

IMPACT OF FINANCIAL LITERACY ON INVESTMENT BEHAVIOR: A META-ANALYTIC REVIEW

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ABSTRACT

This meta-analytic review synthesizes empirical evidence from 76 quantitative studies to examine the relationship between financial literacy and investment behavior across diverse populations and contexts. The analysis included 539 effect sizes covering over 160,000 individuals from 33 countries. Results demonstrate a significant positive association between financial literacy and investment behavior (pooled effect size $r = 0.286$, 95% CI [0.237, 0.334], $p < 0.001$). Subgroup analyses reveal that objective assessments of financial literacy yield stronger effects ($r = 0.348$) compared to subjective self-reports ($r = 0.221$). The relationship is moderated by demographic factors, with stronger effects observed in developed countries and among educated populations. Publication bias assessment indicates minimal bias in the literature. These findings provide robust evidence supporting the importance of financial literacy in promoting sound investment decisions and market participation.

Key words: Financial literacy, Financial-Investment behavior, Stock market participation, Portfolio diversification, Objective vs. subjective literacy

I. INTRODUCTION

Financial literacy, defined as the knowledge and skills necessary to make informed financial decisions, has emerged as a critical factor influencing investment behavior worldwide (Lusardi & Mitchell, 2014). As individuals increasingly assume responsibility for their retirement savings and face complex financial markets, understanding the relationship between financial knowledge and investment choices becomes paramount for policymakers and financial educators.

The theoretical foundation linking financial literacy to investment behavior rests on the premise that better-informed individuals make more rational financial decisions. Higher financial literacy should lead to increased market participation, improved portfolio diversification, and more appropriate risk-taking behavior (Van Rooij et al., 2011). However, empirical studies have shown varying effect sizes across different populations, measurement approaches, and economic contexts, necessitating a comprehensive meta-analytic synthesis.

Prior research has demonstrated positive associations between financial literacy and various investment outcomes. Van Rooij et al. (2011) found that financially literate individuals were significantly more likely to participate in stock markets, with effect sizes comparable to traditional predictors like education and wealth. Similarly, Guiso and Jappelli (2009) documented strong correlations between financial literacy measures and portfolio diversification, with increases in literacy associated with 15 percentage point improvements in diversification indices.

This meta-analysis aims to quantify the overall relationship between financial literacy and investment behavior while examining potential moderators that explain heterogeneity in findings across studies.

1.1 Objectives

Primary Objective: To estimate the pooled association between financial literacy and investment behavior across empirical studies using meta-analytic techniques.

Secondary Objectives:

1. To examine moderators, including age, gender, country income level, objective versus subjective literacy measures, and sample characteristics through subgroup analyses and meta-regression.
2. To assess publication bias and evaluate the impact of study quality on effect size estimates.
3. To identify patterns of heterogeneity and provide evidence-based recommendations for financial education policy.

1.2 Research Questions and Hypotheses

Primary Research Question: What is the magnitude of the association between financial literacy and investment behavior across empirical studies?

Hypotheses:

- H1: Financial literacy demonstrates a positive association with investment behavior across populations and contexts.
- H2: Objective measures of financial literacy show stronger associations with investment behavior compared to subjective self-assessments.
- H3: The relationship varies systematically across demographic groups and economic contexts.

II. METHODS

Eligibility Criteria

Population: Individuals of any age from any geographical region participating in empirical research studies.

Exposure: Financial literacy measured through objective knowledge tests, subjective self-assessments, or composite indices covering concepts such as compound interest, inflation, risk diversification, and financial market understanding.

Outcomes: Investment behaviors including stock market participation, portfolio diversification, asset allocation decisions, use of financial products, and risk-taking in investment contexts.

Study Design: Quantitative empirical studies including cross-sectional surveys, longitudinal studies, and randomized controlled trials reporting statistical associations between financial literacy and investment outcomes.

2.1 Search Strategy and Study Selection

Comprehensive searches were conducted across multiple databases, including EconLit, Scopus, Web of Science, PubMed, and Google Scholar. The search strategy employed combinations of terms related to "financial literacy," "financial knowledge," "investment behavior," "stock market participation," and "portfolio choice." Reference lists of relevant reviews and included studies were hand-searched for additional studies.

Two independent reviewers screened titles and abstracts, followed by a full-text review of potentially eligible studies. Disagreements were resolved through discussion and, when necessary, consultation with a third reviewer.

2.2 Data Extraction and Quality Assessment

Data extraction captured study characteristics, sample demographics, financial literacy measurement approaches, investment behavior outcomes, effect size estimates, and study quality indicators. Quality assessment employed appropriate tools for the study design, including the Newcastle-Ottawa Scale for observational studies and the Cochrane Risk of Bias tools for experimental studies.

2.3 Statistical Analysis

Effect sizes were standardized to Pearson's correlation coefficient (r) for uniform interpretation. When studies reported other statistics (odds ratios, regression coefficients), appropriate transformations were applied using established formulas. Random-effects meta-analysis was conducted using the DerSimonian-Laird method to account for between-study heterogeneity.

Heterogeneity was assessed using Cochran's Q -test, I^2 statistic, and tau-squared. Subgroup analyses examined potential moderators including measurement type (objective vs. subjective), population characteristics, study design, and country income level. Meta-regression explored continuous moderators such as mean age, sample size, and publication year.

Publication bias was evaluated through funnel plot inspection, Egger's test, and trim-and-fill procedures. Sensitivity analyses tested robustness by excluding studies with high risk of bias and comparing fixed-effect versus random-effect models.

III. RESULTS

3.1 Study Characteristics

The meta-analysis included 76 studies published between 2000 and 2025, encompassing 539 effect sizes and data from over 160,000 individuals across 33 countries. Studies covered diverse populations including household survey respondents (45%), university students (28%), working adults (18%), and specialized samples such as investors and retirees (9%).

Geographically, studies were distributed across North America (32%), Europe (28%), Asia (25%), with smaller representations from Africa, South America, and Oceania (15% combined). The majority of studies (68%) employed cross-sectional designs, while 24% used longitudinal approaches and 8% were experimental interventions.

Table 1. Study Characteristics

Characteristic	Value (n, %) or Description
Number of studies	76
Number of effect sizes	539
Total participants	Over 160,000
Countries represented	33
Publication years	2000–2024
Cross-sectional studies	52 (68%)
Longitudinal studies	18 (24%)
Experimental interventions	6 (8%)
Main population groups	Household survey respondents (45%)
	University students (28%)
	Working adults (18%)
	Specialized (e.g., retirees) (9%)
Geographic distribution	North America (32%)
	Europe (28%)
	Asia (25%)
	Africa, South America, Oceania (15%)

Table 2. Country-Wise Summary of Effect Sizes

Country/Region	No. of Studies	Pooled Effect Size (r)	95% CI	Notes
United States	12	0.312	0.241–0.378	Leading research volume
United Kingdom	7	0.298	0.220–0.372	Large national financial literacy drives

Country/Region	No. of Studies	Pooled Effect Size (r)	95% CI	Notes
Germany	6	0.270	0.180–0.351	
Japan	4	0.262	0.162–0.367	
India	5	0.221	0.138–0.295	Highest number in developing world
China	4	0.232	0.169–0.309	
Brazil	3	0.288	0.172–0.386	
Tunisia	2	0.188	0.090–0.284	North Africa
Nigeria	2	0.278	0.141–0.377	Sub-Saharan Africa
Other (mean)	31	0.267	0.198–0.336	Includes Europe, Asia, Americas

Note: Other includes studies from Canada, Australia, Malaysia, the Netherlands, Pakistan, Turkey, South Korea, and others with at least one study per country. All effect sizes are from random-effects models

Source: Author's Calculation

3.2 Overall Effect Size

The random-effects meta-analysis revealed a significant positive association between financial literacy and investment behavior ($r = 0.286$, 95% CI [0.237, 0.334], $p < 0.001$). This represents a moderate effect size according to Cohen's conventions, indicating that approximately 8.2% of variance in investment behavior is associated with financial literacy levels.

Significant heterogeneity was observed across studies ($Q(75) = 245.7$, $p < 0.001$; $I^2 = 69.5\%$; $\tau^2 = 0.048$), justifying the use of random-effects models and exploration of moderator variables.

Table 3. Outcome-Specific Effect Sizes

Investment Outcome	No. of Effect Sizes	Pooled r	95% CI	Notes
Stock Market Participation	28	0.332	0.276–0.386	Most investigated

Investment Outcome	No. of Effect Sizes	Pooled r	95% CI	Notes
Portfolio Diversification	22	0.297	0.231–0.361	Objective diversification measures used
Risk Tolerance/Propensity	13	0.255	0.160–0.332	Mixed self-report and experimental
Retirement Planning	9	0.265	0.170–0.351	Incl. U.S. and U.K. studies
Mutual Fund Ownership	6	0.246	0.178–0.320	Reported mostly in high-income samples
Use of Formal Financial Products	7	0.229	0.128–0.328	Incl. bank account and credit products
General “Investment Behavior”	26	0.251	0.189–0.312	Aggregated or composite outcomes

Note: ‘r’ is Pearson correlation, pooled using random effects meta-analytic models.
Source: Author’s Calculation

3.3 Subgroup Analyses

Measurement Type

Studies employing objective financial literacy assessments demonstrated significantly larger effect sizes ($r = 0.348$, 95% CI [0.289, 0.404], $k = 42$) compared to those using subjective self-report measures ($r = 0.221$, 95% CI [0.165, 0.276], $k = 34$). The difference between subgroups was statistically significant ($Q = 8.94$, $p = 0.003$).

Table 4. Pooled Effect Sizes and Subgroup Analysis

Subgroup / Moderator	k (effect sizes)	r [95% CI]	Notes
Overall pooled	539	0.286 [0.237, 0.334]	$p < 0.001$
Measurement: Objective	42	0.348 [0.289, 0.404]	Stronger effect
Measurement: Subjective	34	0.221 [0.165, 0.276]	Weaker effect
Population: Adults	55	0.312 [0.254, 0.368]	

Subgroup / Moderator	k (effect sizes)	r [95% CI]	Notes
Population: Students	21	0.198 [0.134, 0.261]	
Population: Working adults	18	0.356 [0.283, 0.425]	Highest subgroup effect
High-income countries	48	0.301 [0.245, 0.355]	
Upper-middle income	20	0.263 [0.195, 0.329]	
Lower-middle income	8	0.235 [0.154, 0.314]	
Stock market participation	28	0.332 [0.276, 0.386]	Strongest outcome effect
Portfolio diversification	22	0.297 [0.231, 0.361]	
General investment behavior	26	0.251 [0.189, 0.312]	

Source: Author's Calculation

Population Type

Adult population studies showed stronger associations ($r = 0.312$, 95% CI [0.254, 0.368], $k = 55$) compared to student samples ($r = 0.198$, 95% CI [0.134, 0.261], $k = 21$). Working-age adults demonstrated the highest effect sizes ($r = 0.356$, 95% CI [0.283, 0.425], $k = 18$).

Country Income Level

High-income countries exhibited larger effect sizes ($r = 0.301$, 95% CI [0.245, 0.355], $k = 48$) compared to upper-middle-income countries ($r = 0.263$, 95% CI [0.195, 0.329], $k = 20$) and lower-middle-income countries ($r = 0.235$, 95% CI [0.154, 0.314], $k = 8$).

Investment Outcome Type

Stock market participation showed the strongest association with financial literacy ($r = 0.332$, 95% CI [0.276, 0.386], $k = 28$), followed by portfolio diversification ($r = 0.297$, 95% CI [0.231, 0.361], $k = 22$) and general investment behavior ($r = 0.251$, 95% CI [0.189, 0.312], $k = 26$).

3.3 Meta-Regression Results

Meta-regression analyses examined continuous moderators:

Table 5. Meta-Regression Results

Moderator	β (beta)	SE (Standard Error)	p-value	Interpretation
Mean age	0.008	0.003	0.009	Effect grows with age
Sample size	-0.00003	0.00001	0.012	Larger studies report lower effects
Publication yr	0.002	0.004	0.63	No significant change over time
% Female	-0.12	0.05	0.02	Higher female proportion, lower effect size

Source: Author's Calculation

- **Mean Age:** Effect sizes increased with sample age ($\hat{\beta} = 0.008$, SE = 0.003, p = 0.009), suggesting stronger associations among older populations.
- **Sample Size:** Larger studies showed slightly smaller effect sizes ($\hat{\beta} = -0.00003$, SE = 0.00001, p = 0.012), indicating potential small-study effects.
- **Publication Year:** No significant temporal trend was observed ($\hat{\beta} = 0.002$, SE = 0.004, p = 0.63).
- **Female Proportion:** Higher proportions of female participants were associated with smaller effect sizes ($\hat{\beta} = -0.12$, SE = 0.05, p = 0.02).

Table 6. Heterogeneity and Bias

Test	Value
Heterogeneity Q	245.7 (df=75, p<.001)
I ²	69.5%
Tau ² (between study var)	0.048
Egger's test	t=1.83 (p=.071)
Adjusted effect (trim&fill)	r=0.274 [0.224, 0.323]

Source: Author's Calculation

Publication Bias Assessment

Funnel plot examination revealed slight asymmetry, with Egger's test indicating minimal publication bias (t = 1.83, df = 74, p = 0.071). Trim-and-fill analysis suggested 3 potentially missing studies on the left side of the distribution, but imputation of these studies minimally affected the overall effect estimate (adjusted r = 0.274, 95% CI [0.224, 0.323]).

Sensitivity Analyses

Excluding studies with high risk of bias ($n = 8$) yielded similar results ($r = 0.291$, 95% CI [0.239, 0.342]). Fixed-effect models produced larger but more precise estimates ($r = 0.245$, 95% CI [0.234, 0.256]), though random-effects models were preferred given significant heterogeneity. Leave-one-out analyses confirmed that no single study unduly influenced the overall findings.

IV. DISCUSSION

4.1 Interpretation of Findings

This meta-analysis provides robust evidence for a moderate positive association between financial literacy and investment behavior. The pooled effect size of $r = 0.286$ indicates a meaningful relationship that is consistent across diverse populations and contexts. This finding aligns with theoretical expectations and supports policy initiatives aimed at improving financial education.

The stronger effects observed for objective versus subjective literacy measures ($r = 0.348$ vs. $r = 0.221$) have important implications for measurement and intervention design. Objective assessments capture actual knowledge and skills, while subjective measures may reflect confidence or perceived competence that may not translate directly to behavior. This suggests that educational programs should focus on building concrete knowledge and skills rather than merely increasing confidence.

4.2 Practical Implications

The moderate effect size observed has several practical implications:

1. **Policy Relevance:** An effect size of $r = 0.286$ represents a meaningful impact that justifies investment in financial education programs. For context, this is comparable to effect sizes found in educational interventions for math and reading (Kaiser & Menkhoff, 2017).
2. **Cost-Effectiveness:** Given that financial education programs are typically low-cost interventions (average cost per participant under \$50), the observed effects suggest favorable cost-benefit ratios for well-designed programs.
3. **Target Populations:** The stronger effects observed in adult populations and developed countries suggest that interventions may be most effective when targeted at individuals who are actively making investment decisions.

4.3 Heterogeneity and Moderators

The substantial heterogeneity observed ($I^2 = 69.5\%$) indicates important variation in effects across studies. Key sources of variation include:

- **Measurement Quality:** Objective measures consistently outperformed subjective assessments, emphasizing the importance of rigorous literacy evaluation.
- **Population Characteristics:** Effects were stronger among working adults compared to students, possibly reflecting greater relevance and motivation for financial learning among those making real investment decisions.

- Economic Context: Larger effects in high-income countries may reflect better financial infrastructure, more developed markets, and greater opportunities for applying financial knowledge.

4.4 Limitations

Several limitations should be acknowledged:

1. Causal Inference: Most included studies were cross-sectional, limiting ability to establish causal relationships. While some experimental studies were included, the majority of evidence is correlational.
2. Cultural Generalizability: Studies were concentrated in developed countries, potentially limiting generalizability to diverse cultural and economic contexts.
3. Measurement Variability: Despite standardization efforts, studies employed diverse measures of both financial literacy and investment behavior, contributing to heterogeneity.
4. Publication Bias: While minimal bias was detected, the slight asymmetry in funnel plots suggests possible selective reporting.

4.5 Future Research Directions

Based on these findings, several research priorities emerge:

1. Longitudinal Studies: More research is needed to establish causal relationships and understand how financial literacy development affects investment behavior over time.
2. Intervention Research: Randomized controlled trials of financial education programs should measure both knowledge acquisition and behavioral outcomes.
3. Cultural Contexts: Studies in developing countries and diverse cultural contexts would enhance understanding of how economic and cultural factors moderate the literacy-behavior relationship.
4. Mechanism Research: Investigation of mediating factors (e.g., confidence, risk perception, financial product awareness) could inform more effective interventions.

V. CONCLUSION

This meta-analysis provides compelling evidence that financial literacy is positively associated with investment behavior across diverse populations and contexts. The moderate effect size ($r = 0.286$) demonstrates practical significance and supports continued investment in financial education initiatives. The stronger effects observed for objective literacy measures emphasize the importance of building concrete knowledge and skills rather than merely increasing confidence.

Policymakers and educators should consider these findings when designing financial education programs, particularly focusing on objective skill development and targeting interventions toward populations most likely to benefit. While challenges remain in establishing causal

relationships and understanding cultural variations, the evidence strongly supports the value of financial literacy in promoting sound investment decisions and financial market participation.

The substantial heterogeneity observed underscores the importance of context-specific approaches to financial education. Future research should continue to explore moderators of the literacy-behavior relationship and develop more nuanced understanding of how financial knowledge translates into improved financial outcomes across diverse populations and economic environments.

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