Journal of Ecohumanism
2025
Volume: 4, No: 1, pp. 1626 – 1634
ISSN: 2752-6798 (Print) | ISSN 2752-6801 (Online)
https://ecohumanism.co.uk/joe/ecohumanism
DOI: https://doi.org/10.62754/joe.v4i1.5977

The Impact of Robo-Advisors and Risk Tolerance on Retail Investor Portfolio Performance

Hasanudin[1]

Abstract

The increasing adoption of financial technology has transformed investment landscapes, with robo-advisors emerging as pivotal tools for retail investors. This study explores the impact of robo-advisors and individual risk tolerance on the performance of retail investor portfolios. By employing a qualitative approach, utilizing literature review and library research methods, this paper investigates how robo-advisors facilitate portfolio diversification, optimize asset allocation, and mitigate biases that often affect traditional investment decisions. The analysis highlights the significance of aligning investment strategies with investors' risk tolerance to enhance long-term portfolio performance. Through comprehensive examination of existing academic and industry literature, the study identifies key benefits of robo-advisors, such as cost efficiency, accessibility, and data-driven insights, while also addressing potential limitations, including algorithmic rigidity and lack of personalized advisory services. Findings suggest that retail investors with varying degrees of risk tolerance can significantly improve portfolio outcomes by leveraging robo-advisors, provided they maintain a balanced approach to automated and manual investment strategies. The study concludes that the synergy between robo-advisors and personalized risk assessment serves as a crucial factor in driving optimal portfolio performance for retail investors. Future research may further investigate the dynamic relationship between evolving AI-based advisory platforms and behavioral finance principles.

Keywords: *Robo-Advisor, Risk Tolerance, Portfolio Performance, Retail Investors, Financial Technology.*

Introduction

The rise of financial technology has revolutionized the investment landscape, particularly through the introduction of robo-advisors, which provide algorithm-driven financial planning services with minimal human supervision (Syed, 2024). As retail investors increasingly seek cost-effective and accessible investment solutions, robo-advisors have become essential in democratizing financial services (Boreiko & Massarotti, 2020). Simultaneously, the psychological aspect of investing, notably risk tolerance, continues to play a critical role in shaping portfolio performance (Alsabah et al., 2021). This study seeks to explore the intersection between these technological advancements and investor psychology, emphasizing how robo-advisors interact with individual risk tolerance to influence portfolio outcomes.

Despite the growing body of research on robo-advisors and behavioral finance, a significant research gap exists in understanding how these two factors jointly impact portfolio performance (Grealish & Kolm, 2021). Previous studies have predominantly focused on the operational efficiency and cost-effectiveness of robo-advisors (Banerjee, 2024), while others have examined risk tolerance as a standalone factor influencing investment decisions (Gaspar & Oliveira, 2024). However, limited research addresses the synergy between robo-advisors and investors' psychological profiles. This paper fills this gap by investigating how risk tolerance mediates the relationship between robo-advisor usage and portfolio performance, contributing novel insights into personalized financial strategies (Salinas, 2024).

The integration of robo-advisors and risk tolerance assessment can potentially optimize portfolio performance by aligning automated strategies with individual risk preferences (Kalabayev et al., 2023). This research aims to provide actionable insights for retail investors, financial institutions, and policymakers by demonstrating how technological tools can enhance decision-making while respecting psychological boundaries (Bhatia et al., 2022). The findings could bridge the gap between technology and behavioral

[1] Universitas Nasional, Indonesia, Email: hasanudinsadikin910@gmail.com

Journal of Ecohumanism
2025
Volume: 4, No: 1, pp. 1626 – 1634
ISSN: 2752-6798 (Print) | ISSN 2752-6801 (Online)
https://ecohumanism.co.uk/joe/ecohumanism
DOI: https://doi.org/10.62754/joe.v4i1.5977

finance, fostering a more holistic approach to wealth management and improving investor confidence and financial literacy (Clarke, 2020).

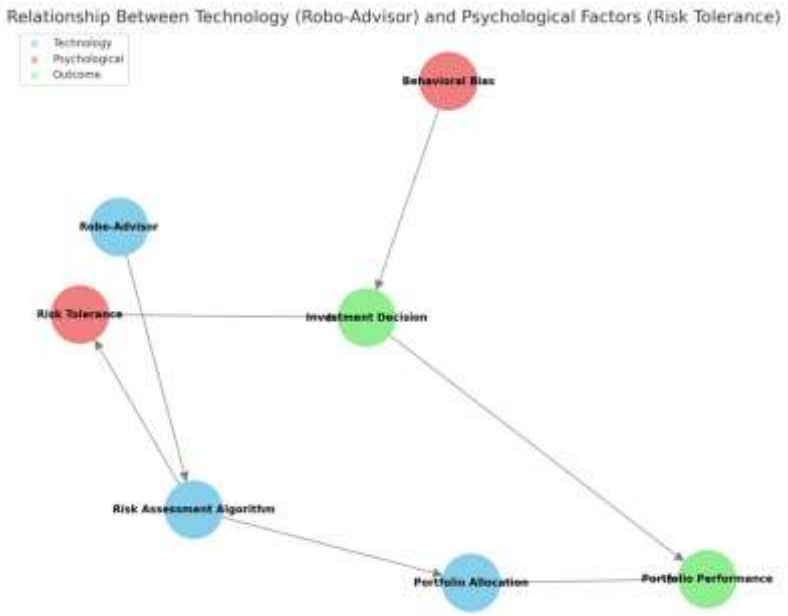
Research Method

This research employs a qualitative approach with a literature study design focusing on analyzing the impact of robo-advisor usage and risk tolerance on retail investors' portfolio performance. The study aims to understand how the two independent variables (robo-advisor and risk tolerance) influence the dependent variable (portfolio performance) through secondary data collection from various academic and industry-related sources.

Data sources for this research are derived from international journal articles, industry reports, and academic publications published in the last five years. Data sources are selected from databases such as Google Scholar, ScienceDirect, and ProQuest to ensure the quality and relevance of the information gathered ((Kommers, 2023);(Alsabah et al., 2021)).

Data collection techniques are conducted through documentation methods, namely identifying, accessing, and analyzing relevant literature focusing on the use of robo-advisors in portfolio management and the influence of psychological factors, such as risk tolerance, in investment decision-making (So, 2021). Additionally, an analysis of previous studies that separately discuss robo-advisors and risk tolerance is used to construct an integrative conceptual framework (Figueiredo, 2020) (Zhang et al., 2021).

Data analysis methods used in this research include content analysis, involving the identification of themes, patterns, and relationships between concepts found in the reviewed literature (Vijaya et al., 2024). Through this analysis, researchers can draw conclusions about how robo-advisors interact with investors' risk tolerance to influence portfolio performance (Torno & Schildmann, 2020). This analysis also enables the exploration of the advantages and limitations of robo-advisors under different market conditions and varying risk preferences (Bhatia et al., 2021).



The diagram illustrates the relationships between technological actors (like robo-advisors) and psychological factors (such as risk tolerance) in influencing investment outcomes:

- Robo-Advisors utilize risk assessment algorithms to evaluate investors' psychological factors, including risk tolerance and behavioral biases.

Journal of Ecohumanism
2025
Volume: 4, No: 1, pp. 1626 – 1634
ISSN: 2752-6798 (Print) | ISSN 2752-6801 (Online)
https://ecohumanism.co.uk/joe/ecohumanism
DOI: https://doi.org/10.62754/joe.v4i1.5977

- These algorithms shape Portfolio Allocation, aligning it with the investor's risk tolerance.
- Risk tolerance and behavioral biases collectively influence the Investment Decision, which, in turn, impacts Portfolio Performance.
- Technological outputs, such as tailored portfolios, also directly contribute to performance outcomes.

Results and Discussion

The following table contains a list of 10 scientific articles relevant to the topic The Impact of Robo-Advisors and Risk Tolerance on Retail Investors' Portfolio Performance. These articles were selected through a filtering process from Google Scholar within the last five years (2019-2024). The filtering process was conducted based on the following criteria:

Table 1. Literature Review

No	Article Title	Authors	Year	Key Findings
1	Assessment of the efficiency of investment robo-advisory	Salinas, G.A.M.	2024	Robo-advisors enhance diversification and adjust portfolios according to investors' risk tolerance.
2	Robo-advisory: From investing principles and algorithms to future developments	Grealish, A., & Kolm, P.N.	2021	Robo-advisors provide significant benefits to retail investors through automated portfolio management based on algorithms.
3	Robo-advising: Learning investors' risk preferences via portfolio choices	Alsabah, H., & Capponi, A.	2021	Robo-advisors adjust risk profiles based on investor behavior and portfolio decisions.
4	Robo-advisors-market impact and fiduciary duty of care to retail investors	Clarke, D.	2020	Robo-advisors increase portfolio efficiency but have limitations in adapting to extreme market changes.
5	How risk profiles of investors affect robo-advised portfolios	Boreiko, D., & Massarotti, F.	2020	Investor risk profiles significantly affect the composition and results of portfolios recommended by robo-advisors.
6	Portfolio management with the help of AI: What drives retail Indian investors to robo-advisors?	Banerjee, S.	2024	Psychological factors and financial literacy play a significant role in the adoption of robo-advisors among retail investors.
7	Performance of Robo-Advisors Versus Mean-Variance Theory	Figueiredo, J.G.	2020	Robo-advisors deliver competitive performance with the mean-variance theory in portfolio management.
8	Digital innovation in wealth management landscape	Bhatia, A., Chandani, A., & Mehta, M.	2022	Digital innovation through robo-advisors reduces behavioral biases in investment decisions.

Journal of Ecohumanism
2025
Volume: 4, No: 1, pp. 1626 – 1634
ISSN: 2752-6798 (Print) | ISSN 2752-6801 (Online)
https://ecohumanism.co.uk/joe/ecohumanism
DOI: https://doi.org/10.62754/joe.v4i1.5977

9	Robo Advising and Investor Profiling	Gaspar, R.M., & Oliveira, M.	2024	Robo-advisors can identify investor risk profiles more accurately than traditional methods.
10	What Do Robo-Advisors Recommend?-An Analysis of Portfolio Structure, Performance and Risk	Torno, A., & Schildmann, S.	2020	Robo-advisors produce risk-based portfolio recommendations, often more stable in the long term.

Effectiveness of Robo-Advisors in Portfolio Diversification

The main findings from various articles indicate that robo-advisors have a high capability to diversify retail investors' portfolios (Salinas, 2024). This provides small investors with the opportunity to have broader and more diversified portfolios at a lower cost compared to conventional investment managers. Such diversification helps reduce risk while enhancing potential returns.

Portfolio Adjustment Based on Risk Tolerance

Several studies highlight that robo-advisors can adjust portfolio compositions according to each investor's level of risk tolerance (Alsabah & Capponi, 2021). By utilizing historical data and behavioral analysis, robo-advisors dynamically tailor portfolio strategies in response to changes in investor risk profiles.

Reduction of Psychological Bias in Decision-Making

Bhatia et al. (2022) demonstrate that the use of robo-advisors helps reduce cognitive biases in the investment decision-making process. This is primarily due to algorithms that are based on data analysis rather than human emotions or intuition, resulting in more objective and rational investment decisions.

Limitations of Robo-Advisors in Facing Market Volatility

Although robo-advisors have advantages in portfolio management, Clarke (2020) identifies that one limitation is the lack of flexibility in responding to extreme market conditions. Robo-advisors tend to maintain passive strategies, which can sometimes be less responsive to significant changes in the financial markets.

Combination of Technology and Psychology in Portfolio Performance

Gaspar & Oliveira (2024) emphasize that the combination of robo-advisor technology and psychological factors, such as risk tolerance, yields optimal results in portfolio performance. Robo-advisors that understand investors' psychological profiles have the potential to produce portfolios that better align with the needs and long-term goals of investors.

Increased Adoption and the Role of Financial Education

Research by Banerjee (2024) shows that financial literacy plays a significant role in the adoption rate of robo-advisors among retail investors. The higher the understanding of risk and technology, the more likely investors are to use robo-advisors as the primary tool in their portfolio management.

Discussion

In an increasingly digitalized investment world, robo-advisor technology has significantly transformed portfolio management, particularly for retail investors. The combination of advanced technology and psychological factors, such as risk tolerance, plays a crucial role in determining portfolio performance. This

Journal of Ecohumanism
2025
Volume: 4, No: 1, pp. 1626 – 1634
ISSN: 2752-6798 (Print) | ISSN 2752-6801 (Online)
https://ecohumanism.co.uk/joe/ecohumanism
DOI: https://doi.org/10.62754/joe.v4i1.5977

article discusses three main aspects that influence the relationship between robo-advisors, risk tolerance, and retail investors' portfolio performance:

Robo-Advisors as a Technological Innovation in Portfolio Management

Robo-advisors have become one of the most significant milestones in the technological revolution within the financial sector. By leveraging artificial intelligence (AI) and advanced algorithms, robo-advisors offer a new approach to investment management that is more affordable and efficient. This technology breaks the old paradigm that sophisticated portfolio management is only accessible to large investors with abundant capital. Now, anyone with limited funds can participate in well-diversified investments through robo-advisor services (Hasanudin & Fera Yulianti, 2020).

One of the main attractions of robo-advisors is their ability to enhance efficiency in portfolio management. Processes that typically take time and involve numerous human interactions can now be completed in minutes. Investors simply fill out a questionnaire describing their risk profile and financial goals. Based on this data, robo-advisors automatically allocate funds into a diversified portfolio. This process not only saves time but also reduces operational costs that often burden traditional investment management services.

Additionally, robo-advisors expand access for the general public to engage in the investment world. Previously, financial advisory services often required high fees and minimum investment amounts that were out of reach for most individuals. With robo-advisors, these barriers can be overcome, allowing more people the opportunity to build their wealth through financial markets. This inclusivity plays a crucial role in democratizing investment and promoting financial literacy across various groups.

Another significant advantage is the ability to reduce emotional bias in investment decision-making. Emotions, such as fear and greed, are often the main enemies of investors, especially during volatile market conditions. Robo-advisors operate based on data and tested algorithms, making investment decisions more rational and measured. This helps investors remain disciplined in executing long-term investment strategies without being swayed by short-term market fluctuations.

Portfolio diversification is also a standout feature offered by robo-advisors. With algorithms programmed to spread investments across various asset classes, robo-advisors help mitigate risks associated with reliance on a single sector or instrument. This diversification is crucial for maintaining portfolio stability, particularly in the face of global economic uncertainty. With a well-diversified portfolio, the risk of loss can be minimized, and the potential for long-term gains is better preserved.

Robo-advisors also provide a high level of flexibility and customization, allowing users to adjust their investment strategies according to their individual needs and preferences. Investors can determine the level of risk they are willing to take, as well as set investment goals, such as retirement funds, children's education, or property purchases. This flexibility enables individuals to have full control over their portfolios without needing extensive expertise in market analysis.

While robo-advisors offer numerous advantages, it is essential for investors to maintain a basic understanding of investment principles. Although robo-advisors can automate many aspects of portfolio management, understanding how diversification, risk management, and market trends work will help investors maximize the benefits of this technology. With a combination of basic knowledge and advanced technology, investors can make more informed and accurate decisions.

On the other hand, robo-advisors have limitations that need to be considered. Although algorithms can handle most scenarios, there are times when market conditions require human intervention that is more intuitive. In extreme market situations or during a global financial crisis, human abilities to read market sentiment and make tactical decisions can be an advantage that machines find hard to replicate. Therefore, some investors choose a hybrid approach that combines robo-advisor services with consultations from professional investment managers.

Journal of Ecohumanism
2025
Volume: 4, No: 1, pp. 1626 – 1634
ISSN: 2752-6798 (Print) | ISSN 2752-6801 (Online)
https://ecohumanism.co.uk/joe/ecohumanism
DOI: https://doi.org/10.62754/joe.v4i1.5977

The adoption of robo-advisors also reflects a shift in the behavior of younger investors who are more tech-savvy. Millennials and Gen Z, who grew up in the digital age, are more comfortable entrusting their financial management to technology-based platforms than conventional methods. This trend is expected to continue as the demand for fast, easy, and transparent investment solutions increases.

Overall, robo-advisors have brought significant changes to how people manage their wealth. With the efficiency, accessibility, and objectivity they offer, this technology has great potential to become a cornerstone of the financial industry in the future. For retail investors, robo-advisors are tools that allow them to engage in global financial markets more simply and affordably, opening new opportunities to achieve long-term financial goals.

The Role of Risk Tolerance in Investment Decision-Making

Risk tolerance plays a crucial role in shaping an investor's behavior and decisions in the financial markets. Each individual has a different level of tolerance, depending on various personal and situational factors. A deep understanding of risk tolerance not only helps investors select appropriate investment instruments but also maintains emotional and mental stability when facing unpredictable market dynamics. In the long term, awareness of risk tolerance allows investors to remain consistent with the investment strategies they have designed.

Risk tolerance is generally defined as an investor's ability and willingness to endure potential losses in their investments. This concept is often associated with how much market volatility an investor can bear without feeling anxious or disturbed. In practice, risk tolerance is divided into three main categories: conservative, moderate, and aggressive. Conservative investors prioritize stability and security, opting for low-risk instruments such as government bonds or deposits. Conversely, aggressive investors are more willing to pursue opportunities with high potential returns, despite the significant risks involved, such as stocks or cryptocurrencies.

Many factors influence an individual's level of risk tolerance. Age is one of the most frequently mentioned factors in investment literature. Younger investors generally have a higher risk tolerance because they have more time to recover from potential losses. On the other hand, investors nearing retirement tend to reduce their exposure to high-risk assets to ensure the stability and security of their funds. In addition to age, other factors such as income, investment experience, and financial goals also play a role in determining how much risk an investor can accept.

Investment experience plays a significant role in increasing risk tolerance. Investors who have been involved in the market for a long time tend to have a better understanding of market cycles and can manage their emotions more effectively. They are better at distinguishing between short-term market fluctuations and long-term trends. In contrast, novice investors may panic when facing portfolio declines, prompting impulsive decisions such as selling assets when prices are low. Therefore, gradual education and experience in investing are key to improving risk tolerance.

Risk tolerance directly impacts how investors allocate assets within their portfolios. Investors with high risk tolerance tend to have a larger portion of stocks, as stocks offer higher growth potential despite their volatility. Conversely, investors with low risk tolerance prefer bonds or money market funds, which provide stability but yield lower returns. Diversification is one of the primary strategies to balance risk and return, allowing investors to have a combination of assets that complement each other under various market conditions.

Finding the right balance between risk and return is a key element in successful portfolio management. Investors must understand that no investment is entirely risk-free. Even instruments considered safe, such as government bonds, still carry some risk, albeit at a lower level. Therefore, it is essential for investors to determine the level of risk that aligns with their profile and adjust their portfolios periodically as their financial situation and life goals change.

Journal of Ecohumanism
2025
Volume: 4, No: 1, pp. 1626 – 1634
ISSN: 2752-6798 (Print) | ISSN 2752-6801 (Online)
https://ecohumanism.co.uk/joe/ecohumanism
DOI: https://doi.org/10.62754/joe.v4i1.5977

An effective way to manage risk is through diversification across sectors and asset classes. Diversification prevents the portfolio from being overly reliant on the performance of a single type of asset. When one sector experiences a downturn, another sector with positive performance can help offset the overall impact of losses. In other words, diversification is a preventive measure that can keep a portfolio stable even during market turbulence.

However, it is important to remember that diversification alone is not the only solution. Investors must actively monitor portfolio performance and rebalance it as needed. Rebalancing is the process of readjusting the proportions of assets in a portfolio to ensure they remain aligned with the investor's risk tolerance and financial goals. Without rebalancing, portfolios can become too risky or too conservative over time, potentially hindering long-term asset growth.

From a psychological perspective, understanding risk tolerance can also help investors manage stress and emotions when facing market uncertainty. Investors who are fully aware of their tolerance limits tend to remain calm and confident in their decision-making. They are less likely to be swayed by negative news or short-term trends that could trigger impulsive actions. Thus, having a strong understanding of risk tolerance not only impacts financial outcomes but also contributes to the investor's mental well-being.

In conclusion, risk tolerance is a fundamental aspect that every investor must understand before embarking on their investment journey. By recognizing the level of risk they can accept, investors can design more targeted strategies aligned with their long-term financial goals. This understanding will help create a balanced portfolio capable of withstanding various market conditions, thereby increasing the chances of achieving consistent investment success

The Synergy Between Robo-Advisors and Risk Tolerance in Portfolio Performance Optimization

The synergy between robo-advisors and investor risk tolerance has significantly transformed how investors manage their portfolios. By combining advanced technology with a deep understanding of investor psychology, robo-advisors create personalized and effective solutions for optimizing portfolio performance. This approach not only ensures well-diversified portfolios but also guarantees that the applied investment strategies align with each individual's comfort level and risk profile.

Portfolio adaptation based on risk tolerance is a crucial initial step in this process. When an investor starts using a robo-advisor service, they are required to fill out a questionnaire that assesses their willingness to take on risk. This questionnaire includes questions about financial goals, investment horizons, and reactions to market fluctuations. The algorithm then uses this data to build a portfolio that reflects the investor's unique risk profile. In this way, the resulting portfolio truly mirrors the investor's comfort level and expectations.

Over time, robo-advisors not only build portfolios but also manage them dynamically. In response to changing market conditions or shifts in investor risk tolerance, robo-advisors can automatically adjust asset allocations. For example, if an investor becomes more conservative as they age, the robo-advisor will reduce exposure to high-risk stocks and increase the proportion of bonds or more stable assets. This approach ensures that the portfolio remains relevant and aligned with evolving financial needs.

Additionally, portfolio evaluation and rebalancing are conducted regularly. Robo-advisors continuously monitor portfolio performance to ensure that asset distribution remains consistent with the initial risk profile. When the proportion of a particular asset grows beyond the desired threshold, the robo-advisor rebalances by selling part of that asset and reallocating funds to underperforming assets. Rebalancing is key to maintaining a balance between risk and potential returns, ensuring consistent portfolio performance in the long term.

Journal of Ecohumanism
2025
Volume: 4, No: 1, pp. 1626 – 1634
ISSN: 2752-6798 (Print) | ISSN 2752-6801 (Online)
https://ecohumanism.co.uk/joe/ecohumanism
DOI: https://doi.org/10.62754/joe.v4i1.5977

One of the greatest benefits of this synergy is increased investor confidence in portfolio management. Many retail investors feel uncertain and hesitant when making investment decisions, especially during periods of market uncertainty. By using a robo-advisor, decisions are based on objective data analysis and well-tested algorithms. This combination reduces emotional bias and ensures that every step taken is grounded in solid reasoning. Over time, this creates a more stable and satisfying investment experience.

Furthermore, the synergy between technology and psychology positively impacts financial literacy. Investors who initially had only a basic understanding of investing can learn more through reports and analyses provided by robo-advisors. This process offers new insights into how financial markets operate and how various factors, including risk tolerance, influence portfolio performance. As a result, robo-advisors serve not only as investment tools but also as educational platforms that promote financial literacy growth.

In practice, using robo-advisors also helps investors prepare for an uncertain future. With automated and flexible portfolio management, investors can rest assured that their assets are managed optimally even if they do not monitor the market daily. This is particularly beneficial for individuals with busy schedules or limited knowledge of financial analysis. Robo-advisors become trusted partners that tirelessly work to ensure portfolios continue to grow in line with established goals.

However, it is essential to note that while robo-advisors offer numerous conveniences, investors must still take the time to understand how this technology operates. Understanding how algorithms make decisions and how risk tolerance data affects investment strategies will help investors maximize the benefits of these services. By doing so, investors can make more informed and proactive decisions in designing long-term investment strategies.

The author believes that the synergy between technology and psychology will become the new standard in modern investing. In the coming years, robo-advisor services are expected to evolve further, integrating more sophisticated technologies such as artificial intelligence and predictive analytics. This will elevate portfolio management to a more personalized and precise level, enabling investors to achieve their financial goals more efficiently.

In conclusion, the integration of robo-advisors and risk tolerance offers numerous benefits to retail investors. By combining accurate data analysis with a deep understanding of investor psychology, robo-advisors create a safer, more comfortable, and productive investment experience. This approach not only optimizes portfolio performance but also helps investors build a stronger and more sustainable financial foundation for the future.

By utilizing robo-advisors and understanding risk tolerance, retail investors have a greater chance of achieving their financial goals without having to spend excessive time on active investment management.

Conclusion

The integration of robo-advisors and risk tolerance assessment has significantly transformed the landscape of retail investment. As demonstrated by various studies, robo-advisors enhance portfolio performance by automating asset allocation, reducing emotional biases, and ensuring consistent diversification. This technology enables retail investors to access sophisticated investment strategies that were previously exclusive to high-net-worth individuals. Additionally, aligning portfolio strategies with individual risk tolerance results in better investment outcomes, fostering greater confidence and stability among investors.

The research highlights that the synergy between robo-advisors and psychological factors, such as risk tolerance, plays a critical role in optimizing portfolio performance. By dynamically adjusting portfolios based on investor behavior and market conditions, robo-advisors offer a personalized investment experience. However, while robo-advisors are highly effective in stable market conditions, limitations remain in their responsiveness to extreme market fluctuations. This emphasizes the need for continuous innovation to enhance algorithmic adaptability in volatile environments.

Journal of Ecohumanism
2025
Volume: 4, No: 1, pp. 1626 – 1634
ISSN: 2752-6798 (Print) | ISSN 2752-6801 (Online)
https://ecohumanism.co.uk/joe/ecohumanism
DOI: https://doi.org/10.62754/joe.v4i1.5977

Future studies could delve deeper into the long-term performance comparison between robo-advised and manually managed portfolios during periods of market crisis. Exploring how artificial intelligence and machine learning can improve robo-advisors' adaptability to sudden market changes is essential. Additionally, further research could investigate the psychological profiles of retail investors to develop more accurate risk tolerance assessment tools, enabling a more tailored and effective portfolio management experience. Expanding research across diverse demographic and geographic segments would also provide a more comprehensive understanding of robo-advisor adoption and its impact on global retail investors.

Conflicts of Interest

The author(s) declare that there are no conflicts of interest regarding the publication of this paper.

References

Alsabah, H., Capponi, A., Ruiz Lacedelli, O., & Stern, M. (2021). Robo-advising: Learning investors' risk preferences via portfolio choices. Journal of Financial Econometrics, 19(2), 369–392.

Banerjee, S. (2024). Portfolio management with the help of AI: What drives retail Indian investors to robo-advisors? The Electronic Journal of Information Systems in Developing Countries, e12346.

Bhatia, A., Chandani, A., Atiq, R., Mehta, M., & Divekar, R. (2021). Artificial intelligence in financial services: a qualitative research to discover robo-advisory services. Qualitative Research in Financial Markets, 13(5), 632–654.

Bhatia, A., Chandani, A., Divekar, R., Mehta, M., & Vijay, N. (2022). Digital innovation in wealth management landscape: the moderating role of robo advisors in behavioural biases and investment decision-making. International Journal of Innovation Science, 14(3/4), 693–712.

Boreiko, D., & Massarotti, F. (2020). How risk profiles of investors affect robo-advised portfolios. Frontiers in Artificial Intelligence, 3, 60.

Clarke, D. (2020). Robo-advisors-market impact and fiduciary duty of care to retail investors. Available at SSRN 3539122.

Figueiredo, J. G. (2020). Performance of Robo-Advisors Versus Mean-Variance Theory. Universidade de Lisboa (Portugal).

Gaspar, R. M., & Oliveira, M. (2024). Robo Advising and Investor Profiling. FinTech, 3(1), 102–115.

Grealish, A., & Kolm, P. N. (2021). Robo-advisory: From investing principles and algorithms to future developments. SSRN Electronic Journal, 1–29.

Hasanudin, D. T. A., & Fera Yulianti. (2020). Jurnal Rekayasa Informasi, Vol..9 , No.1, April 2020. Jurnal Rekayasa Informasi, 9(1), 6–19.

Kalabayev, A., Adilkhanova, A., & Nurguzhina, A. (2023). The Future of Retail Investing: Goal-Oriented Asset Allocation Platforms. 2023 IEEE International Conference on Smart Information Systems and Technologies (SIST), 202–207.

Kommers, D. (2023). The role of robo-advising in the asset management industry: a study on differences in robo-advised portfolio compositions for investors with similar risk. University of Twente.

Salinas, G. A. M. (2024). Assessment of the efficiency of investment robo-advisory. Vilniaus universitetas.

So, M. K. P. (2021). Robo-advising risk profiling through content analysis for sustainable development in the Hong Kong financial market. Sustainability, 13(3), 1306.

Syed, W. K. (2024). How AI-driven Robo-Advisors Impact Investment Decision-making and Portfolio Performance in the Financial Sector: A Comprehensive Analysis. 11.

Torno, A., & Schildmann, S. (2020). What Do Robo-Advisors Recommend?-An Analysis of Portfolio Structure, Performance and Risk. Enterprise Applications, Markets and Services in the Finance Industry: 10th International Workshop, FinanceCom 2020, Helsinki, Finland, August 18, 2020, Revised Selected Papers 10, 92–108.

Vijaya, C., Hati, K., & Thenmozhi, M. (2024). Developing a Security Risk Assessment based Smart Beta Portfolio Model for Robo Advising. Australasian Accounting, Business and Finance Journal, 18(3), 7–25.

Zhang, L., Pentina, I., & Fan, Y. (2021). Who do you choose? Comparing perceptions of human vs robo-advisor in the context of financial services. Journal of Services Marketing, 35(5), 634–646.