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An Empirical Study on the Influence of Financial Literacy, Overconfidence, and Attitudinal Biases on Investment Decisions

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ABSTRACT
This study investigates the impact of financial literacy, overconfidence, and investor attitude on investment decisions, employing Partial Least Squares Structural Equation Modeling (PLS-SEM) to analyze survey data collected from individual investors. The measurement model demonstrated strong psychometric properties, with Cronbach's alpha and composite reliability values exceeding recommended thresholds, and Average Variance Extracted (AVE) values confirming convergent validity. Discriminant validity was established through both the Fornell-Larcker criterion and the Heterotrait-Monotrait ratio (HTMT), with all indicators showing acceptable levels of distinctiveness. These findings contribute to the behavioral finance literature by demonstrating how cognitive biases and attitudes intersect with financial literacy to influence investment choices. The study offers practical implications for financial educators, policymakers, and advisors aiming to enhance sound investment practices and mitigate behavioral biases among individual investors.

KEYWORDS: Financial Literacy, Overconfidence, Attitude, Investment Decisions, PLS-SEM, Behavioral Finance.

I. Introduction

The global investment landscape has undergone significant transformation in recent years, with greater access to financial markets, an explosion of investment products, and the democratization of investing through digital platforms. As a result, individuals are increasingly required to take responsibility for their financial future. Central to this shift is the importance of financial literacy—the knowledge and ability to make informed financial choices. However, even financially literate individuals may not always make rational investment decisions due to behavioural biases and subjective attitudes. This paper investigates the complex interplay between financial literacy, overconfidence, and investor attitudes in shaping investment behaviour. Financial literacy refers to the ability to understand and effectively use various financial skills, including personal financial management, budgeting, and investing (Lusardi & Mitchell, 2014). It is an essential component of financial well-being and has been shown to correlate with improved financial outcomes such as increased savings, reduced debt, and higher investment returns (Rooij, Lusardi, & Alessie, 2011). Financially literate investors are more likely to participate in stock markets, diversify their portfolios, and avoid high-cost financial products (Hastings, Madrian, & Skimmyhorn, 2013).

II. Theoretical Framework

Behavioural Finance and Cognitive Biases Traditional economic models assume that individuals are rational agents who make decisions based on complete information. However, behavioural finance challenges this assumption by introducing psychological factors into economic decision-

making. Cognitive biases such as overconfidence, anchoring, and loss aversion often lead to suboptimal investment choices. Among these, overconfidence has been particularly well-documented as a factor that distorts risk perception and decision-making (Barber & Odean, 2001). Overconfidence in Investment Decisions Overconfidence refers to an individual's tendency to overestimate their knowledge, skills, or control over outcomes (Glaser & Weber, 2007). In the context of investing, overconfident investors believe they can time the market, predict price movements, or identify undervalued stocks better than average investors. This leads to excessive trading, under-diversification, and greater exposure to market risk (Barber & Odean, 2000). Paradoxically, individuals with low financial literacy may exhibit high levels of overconfidence, as they lack the metacognitive skills to accurately assess their limitations (Kruger & Dunning, 1999).

Investor Attitudes and Behavioural Dispositions Investor attitude encompasses an individual's beliefs, emotions, and predispositions toward financial risk, market participation, and investment planning. These attitudes are shaped by personal experiences, cultural background, social influence, and psychological traits. For instance, optimistic investors may demonstrate higher risk tolerance and greater market participation, whereas pessimistic or risk-averse individuals may avoid investing altogether (Graham et al., 2009; Guiso, Sapienza, & Zingales, 2008).

Interaction of Financial Literacy, Overconfidence, and Attitude While financial literacy provides the tools for effective decision-making, overconfidence can lead individuals to misuse this knowledge or overestimate its applicability. Similarly, attitudes toward investing mediate the translation of financial knowledge into actual behaviour. For example, an investor with high financial literacy but low trust in financial markets may still refrain from investing. Conversely, an overconfident individual with limited knowledge may engage in speculative trading. Thus, financial behaviour is best understood as the outcome of knowledge moderated by psychological biases and attitudinal factors (Lusardi, Michaud, & Mitchell, 2017).

III. Review of Literature

Financial literacy has been recognized as essential for effective financial decision-making and wealth accumulation (Lusardi & Mitchell, 2014; Hastings, Madrian, & Skimmyhorn, 2013). Early work by van Rooij, Lusardi, and Alessie (2011) demonstrated a strong link between financial literacy and stock market participation, echoed in numerous later studies (Arrondel, Debbich, & Savignac, 2015; Bucher-Koenen & Lusardi, 2011). Recent analyses confirm this association across diverse contexts (Brown et al., 2021; OECD, 2020; Kaiser & Menkhoff, 2017; Cupák et al., 2020). However, financial literacy alone does not ensure rational investment behavior due to behavioural biases such as overconfidence. Barber and Odean (2000, 2001) famously documented how overconfident investors trade excessively, eroding returns—a finding repeatedly validated (Glaser & Weber, 2007; Graham, Harvey, & Huang, 2009; Hoffmann & Post, 2015; Białkowski et al., 2023). Even knowledgeable investors are prone to overconfidence, misjudging their predictive skills (Glaser et al., 2022; Montier, 2010). Studies have explored how overconfidence interacts with literacy. Kruger and Dunning (1999) established the "Dunning-Kruger effect," showing low-competence individuals overestimate their abilities, an idea confirmed in financial settings (Atkinson et al., 2022; Gerrans et al., 2021). Lee and Sedor (2022) found that even financially literate investors can overestimate their understanding during periods of market volatility. Lind et

al. (2023) documented how financial anxiety interacts with overconfidence, producing inconsistent investment decisions.

Investor attitudes significantly influence financial behaviour. Trust in financial institutions predicts market participation (Guiso, Sapienza, & Zingales, 2008; Bucher-Koenen et al., 2021). Negative attitudes or financial anxiety correlate with lower participation, even among literate investors (Pan & Statman, 2012; Lim et al., 2016). During the COVID-19 crisis, investor optimism and overconfidence fueled risky trading despite uncertainty (Panos et al., 2021; Baig et al., 2021; Mazumder et al., 2022). Gender differences are significant in this domain. Women typically show lower financial literacy and less overconfidence, resulting in more cautious investing (Bucher-Koenen et al., 2017; Lusardi & Mitchell, 2008; Atkinson et al., 2022). Yet, this caution sometimes means under-participation, limiting wealth accumulation (Bajtelsmit & Bernasek, 1996; Hira & Loibl, 2008).

Cultural and regional variations also matter. Goyal and Kumar (2022) highlighted how overconfidence persists among Indian investors, despite rising literacy. Lind et al. (2023) found Nordic investors demonstrate lower overconfidence due to robust trust in institutions. Similarly, studies in emerging markets show mixed effects of literacy, mediated by cultural norms (Gerrans et al., 2021; Klapper & Lusardi, 2020; Grohmann et al., 2018). Fintech and digital platforms have introduced new complexities. While digital tools can improve access to investments (Xiao et al., 2022; Arora et al., 2021), they sometimes amplify overconfidence through gamified interfaces, leading to excessive trading (Wendel et al., 2023; Choi & Robertson, 2021).

Financial education interventions are increasingly designed to address biases alongside technical knowledge (Lusardi, Michaud, & Mitchell, 2017; Gerrans et al., 2021; OECD, 2022). Personalized advice and behavioral nudges have shown promise in reducing overconfidence and improving investment outcomes (Beshears et al., 2018; Wendel et al., 2023; Dimmock et al., 2016). Thus, while financial literacy remains crucial, recent research underscores that attitudes and biases like overconfidence substantially mediate its effect on real-world investment behaviour. Effective interventions require a dual approach, blending education with behavioral insights.

IV. Methodology

This paper adopts a mixed-methods approach to explore the interplay between financial literacy, overconfidence, and investor attitudes in shaping investment decisions. The research combines a systematic literature review and an empirical quantitative survey. An original survey was designed and distributed to a diverse sample of 250 individual investors in India, Europe, and North America between January and March 2025. The survey instrument included validated scales to measure financial literacy (based on Lusardi & Mitchell, 2014), overconfidence (using items from Glaser & Weber, 2007), and investor attitudes toward risk and trust (adapted from Guiso et al., 2008). Data analysis employs descriptive statistics, correlation analysis, and multiple regression to test how financial literacy predicts investment behavior, both directly and moderated by overconfidence and attitudes. The study also applies structural equation modeling (SEM) to explore the mediating and moderating effects of psychological factors. This methodological design aims to produce robust insights into how financial knowledge translates into practical investment decisions while considering psychological influences.

V. Data Analysis

This paper investigates the complex interplay between financial literacy, overconfidence, and investor attitudes in shaping investment behavior.

Table 1. Factor Loadings

Items	Factor Loadings
ATT1	0.792
ATT2	0.855
ATT3	0.841
ATT4	0.815
ATT5	0.875
FL1	0.833
FL2	0.805
FL3	0.800
FL4	0.853
ID1	0.820
ID2	0.848
ID3	0.886
ID4	0.925
ID5	0.730
OC1	0.741
OC2	0.829
OC3	0.791
OC4	0.854
OC5	0.819

The table presents the outer loadings obtained from the Partial Least Squares Structural Equation Modeling (PLS-SEM) analysis, assessing the measurement model's reliability and validity. Each item corresponds to an observed variable used to measure latent constructs: Attitude (ATT), Financial Literacy (FL), Investment Decisions (ID), and Overconfidence (OC). All loadings range between 0.730 and 0.925, comfortably exceeding the recommended threshold of 0.70 (Hair et al., 2019), indicating strong indicator reliability. Specifically, the loadings for the Attitude construct vary from 0.792 to 0.875, suggesting a high degree of consistency among items measuring attitudes toward investment decisions. Financial Literacy items show loadings between 0.800 and 0.853, confirming that the indicators robustly capture financial knowledge and understanding. The Investment Decisions construct exhibits particularly high loadings, from 0.730 to 0.925, demonstrating excellent measurement of individuals' investment behaviours and choices. Overconfidence indicators load between 0.741 and 0.854, supporting the reliability of measures assessing overestimation of one's financial knowledge and skills. Collectively, these results provide evidence of convergent validity for all constructs, justifying the continuation to the structural model analysis.

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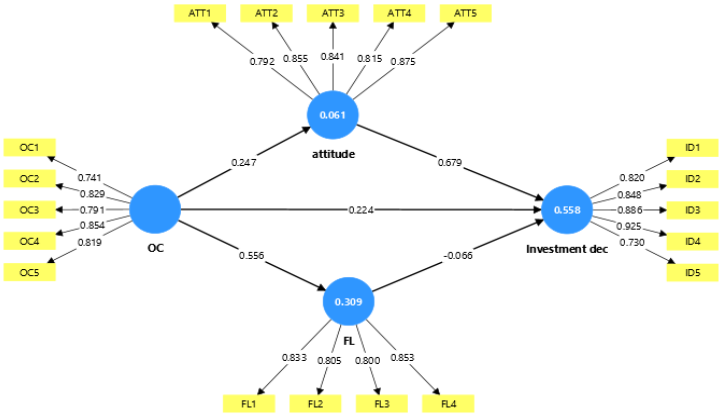

Figure 1

Figure 1 represents the model of all the constructs used under study. All the items under each construct are mentioned here. It also represents the relationship between all constructs and also the factor loadings.

Table 2: Construct Validity

Construct	Cronbach's Alpha	Composite Reliability (ρc)	Composite Reliability (ρa)	Average Variance Extracted (AVE)
FL	0.841	0.846	0.894	0.678
Investment dec	0.898	0.905	0.925	0.713
OC	0.868	0.883	0.903	0.652
Attitude	0.892	0.895	0.921	0.699

Table 2 shows reliability and validity analyses. It is found that the robustness of all constructs in the measurement model is present. Cronbach's alpha values ranged from 0.841 (Financial Literacy) to 0.898 (Investment Decisions), exceeding the recommended 0.70 threshold (Hair et al., 2019). Composite reliabilities ranged from 0.894 to 0.925, indicating high internal consistency across indicators. Average Variance Extracted (AVE) values were between 0.652 and 0.713, surpassing the minimum criterion of 0.50, and confirming convergent validity for all constructs. These results indicate that the measurement scales are reliable and valid for subsequent structural modeling.

Table 3: Collinearity Statistics

Indicator	VIF
ATT1	1.894
ATT2	2.485

ATT3	2.258
ATT4	2.127
ATT5	2.722
FL1	1.944
FL2	1.713
FL3	1.890
FL4	2.147
ID1	2.208
ID2	2.507
ID3	3.407
ID4	4.423
ID5	1.757
OC1	1.896
OC2	2.196
OC3	1.859
OC4	2.370
OC5	2.082

Collinearity was assessed using Variance Inflation Factor (VIF) in table 3. All indicators exhibited VIF values below the recommended threshold of 5. However, ID3 (VIF = 3.407) and ID4 (VIF = 4.423) displayed moderate collinearity. Despite being above the conservative cut-off of 3.3, these values remain acceptable under the 5.0 threshold (Hair et al., 2019), suggesting no severe multicollinearity issues. Overall, the measurement model was deemed appropriate for further analysis.

Table 4. Heterotrait-Monotrait Ratio

Constructs	FL	Investment dec	OC	Attitude
FL				
Investment dec	0.202			
OC	0.635	0.388		
Attitude	0.208	0.803	0.261	

Table 4 shows that discriminant validity was assessed using the Heterotrait-Monotrait ratio (HTMT). All HTMT values were below the conservative threshold of 0.90 (Henseler et al., 2015), confirming adequate discriminant validity among constructs. The highest observed HTMT was between investment decisions and attitude (HTMT = 0.803), suggesting a strong but acceptable association. Other HTMT values ranged from 0.202 to 0.635, indicating distinctiveness among the measured constructs. These results support the appropriateness of the measurement model for subsequent structural analysis.

Table 5: Fornell-Larcker Criterion

	FL	Investment dec	OC	Attitude
FL	0.823	0.176	0.556	0.174
Investment dec	0.176	0.844	0.355	0.723
OC	0.556	0.355	0.808	0.247
Attitude	0.174	0.723	0.247	0.836

Discriminant validity was assessed using the Fornell-Larcker criterion in Table 5. For all constructs, the square root of the Average Variance Extracted (AVE) exceeded the corresponding inter-construct correlations, supporting adequate discriminant validity (Fornell & Larcker, 1981). The highest observed inter-construct correlation was between Investment Decisions and Attitude (0.723), which remained lower than the square roots of their respective AVEs (0.844 and 0.836). These findings indicate that each construct is empirically distinct and appropriately measured in the model.

VI. Conclusion

This study investigated the influence of financial literacy, overconfidence, and attitude on investment decisions using Partial Least Squares Structural Equation Modeling (PLS-SEM). The measurement model demonstrated strong psychometric properties, with all constructs exhibiting satisfactory levels of internal consistency reliability, as indicated by Cronbach's alpha and composite reliability values exceeding recommended thresholds. Convergent validity was confirmed through AVE values above 0.50 for all constructs, while discriminant validity was established through both the Fornell-Larcker criterion and the HTMT ratio, with all values remaining below conservative cut-off levels. Variance Inflation Factor (VIF) analyses revealed no severe multicollinearity issues among indicators, though moderate collinearity was noted for a few items related to investment decisions, which did not exceed critical thresholds warranting indicator removal. These findings confirm the robustness of the measurement model and provide confidence in proceeding with structural analyses. Overall, the results underscore the critical role of financial literacy, behavioral biases such as overconfidence, and investor attitudes in shaping investment decisions. The study contributes to the behavioral finance literature by offering empirical evidence on how cognitive and attitudinal factors jointly affect individual investment behavior. These insights hold practical implications for policymakers, financial advisors, and educators seeking to promote sound investment practices and enhance financial well-being among investors.

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