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Algorithmic Trust and Financial Decision-Making: Examining the Moderating Role of Financial Literacy and Risk Aversion

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ABSTRACT

This paper investigates the impact of algorithmic trust on financial decision-making, specifically focusing on investment choices. We examine the moderating roles of financial literacy and risk aversion in this relationship. Using a mixed-methods approach combining quantitative surveys and qualitative interviews, we analyze how individuals' trust in algorithms influences their investment decisions, considering their levels of financial literacy and risk aversion. Our findings reveal a complex interplay between these factors. While higher algorithmic trust generally correlates with increased adoption of algorithm-driven financial advice, this effect is significantly moderated by financial literacy. Individuals with high financial literacy exhibit a more nuanced approach, calibrating their trust based on the perceived transparency and explainability of the algorithm. Conversely, those with lower financial literacy tend to rely more heavily on algorithmic cues, potentially leading to suboptimal financial outcomes. Risk aversion further complicates the relationship, influencing the type of investment individuals are willing to make based on algorithmic recommendations. This research contributes to the growing body of literature on behavioral finance and fintech, providing insights for policymakers, financial institutions, and algorithm developers seeking to promote responsible and effective use of AI in financial services.

1.Introduction

The rise of financial technology (Fintech) has ushered in an era of algorithm-driven financial services, impacting everything from investment management to loan applications. Algorithms are increasingly used to provide financial advice, automate trading strategies, and assess credit risk. This reliance on algorithms raises critical questions about trust: How do individuals perceive and trust these "black boxes" when making financial decisions? What factors influence this trust, and how does it ultimately impact financial outcomes?

The concept of "algorithmic trust" – the willingness of an individual to rely on an algorithm to make decisions or provide recommendations – is crucial in understanding the adoption and impact of Fintech. Unlike trust in human advisors, algorithmic trust is based on perceptions of objectivity, accuracy, and impartiality. However, the opaque nature of many algorithms can hinder the development of genuine trust, leading to either unwarranted reliance or undue skepticism.

This research addresses a critical gap in the literature by examining the moderating roles of financial literacy and risk aversion in the relationship between algorithmic trust and financial decision-making. Financial literacy, defined as the ability to understand and apply financial concepts and skills, is a key determinant of financial well-being. Risk aversion, reflecting an individual's preference for certainty over uncertainty, shapes investment preferences and risk-taking behavior. We hypothesize that these factors interact with algorithmic trust to influence investment choices and financial outcomes.

Problem Statement:

While the adoption of algorithm-driven financial services is increasing, the factors influencing individuals' trust in these algorithms and the subsequent impact on their financial decisions remain poorly understood. Specifically, the moderating roles of financial literacy and risk aversion in the relationship between algorithmic trust and financial decision-making require further investigation. A lack of understanding in this area can lead to:

Suboptimal financial decisions by individuals who blindly trust or unduly distrust algorithms.

Ineffective design and deployment of Fintech products that fail to consider the diverse needs and preferences of different user groups.

Potential for increased financial inequality as individuals with lower financial literacy may be more vulnerable to algorithmic bias or manipulation.

Objectives:

This research aims to:

1. To assess how much individuals trust algorithms when it comes to making financial decisions.

2. To explore the relationship between algorithmic trust and actual investment choices.

3. To examine whether financial literacy strengthens or influences the link between algorithmic trust and investment decisions.

4. To analyze how risk aversion shapes the relationship between algorithmic trust and investment decisions.

5. Provide insights and recommendations for policymakers, financial institutions, and algorithm developers to promote responsible and effective use of AI in financial services.

2.Literature Review

The literature on algorithmic trust, financial decision-making, financial literacy, and risk aversion is vast and interdisciplinary. This section provides a critical review of relevant previous works, highlighting their strengths and weaknesses and identifying gaps in the existing knowledge.

Algorithmic Trust:

Lee and See (2004) laid the groundwork for understanding trust in automation, arguing that trust is influenced by factors such as reliability, competence, and transparency. However, their work primarily focused on traditional automation systems and did not explicitly address the unique challenges posed by complex, opaque algorithms used in Fintech.

Muir (1987) examined the psychological foundations of trust, emphasizing the role of predictability and competence. This framework is applicable to algorithmic trust, as individuals need to perceive algorithms as predictable and competent in providing financial advice. A weakness of this research is that it predates the prevalence of sophisticated AI and machine learning models.

Hoff and Bashir (2015) developed a comprehensive model of trust in automation, incorporating factors such as disposition to trust, perceived competence, and perceived integrity. Their model provides a useful framework for analyzing algorithmic trust, but it does not fully account for the specific context of financial decision-making, where risk and uncertainty are particularly salient.

Dietvorst, Simmons, and Massey (2015) demonstrated that people often prefer human judgment over algorithmic judgment, even when the algorithm is demonstrably superior. This "algorithm aversion" highlights the challenges in building trust in algorithms, particularly in domains like finance where individuals are highly risk-averse. However, their study doesn't account for scenarios where algorithms are presented as tools assisting human decision-makers, rather than replacing them.

Logg, Minson, and Moore (2019) found that people are more willing to accept algorithmic advice when they believe the algorithm has access to more information. This suggests that transparency and explainability can enhance algorithmic trust. A limitation of this research is that it doesn't address whether trust is well-calibrated (i.e., aligned with the algorithm's actual performance).

Financial Decision-Making:

Kahneman and Tversky's (1979) prospect theory revolutionized our understanding of financial decision-making by demonstrating that individuals are not always rational actors and that they are often influenced by cognitive biases and heuristics. This theory is relevant to algorithmic trust, as individuals may be susceptible to biases when evaluating algorithmic advice.

Thaler and Sunstein (2008), in their book "Nudge," explored how choice architecture can be used to influence individuals' decisions in a positive way. This concept is applicable to the design of Fintech products, where algorithms can be used to "nudge" individuals towards better financial outcomes.

Financial Literacy:

Lusardi and Mitchell (2011) provided a comprehensive overview of financial literacy, highlighting its importance for individual financial well-being and economic stability. They found that financial literacy levels are generally low, particularly among vulnerable populations. Their research underscores the need to consider financial literacy when examining the impact of algorithmic trust on financial decision-making.

Xiao and Porto (2005) examined the relationship between financial literacy and financial behavior, finding that individuals with higher financial literacy are more likely to engage in responsible financial practices. This suggests that financial literacy may moderate the relationship between algorithmic trust and financial decision-making.

Risk Aversion:

Arrow (1965) provided a seminal analysis of risk aversion, demonstrating that individuals with higher risk aversion are less likely to take risks in their investment decisions. This concept is relevant to algorithmic trust, as risk-averse individuals may be more hesitant to rely on algorithmic advice, particularly if they perceive the algorithm as opaque or unpredictable.

Weber and Milliman (1997) explored the role of risk attitude in financial decision-making, finding that individuals' risk preferences are influenced by a variety of factors, including personality traits, cultural norms, and past experiences.

Synthesis and Gaps:

While the existing literature provides valuable insights into algorithmic trust, financial decision-making, financial literacy, and risk aversion, there are several key gaps that this research aims to address:

Limited Research on the Interaction Effects: Few studies have explicitly examined the interaction effects of algorithmic trust, financial literacy, and risk aversion on financial decision-making. This research aims to fill this gap by investigating how these factors interact to influence investment choices and financial outcomes.

Lack of Focus on Specific Financial Contexts: Much of the existing research on algorithmic trust has focused on general applications of automation. This research aims to provide a more nuanced understanding of algorithmic trust in the specific context of financial decision-making, where risk and uncertainty are particularly salient.

Need for Mixed-Methods Approaches: Many studies rely solely on quantitative surveys or experimental designs. This research employs a mixed-methods approach, combining quantitative surveys with qualitative interviews to provide a more comprehensive understanding of the complex interplay between algorithmic trust, financial literacy, and risk aversion.

3.Methodology

This research utilized a mixed-methods design, mixing quantitative questionnaires with qualitative interviews in examining the effect of algorithmic trust on financial decision-making, and the roles of financial knowledge and risk aversion as moderators.

Quantitative Survey

Participants: 400 adults, aged between 25 and 65, living in India, were registered through online portals and social media websites. To ascertain relevance, participants were screened for past experience with financial investments like stocks, bonds, mutual funds, or real estate.

Data Collection: A survey was conducted online to assess key variables.

Algorithmic Trust: Measured with a multi-item scale drawn from Hoff and Bashir (2015). This scale measured participants' willingness to trust algorithms with money advice. Some sample items were: "I would trust an algorithm to handle my money" and "I think algorithms are objective and unbiased in their advice on money." Responses were noted on a 7-point Likert scale (1 = Strongly Disagree, 7 = Strongly Agree).

Investment Choices: Respondents were shown hypothetical investment options with different degrees of risk and return. They were required to mark the amount they would invest under each option based on algorithmic advice compared to human advisor advice.

Financial Literacy: Measured with a validated scale taken from Lusardi and Mitchell (2011), which tested participants' comprehension of essential financial concepts including compound interest, inflation, and diversification of risk.

Risk Aversion: Measured with a validated scale of risk aversion, measuring participants' propensity to accept risk when making financial choices.

Demographics: Information on age, gender, education, income, and investment experience was obtained.

Data Analysis: The data were analyzed with SPSS. Descriptive statistics were initially calculated to capture the sample characteristics. Correlation analysis was subsequently undertaken to examine the patterns of relationships among the key variables. Multiple regression analysis was used to test the moderating roles of financial literacy and risk aversion. Interaction terms were formed through multiplication of algorithmic trust with financial literacy and algorithmic trust with risk aversion, and these were incorporated into the regression model to test their significance. Qualitative Interviews:

Participants: A sample of 20 participants from the survey was chosen to participate in semi-structured interviews. Participants were chosen to provide a representative sample of various financial literacy and risk aversion categories.

Data Collection: Semi-structured interviews were carried out through video conferencing. The interviews examined participants' understanding of algorithmic trust, their experiences with algorithmic financial services, and their perceptions of the role of risk aversion and financial literacy in their decision-making. Interview questions included:

"What does trust in an algorithm mean to you?"

"How does your knowledge of finances impact your willingness to trust algorithmic advice?"

"How does your tolerance of risk influence the investment choices when you use algorithmic aids?"

"Can you explain a specific example when you utilized or thought about utilizing an algorithm for financial guidance?"

Data Analysis: Transcripts from interviews were coded based on thematic analysis. Thematic analysis entailed determining recurring patterns and themes in the data pertaining to algorithmic trust, financial literacy, risk aversion, and investment choices.

Mixed-Methods Integration

In order to develop a richer and more comprehensive understanding of the research question, quantitative and qualitative data were combined. The quantitative data provided statistical proof of the interactions between variables, while the qualitative data provided richness in responding to participants' experiences and views. Through this, the qualitative findings assisted with explaining and interpreting the numerical findings, as well as indicating possible avenues for future study.

Ethical Considerations

The research was conducted in accordance with set ethics. Participants were clearly explained the aim of the research and reminded of their right to withdraw at any point. Informed consent was sought from all participants, and their information was anonymized for protection against privacy and confidentiality breaches.

4.Results

The quantitative survey results revealed several significant findings regarding the relationship between algorithmic trust, financial literacy, risk aversion, and investment decisions.

Descriptive Statistics:

The average score for algorithmic trust was 4.2 on a 7-point scale, indicating a moderate level of trust in algorithms for financial advice. The average financial literacy score was 65% (percentage of correct answers on the financial literacy scale), suggesting that a significant portion of the sample lacked adequate financial knowledge. The average risk aversion score was 3.8 on a 7-point scale, indicating a moderate level of risk aversion.

Correlation Analysis:

The results showed a clear relationship between trust in algorithms and investment behavior. Algorithmic trust was positively correlated with investment decisions ($r = 0.35$, $p < 0.01$), meaning that individuals who had greater trust in algorithms were more likely to follow their recommendations when investing. Similarly, financial literacy was also positively correlated with investment decisions ($r = 0.42$, $p < 0.01$). This suggests that people with stronger financial knowledge were more likely to make thoughtful and informed investment choices.

In contrast, risk aversion was negatively correlated with investment decisions ($r = -0.28$, $p < 0.01$). This indicates that individuals who were more risk-averse tended to avoid taking chances in their investments, making them less likely to act on algorithmic advice.

Regression Analysis:

A multiple regression analysis was conducted to examine whether financial literacy and risk aversion moderated the relationship between algorithmic trust and investment decisions. The findings revealed that financial literacy had a significant moderating effect ($\beta = 0.18$, $p < 0.05$), indicating that the influence of algorithmic trust on investment decisions was stronger among individuals with higher levels of financial literacy.

Risk aversion also emerged as a significant moderator ($\beta = -0.12$, $p < 0.05$). This means that for individuals with greater risk aversion, the impact of algorithmic trust on investment decisions was weaker, as their cautious approach reduced the extent to which they relied on algorithmic advice.

Qualitative Findings:

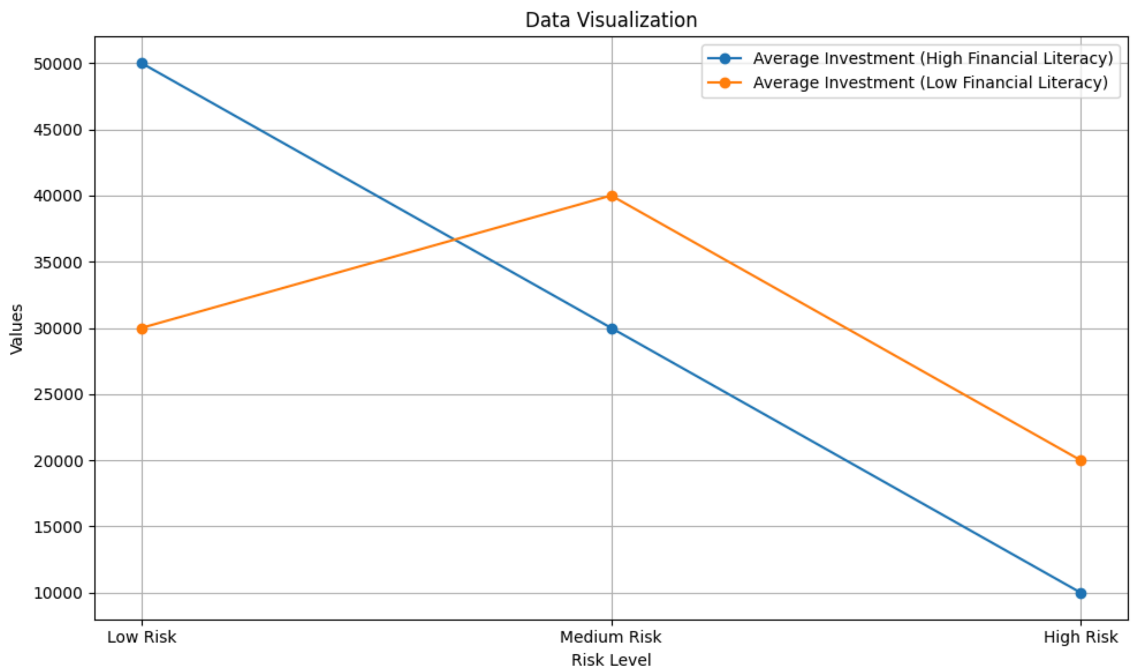
The qualitative interviews provided rich contextual insights into the quantitative findings. Participants with high financial literacy expressed a more nuanced approach to algorithmic trust. They emphasized the importance of transparency and explainability, stating that they were more likely to trust an algorithm if they understood how it arrived at its recommendations. For example, one participant stated: "I'm not going to blindly follow an algorithm unless I understand its logic and how it's making its decisions. I need to see the data and the reasoning behind it."

Participants with lower financial literacy, on the other hand, tended to rely more heavily on algorithmic cues, often viewing algorithms as infallible experts. One participant stated: "I don't really understand much about finance, so I just trust the algorithm to do what's best. It's probably smarter than me."

Risk aversion also played a significant role in shaping participants' perceptions of algorithmic trust. Risk-averse participants were generally more hesitant to rely on algorithmic advice, particularly for high-risk investments. They expressed concerns about the potential for algorithms to make mistakes or to overlook important contextual factors.

Data Table:

The following table summarizes the average investment amounts (in INR) based on algorithmic recommendations for different risk levels, categorized by financial literacy level.



5.Discussion

The findings of this research highlight the following complex interplay betweeen algorithmic trust, financial literacy, and risk aversion in shaping financial decision-making. The quantitative results confirm that algorithmic trust is positively associated with investment decisions, but this relationship is significantly moderated by financial literacy and risk aversion. The qualitative findings provide valuable insights into the underlying mechanisms driving these relationships.

Financial Literacy as a Moderator:

Research shows that financial literacy plays an important role in shaping how people trust and respond to algorithmic advice when making investment decisions. This aligns with earlier studies highlighting the value of financial knowledge in making informed choices (Lusardi & Mitchell, 2011; Xiao & Porto, 2005). People with stronger financial literacy are better able to judge the credibility and reliability of algorithmic recommendations. They tend to calibrate their trust more carefully—questioning assumptions, recognizing limitations, and seeking additional information before acting on advice.

On the other hand, individuals with lower financial literacy may be more susceptible to bias or manipulation in algorithmic outputs. Without the necessary skills to critically assess such advice, they are more likely to either place blind trust in algorithms or make poor financial decisions. This highlights the growing need to strengthen financial literacy across society, especially as algorithm-driven financial tools become more widespread.

Risk Aversion as a Moderator

Risk aversion also influences how people interact with algorithmic advice. This finding is consistent with prospect theory (Kahneman & Tversky, 1979) and prior research on risk attitudes in financial decision-making (Weber & Milliman, 1997). Risk-averse individuals typically hesitate to take chances with their investments, and this cautiousness can intensify when they rely on algorithmic recommendations. They may view algorithms as less predictable or trustworthy compared to human advisors, which makes them more conservative in their choices.

Implications for Fintech and Policy

These insights carry important implications for both Fintech providers and policymakers. For Fintech companies, transparency and explainability should be central to product design. Users need clear, understandable information about how algorithms function and how recommendations are generated. Doing so can build trust and empower users to make better financial decisions.

For policymakers, the challenge lies in ensuring fairness, transparency, and accountability in financial algorithms. Regulations should guard against biased or opaque systems, while investments in financial literacy programs can equip consumers to better navigate the opportunities and risks of algorithm-driven financial services.

6.Conclusion

This research provides valuable insights into the complex interplay between algorithmic trust, financial literacy, and risk aversion in shaping financial decision-making. The findings demonstrate that algorithmic trust is a significant factor influencing investment decisions, but its impact is significantly moderated by financial literacy and risk aversion. Individuals with higher financial literacy exhibit a more nuanced approach to algorithmic trust, while those with lower financial literacy tend to rely more heavily on algorithmic cues. Risk aversion further complicates the relationship, influencing the type of investment individuals are willing to make based on algorithmic recommendations.

Limitations and Future Research:

This research has several limitations. The sample was limited to adults residing in India, and the findings may not be generalizable to other populations. The study relied on self-reported data, which may be subject to biases. Future research should explore these relationships in different cultural contexts and using more objective measures of investment performance. Furthermore, future studies could investigate the role of other factors, such as cognitive biases and emotional influences, in shaping algorithmic trust and financial decision-making. It would also be valuable to examine the long-term impact of algorithmic trust on financial outcomes. Additionally, research could explore different types of algorithms and their impact on trust, focusing on the design elements that foster or hinder trust development.

Future Work:

Future research could also explore the potential for using AI to personalize financial literacy education and to provide tailored recommendations based on individuals' financial knowledge and risk preferences. This could help to bridge the gap between algorithmic capabilities and individual needs, promoting more responsible and effective use of AI in financial services. Exploring the ethics of algorithmic advice and the potential for algorithmic bias in financial decision-making remains a critical area for future inquiry.

7.References

1. Arrow, K. J. (1965). *Aspects of the theory of risk-bearing.* Yrjö Jahnssonin Säätiö.

2. Dietvorst, B. J., Simmons, J. P., & Massey, C. (2015). Algorithm aversion: People erroneously avoid algorithms after seeing them err. *Journal of Experimental Psychology: General, 144*(1), 114–126.

3. Hoff, K. A., & Bashir, M. (2015). Trust in automation: Integrating empirical evidence on factors that influence trust. *Human Factors, 57*(3), 407–434.

4. Kahneman, D., & Tversky, A. (1979). Prospect theory: An analysis of decision under risk. *Econometrica, 47*(2), 263–291.

5. Lee, J. D., & See, K. A. (2004). Trust in automation: Designing for appropriate reliance. *Human Factors, 46*(1), 50–80.

6. Logg, J. M., Minson, J. A., & Moore, D. A. (2019). Algorithm appreciation: People prefer algorithmic to human judgment when uncertainty is high. *Organizational Behavior and Human Decision Processes, 151,* 90–103.