Heuristics at Play: Can Financial Literacy Lead to Smarter Investment Decisions?

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Abstract – The present study attempts to investigate the impact of heuristics bias on investment decision making via the mediating role of financial literacy. The study is based on the behavioral finance theory and conducted through the structural equation modeling (SEM) approach to analyze the relationships that exist between heuristic bias, financial literacy, and investment decisions. The results of the study reveal a noteworthy positive impact of heuristic approaches on investment decisions, as well as the role of financial literacy in shaping those decisions. Moreover, there exists a notable mediating effect of financial literacy on the relationship between heuristics and investment decisions.

Key Words: Heuristics Bias, Financial Literacy, Investment Decision

1.INTRODUCTION

Within the realm of investment, individuals frequently engage in decision-making that can be categorized as either rational or irrational, contingent upon their comprehension of the market. This phenomenon has been extensively examined in both traditional finance and behavioral finance disciplines. Traditional finance is based on the idea that investors are rational and make sensible investment decisions. It is an attempt to maximize returns by selecting the best alternatives of investments, even during uncertain times (Kumar & Goyal, 2015). Efficient market hypothesis is a theory that states that the stock market is perfectly efficient and stock prices reflect all the information known (Fama, 1970). Behavioral finance questions the aspect of rational investment decision making among investors. On its part, behavioral finance looks into the psychology of the irrational decisions made by individual investors (Semenov, 2009). It is believed that behavioral biases have a massive impact on investment decisions and as such, this leads to lower investment returns at the stock market. Behavioral finance encompasses the exploration of the irrational tendencies exhibited by investors, as well as the various biases that influence their decision-making processes.

The existence of cognitive biases arises from the difficulties investors face in predicting market movements, resulting in distorted investment decisions (Stanovich & West, 2008). Behavioral finance embodies a modern framework that delineates the relationship between psychological influences and investor conduct, clarifying their effects on the processes of decision-making. The domain of behavioral finance has recently gained considerable traction in the context of stock market investments.

This study aims to explore the influence of behavioral biases, with a specific focus on heuristic bias, on the process of investment decision-making, while also examining the mediating effect of financial literacy. Financial literacy aids individual investors in reducing the probability of engaging in irrational decision-making to some extent. In previous eras, investors lacked the requisite knowledge to thoroughly explore the foundational aspects of the company, industry, and economy at large. Ideally, they would embrace technical dimensions and illogical conduct in the realm of investment decision-making.

 Nevertheless, investors today possess a considerable level of education, characterized by a profound understanding of financial principles, which they frequently apply in their investment choices. Consequently, the influence of financial literacy and behavioral biases serves as the genuine impetus for embarking on this foundational research in an empirical context. This research endeavors to measure the investment decision-making behaviors of individual investors in India, exploring the degree to which their investment selections are shaped by heuristic biases and the potential mediating role of financial literacy in this dynamic. It further aids in assessing whether individual investors adopt a

rational or irrational stance in their investment decisions as a consequence of financial illiteracy.

2. Conceptual Framework

Heuristic Bias: Heuristic biases in the psychology domain can be defined as mental shortcuts learned through experience, and explain how investors make decisions and solve problems, especially solving complex problems where incomplete information is available (Ritter, 1988). It has been found that heuristics are beneficial when time is at premium and information is minimal (Tversky and Kahneman, 1974). The study by Tversky and Kahneman (1974) introduced three heuristics that individual investors can use in their decision-making: anchoring, availability, and representativeness. Thereafter, Waweru et al. (2008) added overconfidence to the pre-existing model.

Financial Literacy: Financial literacy refers to the extent of an individual's understanding of financial concepts and issues (Epstein & Stanley, 1990). Those possessing a more profound comprehension of financial concepts are likely to engage in superior investment decision-making compared to individuals with a more constrained grasp of such matters. In an ordinary sense, it can be described as an ability to understand the economy and how economic situations and events influence decision-making (Worthington, 2006). It has been defined as one of the essential financial management tools that are used in savings, budgeting, investing and insurance in a particular context (Gallery et al., 2010). Financial literacy entails identification, evaluation, control, and/or explanation of Stock market investment issues (Vitt & Anderson, 2001). Financial literacy could be discussed in three possible lenses; that is, financial competency, financial proficiency, and financial opportunity. Financial competency relates to the imparting of relevant information about different financial products (Shobha & Shalini, 2015). Financial proficiency relates to knowledge and communication aptitude; it is the encouragement of financial literacy to make well-versed decisions (Hilgert et al., 2003). Financial opportunities underscore that an investor with a sound understanding of finance should possess the capacity to allocate resources and reap rewards from their investments.

Investment Decisions: Investment entails the allocation of capital with the anticipation of deriving future advantages. The realm of investment presents a spectrum of variability; however, with diligent research and a composed mind-set, one can achieve success. It is the aspiration of every investor to engage in the most judicious investment decisions (Sharpe, 1964). Merton (1987) posits that the efficacy of investment decisions hinges on possessing prior financial knowledge. Conventional finance posits that individuals possess comprehensive information and consistently engage in rational decision-making. Behavioral finance posits that investment decisions may often deviate from rationality, influenced by factors such as imperfect information (Bikhchandani et al., 1992), bounded rationality (Pompain, 2006), anomalies (Ajmal et al., 2011), fundamental heuristics (Baker and Nofsinger, 2010), psychological biases (Baker and Nofsinger, 2002), and behavioral biases (Shefrin, 2007). Furthermore, the psychological dimensions of investors' mental states are crucial for comprehending the nuances of irrational decision-making.

3. Review of Literature

Financial Literacy and Investment Decision

Plethora of researches have been undertaken to study the relationship between financial literacy and investment decision. Sivaramakrishnan et al. (2017) conducted an analysis of the influence of financial literacy on investment choices within the stock market. The research employs the theory of planned behavior to elucidate investor engagement in the Indian stock market. The theory of planned behavior articulates consumer financial literacy as an integral component of perceived behavioral controls. Further the study conducted by (Ajzen, 1991). indicate that the intention to engage in stock market investments was positively influenced by both subjective and objective financial literacy, while actual behavior was solely impacted by objective financial literacy. The research further indicates that financial well-being exerts a favorable impact on investor behavior. In the similar context Ahmed et al. (2020) discovered that financial literacy exerts a beneficial influence on investors' decision-making processes regarding their investments. Further according to (Hastings et al., 2013) financial proficiency correlates with the extent of investors' financial knowledge. Investors with substantial financial resources are able to engage in proactive planning, uncover insights, and effectively leverage information. Furthermore, it assists investors in becoming acquainted with the appropriate

moments to seek counsel and the manner in which to act upon such guidance. It enables them to achieve exceptional advancements.

Heuristic Bias and Investment Decision

Heuristic bias is often referred to as a rule of thumb; it streamlines the decision-making process for investors, particularly in uncertain and challenging situations, by minimising the complexity involved in evaluating probabilities and predicting outcomes to facilitate straightforward judgements (Kahneman & Tversky, 1974Under the aspect of representativeness Toma (2015) discovered the positive impact of representativeness bias on the investment decisions. The author stated that representativeness bias is the main element in improving the returns of individual investors. Similarly, (Badshah, et al., 2016) found a positive relationship between the representativeness bias and investment decision. On the same note, Ikram (2016) established that representativeness bias affected the trading of individual investors positively. Later in the scope of the availability bias Ikram (2016) has analysed how the behavioural factors may affect the decision-making of individual investors who act in the Islamabad stock exchange. The researchers found that availability bias positively influenced their investment decision, which means that this cognitive bias caused the returns of individual investors to increase. Khan (2015) found that the availability bias is a very significant factor that determines the nature of investment by individual investors. Later in the context of overconfidence bias Bakar and Yi (2016) found out that overconfidence bias phenomenon plays a significant role in the process of making decisions by investors. People who participate in investment processes and are usually affected by an overconfidence bias are not good at assessing risk factors and overestimate their expected profit (Baker and Nofsinger, 2002). As a result, they do not provide sufficient diversification in their portfolios thus they tend to trade excessively thereby ending up making less money or returns relative to the market in general (Odean, 2002). Later in the discussion of Anchoring bias Lowies et al. (2016) found out that anchoring and adjustment effect is a key factor that tends to affect decisions made by property fund managers. An investigative study, conducted by Ishfaq and Anjum (2015), suggested that anchoring has a positive effect on risky investment decisions. The conclusions of the study by

Waweru et al. (2008) make it clear that the anchoring and adjustment bias had a serious impact on the financial behavior of the institutional investors working in the Nairobi Stock Exchange.

Objectives of the Study

1. To study the impact of heuristic bias on investment decisions.
2. to explore the influence of financial literacy on investment decisions.
3. To identify the impact of heuristic bias on financial literacy
4. To explore the mediating effect of Financial Literacy between the relationship of Heuristic bias and investment decisions.

Hypotheses

H1: There is a significant impact of Financial Literacy on Investment Decision

H2: Heuristic bias significantly effects Financial Literacy

H3: Heuristic bias significantly effects Investment Decisions

H4: There is a significant mediating impact of Financial Literacy between the relationship of heuristics bias and investment decisions.

4. Research Methodology

The study was causal, employing the survey approach for data collection. The study's sample comprised investors actively engaged in stock market investments. The sample size was established at 300 participants. Individual respondents were regarded as the sample units. A deliberate non-random sampling method was utilized.

To analyses the synergistic effects of heuristic biases on investment choices through the perspective of individual values. The necessary data was gathered from individual investors via a questionnaire administered through Google Forms. The questionnaire comprised 38 self-assessment enquiries, including 7 pertaining to heuristic biases, 10 designed to gauge financial literacy, 15 focused on investment decisions, and 6 addressing the socio-demographic characteristics of the respondents. The questionnaire was divided into 3 parts. The first one is concerned with socio-economic, demographic factors such as gender, age, educational level, profession, income, and investment experience. This is followed by the second part that addresses the behavioral

biases and financial literacy. Lastly, the investment decision-making section is concerned.

Measurement Scales

Heuristic Bias: A standardized measure from the research of Waweru et al. (2008) was utilized, comprising seven items pertaining to heuristic bias. Data were gathered using a Likert scale ranging from 1 to 5, where 1 signifies strong disagreement and 5 denotes strong agreement.

Financial Literacy: A standardized measure from the research of (Chen & Volpe, 1998) was utilized, comprising ten items pertaining to heuristic bias. Data were gathered using a Likert scale ranging from 1 to 5, where 1 signifies strong disagreement and 5 denotes strong agreement.

Investment Decisions: A standardized measure from the research of (Brooks, 2022) was utilized, comprising fifteen items pertaining to heuristic bias. Data were gathered using a Likert scale ranging from 1 to 5, where 1 signifies strong disagreement and 5 denotes strong agreement.

5. Data Analysis

Subsequent to the data collection procedure, an analysis was conducted utilizing SMART-PLS software. In the context of reflective constructs, it is advisable to conduct a measurement model assessment (Hair et al., 2017). This assessment relies on the evaluation of outer loadings, Cronbach's alpha reliability, composite reliability, as well as convergent and discriminant validity.

Table 1: Measurement Model Assessment

Construct	Items	Loadings/Weights	Cronbach's Alpha	CR	AVE
Heuristic Bias	HB2	0.687	0.772	0.776	0.524
	HB3	0.741			
	HB4	0.766			
	HB5	0.752			
	HB6	0.667			
Financial Literacy	FL2	0.723	0.775	0.776	0.526
	FL3	0.725			
	FL4	0.709			
	FL11	0.748			
	FL12	0.722			
Investment Decision	ID2	0.724	0.744	0.746	0.565
	ID3	0.777			
	ID4	0.773			
	ID5	0.731			

The information concerning the constructs with their characteristics, factor loadings, internal consistency reliability, composite reliability, and average variance extracted is displayed in Table No.1. All the constructs of the analysis were reflective. Factor loadings of all the variables are calculated to assess how well the items are internally consistent. Some of the items will not be used in the study owing to their factor loadings which are less than 0.5. The values of the internal consistency reliability and composite reliability were above the set bar of 0.7 (Hair et al., 2017; 2019). The average variance extracted has been determined so as to determine the convergent validity of the model. The obtained values were above the threshold value of 0.5, which was determined by Fornell and Larcker (1981) and Hair et al. (2019). In this way, the convergent validity was established.

Table 2: Discriminant Validity- Fronell Lacker Criterion

	Financial Literacy	Heuristic Bias	Investment Decision
Financial Literacy	0.726		
Heuristic Bias	0.642	0.724	
Investment Decision	0.628	0.637	0.752

The technique proposed by Fornell and Larcker (1981) involves estimating the square root of the Average Variance Extracted (AVE) and comparing it with the correlations among latent variables. In Table No. 2, the off-diagonal values exceed the correlations among the variables. Consequently, the criteria for discriminant validity were satisfied.

Structural Model Assessment

The interconnections between the constructs have been examined in the context of structural model evaluations (Hair et al., 2017). The assessment of the structural model was conducted through the application of various procedures. In order to ascertain the necessary probability values, a total of 5000 bootstraps have been executed (Hair et al., 2019). The structural model must be devoid of any multi-collinearity complications. Consequently, the VIF values were evaluated, revealing that all constructs in the study fell below the threshold of 3.33, as proposed by Diamantopoulos et al. (2008).
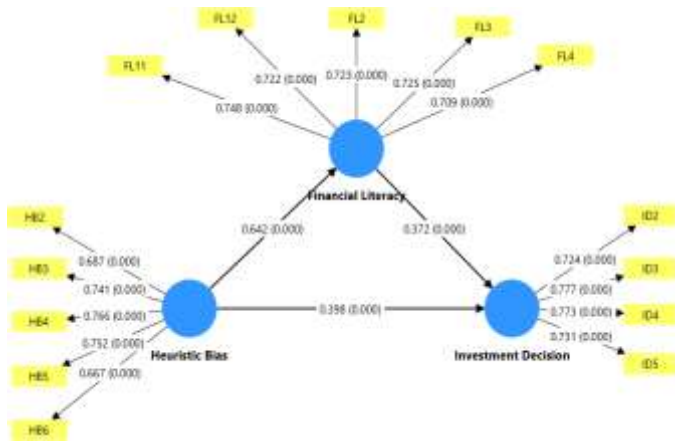
Table 3: Direct Effect

Hypothesis	Path Relation	Beta Value	T statistics	P values	Decision
H1	Financial Literacy -> Investment Decision	0.372	5.603	0.000	Supported
H2	Heuristic Bias -> Financial Literacy	0.642	13.872	0.000	Supported
H3	Heuristic Bias -> Investment Decision	0.637	16.842	0.000	Supported

Table 4 indicates the findings of direct path associations among Heuristic Bias, Financial Literacy, and Investment Decision Making, with statistical signs, such as Beta values, T-statistics, and P-values.

H1: Financial Literacy → Investment Decision (β = 0.372, t = 5.603, p = 0.000)

This finding implies that the effect of financial literacy on investment decisions is positive and significant. The value of the beta is 0.372, implying that with an increase in the level of financial literacy, the quality or effectiveness of the investment decision-making improves by 37.2 percent. The T-value is high and p<0.05 (p = 0.000 in this case) indicating that this relationship is supported by statistics. These findings are in line with previous researches (e.g., Lusardi & Mitchell, 2014) that showed that individuals that possess financial literacy possess more confidence and knowledge in their investment decisions.

H2: Heuristic Bias → Financial Literacy (β = 0.642, t = 13.872, p = 0.000)

The association between heuristic bias and financial literacy shows a strong positive influence. The value of beta equals 0.642, which means that the heuristic tendencies (such as mental shortcuts or biases) have a significant effect on the level of financial literacy of an individual. Although this sounds counterintuitive, it implies that people who are subject to heuristic biases can also demand or utilize financial literacy in order to make more adequate choices or that they acquire literacy via experiential learning (trial-and-error). This could be construed as the interplay between cognitive behavior and learning- i.e. knowledge of heuristics may lead people to develop their literacy levels so as to reduce bias.

H3: Heuristic Bias → Investment Decision (β = 0.637, t = 16.842, p = 0.000)

The direct effect of heuristic bias to investment decision is also positive and significant. The value of beta equal to 0.637 suggests that heuristic biases are very strong determinants of investment behavior- possibly, by affecting the pace, the certainty, or the pattern of decisions. It is in line with the behavioral finance theories (Tversky & Kahneman, 1974) that state that heuristic-based investors tend to use the rule-of-thumb based decision making rather than analytical decision making. Although these guidelines are biased, they occasionally lead to faster or even profitable investment decisions.

Table 4: Mediating Effect

Hypothesis	Path Relation	Beta Value	T statistics	P values	Decision
H4	Heuristic Bias -> Financial Literacy -> Investment Decision	0.239	5.527	0.000	Supported

Table 4 shows how financial literacy mediates the connection between heuristic bias and investment decision-making. The indirect effect Heuristic Bias → Financial Literacy → Investment Decision has a beta of 0.239, T-statistic of 5.527, and a p-value of 0.000, which implies that the mediated effect is statistically significant and large. This finding verifies Hypothesis H4, and it offers empirical evidence that financial literacy partly mediates the relation involving heuristic bias and investment decisions.

Putting it in less technical terms, the data shows that heuristic biases, e.g. the preference of using mental shortcuts or simplified decision rules, do not exclusively influence investment choices on a direct basis. Rather, they also determine the degree of financial literacy, which subsequently impacts the way people make investment decisions. Investors with a high level of reliance on heuristics can be self-aware of their weaknesses or pursue financial knowledge with a subsequent investment behavior guided by this new information or balanced views.

The present mediation result is consistent with dual-process accounts in behavioral finance (Stanovich & West, 2000) that distinguish between intuitive (System 1) and analytical (System 2) processing. Heuristics may arise due to intuitive reasoning, yet they can be perfected across learning and mental interaction - which, in this case, is financial literacy. In addition, this result in line with the knowledge action framework (Lusardi & Mitchell, 2014) highlights that better financial knowledge can act as a cognitive instrument to regulate the potentially negative effects of biases.

Table 5: Adjusted R Square

	Adj R Square	T statistics	P values
Financial Literacy	0.411	6.911	0.000
Investment Decision	0.484	9.045	0.000

Table 5 shows the values of Adjusted R Square (R^2), T-statistic, and p-value of the endogenous constructs, which are Financial Literacy and Investment Decision. The value of adjusted R^2 of Financial Literacy is 0.411, which implies that the model, in fact, explains approximately 41.1 % of the variance in Financial Literacy, or rather the effect or impact of heuristic bias. Likewise, the adjusted R^2 of Investment Decision is 0.484 indicating that the model is significant in explaining the variance in Investment Decision Making, and this is a high percentage in behavioral studies.

6. Conclusion & Implications

Through the results exhibited in the measurement and the structural model tests, the study can offer viable explanations on the role played by heuristic bias and financial literacy in investment decision-making. The findings indicate that heuristic bias directly and indirectly affects investment decisions, and

financial literacy is a considerable mediator of this association. Precisely, financial literacy has a positive effect on investment decision-making (β = 0.372, p < 0.001), whereas the heuristic bias not only directly influences investment decision-making (β = 0.637, p < 0.001), but also significantly affects financial literacy (β = 0.642, p < 0.001). The indirect impact of financial literacy on the relation between heuristic bias and investment decision-making is significant (β = 0.239, p < 0.001), thus fulfilling the requirement of mediating role between the heuristic bias and investment decision-making.

The values of adjusted R square also substantiate the robustness of the model as heuristic bias and financial literacy have a common variance of 41.1 percent in financial literacy and 48.4 percent in investment decision-making. Furthermore, the heuristic bias measurement model demonstrates sufficient reliability and validity, as Cronbach Alpha (0.772), Composite Reliability (0.776), and Average Variance Extracted (0.524) are above the advocated levels.

On a theoretical level, the research adds to the literature of behavioral finance by means of combining psychological concepts such as heuristic bias with financial capability indicators to provide a more fine-grained view of how investors make decisions. It also highlights the significance of the cognitive and educational aspect in shaping the financial behavior and thus enhances the domains of investor psychology models. In practical terms, the results imply the possibility of using improvements in financial literacy as a form of protection against adverse impacts of cognitive biases. It directly applies to policymakers, educators, and financial advisors, who must put a special focus on financial education initiatives designed to enhance the quality of decisions. Also, investment platforms, and fintech apps can be designed with behavior-conscious tools and educative nudges to encourage knowledgeable and rational investing behaviors. On the whole, the research leads to the belief that both cognitive and informational dimensions should be addressed to promote the sound financial decision-making among people.

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