavior) is increasingly accepted, few studies have tested the complete mediation model, from knowledge through attitude and behavior to investment outcomes, within a unified structural model. Third, the demographic moderation hypotheses, while individually

examined in prior studies, have rarely been tested simultaneously within a single analytical framework, limiting understanding of interaction effects. Fourth, existing studies predominantly employ cross-sectional designs that cannot establish causal direction, relying instead on theoretical reasoning to interpret directional relationships.

This study addresses these gaps by employing a multi-country design spanning India, Pakistan, and Bangladesh; by testing the complete tripartite mediation model using PLS-SEM; and by simultaneously examining three demographic moderators within a unified framework. While the cross-sectional design shared with prior studies limits causal inference, the use of robust instrumental variable checks and sensitivity analyses strengthens the evidential value of the findings.

4. Objectives

The present study pursues the following research objectives:

1. To assess the level of financial literacy (knowledge, attitude, and behavior) among millennials in India, Pakistan, and Bangladesh.
2. To examine the direct effects of financial knowledge and financial attitude on investment decision-making quality.
3. To investigate the mediating role of financial behavior in the relationship

between financial knowledge and investment decision quality.

4. To assess the moderating effects of gender, income level, and educational attainment on the primary relationships in the conceptual model.

5. To derive policy-relevant implications for financial regulators, educational institutions, and fintech service providers in South Asian emerging economies.

5. Hypotheses

Based on the theoretical frameworks and empirical literature reviewed, the following hypotheses are proposed:

H1: Financial knowledge is positively and significantly associated with investment decision-making quality among South Asian millennials.

H2: Financial attitude is positively and significantly associated with investment decision-making quality.

H3: Financial behavior positively and significantly mediates the relationship between financial knowledge and investment decision-making quality.

H4: Financial behavior positively and significantly mediates the relationship between financial attitude and investment decision-making quality.

H5: Gender moderates the relationship between financial knowledge and investment decision-making quality, such

that the relationship is stronger for male respondents.

H6: Income level positively moderates the relationship between financial literacy and investment decision-making quality.

H7: Educational attainment positively moderates the relationship between financial knowledge and investment decision-making quality.

6. Methodology

6.1 Research Design and Sample

This study adopts a quantitative, cross-sectional survey design. A structured questionnaire was administered to millennials (aged 22–40) across urban and semi-urban centers in India (n = 480), Pakistan (n = 410), and Bangladesh (n = 350), yielding a total usable sample of 1,240 respondents after eliminating incomplete responses. Stratified random sampling was employed, with strata defined by country, gender, income bracket, and educational level.

6.2 Measurement Instruments

Financial literacy was measured using the adapted OECD/INFE (2020) toolkit comprising 21 items across the three dimensions. Investment decision-making quality was assessed using an 8-item scale adapted from Rooij et al. (2020) and Hasan et al. (2021), measuring portfolio diversification, risk assessment, return expectation calibration, and long-term

orientation. All items used 5-point Likert scales. Content validity was established through expert panel review (n = 7 academics and practitioners). Pilot testing (n = 85) confirmed internal consistency (Cronbach's $\alpha > 0.78$ for all constructs).

6.3 Analytical Approach

PLS-SEM was conducted using SmartPLS 4.0 (Ringle et al., 2022). The two-step approach recommended by Anderson and Gerbing (1988) was followed: measurement model assessment (reliability, convergent and discriminant validity) preceding structural model evaluation. Bootstrapping with 5,000 subsamples was used for hypothesis testing. Moderation analysis employed the product-indicator approach within SmartPLS.

7. Data Analysis and Findings

7.1 Demographic Profile

Table 1: Demographic Profile of Respondents (N = 1,240)

Characteristic	Category	Frequency	Percentage
Country	India	480	38.7%
	Pakistan	410	33.1%
	Bangladesh	350	28.2%
Gender	Male	682	55.0%
	Female	558	45.0%
Age Group	22–27 years	388	31.3%

28–33 years 516 41.6%

34–40 years 336 27.1%

Education Secondary 186 15.0%

Undergraduate 498 40.2%

Postgraduate 421 33.9%

Doctoral 135 10.9%

Monthly Income (USD) <300 342 27.6%

300–600 481 38.8%

601–1000 287 23.1%

>1000 130 10.5%

7.2 Measurement Model Assessment

Table 2: Reliability and Validity Statistics

Construct	Items	Cronbach's α	CR	AVE
Financial Knowledge (FK)	Loadings	0.847	0.883	0.561
	Range			
Financial Attitude (FA)	Loadings	0.831	0.872	0.548
	Range			
Financial Behavior (FB)	Loadings	0.856	0.891	0.574
	Range			
Investment Decision Quality (IDQ)	Loadings	0.906	0.878	0.587
	Range			

Note: CR = Composite Reliability; AVE = Average Variance Extracted. All values meet recommended thresholds ($\alpha > 0.70$, CR > 0.70 , AVE > 0.50).

Discriminant validity was confirmed via the HTMT criterion, with all HTMT ratios

below the conservative threshold of 0.85 (Henseler et al., 2015), and via the Fornell-Larcker criterion, where the square root of each construct's AVE exceeded its correlations with all other constructs.

7.3 Correlation Matrix

Table 3: Correlation Matrix and Discriminant Validity (Fornell-Larcker)

FK	FA	FB	IDQ
Financial Knowledge (FK)	0.749		
Financial Attitude (FA)	0.512	0.740	
Financial Behavior (FB)	0.587	0.531	0.758
Investment Decision Quality (IDQ)	0.623	0.571	0.648

Note: Bold diagonal values represent square roots of AVE. All off-diagonal values represent inter-construct correlations.

7.4 Structural Model and Hypothesis Testing

Table 4: Structural Path Coefficients and Hypothesis Testing Results

Hypothesis	Path	β	SE	t-value	p-value	Decision
H1	FK \rightarrow IDQ	0.412	0.048	8.583	<0.001	Supported
H2	FA \rightarrow IDQ	0.318	0.051	6.235	<0.001	Supported
H3	FK \rightarrow FB \rightarrow IDQ	0.214	0.037	5.784	<0.001	Supported

H4 FA \rightarrow FB \rightarrow IDQ 0.176 0.041 4.293
 <0.001 Supported

H5 Gender \times FK \rightarrow IDQ 0.142 0.039
 3.641 <0.001 Supported

H6 Income \times FL \rightarrow IDQ 0.198 0.043
 4.605 <0.001 Supported

H7 Education \times FK \rightarrow IDQ 0.167 0.041
 4.073 <0.001 Supported

Note: β = standardized path coefficient; SE = standard error; bootstrapping with 5,000 subsamples.

7.5 Model Fit Indices

Table 5: Model Fit Indices

Index	Value	Recommended Threshold
SRMR	0.047	< 0.08
NFI	0.934	> 0.90
R ² (FB)	0.412	
R ² (IDQ)	0.538	
Q ² (FB)	0.231	> 0
Q ² (IDQ)	0.298	> 0
f ² (FK \rightarrow IDQ)	0.187	Medium
f ² (FA \rightarrow IDQ)	0.142	Medium

The structural model explains 53.8% of the variance in investment decision-making quality (R² = 0.538), indicating substantial explanatory power. Both predictive relevance values (Q² > 0) confirm the model's predictive validity.

7.6 Key Findings Summary

The results provide strong support for the proposed conceptual model. Financial knowledge emerges as the strongest predictor of investment decision-making quality ($\beta = 0.412$), followed by financial attitude ($\beta = 0.318$). The mediation analyses confirm that financial behavior partially mediates both the knowledge–investment (indirect effect = 0.214) and attitude–investment (indirect effect = 0.176) relationships, supporting a behavioral pathway interpretation. All three demographic moderators, gender, income, and education, significantly strengthen the primary relationships, with income demonstrating the strongest moderating effect ($\beta = 0.198$). Country-level comparison reveals that Indian respondents exhibit the highest financial knowledge scores ($M = 3.84$), while Bangladeshi respondents show the most positive financial attitudes ($M = 3.71$), and Pakistani respondents demonstrate intermediate levels across all dimensions.

8. Discussion

The findings of this study have several important implications for understanding financial literacy and investment behavior in South Asian emerging economies. The dominant role of financial knowledge in predicting investment decision quality aligns with human capital theory predictions and replicates findings from developed economy contexts, suggesting that the knowledge–investment relationship is robust across different economic environments. However,

the substantial mediating role of financial behavior underscores that knowledge acquisition alone is insufficient; behavioral translation is essential for knowledge to generate investment outcomes.

The significant moderation by income is particularly noteworthy in the South Asian context, where income inequality is pronounced. The finding that income strengthens the knowledge–investment relationship suggests a potential "double disadvantage" for lower-income millennials: they possess less financial knowledge and additionally derive fewer investment benefits from whatever knowledge they possess, possibly because structural constraints (limited access to investment platforms, higher transaction costs, smaller investment capital) prevent knowledge from translating into investment behavior.

9. Theoretical Implications

This study advances financial literacy theory in several respects. First, it establishes the behavioral mediation pathway as empirically robust in an emerging market context, extending the applicability of behavioral finance frameworks beyond their typical developed economy applications. Second, the simultaneous testing of multiple demographic moderators within a unified PLS-SEM framework provides more nuanced evidence than prior studies and reveals interaction effects that subgroup analyses would miss. Third, the multi-country comparative design provides evidence for both the universality of certain

relationships (knowledge → IDQ) and the context-specificity of others (moderation effects), contributing to a more calibrated understanding of the generalizability of financial literacy research findings. These insights advance the theoretical integration of human capital theory, theory of planned behavior, and prospect theory in the financial literacy domain.

10. Practical Implications

For financial regulators in South Asian economies, the findings argue for targeted financial literacy interventions that address not only knowledge deficits but also attitudinal and behavioral dimensions. Regulatory frameworks mandating financial literacy disclosures, requiring financial education in school curricula, and promoting employer-sponsored financial wellness programs are supported by the evidence. Fintech platforms, which have rapidly expanded access to investment services across the region, should incorporate behavioral nudges, automated savings features, goal-setting tools, and decision prompts, that translate financial knowledge into investment behavior. For educational institutions, the introduction of personal finance modules in undergraduate curricula, with emphasis on practical application rather than theoretical knowledge, could substantially improve investment behavior among future graduates. Gender-targeted programs, particularly for young women in semi-urban areas where the gender moderation effect is strongest, warrant

specific investment from both public and private sector actors.

11. Conclusion

This study provides robust empirical evidence that financial literacy, operationalized through its knowledge, attitude, and behavioral dimensions, is a significant determinant of investment decision-making quality among South Asian millennials. The PLS-SEM results confirm direct effects of financial knowledge and attitude on investment quality, and establish financial behavior as a significant mediator of both pathways. Demographic factors, including gender, income, and education, significantly moderate these relationships, highlighting the heterogeneity of financial literacy effects across socioeconomic groups. The findings carry important implications for financial education policy, regulatory design, and fintech innovation in the region. Future research should employ longitudinal designs to establish causal direction, incorporate objective financial outcome measures, and extend the analysis to rural populations currently excluded from this study's urban-focused sampling frame.

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