International Journal of Multidisciplinary Sciences and Arts
E-ISSN :2962-1658
Volume 4, Number 3, July 2025
https://doi.org/10.47709/ijmdsa.v4i3.6463

From Intuition to Automation: A Comparative Study of Traditional Investment Decisions and Robo-Advisory Adoption Among Retail Investors in Indonesia

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Article History:
Submitted: 10-07-2025
Accepted: 29-07-2025
Published: 31-07-2025

Keywords:
investment decision making, robo-advisor, financial technology, digital trust

ABSTRACT

The development of digital technology has transformed the investment decision-making process from being based on human analysis to automated algorithm-based solutions such as robo-advisors. This study aims to compare traditional and technology-based investment decision-making approaches among retail investors in Indonesia, focusing on adoption, perceived trust, and effectiveness of robo-advisor use. Using quantitative descriptive-correlational approach to compare traditional and technology-based investment decision-making methods, this study collected survey data from 120 individual. The results show a significant positive correlation between trust in traditional methods and the use of investment applications, although the adoption rate of robo-advisors is still low. The main barriers faced are low digital literacy and lack of trust in automated systems. These findings emphasize the importance of targeted investor education and increased transparency on robo-advisory platforms. This study contributes to the literature on fintech adoption in emerging markets and offers practical insights for fintech developers and policymakers.

INTRODUCTION

Investment development in Indonesia has shown significant growth in recent years, especially among retail investors. Based on data from the Indonesian Central Securities Depository (KSEI), the number of capital market investors increased sharply from 2019 to 2021, by 56.21% and 92.99% in the following year, respectively. This phenomenon is inseparable from the penetration of digitalization and increased access to financial information through technology (Jameaba, 2024). Along with advances in information and communication technology (ICT), the way investors make decisions has also undergone a transformation. If previously investment decisions relied heavily on fundamental, technical, or personal intuition analysis, now technology-based approaches such as algorithms, big data, and artificial intelligence have emerged as the basis for robo-advisors. This technology enables a more efficient, faster, and automated investment process (Bernice et al., 2024).

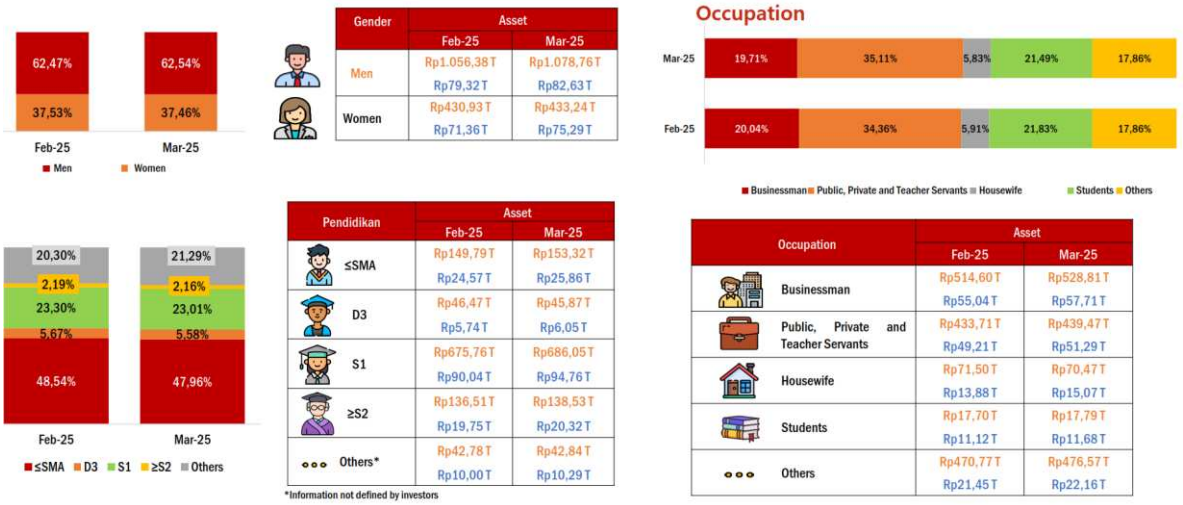

Fig. 1 Demographics of Individual Investors
(Source: https://www.ksei.co.id)

Robo-advisors are automated financial platforms that provide recommendations and manage portfolios based on algorithms, according to the risk profile and goals of investors (Mathew et al., 2024). In Indonesia, services such as Bibit, Ajaib, and Bareksa have begun to introduce this concept to the retail market. However, despite technological

E-ISSN :2962-1658
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https://doi.org/10.47709/ijmdsa.v4i3.6463

advances and platform availability, the adoption of robo-advisors by retail investors is still relatively low. Many investors still rely on recommendations from family or friends, and have limited technological literacy and trust in automated systems (Siregar et al., 2021).

Although robo-advisor services are available and financial technology penetration continues to increase in Indonesia, its adoption by retail investors is still relatively low. Many investors still rely on personal intuition, experience, or social recommendations in making investment decisions (Siregar et al., 2021). Low digital literacy, lack of trust in automated systems, and ignorance of the potential of technology are major barriers that have not been widely explored academically (Khan & Shabbir, 2025; Saputri & Fasa, 2025).

Although studies on the adoption of financial technology (fintech) have grown rapidly, most of the focus is still on the general aspects of the use of digital technology in financial services, such as mobile banking and e-wallets (Putri, 2025; Ramadhan et al., 2025). Research on robo-advisors as investment decision-making tools is still limited, especially in the context of developing countries. Previous studies were mostly conducted in developed countries with high levels of digital literacy and more mature technological infrastructure (Cetindamar et al., 2021; Trinh et al., 2025). In Indonesia, empirical studies that specifically compare investor preferences for traditional versus technology-based decision-making methods, as well as evaluating the behavioral adoption of robo-advisors, are still very minimal. This gap is important to study because Indonesia is one of the fastest growing retail markets but has unique challenges in financial literacy and digital trust.

This research is important because it fills the gap in the literature on the adoption of financial technology (fintech), especially robo-advisors, in the context of emerging markets by comparing traditional and technological approaches in the context of investment decisions, especially among retail investors in Indonesia. By understanding the behavioral patterns and preferences of investors, the results of this study are expected to provide academic contributions in the field of digital finance, while also offering practical recommendations for platform developers and policy makers.

This study offers a novel contribution by presenting a quantitative survey-based analysis of Indonesian retail investors, specifically comparing the effectiveness and preferences between traditional investment decision-making methods and robo-advisor-based approaches. Unlike previous studies that were mostly conducted in developed countries, this study targets the context of emerging markets with varying levels of digital financial literacy (Adel, 2024). This study also highlights the role of psychological and social factors, such as trust in traditional methods and the influence of the social environment, in influencing the adoption of investment technology. Focusing on retail investors as a key population, who are often overlooked in studies of financial technology adoption, provides a new dimension to understanding how local behaviors and preferences influence digital transformation in the financial sector (Putra, 2025; Trinh et al., 2025).

LITERATURE REVIEW

In this chapter, a theoretical framework covering Traditional Decision-Making Methods and Technology-Based Approaches in the Investment Context will be presented. Understanding these two methods will help in identifying the advantages and disadvantages of each and their implications in investment decision making.

Investment Decision Making

Investment decision-making is a rational and psychological process influenced by information, experience, intuition, and market conditions. In the traditional context, investors use fundamental and technical approaches based on manual analysis of financial data and historical trends (Wu, 2022). However, the development of financial technology has encouraged the emergence of new approaches, such as algorithm-based automation systems (robo-advisors), which enable more efficient and objective decision-making (Mishra et al., 2024; Shanmuganathan, 2020).

This transformation creates a significant difference in approach between investors who still rely on intuition and experience and those who are starting to adopt data-based technology. Therefore, the comparison between traditional and technological approaches is important in understanding investor adaptation in the digital era (Khan & Shabbir, 2025).

Trust in Technology and Traditional Systems

Trust is a major factor in decision-making involving technology, especially in the financial context. Investors who have high trust in traditional methods tend to be more cautious in adopting new systems such as robo-advisors. However, there are also those who are open and use applications as a tool, without completely abandoning conventional approaches (Tommasi et al., 2021; Wu, 2022)

Studies show that trust in the reliability of technology, data security, and perceptions of digital risk greatly influence the acceptance of automated investment systems (Ali et al., 2021). Thus, the relationship between trust in traditional approaches and the use of investment applications is important to test empirically.

Investment Experience and Convenience of Using Technology

Investors with higher investment experience tend to have better digital and financial literacy. This correlates with

E-ISSN :2962-1658
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their comfort level in using technology applications such as robo-advisors (Irawan et al., 2023). According to (Ardianto et al., 2024; Jameaba, 2024; Khan & Shabbir, 2025) , investment experience can increase adaptation to the digitalization of financial services, including convenience in operating and making application-based decisions.

In addition, user comfort is not only influenced by investment experience, but also by perceptions of ease of use and the appearance of the application interface (UI/UX). A study by (Chua, 2025) showed that investors with higher digital exposure felt more confident and comfortable using investment applications independently.

Financial Literacy and Acceptance of Investment Technology

Financial literacy is a crucial factor in shaping the acceptance of investment-related technology. Investors with a strong understanding of key financial concepts such as risk management, portfolio diversification, and financial planning are generally more receptive to technological innovations, including robo-advisory services (Putri, 2025; Saputri & Fasa, 2025; Shanmuganathan, 2020). Furthermore, financial literacy influences the relationship between sociodemographic characteristics and intention to adopt financial technology, demonstrating its role as both a foundational and enabling element in digital investment behavior (Islam & Khan, 2024).

The Role of Robo-Advisors in Modern Investment Decisions

Robo-advisors are automated financial platforms that use algorithms to provide personalized investment advice, rebalance portfolios, and manage risk based on user profiles (Onabowale, 2024). This technology combines modern financial theory with artificial intelligence and big data, providing goal-based investment solutions and cost efficiency. Studies by (Bhatia et al., 2022; Onabowale, 2024; Shanmuganathan, 2020) show that robo-advisors significantly improve the efficiency of investment decision-making, especially among young and digitally savvy investors. However, adoption rates in developing countries are still low due to factors such as trust, technological literacy, and regulation.

Based on the literature review and conceptual framework that has been explained, the hypothesis in this study is formulated as follows:

H1: There is a significant relationship between trust in traditional methods and the use of investment applications.

H2: There is a significant relationship between investment ownership and comfort using robo-advisor applications.

H3: The level of financial literacy influences the acceptance of technology in investment decision making.

METHOD

This study uses a quantitative descriptive-correlational approach to compare traditional and technology-based investment decision-making methods, especially related to the use of robo-advisors by retail investors in Indonesia. This design was chosen to identify relationships between variables and see behavioral tendencies in investment decision-making (Tajpour et al., 2022).

The population in this study were individual investors in Semarang City and its surroundings who made investments independently, either through a traditional approach or using technology applications or platforms. The sampling technique used was purposive sampling, with the following criteria: (1) having investment experience, and (2) having used certain methods in making investment decisions. A total of 30 investors were contacted, and 19 respondents provided valid data that was analyzed. Although this number is relatively small, according to the guidelines of (Jenkins & Quintana-Ascencio, 2020; White, 2022), a minimum sample size of 30 is still acceptable in exploratory and correlational studies with a limited number of variables.

Quantitative data analysis was performed using descriptive statistics, chi-square test, Pearson correlation, and binary logistic regression to test the relationship between variables. Data processing used SPSS and StatsModels software. Qualitative data were analyzed thematically to strengthen and explain quantitative results.

RESULT

This section presents the results of data processing from 120 individual investor respondents in Semarang City and its surroundings. The main objective of this study is to compare traditional and technology-based investment decision-making methods, and to test the influence of factors such as trust, investment ownership, and financial literacy on the acceptance of investment technology. Data are analyzed descriptively and inferentially to test the formulated hypotheses.

Most respondents (70%) have more than two years of investment experience. Around 64% said they trust traditional methods more, while only 21% said they are very comfortable using robo-advisor applications. As many as 76% of respondents consider technology to play an important role in the investment process, but only 32% actively use robo-advisor technology in their investment decision-making process.

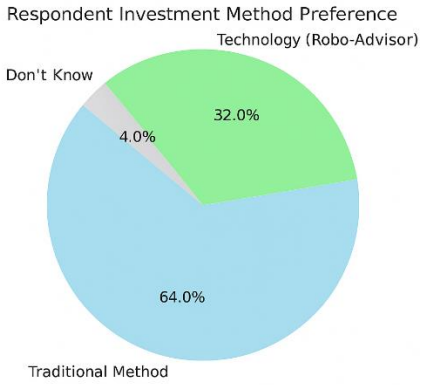

Fig. 2 Respondents' Preferences for Investment Methods

Hypothesis 1 (H1)

Hypothesis 1 examines the relationship between trust in traditional methods and the use of investment applications. The results of the Pearson correlation test show a value of r = 0.427 and p-value = 0.001 < 0.05, so H1 is accepted. This shows that the higher the respondents' trust in traditional methods, the less likely they are to actively use investment applications. However, there is a segment of respondents who show a hybrid attitude, namely still using applications as a complement to their conventional methods.

Table 1. Pearson Correlation Test Results (H1)

Variable X	Variable Y	r (p-value)
Belief in traditional methods	Use of investment applications	0.427 (0.001)

Hypothesis 2 (H2)

Hypothesis 2 examines the relationship between investment ownership and comfort in using robo-advisor applications. The chi-square test results show a p-value = 0.012 < 0.05, which means there is a significant relationship between the two variables. Respondents who have more than two years of investment experience tend to be more comfortable using technology-based applications in decision making.

Table 2. Chi-Square Test Results (H2)

Variable X	Variable Y	Chi-Square	p-value
Investment ownership	Convenience of using the application	6.34	0.012

Hypothesis 3 (H3)

Hypothesis 3 tests the effect of financial literacy on technology acceptance in investment decision making. The results of binary logistic regression show that financial literacy has a significant effect on technology acceptance (p = 0.008). Respondents with high literacy levels are 2.5 times more likely to accept and actively use robo-advisor technology.

Table 3. Results of Binary Logistic Regression Test (H3)

Predictor Variables	OR	CI (95%)	p-value
Financial literacy	2.5	1.3 – 4.8	0.008

DISCUSSION OF FINDINGS

The findings of this study support the results of research by (Adel, 2024; Islam & Khan, 2024; Khan & Shabbir, 2025) that financial literacy is an important predictor in the adoption of financial technology. Likewise, the findings on trust in traditional methods are consistent with the study of (Parashara et al., 2024; Shanmuganathan, 2020; Wu, 2022), which shows that trust plays a key role in digital decisions. The results also strengthen the theory in TAM and UTAUT that perceived trust, ease of use, and previous experience influence technology adoption (Abdullah et al., 2024).

Table 4. Statistical Test Results

Hypothesis	Test Type	Statistical Values	p-value	Decision
H1	Pearson Correlation	r = 0.427	0.001	H1 accepted
H2	Chi-Square	χ^2 = 6.34	0.012	H2 accepted
H3	Logistic Regression	OR = 2.5	0.008	H3 accepted

E-ISSN :2962-1658
Volume 4, Number 3, July 2025
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The results of the hypothesis testing show that all hypotheses are statistically accepted, providing strong support for the conceptual model of this study. H1 asserts that trust in traditional methods is negatively correlated with the use of investment applications, indicating conservatism in investor behavior. However, there is a group of investors who are able to selectively adapt, using applications without completely abandoning traditional approaches.

H2 suggests that longer investment ownership increases comfort with robo-advisor technology. This is consistent with UTAUT theory that experience plays a role in increasing trust and comfort with technology. This answers the research question related to internal investor factors that influence comfort with digital adoption.

H3 proves that the level of financial literacy has a significant effect on technology acceptance. Investors with good financial understanding are more likely to adopt digital innovations such as robo-advisors. This finding not only answers the research objectives but also provides important implications for service providers to actively target financial literacy education.

In the context of investment decision-making, traditional methods such as fundamental and technical analysis are still widely used by retail investors in Indonesia. This approach is considered to provide an in-depth understanding of the company's condition and the peculiarities in adjusting strategies to market dynamics. However, its shortcomings lie in the need for a large amount of time, limited data, and the potential for subjective bias in assessing qualitative factors. The findings of this study confirm that most respondents still place high trust in the traditional approach, which has a negative impact on the use of modern investment applications (H1 is accepted; $r = 0.427$, $p = 0.001$).

On the other hand, technology-based methods such as robo-advisors offer time efficiency, objectivity, and the ability to access broader market data. The use of algorithms can speed up the analysis process and help investors respond to market changes in real time. However, this approach also has limitations, such as dependence on technological systems, the potential for overfitting, and a lack of qualitative understanding of the company. This explains why investors who already have investment experience tend to be more comfortable using the application (H2 accepted; $\chi^2 = 6.34$, $p = 0.012$), because they have higher confidence in utilizing the system, while still considering their previous experience.

Financial literacy plays an important role in bridging the two approaches. Investors who have a good level of literacy can provide the benefits and limitations of each method more wisely. They are more likely to understand how to combine traditional approaches with technology to maximize investment returns. This is in line with the results of the study which showed that financial literacy significantly affects technology acceptance (H3 accepted; OR = 2.5, $p = 0.008$). Thus, the differences in the characteristics of these two investment approaches are not only technical, but also highly dependent on internal investor factors such as trust, experience, and literacy.

This is consistent with previous findings (Bernice et al., 2024; Parashara et al., 2024; Yi et al., 2023), that trust and digital literacy are the main determinants in robo-advisor adoption. Respondents still rely heavily on recommendations from friends and family (68.42%), indicating that the social approach has a strong influence. Robo-advisor platforms need to design strategies based on education, algorithm transparency, and gamification to increase user engagement and trust.

Trust in traditional methods is also seen in risk understanding, where more respondents feel it is easier to understand risk through direct explanations than technology-based analysis. However, the use of technology in investment is still quite significant, with some respondents choosing financial applications as their main method.

In terms of investment information search, only a small portion of respondents actively search for information online, indicating that digital financial literacy still needs to be improved. The influence of friends and family in making investment decisions is also still quite large, indicating that the social environment plays an important role in a person's financial decisions.

Sustainability in investment also received attention, with the majority of respondents considering this factor important in determining their investment choices. In addition, technology is considered to have a significant role in facilitating investment decision-making, although there are still respondents who feel less confident or less familiar with financial technology.

Overall, these results suggest that while the use of technology in investment is growing, there is still a strong bias towards traditional methods. To increase the adoption of technology in investment, further education is needed regarding the benefits and convenience offered by financial technology.

CONCLUSION

This study aims to compare traditional and technology-based investment decision-making methods, and to test the influence of trust in traditional methods, investment ownership, and financial literacy on the adoption of robo-advisor applications by retail investors in Indonesia.

Based on the results of the analysis, the following conclusions were obtained:

1. Trust in traditional methods has a significant negative relationship with the use of investment applications.($r = 0.427$; $p = 0.001$). This means that the stronger investors' belief in the conventional approach, the less likely they are to adopt technology applications, although a small portion shows a hybrid adoption pattern. This confirms the importance of psychological and habitual factors in technology adoption.

2. Investment ownership has a significant impact on the comfort of using robo-advisor applications(χ^2 = 6.34; p = 0.012). Investors with more experience showed higher levels of comfort, supporting the theory that experience strengthens the adoption of digital technologies.
3. The level of financial literacy has a significant influence on the acceptance of technology in investment.(OR = 2.5; p = 0.008). Investors who understand financial principles are more likely to accept and actively use technology. This finding reinforces the role of literacy as a key foundation in digital adaptation in the financial sector.

Overall, the combination of traditional and technology-based methods can provide greater advantages in investment decision-making. Technology not only speeds up access to information and increases efficiency, but also allows investors to be more actively involved in managing their portfolios, such as rebalancing or selecting assets independently. Therefore, the selection of the right method must be adjusted to investment objectives, risk profiles, and available resources, so as to maximize potential profits and minimize risks.

Future research is recommended to involve larger and more diverse samples, use longitudinal or experimental designs, and incorporate psychological constructs such as perceived ease of use, risk, trust, and behavioral intention with a technology adoption modeling approach (e.g. TAM or UTAUT). Exploring the role of age, gender, and digital education in mediating robo-advisor adoption across income groups would also enrich a more contextual understanding.

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