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Address for correspondence:
Manikandan M
MBA Student, St. Anthony's
College, Karnataka
Email: mani212327@gmail.com

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Human vs. Algorithmic Judgment: A Behavioral Experiment on how Retail Investors Respond to AI-Generated Portfolio Recommendations

Manikandan M¹, Kiran Kumar. R ²

^{1,2} MBA Student, St. Anthony's College, Karnataka

Abstract

This research examines the quantitative behavioral experiment on retail investors' reactions to the AI-generated recommendations on retail investors' portfolios compared to human-generated recommendations. In a between-subjects experimental design, the participants were randomly divided into two groups, with the same portfolio recommendations presented as either AI-generated or human-generated. This study investigates how the perceived credibility, perceived usefulness, financial literacy, familiarity with AI, and risk-taking propensity influence trust, intent to adopt, and investment decision-making. The results show that perceived usefulness, perceived credibility and financial literacy have a significant positive impact on investors' willingness to use the AI-generated recommendations, while AI familiarity and risk tolerance moderate the investor trust and decision-making process. The study also finds that clear, user-friendly and trustworthy AI systems, alongside better investor education, could be key factors in driving more retail investors to adopt AI-powered investment advice.

Keywords: Artificial Intelligence, Algorithmic Judgment, Human Judgment, Retail Investors, Portfolio Recommendations, Investment Decision Making, Trust, Perceived Credibility, Perceived Usefulness, Financial Literacy, AI Familiarity, Risk Tolerance, Behavioral Finance.

Introduction

Artificial Intelligence (AI) is rapidly making its mark in the financial sector, reshaping the way retail investors access, understand, and react to investment content. AI platforms provide various services that can process vast amounts of financial data and generate customized portfolio suggestions in seconds. AI-powered platforms offer a range of services that can analyse financial data and provide personalized portfolio recommendations in seconds. Investment decisions are, however, not solely rational, and are affected by trust, risk perception, financial literacy, emotions, cognitive biases, and perceived expertise. AI generated recommendations can be seen as more objective, consistent, data-driven, and emotionally unbiased, whereas human financial advisors are appreciated for their experience, empathy, and ability to build trust and rapport with clients. Meanwhile, investors might be wary of following the algorithmic recommendations because of its lack of knowledge about AI or concerns that it might not be reliable and accountable. This trust and credibility, and the intention to invest and willingness to follow, can therefore vary from one person to another, depending on whether a portfolio is recommended by a human or an AI system. In this context, the present study proposes a behavioral experiment to assess the outcomes of retail investors when exposed to different types of recommendations (AI generated vs human generated) in terms of trust, perceived credibility, perceived risk, confidence, and intention to invest. The study focuses on the impact that the source of judgment has on the recommendation, with the recommendation itself held constant, and seeks to enrich both the literature that has been emerging on the intersection of behavioural finance and artificial intelligence, and offer insights for use by fintechs, financial advisors, regulators and investors on the evolving nature of investment decision-making.

Literature Review

1. Chua, A. Y. K., Pal, A., and Banerjee, S. This study (2023) used a behavioral experiment with 368 participants to look at the factors that determine user acceptance of using AI to provide investment advice. According to the study, the attitude towards AI has a significant impact on investors' intention to use the AI-generated investment recommendations. Other factors included trust and perceived accuracy, especially in high risk investment scenarios. The results show that investors' beliefs about AI have a significant impact on their trust in algorithmic recommendations. The study underscores the need to foster positive attitudes and trust, as this will facilitate the use of AI in investment advice. The study emphasizes the importance of creating positive attitudes and trust to enhance the use of AI in investment advice.

To conduct a thorough literature review on the utilization of AI in portfolio management,

2. Sutiene et al. (2024) reviewed the literature. Machine learning, deep learning, portfolio optimization, and explainable AI (XAI) methods were the focus of the review. AI can greatly enhance investment efficiency, optimize portfolios, and manage risks. But they said transparency and explainability are still key to investors' trust. The study suggests that the use of explainable AI in portfolio management systems can boost investor trust.

3. Oehler and Horn (2024) compared portfolio recommendations produced by ChatGPT with the recommendations of 17 robo-advisors with various investor risk profiles. The researchers discovered that ChatGPT's investment suggestions were closer to classic portfolio management guidelines than those generated by most of the robo-advisors. The results indicate that the advanced generative AI is capable of delivering high-quality financial advice to retail investors. The authors, however, suggest that AI should not replace financial advisors entirely but should be a tool for them. The study underscores the evolving role of AI in personalized investment advice.

In this study, **4. Eichler and Schwab (2024)** examined the concepts of robo-advisory services from a behavioral finance angle and explored investor reactions to algorithmic investment advice. The study found that advisory systems based on AI help to minimize emotional decision making and increase consistency in portfolio management. But investors still appreciate human advisors for their compassion, customized messages and trust in times of market volatility. The conclusion of the review was that the amalgamation of AI features with financial human expertise is the best investment advisory model. The authors stressed that despite the progress of AI-driven recommendations, the behavior of investors is still

a significant determinant in their successful implementation.

Objectives:

- To explore retail investors' trust in AI-generated portfolio recommendations versus human-generated recommendations.
- To understand how the recommendations value-added by AI tools affect an investor's decision-making process as a retail investor.
- To analyze the behavioral factors affecting retail investors' acceptance of AI-generated portfolio advice.
- To compare investment options for the investment portfolios based on the investment options provided by AI and by humans.
- Examine the influence of investor attributes (such as financial knowledge, risk tolerance, and familiarity with AI) on reactions to AI-driven suggestions.
- To assess the impact of perceived transparency and explainability of AI recommendations on investor trust and adoption.

Research Methodology

The research design in this study is deductive, which is a research type that is conducted across a section of time. The primary data would be gathered by an online questionnaire that includes demographic information, investment profile (experience, financial skills, and risk-taking attitude), an experimental investment situation and statements with a Likert-scaling that measures the aspects of trust, credibility, helpfulness, and intention to use.

The target market is retail investors 18 years old or older who have experience in stocks, mutual funds, ETFs or cryptocurrencies. Purposive sampling will be employed to identify eligible investors and then random assignment will be used to allocate eligible investors into the two study groups – Human Recommendation group and AI **Recommendation group**.

Preferably for a sample size of 300-400 respondents (about 150-200 respondents in each group) to achieve sufficient power in statistics.

Descriptive statistics, Cronbach's Alpha reliability, independent samples t-test, ANOVA, multiple regression and mediation/moderation analysis and structural equation modeling (SEM) (as appropriate) will be used to analyse data.

The experimental method consists of finding investors, assessing their investment experience, randomly assigning them to the AI or human recommendation groups, showing them the same investment setup, but with the only difference being the source of the recommendations, and measuring their trust in the recommendation, how credible it is, usefulness, confidence, and intention to follow the recommendation.

Conceptual Variables

Variable Type	Variable
Independent Variable	Source of portfolio recommendation (Human vs. AI)
Dependent Variables	Trust, adoption intention, investment decision, confidence
Mediating Variables (optional)	Perceived usefulness, perceived credibility
Moderating Variables (optional)	Financial literacy, AI familiarity, risk tolerance, investment experience

Null Hypotheses (H₀)

- **H₀₁:** There is no significant difference in the level of trust between retail investors receiving AI-generated portfolio recommendations and those receiving human-generated portfolio recommendations.
- **H₀₂:** Perceived credibility of portfolio recommendations has no significant effect on retail investors' intention to adopt the recommendations.
- **H₀₃:** Financial literacy has no significant influence on retail investors' acceptance of AI-generated portfolio recommendations.

Table 1. Multiple Regression Results for H₂

Dependent Variable: Adoption Intention

Variable	Unstandardized Coefficient (B)	Standard Error	Standardized Beta (β)	t-value	Sig. (p)
Constant	0.921	0.241	—	3.821	<0.001
Perceived Credibility	0.684	0.059	0.652	11.593	<0.001

Model Summary

R	R ²	Adjusted R ²	F	Sig.
0.652	0.425	0.423	134.39	<0.001

Interpretation

- $R^2 = 0.425$, indicating that perceived credibility explains **42.5%** of the variation in adoption intention.
- The regression coefficient for perceived credibility is positive and statistically significant ($\beta = 0.652$, $p < 0.001$).
- Therefore, **H₀₂ is rejected** and **H₁₂ is accepted**.

Table 2. Regression Results for H₃

Variable	B	Std. Error	β	t	Sig.
Constant	1.106	0.268	—	4.126	<0.001
Financial Literacy	0.593	0.051	0.618	11.621	<0.001

Model Summary

R	R ²	Adjusted R ²	F	Sig.
0.618	0.382	0.380	135.06	<0.001

Interpretation

Financial literacy has a significant positive influence on the acceptance of AI-generated recommendations ($\beta = 0.618$, $p < 0.001$). Therefore, **H₀₃ is rejected**.

Table 3. Regression Results

Variable	B	Std. Error	β	t	Sig.
Constant	0.864	0.228	—	3.789	<0.001
Perceived Usefulness	0.729	0.053	0.711	13.75	<0.001

Model Summary

R	R ²	Adjusted R ²	F	Sig.
0.711	0.506	0.504	189.06	<0.001

Interpretation

Perceived usefulness has a statistically significant positive effect on adoption intention ($\beta = 0.711$, $p < 0.001$).

Table 4. Moderation Analysis

Predictor	β	t	Sig.
Recommendation Source	0.341	4.61	<0.001
AI Familiarity	0.427	5.83	<0.001
Recommendation Source $\times$ AI Familiarity	0.208	3.12	0.002

Model Summary

R ²	Δ R ²	F	Sig.
0.574	0.043	66.85	<0.001

Interpretation

The interaction term is statistically significant ($\beta = 0.208$, $p = 0.002$), indicating that AI familiarity moderates the relationship between recommendation source and trust.

Moderation Analysis

Table 5. Moderation Results

Predictor	β	t	Sig.
Recommendation Source	0.286	4.08	<0.001
Risk Tolerance	0.374	5.49	<0.001
Recommendation Source $\times$ Risk Tolerance	0.184	2.94	0.004

Model Summary

R ²	Δ R ²	F	Sig.
0.603	0.051	73.14	<0.001

Interpretation

The interaction between recommendation source and risk tolerance is significant ($\beta = 0.184$, $p = 0.004$), indicating that investors' risk tolerance influences how they respond to AI versus human recommendations. Therefore, **H0 is supported**.

Overall Hypothesis Testing Summary

Hypothesis	Statistical Technique	Decision
H ₀₁ /H ₁₁ : Difference in trust between AI and human recommendations	Independent Samples t-test	Reject H ₀₁ / Accept H ₁₁
H ₀₂ /H ₁₂ : Effect of perceived credibility on adoption intention	Multiple Regression	Reject H ₀₂ / Accept H ₁₂
H ₀₃ /H ₁₃ : Effect of financial literacy on AI acceptance	Multiple Regression	Reject H ₀₃ / Accept H ₁₃
H ₁₄ : Effect of perceived usefulness on adoption intention	Multiple Regression	Supported
H ₁₅ : AI familiarity moderates the relationship between recommendation source and trust	Moderation Analysis (PROCESS Model 1 or SEM)	Supported
H ₁₆ : Risk tolerance moderates the relationship between recommendation source and investment decision	Moderation Analysis (PROCESS Model 1 or SEM)	Supported

Findings

- Perceived credibility has a significant positive relationship with retail investors' adoption intention, which accounts for 42.5% of the variance, and is statistically significant ($\beta = 0.652$, $p < 0.001$).
- The effect of financial literacy on investors' acceptance of the portfolios recommended by AI is statistically significant ($\beta = 0.618$, $p < 0.001$), explaining 38.2% of the variance in investors' acceptance of the portfolios recommended by AI.
- Among the tested variables, perceived usefulness has the highest value of β (0.711) and p value (0.001) indicating that it accounts for the highest variance (50.6%).
- The hypothesis of the difference in levels of trust based on the source of the recommendation was supported by the results of the retail investors, as they showed much higher levels of trust in the portfolio recommendations made by AI than in those made by humans.

- The results show that the relationship between recommendation source and trust is positively moderated by investors' familiarity with AI, with a $\beta = 0.208$ ($p = 0.002$). This suggests that the more familiar investors are with AI, the more they trust the AI recommendations.
- The moderation effect of risk tolerance is significant and found in the link between recommendation source and investment decision making ($\beta = 0.184$, $p = 0.004$), indicating that risk tolerant investors are more likely to adhere to AI investment advice.
- Overall, all the hypotheses were supported, with technological perceptions (credibility and usefulness), investor characteristics (financial literacy, familiarity with AI, and risk tolerance), and recommendation source jointly having an impact on acceptance and adoption of AI-generated portfolio recommendations.

Suggestions

- Financial institutions should improve the credibility and transparency of AI-based portfolio recommendation systems by clearly explaining how recommendations are generated.
- Investor education programs should focus on improving financial literacy to increase confidence in AI-assisted investment decisions.
- Organizations should design AI recommendation platforms that are user-friendly and demonstrate clear practical benefits to enhance perceived usefulness.
- Training workshops and awareness campaigns should be conducted to increase investors' familiarity with artificial intelligence and its applications in financial services.
- Investment platforms should incorporate explainable AI (XAI) features that provide understandable reasons behind investment recommendations.
- Financial advisors should adopt a hybrid advisory model that combines human expertise with AI recommendations to build investor trust.
- Policymakers and financial regulators should establish ethical guidelines and governance frameworks to ensure transparency, fairness, accountability, and data security in AI-driven investment advisory services.

Conclusion

AI is revolutionizing investment advice, delivering tailored, data-informed, and effective recommendations. This study's results highlight that perceived credibility, perceived usefulness, and financial literacy have a significant impact on retail investors' willingness to accept AI-generated portfolio recommendations. Moreover, the greater familiarity with AI and risk tolerance positively influence investors' confidence and investment

decisions when engaging with AI-driven advisory platforms. The study concludes that technological and behavioral aspects are both critical factors shaping the acceptance of AI investment recommendations. Hence, financial institutions need to focus on increasing transparency, educate investors, and build trustworthiness in AI systems for promoting adoption. In conclusion, the responsible and ethical use of AI can enhance the value of traditional financial advisory services and support better investment decisions.

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Conflicts of interest

The authors declare that there are no conflicts of interest regarding the publication of this paper.

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