

MASTERARBEIT | MASTER'S THESIS

Titel | Title

The Transformation of Asset Management: Evaluating the Impact of AI-Driven
Robo-Advisors

verfasst von | submitted by

Cedric Theodore Antoine Kurek BSc

angestrebter akademischer Grad | in partial fulfilment of the requirements for the degree of
Master of Science (MSc)

Wien | Vienna, 2025

Studienkennzahl lt. Studienblatt |
Degree programme code as it appears on the
student record sheet:

UA 066 914

Studienrichtung lt. Studienblatt | Degree pro-
gramme as it appears on the student record
sheet:

Masterstudium Internationale Betriebswirtschaft

Betreut von | Supervisor:

ao. Univ.-Prof. i.R. Mag. Dr. Josef Windsperger

Abstract

The rise of AI-driven robo-advisors has significantly disrupted the traditional asset management industry, challenging established practices and reshaping client interactions. This study addresses the current research gap in the literature and the problem of understanding the comparative performance, cost-efficiency, and broader implications of robo-advisors in various market conditions while exploring their impact on client trust, regulatory frameworks, and workforce dynamics.

A systematic literature review was conducted using a structured methodology, focusing on peer-reviewed articles and industry reports published over the past five years. Key areas of analysis included performance metrics, cost structures, client engagement, ethical considerations, and workforce implications. The findings reveal that robo-advisors excel in cost efficiency and accessibility, broadening financial inclusion for underserved demographics. While effective in stable markets, they struggle to adapt during volatility. Transparency, data security, and algorithmic fairness are vital for trust-building. Hybrid models combining AI with human expertise show promise in addressing complex needs.

This study provides a more comprehensive understanding to the exiting literature of both the technical and human-centric dimensions of robo-advisory services through a comprehensive overview of its implications for the asset management industry.

Keywords: robo-advisors, asset management, financial technology

Table of Contents

Abstract	II
List of Figures	V
List of Tables.....	VI
1. Introduction.....	1
1.1. Background and Problem Statement.....	1
1.2. Research Goals and Questions.....	3
1.3. Structure of the Thesis	5
2. Theoretical Background	7
2.1. Asset and Investment Management.....	7
2.2. Robo-Advisors in Investment Management.....	11
2.3. Performance Metrics and Market Conditions of AI and Robo-Advisors	13
2.3.1. Key Performance Metrics and Performance of Robo-Advisors	13
2.3.2. Market Conditions and Robo-Advisor Performance	15
2.3.3. German Market for Robo-Advisors.....	17
2.4. Cost Efficiency and Democratization of Services.....	19
2.5. Client Trust, Perception, and Engagement	21
2.5.1. Building Client Trust	21
2.5.2. Client Perception.....	21
2.5.3. Impact of Familiarity and Trust Moderators	22
2.5.4. Client Engagement.....	22
2.6. Regulatory and Ethical Challenges	23
2.7. Impact on Employment and Professional Development.....	24
2.8. Institutional Adaptation and Resistance.....	24
3. Methodology.....	26
3.1. Research Design.....	26
3.2. Research Protocol.....	28

3.3.	Tools and Resources	29
4.	Analysis and Findings	30
4.1.	PRIMA Results	30
4.2.	Concept Matrix	31
4.3.	Thematic Analysis	34
4.3.1.	Client Trust and Perception	34
4.3.2.	Performance.....	38
4.3.3.	Cost and Fee Structures	40
4.3.4.	Democratization of Access to Investment Services	42
4.3.5.	Client Engagement and Adoption Drivers	44
4.3.6.	Regulation and Ethics	46
4.3.7.	Employment and Human Advisors	48
4.3.8.	Market Conditions, Investment Strategy, and Portfolio Allocation	50
4.3.9.	Sustainability	53
4.4.	Summary of the Literature Review	54
5.	Discussion	56
5.1.	Interpretation of the Findings.....	56
5.2.	Implications for the Financial Industry	58
5.3.	Implications for Client Relationship Dynamics.....	59
5.4.	Implications for the Employees	60
5.5.	Limitations of the Study	62
6.	Conclusion.....	64
6.1.	Summary of the Key Findings	64
6.2.	Contribution to Knowledge and Literature	66
6.3.	Recommendations for Practice and Policy	67
6.4.	Futures Areas of Research.....	68
	References	70

List of Figures

Figure 1: Traditional investment management process	9
Figure 2: Robo-advisors value chain vs. traditional financial advisors	12
Figure 3: German landscape of robo-advisors.....	18
Figure 4: SLR process	26
Figure 5: PRISMA flow chart of the search results	30

List of Tables

Table 1: Performance of selected robo-advisors worldwide 2021	16
Table 2: Minimum investment for select platforms	20
Table 3: Concept matrix	33
Table 4: Client Trust and Perception Sub-Themes.	35
Table 5: Performance Sub-Themes.	38
Table 6: Cost and Fee Structure sub-themes	41
Table 7: Democratization of Access to Investment Services Sub-Themes.	42
Table 8: Client Engagement and Adoption Drivers Sub-Themes.....	44
Table 9: Regulation and Ethics Sub-Themes.....	47
Table 10: Employment and Human Advisors Sub-Themes.....	49
Table 11: Market Conditions, Investment Strategy, and Portfolio Allocation Sub-Themes.....	51
Table 12: Sustainability Sub-Themes.	53

1. Introduction

1.1. Background and Problem Statement

The financial industry is undergoing a profound transformation, driven by rapid advancements in technology and the integration of artificial intelligence (AI) across various sectors. One of the most significant innovations in recent years is the emergence of AI-driven robo-advisors, which have fundamentally altered the landscape of asset and wealth management (Shanmuganathan, 2020, p. 1). These automated platforms provide financial advice and portfolio management services, using sophisticated algorithms and data analytics to offer personalized investment strategies. As the adoption of robo-advisors grows, they are not only challenging the traditional asset management models but also reshaping how financial services are delivered, accessed, and experienced by clients (Shanmuganathan, 2020, p. 8).

Historically, investment management has been dominated by human financial advisors. However, the process, which starts from sourcing the products until finally manually executing the transactions, can be time-consuming, costly, and often accessible only to clients with substantial wealth (Phoon & Koh, 2018, p. 84). In this context, robo-advisors emerged in the mid-2000s in response to the limitations of traditional wealth management (Reher & Sokolinski, 2024, p. 4). More specifically, the first robo-advisors emerged after the 2008 financial crisis as automated and passive investment management tools, gaining popularity due to investor preference for low-risk, cost-effective, and passive portfolio management in a low-interest rate environment (Phoon & Koh, 2018, p. 80). The share of Robo advice in the financial industry achieved in 2017 a value of \$200 billion in assets under management worldwide (Hildebrand & Bergner, 2020, p. 659). The United States leads in the value of assets managed by robo-advisors, surpassing \$650 billion in 2020 (Capponi et al., 2020, p. 1).

Robot advisors offer several benefits. They are highly customizable, utilizing complex algorithms, AI, and data analytics in order to tailor portfolios to individual financial circumstances, with the potential to improve investment recommendations and better manage clients' behavior and needs over time (Phoon & Koh, 2018, p. 91). Furthermore, they provide low-cost access to diversified portfolios (Scherer & Lehner, 2023, p. 85). Due to these benefits, researchers expect robo-advisors to democratize the use of financial advisor services to a wider range of clients (Belanche et al., 2019, p. 1412).

Despite these benefits, the rise of robo-advisors presents significant challenges and uncertainties for the traditional asset management sector. The main challenge for a robo-advisor is to execute different asset allocations systematically without human intervention (Bourgeron et al., 2018, p. 2). Furthermore, the rapid adoption of AI-driven solutions raises questions about the long-term viability of human advisors, the quality of advice provided by algorithms, and the broader implications for client trust and engagement. However, Robo advice requires a high level of trust about fair and unbiased treatment in the autonomous decision-making algorithm (Kofman, 2024, p. 2). Furthermore, because these tools are praised for their efficiency, cost savings, and ability to handle large volumes of data, concerns arise regarding their adaptability in unpredictable market conditions, transparency, and the ethical considerations surrounding automated decision-making (Shanmuganathan, 2020, p. 7). These factors present a complex and evolving landscape that requires in-depth examination to understand the full extent of the impact of AI-driven technologies on asset management.

A key aspect of this transformation is the increasing importance of data analytics and machine learning in the decision-making process. Robo-advisors rely on vast amounts of financial data, historical trends, and predictive analytics to make investment decisions (Shanmuganathan, 2020, p. 3). This reliance on data and algorithms not only enhances efficiency but also introduces potential risks, such as algorithmic biases, lack of human intuition, and over-reliance on technology. Traditional asset managers, who have typically depended on human judgment and qualitative analysis, find themselves at a crossroads, needing to adapt to this new AI-driven environment. Automation in portfolio optimization is therefore considered a big issue in investment management (Bourgeron et al., 2018, p. 40). Robo-advisors are likely to replace traditional wealth managers for clients with simpler needs due to their cost-effectiveness and accessibility, but high-net-worth and sophisticated investors may continue to prefer traditional wealth managers for more complex services (Phoon & Koh, 2018, p. 94).

The problem, therefore, lies in understanding the true impact of AI-driven robo-advisors on the asset management sector (Shanmuganathan, 2020, p. 8). Their rise poses questions about the sustainability of traditional advisory models, as traditional financial advice suffers from agency conflicts and behavioral biases (Reher & Sokolinski, 2024, p. 5). Moreover, there is a need to examine how robo-advisors perform across different

market conditions, especially during periods of volatility, and whether they can provide the same level of adaptability and resilience as experienced human advisors.

Research about robo-advisors is still very limited, in this field (Belanche et al., 2019, p. 1412). Different research gaps have been identified, such as how conversational interfaces of robo-advisors can be designed to express brand-consistent personality traits and examine how these interfaces might impact consumer-firm relationships (Hildebrand & Bergner, 2020, p. 673). While interest in cost advantages and scalability has grown, the overall body of literature remains limited in its exploration of how robo-advisors fare over longer time horizons and under diverse economic and customer conditions (Belanche et al., 2019, p. 1412). Existing research also tends to focus on narrow aspects such as user adoption or single-market case studies, leaving gaps in understanding the deeper interplay between algorithmic transparency, trust, and performance in multiple market scenarios (Hildebrand & Bergner, 2020, p. 673). Hence, the central problem addressed in the present study is the disruption caused by AI-driven robo-advisors in the asset management sector, examining their impact on traditional practices, client relationships, cost structures, and regulatory frameworks. As the industry navigates through this disruption, it becomes imperative to evaluate the effectiveness and potential benefits of robo-advisors through a comprehensive study (Abdi & Aysan, 2024, p. 536). Therefore, this study aims to contribute to the broader discourse on the role of AI in finance and provide valuable insights into the future of asset management in an increasingly technology-driven world.

1.2. Research Goals and Questions

The primary goal of the present study is to critically evaluate the impact of AI-driven robo-advisors on the traditional asset management industry through a systematic literature review. The study aims to explore how robo-advisors are reshaping asset management practices, assessing their influence on performance, cost efficiency, client relationships, regulatory frameworks, and employment within the finance sector. By examining these aspects, the study seeks to provide a comprehensive understanding of how AI technologies are transforming the asset management landscape and the implications for future trends. To address the research goal, the following research questions have been formulated:

- **How do AI-driven robo-advisors perform in various market conditions compared to traditional asset managers, particularly in terms of adaptability, resilience, and long-term investment strategies?**

This question directly addresses the goal of conducting a comparative performance analysis between robo-advisors and traditional asset managers. By examining their adaptability and resilience in different market scenarios, the research will provide insights into how AI-driven approaches stack up against human-led strategies, offering an understanding of their strengths and limitations.

- **To what extent do robo-advisors offer more cost-effective and democratized financial advice, and how is this influencing the accessibility and inclusiveness of asset management services?**

This question aligns with the goal of evaluating the cost and accessibility implications of robo-advisors. It helps assess whether robo-advisors are genuinely democratizing access to financial advice and services by lowering costs, thereby contributing to understanding how they influence broader market accessibility and inclusion.

- **How does the integration of AI in asset management impact client perceptions, trust levels, and engagement compared to traditional human advisors?**

Addressing this question contributes to the goal of examining client relationship dynamics in the AI-driven era. Understanding how AI influences trust and engagement will shed light on how robo-advisors affect client satisfaction and the evolving nature of client-advisor relationships in the digital age.

- **What are the key regulatory and ethical challenges associated with the rise of robo-advisors, particularly concerning data privacy, algorithm transparency, and automated decision-making?**

This question supports the goal of conducting a regulatory and ethical analysis by exploring the challenges that AI-driven robo-advisors pose. It helps identify the potential risks and regulatory considerations that must be addressed, providing a comprehensive view of how AI integration affects the asset management industry's ethical and legal landscape.

- **How are robo-advisors affecting employment and the role of financial advisors in the asset management industry, and what skills are becoming essential in this evolving landscape?**

This question is crucial for understanding the employment impact of AI on the finance sector. It examines how robo-advisors are transforming job roles, skills, and opportunities within asset management, thereby providing insights into how the workforce must adapt to thrive in an increasingly AI-driven environment.

1.3. Structure of the Thesis

The second chapter of this thesis explores first a detailed analysis of AI and robo-advisors in finance, examining their application in the financial sector and how they compare with traditional asset management practices. The chapter also investigates the performance metrics of AI-driven solutions, their impact on cost efficiency and democratization of services, client trust and engagement dynamics, regulatory and ethical challenges, the effects on employment and professional development, and how traditional financial institutions are adapting to or resisting these innovations.

The third chapter about the research methodology outlines the research design and methodology employed in this study. It details the systematic literature review approach, data collection methods, and analytical techniques used to investigate the impact of robo-advisors on asset management. This chapter explains the rationale behind the chosen methodology, the process of data collection, the analytical techniques applied, and the tools and resources used in conducting the research.

The fourth chapter contains the analysis and findings, and it presents the results of the research, providing a detailed analysis of the data collected. It includes a descriptive analysis of key trends and patterns observed, the use of a concept matrix to organize the main themes, and a thematic analysis that identifies and discusses the emerging themes.

A discussion of the results will be presented in chapter five, and the findings will be interpreted in light of the research goals and questions, relating them to the broader context of the asset management industry. This chapter explores the implications of the findings for the financial industry, focusing on how AI-driven robo-advisors influence asset management practices, client relationship dynamics, and employment within the sector. It offers an in-depth analysis of how the introduction of AI in asset management

affects various stakeholders and identifies key challenges and opportunities for traditional financial institutions.

In the final chapter, a conclusion is drawn, and the key findings and contributions of the research are summarized, reflecting on how AI-driven robo-advisors are transforming the asset management landscape. The chapter discusses the study's contribution to academic knowledge and practical implications for the financial industry. Additionally, this chapter suggests areas for future research.

2. Theoretical Background

This chapter provides a theoretical foundation for understanding the impact of AI-driven robo-advisors on asset management. It begins by explaining the investment management process as executive in traditional finance. Furthermore, it discusses the emergence of AI and robo-advisors in finance, examining their influence on performance metrics, cost efficiency, client engagement, and regulatory challenges. Additionally, it addresses their impact on employment, professional development, and how traditional financial institutions are adapting or resisting this technological shift.

2.1. Asset and Investment Management

Asset and investment management is an essential activity in the financial services industry. It involves the professional handling, either institutional or on an individual basis, of assets on behalf of a diverse set of potential clients (Basile & Ferrari, 2016, p. 4). Such assets can be equity, corporate bonds, asset-backed securities, alternative investments, and similar investments (Basile & Ferrari, 2016, p. 13). Traditionally, the investment process starts with the definition of the investment policy. This process consists of five steps: identification of objectives and constraints, formalization of the investment policy, implementation of the financial strategy, periodic portfolio rebalancing, and performance assessment and risk control (Basile & Ferrari, 2016, p. 79).

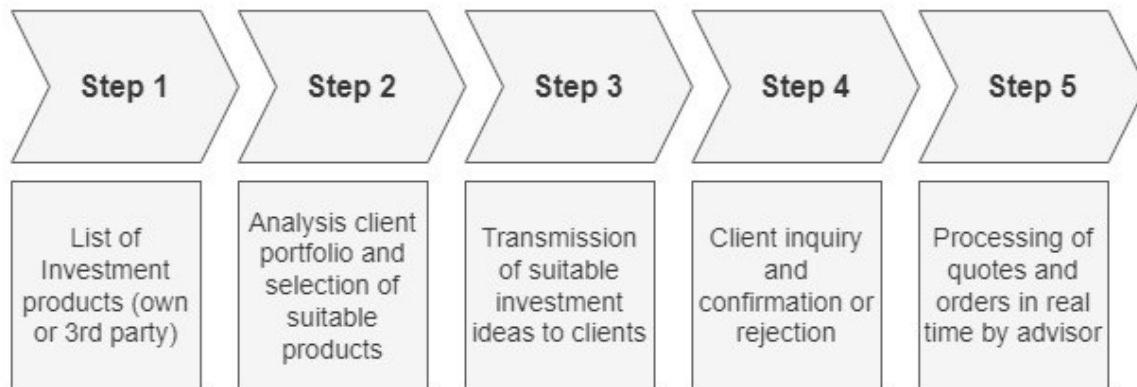
- **Identification of objectives and constraints.** The initial stage involves clearly identifying the investor's objectives and constraints (Basile & Ferrari, 2016, p. 79). This involves determining the investor's goals, risk-return preferences, and whether the policy is based on asset-liability management (requiring strict control over liabilities) or asset-only investment strategies (focusing on optimal asset allocation) (Basile & Ferrari, 2016, pp. 79-80). Constraints influencing the policy include liquidity requirements, time horizon, tax treatment, regulatory obligations, and institution-specific factors, all of which impact risk tolerance and portfolio construction (Basile & Ferrari, 2016, p. 80). These elements shape the investment policy, ensuring it aligns with the investor's obligations and preferences.
- **Formalization of the investment policy.** After defining the objectives and constraints, institutional investors must identify a financial strategy that achieves efficient risk-return combinations over time (Basile & Ferrari, 2016, p. 82). This

requires formalizing the investment policy's objectives, implementation criteria, responsibilities, and control systems, while also deciding on the investment approach, financial instruments, risk constraints, management style, method, and organizational structure, with periodic reviews to ensure effectiveness (Basile & Ferrari, 2016, p. 82).

- **Implementation of the financial strategy.** The implementation of the financial strategy involves either a bottom-up or top-down approach (Basile & Ferrari, 2016, p. 82). The bottom-up method focuses on selecting individual securities first, while the top-down approach emphasizes strategic asset allocation before selecting specific financial instruments (Basile & Ferrari, 2016, pp. 82-83). Institutional investors typically use the top-down approach due to its advantages in reducing forecasting errors, enhancing diversification, and aligning with hierarchical decision-making structures. This approach involves three stages: strategic asset allocation, tactical asset allocation (market timing), and stock picking (Basile & Ferrari, 2016, p. 83).
- **Periodic portfolio rebalancing.** Portfolio rebalancing is an ongoing process where adjustments are made to ensure that the portfolio remains aligned with the original investment policy and objectives (Basile & Ferrari, 2016, p. 90). While a "buy-and-hold" strategy (non-rebalancing) minimizes transaction costs, it can lead to deviations from the original risk profile, loss of risk control, and increased exposure to market volatility (Basile & Ferrari, 2016, p. 91). In contrast, the "constant-mix" strategy periodically restores asset class weights and can be implemented through calendar-based rebalancing, threshold-triggered adjustments, or maintaining asset allocations within set ranges, ensuring alignment with the investor's risk-return objectives (Basile & Ferrari, 2016, pp. 91-92).
- **Performance assessment and risk control.** The final stage of the investment process is performance assessment and risk control, which begins with calculating portfolio returns using appropriate measures (Basile & Ferrari, 2016, p. 93). This stage also involves evaluating risk-adjusted performance, comparing against benchmarks and peers, and using attribution models to identify factors contributing to portfolio performance, ensuring alignment with financial objectives and risk thresholds (Basile & Ferrari, 2016, p. 95).

Once the policy has been defined, the proper investment management happens with customers. Traditionally, this process has been managed by human financial advisors. The process consists typically of five steps, as shown in Figure 1.

Figure 1: Traditional investment management process



Source: own elaboration, based on Phoon & Koh, 2018, p. 83.

- The process begins with a selection of investment products, which can be offered by the managing company itself (own products) or sourced from third parties. These investment products could include various assets such as stocks, bonds, mutual funds, or other financial instruments (Phoon & Koh, 2018, p. 83).
- In the next step, the financial advisor or investment manager analyzes the client's existing portfolio, along with the available investment products. The goal is to select the most suitable products that align with the client's financial objectives, risk tolerance, and investment strategy (Phoon & Koh, 2018, p. 83).
- Once the investment ideas and strategies are identified, they are communicated to the client through various service channels (Phoon & Koh, 2018, p. 83).
- Then, the client engages with the advisor to discuss the proposed investment ideas. Clients can inquire about the details, seek further clarification, or express concerns. They then have the option to confirm or reject the investment order based on their preferences and understanding of the proposed strategy (Phoon & Koh, 2018, p. 83).
- The final step involves the processing of investment orders. Once the client confirms the investment decision, each quote and order request is executed in real-time by the advisor or investment management platform (Phoon & Koh, 2018, p. 83).

In recent years, asset and investment management is being transformed by digital asset management platforms (DAMPs), which, like other digital platforms, restructure the market, leading to a winner-take-all centralization despite the promise of technology-driven decentralization (Haberly et al., 2019, p. 167). This goes hand in hand with new trends in financial technology (fintech) and digital platform economy. These platforms disrupt traditional industries by improving market efficiency (allocative, informational, and functional) but often achieve competitiveness through organizational arbitrage, externalizing costs to users and workers (Haberly et al., 2019, p. 168).

Technological disruption in finance is increasingly following the digital platform model, but it differs from other industries due to finance's inherent informational intensity and regulatory fluidity. While the use of big data to enhance market efficiency in finance is more evolutionary than revolutionary, the financial sector's reliance on information processing has historically led to asymmetrical market efficiency, with high "information arbitrage efficiency" but lower "fundamental valuation" and "functional" efficiency (Haberly et al., 2019, p. 169).

Currently, digital asset management platforms (DAMPs) transform asset and investment management by fundamentally restructuring the market and offering more cost-efficient, technology-driven services that disrupt traditional high-cost models (Haberly et al., 2019, p. 171). The four main types of DAMPs are index funds, exchange traded funds (ETFs), asset manager support platforms, and robo-advisors, each playing a distinct role in enhancing market efficiency (Haberly et al., 2019, p. 171). Index funds and ETFs, as the oldest and simplest DAMPs, allow passive investing at low fees, while more sophisticated platforms like Blackrock's Aladdin use advanced analytics to manage risks and optimize portfolio management on a massive scale (Haberly et al., 2019, pp. 171-172). Robo-advisors, the newest DAMPs, act as online platforms that guide retail investors into cost-effective portfolios, usually composed of ETFs, and are quickly growing into integral parts of the asset management industry (Haberly et al., 2019, pp. 172-173). As these platforms continue to evolve, they are expected to further integrate artificial intelligence and machine learning to enhance their predictive capabilities and personalize investment strategies.

2.2. Robo-Advisors in Investment Management

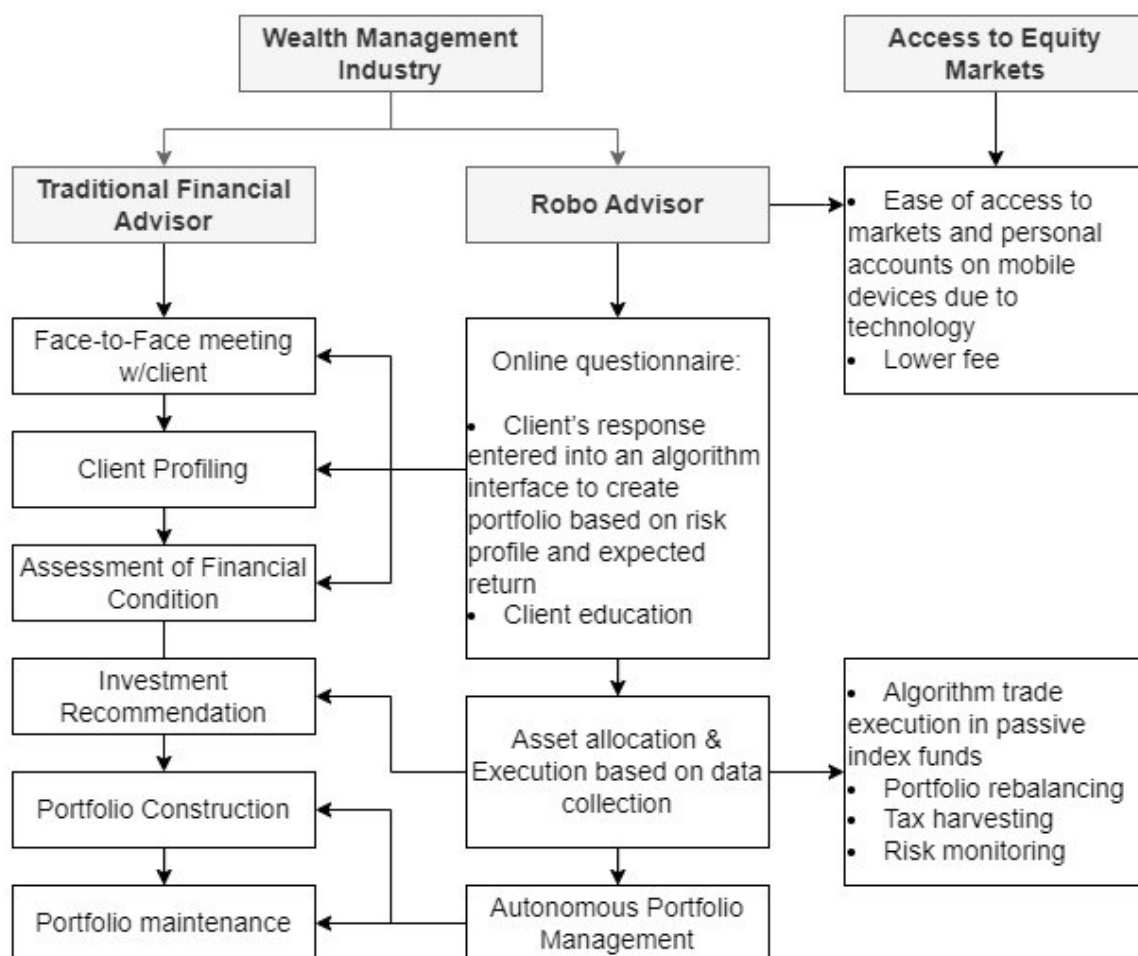
One of the most notable applications of AI in recent years in investment management is the development and proliferation of robo-advisors (Phoon & Koh, 2018, p. 79). Horn (2014) defines robo-advisors as “automated and algorithm-based services to invest on the stock and bond markets without requiring human interaction or judgment” (Horn, 2024, p. 1). Hence, robo-advisors use algorithms and AI to create and manage client portfolios, providing customized investment strategies with minimal human intervention (Abdi & Aysan, 2024, p. 536). Robo-advisors leverage automation to efficiently apply optimal strategies in portfolio management, tax optimization, and financial planning (Grealish & Kolm, 2023, p. 62). They are offered by banks, financial firms, or start-ups, use standardized questionnaires to recommend asset allocation, and typically charge fees based on assets under management (Horn, 2024, pp. 1-2).

While at the moment it is uncertain if they will replace traditional advisory services, hybrid models combining robo-advisor technology with human expertise are already emerging, blending cost efficiency with personalized relationships (Horn, 2024, p. 2). These digital platforms have gained traction, especially among younger investors, and are expected to continue expanding, with global assets under management by robo-advisors projected to grow rapidly (Abdi & Aysan, 2024, p. 536). In this context, regulators and investors seek to understand the evolving landscape of new investment management services leveraged by robo-advisors (Shanmuganathan, 2020, p. 1).

The value chain of robo-advisors, as compared to that of traditional financial advisors, highlights key differences in how they manage client portfolios, provide investment recommendations, and facilitate access to financial markets, as shown in Figure 2 below.

The traditional financial advisor model has historically relied on a high degree of personal interaction and human expertise (Clarke, 2020, p. 7). The process typically begins with a face-to-face meeting between the advisor and the client, where detailed information about the client’s financial goals, risk tolerance, investment preferences, and overall financial situation is gathered. This step establishes the foundation for building a tailored investment strategy and a personalized relationship with the client. Following this, the advisor engages in client profiling and an assessment of the client’s financial condition, evaluating their assets, liabilities, income, expenses, and long-term objectives (Clarke, 2020, p. 7).

Figure 2: Robo-advisors value chain vs. traditional financial advisors



Source: own elaboration, based on Clarke, 2020, p. 7.

Once this assessment is complete, the advisor develops investment recommendations that align with the client's goals and risk profile, subsequently engaging in portfolio construction to build a diversified portfolio of suitable investment products (Clarke, 2020, p. 7). The ongoing process of portfolio maintenance involves regular monitoring of market trends, adjusting investments as needed, and maintaining ongoing communication with the client to ensure that the portfolio continues to meet their evolving financial needs (Clarke, 2020, p. 7).

In contrast, the introduction of robo-advisors has significantly automated and streamlined this process, offering a more efficient and accessible investment management solution (Clarke, 2020, p. 7). The robo-advisor model starts with an online questionnaire, where clients provide information about their financial objectives, risk tolerance, investment preferences, and expected returns. This data is then processed by an

algorithm that automatically creates a personalized investment portfolio. Unlike traditional advisors, robo-advisors do not require face-to-face meetings, allowing for a more scalable and standardized client onboarding process (Clarke, 2020, p. 7).

Following the initial data input, the robo-advisor employs sophisticated algorithms to perform asset allocation and execution, based on data-driven insights and market analysis (Clarke, 2020, p. 7). More precisely, robo-advisors use asset allocation algorithms based on mean-variance analysis, valued for its simplicity and intuitive understanding of the risk-return tradeoff. These algorithms typically assume a constant risk-return coefficient throughout the investment period, adjusting portfolios only in response to changes in a client's risk profile (Capponi et al., 2020, p. 3). This leads to the creation of a diversified portfolio that aligns with the client's financial goals and risk appetite (Capponi et al., 2020, p. 9). The autonomous nature of robo-advisors enables them to handle portfolio management without human intervention, including tasks such as portfolio rebalancing, tax harvesting, and continuous risk monitoring. This automated management process ensures that the client's portfolio remains optimized according to market conditions and the client's investment objectives (Clarke, 2020, p. 7).

One of the significant advantages of robo-advisors is their ability to offer access to equity markets in a more efficient and cost-effective manner (Clarke, 2020, p. 7). Robo-advisors are found to benefit investors with under-diversified portfolios, as well as low-income and less-educated individuals (Cardillo & Chiappini, 2024, p. 7). Additionally, they are advantageous for small and medium-sized banks, improving asset management performance (Cardillo & Chiappini, 2024, p. 7). Clients can easily access their investment accounts through mobile devices and online platforms, allowing them to monitor their portfolios in real-time. The use of technology reduces operational costs, resulting in lower fees compared to traditional financial advisors, making investment management more accessible to a broader audience (Clarke, 2020, p. 7).

2.3. Performance Metrics and Market Conditions of AI and Robo-Advisors

2.3.1. Key Performance Metrics and Performance of Robo-Advisors

The rise of AI-driven robo-advisors has introduced new ways of measuring performance in asset management (Shanmuganathan, 2020, p. 7). Performance metrics include comparisons to benchmarks, risk-adjusted returns, rebalancing advantages, and

specific measures such as the Sharpe ratio, reward to value at risk (RVAR), and Jensen's alpha.

- **Benchmark comparison.** Robo-advisors are often compared to traditional market benchmarks to assess their cumulative performance. This reflects their ability to provide competitive returns through automated portfolio management (Holtfort et al., 2022, p. 40).
- **Risk-adjusted returns.** Risk-adjusted performance indicators such as the Sharpe ratio and reward to value at risk (RVAR) highlight how well these platforms balance risk and return. Robo-advisors generally achieve higher Sharpe ratios, indicating more effective portfolio optimization. Additionally, robo-advisors perform well in terms of RVAR, demonstrating their ability to minimize potential losses while delivering consistent returns (Tao et al., 2021, p. 4). Robo-advisors' superior performance is further underscored by positive Jensen's alpha across multiple models, including the capital asset pricing model (CAPM), Fama and French, and Carhart momentum models (Tao et al., 2021, p. 5).
- **Rebalancing and diversification.** Robo-advisors' automated rebalancing strategies ensure that portfolios remain aligned with predefined risk levels, optimizing returns over time (Holtfort et al., 2022, p. 44). Robo-advisors also enhance portfolio diversification by focusing on broad market exposure through low-cost index funds, reducing the idiosyncratic risks associated with individual stock selections (Rossi & Utkus, 2020, p. 33). By enhancing diversification, robo-advisors help clients achieve a more balanced and resilient portfolio, even in unpredictable market conditions.
- **Cost efficiency.** With fees typically ranging from 0.25% to 0.75% of assets under management, robo-advisors offer a much more affordable option compared to traditional asset managers, who often charge 1-2% (Holtfort et al., 2022, p. 44). This lower cost structure enables broader access to financial services and contributes to the overall democratization of investment management.
- **Overall superior risk management.** Robo-advisors improve risk-adjusted performance primarily by lowering overall portfolio risk rather than increasing returns (Rossi & Utkus, 2020, p. 1). Investors experienced a notable increase in their Sharpe ratios after adopting robo-advisory services (Rossi & Utkus, 2020, p. 2). Such improvements were largely driven by robo-advisors' ability to prevent

clients from making impulsive decisions during market downturns, maintaining long-term investment goals (Capponi et al., 2020, p. 5). By maintaining a long-term perspective and balancing rebalancing strategies with market cycles, robo-advisors mitigate the negative effects of emotional decision-making.

While several factors such as assets under management (AUM), country of origin, and whether a bank is involved in a robo-advisor's operations were analyzed, none of these significantly impacted performance (Holtfort et al., 2022, p. 44). The primary factors influencing performance were the rebalancing methods used and the number of asset allocation strategies employed, emphasizing the importance of simplicity and effective rebalancing in delivering superior returns (Holtfort et al., 2022, p. 44).

Robo-advisors generally do not outperform market indexes, whether in static or dynamic portfolio setups, even with rebalancing (Cardillo & Chiappini, 2024, p. 6). In comparisons with human advisors, results are mixed. Some studies find that robo-advisors match or exceed human advisors' performance, while others attribute this outperformance to business models and client profiles rather than fees or rebalancing strategies (Cardillo & Chiappini, 2024, p. 6).

Several studies indicate that robo-advisors do not outperform market indexes, even with automated portfolio rebalancing, with performance remaining neutral compared to static strategies like buy-and-hold (Cardillo & Chiappini, 2024, p. 7). When comparing robo-advisors to human advisors, the results are mixed, as some studies suggest robo-advisors do not surpass human advisors, while others show they can outperform them, often depending on the business model and client profiles rather than fees or rebalancing strategies (Cardillo & Chiappini, 2024, p. 7).

2.3.2. Market Conditions and Robo-Advisor Performance

The performance of AI-driven robo-advisors varies significantly depending on market conditions. Table 1 provides insights into the varying results of high-performance platforms. Over a three-year period, equity returns ranged from 13.4% (Morgan Stanley) to 16.1% (SoFi), while fixed-income returns varied between 3.5% (Ellevest) and 6.0% (E*Trade) (Statista Research Department, 2023). Overall, the highest three-year portfolio return was achieved by Axos Invest and SigFig at 12.1%, with the lowest being Ellevest at 10.0% (Statista Research Department, 2023).

Table 1: Performance of selected robo-advisors worldwide 2021

Characteristic	3-year equity re- turn	3-year fixed-in- come return	3-year overall re- turn
SoFi	16.1%	4.3%	11.7%
Axos Invest	15.3%	5.9%	12.1%
SigFig	15.3%	5.8%	12.1%
Vanguard	15.1%	4.4%	11.0%
Fidelity Go	14.9%	4.4%	11.2%
E*Trade	14.5%	6.0%	11.3%
Ellevest	14.5%	3.5%	10.0%
Wealthfront	14.0%	5.2%	11.6%
Betterment	13.8%	4.8%	11.0%
Morgan Stanley	13.4%	4.9%	10.8%

Source: own elaboration, based on Statista, 2023.

In stable or bullish market conditions, robo-advisors typically deliver returns comparable to, or slightly better than, traditional market benchmarks (Tao et al., 2021, p. 4). Their use of low-cost index funds and diversified portfolios enables them to track broad market indices effectively. For example, between March 2018 and March 2021, robo-advisors achieved an average cumulative performance of 24.28%, surpassing a benchmark consisting of a 50/50 mix of the MSCI World Index and Barclays Global Aggregate Bonds, which returned 20.68% over the same period (Holtfort et al., 2022, p. 42). This highlights the capacity of robo-advisors to provide competitive returns through efficient and automated portfolio management services in favorable market conditions.

During periods of heightened market volatility, such as the downturn caused by the COVID-19 pandemic, robo-advisors have demonstrated mixed results. While their

passive strategies and automated rebalancing provide some protection against extreme losses, their performance still fluctuates with market conditions. Between February and March 2020, during the height of the COVID-19 crisis, robo-advisors experienced an average loss of -11.36%, slightly outperforming the benchmark's loss of -12.57% (Holtfort et al., 2022, p. 42). Although these results suggest that robo-advisors can mitigate losses during market downturns, active and mixed strategies tended to perform better than purely passive approaches during such periods (Holtfort et al., 2022, p. 42).

Despite their ability to perform well in stable markets, robo-advisors face challenges in highly complex or uncertain market environments. Their reliance on historical data and algorithmic decision-making can limit their flexibility in responding to unforeseen market events or rapidly changing conditions. Research indicates that while robo-advisors can efficiently manage portfolios during normal market cycles, they do not consistently outperform human advisors or static strategies such as buy-and-hold in volatile markets (Cardillo & Chiappini, 2024, p. 6). This limitation is particularly evident when market conditions deviate from historical norms, where human intuition and active management may provide an advantage.

The comparison between robo-advisors and human advisors yields mixed results. Some studies suggest that robo-advisors can match or even exceed the performance of human advisors, particularly due to their lower fees and systematic rebalancing processes (Cardillo & Chiappini, 2024, p. 7). However, other research attributes this outperformance to the business models and client profiles that robo-advisors serve, rather than the effectiveness of their automated strategies (Cardillo & Chiappini, 2024, p. 7). Human advisors may have an edge in more complex investment scenarios that require active decision-making, particularly for high-net-worth individuals with more sophisticated financial needs.

2.3.3. German Market for Robo-Advisors

The German financial services sector is currently undergoing substantial transformation, driven by technological innovation and the rise of digital investment platforms such as robo-advisors (Seiler & Fanenbruck, 2021, p. 1). Germany, as one of the largest financial markets in Europe, is playing a pivotal role in this transformation. With more than 30 active robo-advisors competing for market share, the country has

become a hotspot for the development and adoption of these technologies (Puhle, 2019, p. 334).

The growth of the robo-advisory market in Germany has achieved high dimensions. As of November 2017, the German market had 31 robo-advisors managing an estimated €1.5 billion in AuM (Puhle, 2019, p. 334). This is driven by platforms like Scalable Capital, which alone managed €600 million in AuM, followed by Liquid with €175 million and Cominvest with €80 million (Nicolaisen, 2017). Projections for future growth are optimistic, with estimates suggesting that AuM for robo-advisors in Germany could reach between €3 billion and €600 billion by 2035 (Seiler & Fanenbruck, 2021, p. 14).

As shown in Figure 3 below, robo-advisors are widely distributed across Germany, with key players located in major financial hubs such as Frankfurt, Munich, and Berlin. Notable platforms include Scalable Capital, Liquid, Visualvest, and Fintego, all of which have established a strong presence through their innovative investment strategies and partnerships with traditional financial institutions (Nicolaisen, 2017).

Figure 3: German landscape of robo-advisors



Source: Nicolaisen, 2017, online.

The adoption of robo-advisory services in Germany has been primarily driven by several factors. Firstly, the lower fees and greater accessibility of these platforms make

them attractive to retail investors who might otherwise be excluded from traditional financial advisory services (Seiler & Fanenbruck, 2021, p. 2). This cost-efficiency, coupled with the ability to offer diversified portfolios even to investors with minimal financial knowledge, has democratized access to financial markets. Secondly, the perceived usefulness of robo-advisors, particularly their ability to simplify the investment process, has been a key driver of user adoption. Studies show that perceived usefulness and privacy concerns are the most significant factors influencing the intention to use a robo-advisor in Germany (Seiler & Fanenbruck, 2021, p. 3). In contrast, content and design aspects of the platforms have less impact on adoption rates.

2.4. Cost Efficiency and Democratization of Services

One of the most significant advantages of robo-advisors is their ability to offer cost-efficient financial services, making investment management accessible to a broader audience (Grealish & Kolm, 2023, p. 62). Traditional financial advisory services have historically been expensive. These fees have been a barrier for individuals with lower levels of investable assets, making professional financial advice largely available only to high-net-worth individuals. Robo-advisors, on the other hand, have transformed this model by offering substantially lower fees and eliminating entry barriers, thereby democratizing access to investment management services (Phoon & Koh, 2018, p. 16).

Robo-advisors generally charge fees ranging from 0.25% to 0.75% of AUM, making them a cost-effective alternative to traditional human advisors (Holtfort et al., 2022, p. 44). This reduction in fees is primarily achieved through automation and the use of algorithmic portfolio management, which eliminates much of the manual work that human advisors perform. Through automation, robo-advisors achieve economies of scale, enabling them to deliver high-quality investment management services to clients at a low cost (Grealish & Kolm, 2023, p. 62).

Additionally, many robo-advisors offer features that would typically only be available to clients with significant assets in traditional advisory settings. For instance, automated tax-loss harvesting, which helps optimize after-tax returns, is often included at no extra charge for robo-advisory clients (Grealish & Kolm, 2023, pp. 62-63). This service alone can result in meaningful cost savings for investors, further enhancing the value proposition of these platforms.

Democratization of financial services

The lower fee structures and reduced minimum investment requirements have made robo-advisors a key driver in the democratization of financial services (Tan, 2020, p. 58). Many platforms have little to no minimum investment thresholds, which contrasts sharply with the traditional wealth management models. Betterment offers the most accessible entry, requiring no minimum investment for accounts under \$10,000, making it attractive for smaller retail investors. Wealthfront and Nutmeg have relatively low minimums, at \$500 and £500, respectively, with Wealthfront offering more advanced tax optimization services at \$100,000, as can be seen in Table 2. Higher-end platforms like Vanguard, Clipper Advisor, and Bambu/Crossbridge Capital target wealthier clients, requiring minimums of \$50,000 or more. Youyu provides flexibility with lower thresholds for individual funds but demands \$4,000 for full portfolios.

Table 2: Minimum investment for select platforms

Platform	Country	Minimum Investment
Betterment	U.S.	No minimum for accounts under \$10,000
Wealthfront	U.S.	\$500 (general); \$100,000 for tax-optimized direct indexing service
Vanguard	U.S.	\$50,000
Nutmeg	U.K.	£500
Clipper Advisor	China	\$50,000
Youyu	Hong Kong	\$120–\$800 for individual funds, \$4,000 for a portfolio of funds
Bambu/Cross-bridge Capital	Singapore	\$100,000 (Connect service); \$1 million for high-net-worth clients

Source: own elaboration, based on Phoon and Koh, 2018, p. 6-9.

This democratization has allowed more people, especially millennials and younger investors, to participate in financial markets (Abdi & Aysan, 2024, p. 536). Robo-advisors have simplified the investment process, making it more accessible to those who may

not have prior investment experience (Grealish & Kolm, 2023, p. 19). This accessibility is also enhanced by the digital nature of robo-advisors, which offer intuitive platforms and mobile applications, enabling clients to manage their portfolios and receive financial advice anytime and anywhere.

2.5. Client Trust, Perception, and Engagement

Client trust, perception, and engagement are critical factors that influence the adoption and success of AI-driven robo-advisors in the asset management industry (Belanche et al., 2019, p. 1412). Robo-advisors, while offering cost-effective and efficient solutions, face unique challenges in building and maintaining trust, especially given the lack of personal interaction that traditional advisors provide.

2.5.1. Building Client Trust

Trust in robo-advisors is built through transparency, reliability, and ease of use. Perceived ease of use exerts a significant indirect influence on clients' attitudes towards robo-advisors, affecting both their perception of the platform's usefulness and their intention to use it (Belanche et al., 2019, p. 1418). When clients find the platform intuitive and simple to navigate, they are more likely to view it as useful, which in turn fosters a positive attitude and increases their likelihood of adopting the service. This ease of use is crucial, as clients may initially be skeptical about entrusting their financial portfolios to automated systems (Belanche et al., 2019, p. 1418).

Transparency in fees and operations also plays a vital role in building trust. Robo-advisors are typically very clear about their fee structures, with no hidden charges, which helps build confidence among users. By contrast, traditional financial advisors often involve more opaque fee structures, which can cause mistrust. Moreover, robo-advisors' use of data-driven decision-making helps mitigate emotional biases, ensuring that investment choices are made rationally and systematically, further enhancing client trust over time (Tao et al., 2021, p. 5).

2.5.2. Client Perception

The perception of robo-advisors varies across different demographics. Younger, tech-savvy investors, particularly millennials, tend to have a favorable view of these platforms due to their user-friendly design, low fees, and convenience. For this group, the perceived ease of use is a significant factor in driving adoption. In contrast, older or more traditional investors may be more hesitant, perceiving robo-advisors as

impersonal or less capable of handling complex financial needs that require human intuition (Capponi et al., 2020, p. 4).

Social norms also significantly influence client perception. The influence of subjective norms – the perceived opinions of others – plays a crucial role, especially when clients are faced with a disruptive change like using robo-advisors. Social norms become particularly important for individuals with limited knowledge about robo-advisors, as they rely on the opinions of those around them to shape their attitudes (Belanche et al., 2019, p. 1415). For users with less familiarity with these platforms, social norms have a stronger impact on their intention to use robo-advisors compared to more familiar users, whose decisions are based on personal experience (Belanche et al., 2019, p. 1420).

2.5.3. Impact of Familiarity and Trust Moderators

Familiarity with both financial technology and robo-advisors significantly affects trust. Clients who are more familiar with digital tools and automated systems are likely to feel more comfortable using robo-advisors, while those who are less familiar may struggle to trust these platforms. Familiarity with robot technology can moderate the effects of ease of use and social norms on trust, making it easier for tech-savvy users to adopt robo-advisors without needing to rely heavily on the opinions of others (Belanche et al., 2019, p. 1416). For users with a low level of familiarity, the influence of social norms is heightened, as they rely more on external sources to form their opinions.

2.5.4. Client Engagement

Client engagement with robo-advisors differs from the traditional model, where personal relationships are fostered through face-to-face meetings. Instead, robo-advisors rely on frequent, personalized digital interactions, which help clients stay informed and engaged with their portfolios. Robo-advisors interact repeatedly with clients to learn about changes in their risk profiles, a process that is crucial for both mitigating behavioral biases and improving investment performance (Capponi et al., 2020, p. 5). These interactions allow the platform to adjust strategies based on clients' evolving financial situations, leading to more personalized portfolio management.

One of the strengths of robo-advisors is their ability to optimize the frequency of client interactions. While frequent engagement can be beneficial in keeping clients informed, excessive interaction may actually exacerbate behavioral biases, such as reacting

impulsively to short-term market fluctuations. Lower interaction frequencies tend to mitigate these biases, as they allow clients to focus on long-term investment goals rather than short-term market movements (Capponi et al., 2020, p. 19). Over longer time periods, the fluctuations in market returns average out, leading to more consistent investment outcomes.

2.6. Regulatory and Ethical Challenges

The rise of AI-driven robo-advisors has introduced several regulatory and ethical challenges that the financial industry must address. One of the primary concerns is algorithm transparency (Seiler & Fanenbruck, 2021, p. 3). Robo-advisors rely on complex algorithms to manage portfolios and make investment decisions. However, the lack of transparency in how these algorithms operate raises concerns about fairness, potential biases, and the accountability of automated decision-making. Clients and regulators alike may find it difficult to understand the underlying mechanisms driving investment choices, which could lead to mistrust and legal scrutiny (Shanmuganathan, 2020, p. 7).

Another major challenge is data privacy (Seiler & Fanenbruck, 2021, p. 2). Robo-advisors collect and process vast amounts of personal financial data to offer tailored investment advice. This creates significant risks around data security and privacy, especially if proper safeguards are not in place. Breaches or misuse of sensitive financial information could undermine client trust and expose firms to regulatory penalties (Seiler & Fanenbruck, 2021, p. 5).

Regulatory compliance is also a key concern, as many existing financial regulations were designed for human advisors, not AI-driven platforms. A key regulatory risk involves conflicts of interest that exist in traditional financial advisory services, where human advisors often promote high-commission products. Robo-advisors, however, can mitigate this issue by using algorithms designed to eliminate such conflicts, ensuring that recommendations are aligned with clients' best interests (Lee, 2020, p. 740).

Investor protection is another concern, as robo-advisors need a legal framework that governs the relationship between financial institutions, AI developers, and clients. This regulation is vital to ensure transparency, accountability, and equal service quality, regardless of client wealth. Ensuring that AI-driven advice is as reliable as that provided

to wealthier clients is crucial for maintaining equity in financial services (Lee, 2020, p. 741).

To enhance financial inclusion, regulatory oversight is needed to guarantee that robo-advisors offer the same quality of advice as traditional wealth management providers. This ensures that robo-advisors can effectively serve a broader range of clients without compromising on service quality, helping to democratize access to financial advice (Lee, 2020, p. 744).

2.7. Impact on Employment and Professional Development

The growth of AI-driven robo-advisors is reshaping employment and professional development in the financial services industry. As automation increasingly takes over routine tasks, the demand for entry-level financial advisors is declining. Robo-advisors efficiently manage many of the tasks traditionally performed by junior advisors, such as portfolio management, rebalancing, and tax-loss harvesting. This automation reduces the need for human involvement in basic advisory roles, shifting the focus of financial professionals towards more complex and personalized services (Shanmuganathan, 2020, p. 8).

However, it must be emphasized that robo-advisors are not replacing human advisors entirely. Instead, they are transforming the nature of the advisory profession. Human advisors are still critical for high-net-worth individuals and clients with complex financial needs, who require personalized advice that goes beyond algorithmic solutions. These clients often need services such as estate planning, tax strategies, and long-term financial planning, which involve emotional intelligence and trust—qualities that AI currently lacks (Phoon & Koh, 2018, p. 83). As a result, human advisors are shifting to roles that emphasize client relationships and holistic financial planning.

Additionally, the rise of hybrid models, which combine AI tools with human expertise, is creating new opportunities for financial professionals. These models allow advisors to leverage the efficiency of robo-advisors while offering personalized services, ensuring that financial professionals remain relevant by blending technological and client-centric skills (Tao et al., 2021, p. 5).

2.8. Institutional Adaptation and Resistance

Institutional adaptation involves integrating robo-advisors into existing financial service offerings, often through hybrid models that combine human expertise with automated

services. Large asset management firms and banks, such as Vanguard and Charles Schwab, have developed their own robo-advisory platforms to offer clients a low-cost, scalable solution alongside human advisors. These institutions recognize the growing demand for cost-efficient, accessible financial services, particularly among younger, tech-savvy clients (Haberly et al., 2019, p. 172). By adopting robo-advisors, these firms can maintain market competitiveness while meeting the evolving needs of their clients.

However, not all institutions are adapting quickly. Resistance to robo-advisors often stems from concerns about the potential loss of personal relationships between advisors and clients, which has historically been a key value proposition in traditional wealth management (Phoon & Koh, 2018, p. 86). Additionally, some financial institutions fear that the introduction of robo-advisors may lead to reduced profit margins, as automated services typically offer lower fees compared to traditional advisory models. This is especially true for firms that have relied on high-fee advisory services for high-net-worth individuals (Reher & Sokolinski, 2024, p. 4).

Moreover, the shift towards automation challenges the internal culture of many financial institutions. Resistance may come from employees who fear job displacement or feel unprepared to work alongside AI technologies. For institutions to fully adapt, they must invest in training and professional development to equip their workforce with the necessary skills to navigate the increasing role of AI in finance (Shanmuganathan, 2020, p. 7).

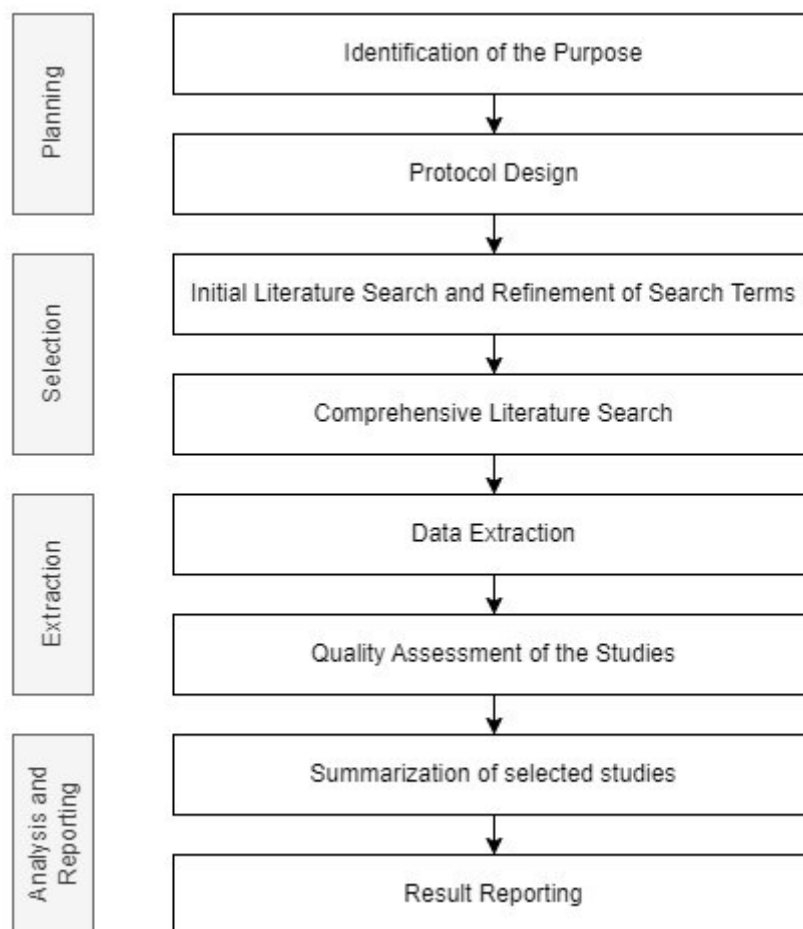
3. Methodology

This chapter outlines the research methodology employed in this study, which focuses on evaluating the impact of AI-driven robo-advisors on the asset management industry. The overall research design and protocol alongside the inclusion and exclusion criteria and the analysis approach will be presented. Furthermore, tools and resources used for the research will be also described.

3.1. Research Design

The systematic literature review (SLR) follows an eight-step process, as detailed by Okoli (2015) and shown in Figure 4 (Okoli, 2015, S. 885). The entire process is documented using the PRISMA flowchart, which provides a transparent flowchart of study selection.

Figure 4: SLR process



Source: Own elaboration, based on Okoli, 2015, p. 885.

- **Objective definition.** The research questions and objectives, outlined in chapter 1.2, guide the focus of the SLR. The primary aim is to critically evaluate the impact of robo-advisors on the traditional asset management industry by analyzing key themes such as performance, cost, democratization of services, client trust, regulation, and employment.
- **Protocol design.** A research protocol was developed to ensure consistency in the review process. This included defining inclusion and exclusion criteria, selecting appropriate databases, specifying keywords (see chapter 3.2), and formulating the approach for data extraction and analysis.
- **Initial literature search and refinement of search terms.** An initial search was conducted using predefined keywords. Based on early results, the search terms were refined in order to ensure that only the most relevant articles were captured.
- **Comprehensive literature search.** The full literature search was conducted across multiple databases. All exclusions were documented with justifications to ensure traceability in the selection process.
- **Data extraction.** Information relevant to the research questions was systematically extracted from the selected studies. This data was categorized and stored for further analysis.
- **Quality assessment of the studies.** Each study was evaluated based on its relevance, quality, and alignment with the research objectives and research questions. Only studies that met the quality criteria were included for further analysis.
- **Summary of selected studies.** The findings from the selected studies were synthesized and summarized. This involved categorizing the main themes and drawing connections between the various studies to form a cohesive understanding.
- **Reporting results.** The results are presented in chapter 4 and discussed in relation to the research questions in chapter 5, offering insights into the impact of AI-driven robo-advisors on the asset management sector.

3.2. Research Protocol

This review primarily employed the database Web of Science (WoS), given its comprehensive coverage across disciplines such as economics, technology, and financial services.

The keywords used in the search were combined with Boolean operators (AND/OR) to ensure relevant results were captured. The specific search string used was:

- ("robo-advisor")
- AND
- ("Performance" OR "Platforms" OR "Cost" OR "Fee" OR "Democratization" OR "Client Trust" OR "Client Perception" OR "Client Engagement" OR "Regulation" OR "Ethics" OR "Employment" OR "Asset Management Industry" OR "Human Advisors")

These keywords reflect the core themes of the research questions and are designed to capture studies addressing performance, cost structures, client relationships, ethical and regulatory challenges, and employment impacts in the context of AI-driven robo-advisory services.

To ensure the relevance and quality of the literature reviewed, the following inclusion and exclusion criteria were applied:

Inclusion criteria:

- Peer-reviewed academic articles and reputable industry reports.
- Primary research articles (reviews, book chapters, and similar were not included).
- Articles published in English or German.
- Publications from the last 5 years (2019–2024) to ensure the review includes the most recent developments in AI and robo-advisors.
- Full-text availability (open access) to ensure a thorough analysis of the content.

These criteria were directly applied into the search and filter options of the literature database.

Exclusion Criteria:

- Articles unrelated to AI-driven robo-advisors or asset management.
- Publications with superficial coverage of the topic or lacking empirical data or methodological rigor.
- Articles focusing on non-financial sectors (e.g., retail, healthcare) that do not address asset management.

These criteria were applied in the screening and thorough analysis of the articles.

The relevant metadata (author, title, journal, year of publication, DOI, and abstract) from the selected articles was extracted into an Excel sheet. This enabled efficient organization and filtering of studies for subsequent analysis. The extracted data was then categorized into thematic areas based on the research questions: performance, cost efficiency, client trust, regulatory and ethical challenges, and employment effects.

The analysis followed two main steps:

1. Thematic analysis: The extracted data was grouped into key themes based on the keywords and research questions. A concept matrix was developed to identify patterns, gaps, and consensus in the literature.
2. Quality assessment: Each study was critically evaluated for methodological rigor, relevance, and its contribution to answering the research questions.

The results of this analysis are presented in chapter 4 using both descriptive and thematic approaches, followed by a discussion in chapter 5.

3.3. Tools and Resources

The following tools and resources were used throughout the research process:

- **Web of Science (WoS):** Primary databases for literature search.
- **Excel:** For data extraction, organization, and analysis.
- **Mendeley:** For reference management and in-text citation tracking.
- **Microsoft Word:** For writing and formatting the thesis.
- **Python and Jupyter Notebook:** For creating diagrams and charts to visualize relevant information.

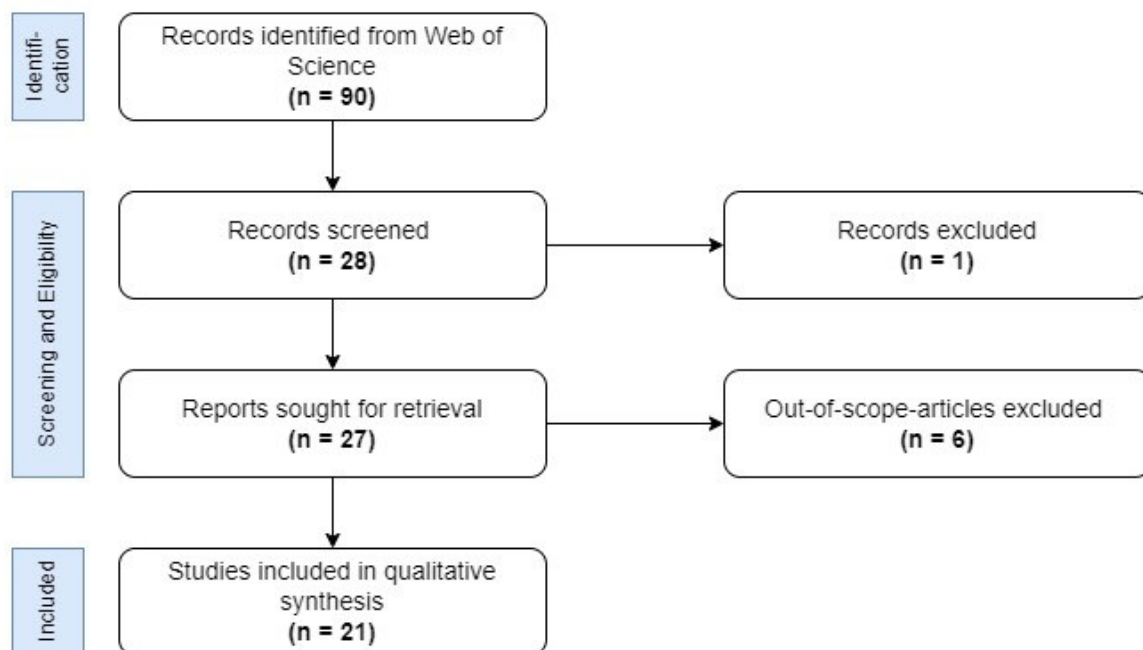
4. Analysis and Findings

This chapter presents the key results of the study, beginning with the PRISMA results of the collected data, followed by an explanation of the concept matrix that organizes the relevant concepts identified in the literature. The thematic analysis is structured around key themes emerging from the concept matrix, offering a deeper exploration of significant aspects related to robo-advisors. These themes include performance and efficiency, client trust and perception, cost structures, the democratization of financial services, regulatory and ethical concerns, comparisons between human and robo-advisors, adoption and client engagement, and sustainability. Each theme will be analyzed to reveal the current state of knowledge and identify gaps or opportunities for future research in the robo-advisory domain.

4.1. PRIMA Results

The initial search was conducted using the Web of Science database, yielding a total of 90 records. These records were identified based on the keyword combination mentioned in chapter 3.2. Figure 5 shows the PRIMSA-Flow of the search process.

Figure 5: PRISMA flow chart of the search results



Source: Own elaboration.

Following the initial identification of 90 records, a screening process was conducted to narrow down the scope. This screening process reduced the number of records to 28, as certain articles were deemed irrelevant or out of scope based on their abstracts, titles, and general relevance to the research questions. During this stage, 1 record was excluded due to a lack of alignment with the core research themes, such as performance evaluation or client trust.

As for the remaining 27 reports, further scrutiny was applied to ensure that only studies directly addressing the key areas of robo-advisors were considered for detailed analysis. A total of 6 articles were excluded for being out of scope, such as focusing too heavily on technical algorithms without connecting to the broader implications for asset management, client trust, or market performance.

Ultimately, 21 studies were included in the final qualitative synthesis. These studies represent the most relevant and high-quality research available on the impact of AI-driven robo-advisors on asset management. These articles were selected for their direct relevance to the research questions, including topics such as the performance of robo-advisors in different market conditions, client engagement and trust, cost efficiency, democratization of financial services, and ethical considerations in the context of AI in finance.

4.2. Concept Matrix

The concept matrix in Table 3 presents a structured overview of the key themes and concepts addressed in the selected articles. It aligns the articles with the primary research questions of the study, categorizing each article according to the relevant concepts it explores. The matrix includes the 21 articles included for the qualitative analysis, each associated with one or more of the following concepts:

- **Client trust.** Investigates factors influencing client trust in robo-advisors, including transparency, perceived reliability, and comparison with human advisors.
- **Client perception.** Examines how clients view robo-advisors in terms of effectiveness, ease of use, and alignment with their financial needs compared to traditional advisors.
- **Performance.** Analyzes robo-advisors' effectiveness across different market conditions, with a focus on risk management and adaptability during stable and volatile periods.

- **Cost and fees.** Focuses on the cost advantages of robo-advisors, comparing their fee structures and affordability with those of traditional financial advisory services.
- **Democratization.** Looks at how robo-advisors increase accessibility to financial services, providing investment opportunities for a wider audience, including those with limited financial knowledge or lower income levels.
- **Client engagement.** Explores the ways robo-advisors maintain user engagement and ensure client satisfaction, often through digital interactions and tailored communication strategies.
- **Adoption drivers.** Investigates the primary factors influencing client adoption of robo-advisors such as perceived usefulness, ease of use, cost benefits, and social influences.
- **Regulation.** Addresses regulatory considerations for robo-advisors, including compliance with data privacy standards, algorithm transparency, and financial oversight.
- **Ethics.** Examines ethical concerns surrounding robo-advisors, including the fairness of automated decision-making, potential biases, and the impact on client autonomy.
- **Employment impact.** Quantifies the implications of robo-advisors on employment within the financial services sector, focusing on the shifting role of human advisors and the need for new skills.
- **Human vs. robo-advisors.** Compares robo-advisors with traditional human advisors, exploring differences in client trust, performance, and service adaptability.
- **Market conditions.** Assesses how robo-advisors perform under varying market conditions, including both stable environments and periods of crisis, such as the COVID-19 pandemic.
- **Investment strategy.** Analyzes the investment strategies used by robo-advisors, including portfolio diversification, asset allocation, and risk management approaches.

- **Portfolio allocation.** Focuses on the portfolio construction and allocation strategies of robo-advisors, examining their ability to provide balanced, risk-adjusted portfolios.
- **Sustainability.** Investigates the incorporation of sustainable investment options in robo-advisory platforms, exploring client preferences for socially responsible and ethical investing.

Table 3: Concept matrix¹

Concept	Articles
Client trust	Zhang et al., 2021; Cheng et al., 2019; Xia et al., 2023; Roh et al., 2023; Nguyen et al., 2023; Wexler & Oberlander, 2021; Yi et al., 2023; Liu et al., 2023
Client perception	Zhang et al., 2021; Cheng et al., 2019; Xia et al., 2023; Yeh et al., 2023; Chang & Wang, 2023
Performance	Ge et al., 2021; Alsabab et al., 2021; Helms et al., 2022; Liu et al., 2023; Xia et al., 2023; Boreiko & Massarotti, 2020; Lee et al., 2020; Leow et al., 2021; Hu et al., 2024
Cost and fees	Helms et al., 2022; Au et al., 2021; Brunen & Laubach, 2022
Democratization	Yi et al., 2023; Nguyen et al., 2023; Brunen & Laubach, 2022
Client engagement	Xia et al., 2023; Yi et al., 2023; Roh et al., 2023; Au et al., 2021
Adoption drivers	Xia et al., 2023; Roh et al., 2023; Nguyen et al., 2023; Luo et al., 2024
Regulation	Nguyen et al., 2023; Wexler & Oberlander, 2021; Leow et al., 2021; Liu et al., 2023

¹ Articles can be associated to more than one concept.

Ethics	Cheng et al., 2019; Roh et al., 2023; Wexler & Oberlander, 2021
Employment	Alsabah et al., 2021; Maier et al., 2022; Zhang et al., 2021
Human advisors	Zhang et al., 2021; Chang & Wang, 2023; Roh et al., 2023
Market conditions	Ge et al., 2021; Liu et al., 2023; Hu et al., 2024
Investment strategy	Helms et al., 2022; Boreiko & Massarotti, 2020; Liu et al., 2023; Leow et al., 2021
Portfolio allocation	Boreiko & Massarotti, 2020; Lee et al., 2020; Liu et al., 2023; Hu et al., 2024
Sustainability	Brunen & Laubach, 2022; Au et al., 2021

Source: Own elaboration.

4.3. Thematic Analysis

Based on the concept matrix shown in Table 3, this section provides a thematic analysis of the core concepts that shape the impact of AI-driven robot advisors in asset management.

4.3.1. Client Trust and Perception

Client trust and perception are essential for the successful adoption and sustained use of robo-advisors in the asset management sector. As these digital platforms rely on algorithms and minimal human interaction, it requires strong and long-term client trust to overcome perceived risks and limitations. The following Table 4 exhibits the main sub-themes with Client Trust and Perception. These capture the main factors influencing trust and perception of robo-advisors, drawing on comparative assessments with human advisors, institutional credibility, transparency, perceived usefulness, algorithm aversion, social influence, and demographic factors.

Table 4: Client Trust and Perception Sub-Themes.

Main Sub-Theme	Description
Comparative Trust	Clients compare robo-advisors to human advisors, valuing expertise and personalized interaction.
Trust Transfer	Trust in institutions providing robo-advisory services enhances confidence in the platforms.
Transparency and Security	Algorithm transparency and robust data security are vital for building client trust.
Perceived Usefulness	Efficiency, ease of access, and quality of advice drive trust and adoption of robo-advisors.
Algorithm Aversion	Reluctance to trust automated systems can hinder adoption, especially among risk-averse clients.
Social Influence	Peer recommendations and demographic factors strongly influence adoption, particularly among youth.
Market Conditions	Robo-advisor trust depends on performance stability during volatile or crisis

Source: Own elaboration.

Comparative Trust in Human vs. Robo-Advisors

Clients frequently compare robo-advisors with human financial advisors, focusing on expertise and reliability. The literature indicates that clients generally favor human advisors with high expertise, as the personalized interaction and depth of knowledge offered by experienced human advisors inspire greater trust. However, clients often view robo-advisors as comparable to less experienced or novice human advisors, suggesting that while robo-advisors may not yet rival top-tier human expertise, they can serve as viable alternatives for clients seeking cost-effective, basic advisory services (Zhang et al., 2021, p. 634). This implies that client trust in robo-advisors is flexible, depending largely on perceived expertise and the complexity of the client's financial needs.

Trust Transfer and Institutional Credibility

Trust transfer, where trust in a reputable vendor or technology is extended to the robo-advisor platform, plays a key role in establishing client trust. Robo-advisors benefit significantly when clients already trust the institution or brand providing the service, as this mitigates skepticism around automated financial advice (Cheng et al., 2019, p. 1). Institutional credibility, supported by a record of reliable service, strongly influences client perception and trust in robo-advisors, particularly during the initial stages of adoption. When a well-established institution offers robo-advisory services, clients are more inclined to see the platform as safe and competent, which facilitates a smoother transfer of trust (Wexler & Oberlander, 2021, p. 351). This underscores the critical role of vendor reputation and brand credibility in promoting trust in robo-advisors.

Transparency, Security, and Privacy Concerns

Transparency in algorithmic processes and robust data security measures are vital for fostering trust in robo-advisors. Clients tend to trust these platforms more when they understand how decisions are made and feel assured about the security of their personal data. Studies indicate that perceived security, privacy, and transparency significantly impact client trust. For instance, when clients perceive that the robo-advisor's processes and decision-making logic are transparent, they feel reassured about its reliability and fairness, which directly influences trust levels (Roh et al., 2023, p. 29). Additionally, addressing privacy concerns is crucial, as clients need assurance that their financial information is safeguarded, particularly in automated settings where personal control is reduced (Nguyen et al., 2023, p. 1). These findings highlight the need for robo-advisors to clearly communicate their data protection measures and decision-making processes to build and maintain client trust.

Perceived Usefulness and Cognitive and Emotional Drivers

Perceived usefulness and emotional engagement are critical drivers of trust and client perception of robo-advisors. When clients see tangible benefits in using robo-advisors, such as ease of access, efficiency, and quality of advice, they are more likely to trust and adopt these platforms. Additionally, emotional factors such as satisfaction and positive engagement play a vital role in building trust. For example, arousal, a form of emotional response, mediates the relationship between perceived usefulness and willingness to use robo-advisors, demonstrating the importance of both cognitive and

affective factors in shaping trust and perception (Xia et al., 2023, p. 2857). Similarly, younger, tech-savvy clients are particularly responsive to usability and perceived usefulness. This indicates that functional benefits combined with an intuitive interface can significantly boost client trust and adoption among these particular users (Yi et al., 2023, p. 1).

Algorithm Aversion and Behavioral Biases

Algorithm aversion, a reluctance to rely on automated systems for decision-making, remains a notable barrier in client perception of robo-advisors. Some clients exhibit a preference for human advisors due to the perceived rigidity and lack of empathy in automated tools. However, clients with a prevention-focused mindset, who prioritize risk avoidance and stability, tend to show greater acceptance of robo-advisors (Chang & Wang, 2023, p. 1). These clients perceive automated systems as aligned with their need for structured, risk-averse approaches to financial management. This insight suggests that while algorithm aversion is a significant factor, targeting prevention-focused clients and emphasizing the structured and objective nature of robo-advisors can improve perception and adoption.

Social Influence and Demographic Factors

Social influence and demographic characteristics, such as age, financial knowledge, and tech-savviness, shape client trust and perception of robo-advisors. Studies reveal that social endorsement, or the influence of peers and social networks, strongly affects clients' willingness to use robo-advisors, especially among younger demographics. This demographic is more likely to adopt robo-advisors if they perceive the technology to be popular and effective within their peer group (Yeh et al., 2023, p. 962). Additionally, financial knowledge and familiarity with digital tools positively correlate with trust, as clients who feel more knowledgeable and competent in finance are more likely to trust and adopt automated advisory services (Yi et al., 2023, p. 1). This suggests that demographic factors and social influences are essential in shaping both trust and perception, particularly among newer generations of investors.

Market Conditions and Trust Stability

Market conditions, particularly in times of volatility or crisis, can significantly impact client trust in robo-advisors. Trust in these platforms may fluctuate based on their performance during such conditions. Clients' trust in robo-advisors can increase if the

platforms demonstrate resilience and effective risk management during unstable markets (Liu et al., 2023, p. 3174). However, underperformance or failure to adapt to rapidly changing conditions can undermine trust, as clients may perceive robo-advisors as lacking the nuanced judgment that human advisors provide in such scenarios. Therefore, consistent performance across market conditions is essential to maintaining stable client trust in robo-advisory services.

4.3.2. Performance

The performance of robo-advisors is central to evaluating their effectiveness and reliability as investment management tools. This section explores key aspects of robo-advisor performance, including adaptability to market conditions, portfolio optimization and asset allocation, risk management, comparisons with traditional investment strategies, and the role of advanced technologies in enhancing performance. The main sub-themes within the Performance category are summarized in Table 5.

Table 5: Performance Sub-Themes.

Main Sub-Theme	Description
Adaptability to Market Conditions	Robo-advisors perform well in stable markets but face challenges adapting to volatile conditions.
Portfolio Optimization	Algorithms optimize portfolios for diversification and risk alignment, though variations exist across platforms.
Risk Management and Rebalancing	Automated rebalancing strategies maintain portfolio alignment and mitigate impulsive client behaviors.
Comparisons with Traditional Strategies	Robo-advisors excel in cost efficiency and objectivity but lack the qualitative insights of human advisors.
Technological Enhancements	AI advancements, such as sentiment analysis and portfolio selection, enhance robo-advisor performance.

Source: Own elaboration.

Adaptability to Market Conditions

A robo-advisor's ability to perform consistently across diverse market conditions is essential for client trust and long-term utility. Research indicates that robo-advisors generally perform well in stable markets, efficiently leveraging data-driven strategies to track benchmarks and deliver competitive returns. However, during volatile periods or market crises, such as the COVID-19 pandemic, robo-advisors' adaptability is tested. Studies show that robo-advisors can maintain stability during crises through automated rebalancing strategies, which reduce risk exposure by adjusting portfolio allocations in response to market changes. This adaptability provides clients with a measure of stability, mitigating impulsive decisions often seen with human investors during volatile periods (Liu et al., 2023, p. 3174). These findings highlight the relative reliability of robo-advisors across different market conditions, supporting their role as robust, crisis-responsive tools.

Portfolio Optimization and Asset Allocation

Portfolio optimization is a core element of robo-advisor performance, aimed at creating diversified, balanced portfolios that align with clients' risk tolerance and investment goals. Many robo-advisors rely on mean-variance optimization and other algorithmic models to guide their asset allocation, balancing risk and return across broad market exposure. Despite common optimization methods, studies reveal variability in robo-advisor recommendations, which can be influenced by platform-specific algorithms and asset class expertise. For instance, some robo-advisors may demonstrate proficiency in specific asset classes, which impacts the suitability and effectiveness of portfolio recommendations (Helms et al., 2022, p. 1028; Boreiko & Massarotti, 2020, p. 1). This suggests that while robo-advisors provide structured investment asset allocation, differences in algorithmic strategies contribute to performance variation across platforms.

Risk Management and Rebalancing Mechanisms

Automated risk management is fundamental to the robo-advisor model, allowing platforms to maintain alignment with clients' risk preferences through systematic rebalancing. By implementing automated rebalancing strategies, robo-advisors can adjust portfolios without client intervention, ensuring that investments remain within predetermined risk thresholds. Rebalancing mechanisms mitigate behavioral biases, helping clients avoid impulsive reactions to market changes, which is particularly beneficial

during periods of high volatility (Leow et al., 2021, p. 1). Advanced algorithms, such as reinforcement learning models, further enhance robo-advisors' ability to adapt to evolving client preferences over time, contributing to their competitive edge in risk management (Hu et al., 2024, p. 983). This automated, adaptive risk management is a key factor in the appeal and reliability of robo-advisors.

Comparisons with Traditional Investment Strategies

When compared with traditional, human-led investment strategies, robo-advisors exhibit unique strengths and limitations. Studies show that while robo-advisors excel in cost efficiency and operational consistency, they may be limited by algorithmic constraints. Human advisors, for instance, can incorporate qualitative insights and adapt more flexibly to complex, evolving client needs. In contrast, robo-advisors maintain objectivity and consistency, particularly in routine market environments, by eliminating human biases and following rule-based protocols (Alsabab et al., 2021, p. 369; Ge et al., 2021, p. 774). These distinctions highlight that while robo-advisors offer significant value in terms of efficiency, human expertise remains advantageous for clients with more intricate financial objectives.

Technological Enhancements and Performance Metrics

Technological advancements, particularly in artificial intelligence and machine learning, are instrumental in enhancing the performance of robo-advisors. Studies demonstrate that innovative models, such as those leveraging sparse and robust portfolio selection, can create portfolios that balance growth potential with risk management effectively (Lee et al., 2020, p. 687). Furthermore, some robo-advisors integrate sentiment analysis from social media to refine portfolio adjustments based on real-time market sentiment, thereby achieving a dynamic response to market (Leow et al., 2021, p. 1). Key performance metrics, such as Sharpe ratios, value-at-risk, and cumulative returns, are widely used to evaluate the success of these advanced models, underscoring the significant role of AI in refining robo-advisor performance (Xia et al., 2023, p. 2857). These technological improvements continue to narrow the gap between robo-advisors and traditional human-led advisory services.

4.3.3. Cost and Fee Structures

Cost efficiency is one of the defining advantages of robo-advisors, setting them apart from traditional financial advisory models that often charge higher fees. This section

discusses the cost structures of robo-advisors, emphasizing their lower fees, the benefits of automation in reducing costs, and the implications to client decision-making. The main sub-themes are described in Table 6.

Table 6: Cost and Fee Structure sub-themes

Main Sub-Theme	Description
Low-Cost Advantage	Robo-advisors charge significantly lower fees (0.25%-0.75% of AUM) compared to traditional advisors (1%-2%).
Automation-Driven Cost Reduction	Automated processes reduce operational costs, enabling competitive fees and efficient service delivery.
Implications for Client Decision-Making	Cost-sensitive clients favor robo-advisors for affordability and transparent fee structures, enhancing satisfaction.

Source: Own elaboration.

Low-Cost Advantage and Competitive Fee Models

Robo-advisors are recognized for their cost-effective fee structures, typically charging clients a small percentage of assets under management (AUM). Studies show that robo-advisors generally charge between 0.25% and 0.75% of AUM, a stark contrast to the 1%-2% fees charged by many traditional human advisors (Helms et al., 2022, p. 1028). This reduced fee model makes robo-advisors an attractive option for clients who seek affordable, hands-off investment solutions. By relying on automated processes, robo-advisors are able to significantly lower operational costs, which enables them to pass on these savings to clients in the form of reduced fees. This cost efficiency is particularly beneficial to retail investors, who may have previously been unable to access financial advisory services due to high fees (Au et al., 2021, p. 1).

Cost Reduction Through Automation

Automation is a key driver behind the low-cost structures of robo-advisors. By utilizing algorithms to manage portfolios, rebalance investments, and optimize asset allocation, robo-advisors minimize the need for human labor, which is a primary cost component in traditional advisory services. This automation allows robo-advisors to maintain

leaner operating models, resulting in lower fees for clients. Studies indicate that automation not only reduces costs but also improves service delivery speed and consistency, adding further value to the client experience while keeping fees low (Brunen & Laubach, 2022, p. 1). As a result, the automated and scalable nature of robo-advisors provides a competitive edge in the cost structure of customer advisory services, enabling them to serve a larger client base without incurring significant operational expenses.

Implications for Client Decision-Making

Cost efficiency also influences client decision-making, as investors increasingly compare the value of robo-advisors with traditional services. Clients who are cost-sensitive or have smaller portfolios are more likely to choose robo-advisors over human advisors due to the significant cost savings associated with automated services. Research suggests that clients who prioritize cost savings and value efficiency perceive robo-advisors as more beneficial, given the lower fees and automated management they offer (Helms et al., 2022, p. 1028). Additionally, the transparent fee structures of robo-advisors further enhance their appeal, as clients can easily understand and anticipate costs, which reduces financial ambiguity and increases client satisfaction (Au et al., 2021, p. 1).

4.3.4. Democratization of Access to Investment Services

One of the most significant impacts of robo-advisors on the financial industry is their role in democratizing access to investment services. This section discusses how robo-advisors have opened up wealth management opportunities to a broader audience, particularly for those traditionally underserved by high-cost financial advisory models, including young investors and those with limited financial knowledge or resources. The main sub-themes within this category are exhibited in the following Table 7.

Table 7: Democratization of Access to Investment Services Sub-Themes.

Main Sub-Theme	Description
Increased Accessibility	Robo-advisors eliminate barriers like high fees and minimum balances, enabling small investors to participate.

Empowerment Through Inclusion	User-friendly interfaces and educational tools empower clients with limited financial knowledge to make informed decisions.
Support for Underserved Groups	Robo-advisors reach millennials and low-income individuals, promoting financial inclusion across demographics.
Strategic Advantage	Democratization differentiates robo-advisors by expanding their market reach and fostering financial engagement.

Source: Own elaboration.

Increased Accessibility for Retail Investors

Robo-advisors make financial advisory services accessible to individuals who may not have been able to afford traditional human advisors. With lower fees and no minimum account balances in many cases, these platforms enable small investors to access diversified, professionally managed portfolios (Yi et al., 2023, p. 1). By eliminating barriers such as high minimum investment thresholds, robo-advisors broaden the pool of potential investors, making it possible for those with limited funds or investment experience to participate in financial markets (Nguyen et al., 2023, p. 1). This increased accessibility marks a shift in the wealth management industry, where cost and investment size have historically restricted access to professional financial advice.

Empowerment Through Financial Inclusion

The democratization enabled by robo-advisors extends beyond just affordability, as these platforms also empower clients through simplified, user-friendly interfaces and educational resources. By making complex investment processes easier to understand, robo-advisors help clients with limited financial knowledge make informed investment decisions. This empowerment is particularly beneficial for younger, tech-savvy investors who may be less inclined to seek traditional advisory services but are open to using digital tools for their investment needs (Brunen & Laubach, 2022, p. 1). With features such as automated rebalancing, tax optimization, and low-cost diversified portfolios, robo-advisors provide tools that allow a wider range of clients to manage their finances effectively.

Support for Underrepresented Demographics

Robo-advisors have been especially influential in reaching demographics that are typically underserved by traditional financial services, such as millennials and individuals with smaller disposable incomes. By providing low-cost, digital-first services, robo-advisors align well with the preferences and financial capacities of these groups, promoting financial inclusion across socioeconomic backgrounds (Nguyen et al., 2023, p. 1). This focus on underserved demographics not only enhances the client base of robo-advisors but also contributes to a more inclusive financial ecosystem, where access to professional investment advice is not limited by wealth or status.

Democratization as a Strategic Advantage

The democratizing effect of robo-advisors is a strategic advantage that differentiates them from traditional advisors, who are often associated with higher costs and exclusivity. The ability to serve clients across income levels and financial expertise not only increases robo-advisors’ market reach but also strengthens their role in promoting broader financial engagement. This competitive edge is particularly relevant in an increasingly digital landscape, where clients seek accessible, low-cost options that traditional advisory services may not provide as effectively (Yi et al., 2023, p. 1). As a result, robo-advisors play a pivotal role in reshaping the wealth management industry by making financial advisory services more inclusive and accessible to all.

4.3.5. Client Engagement and Adoption Drivers

Client engagement and the factors driving adoption are essential to understanding the impact and growth of robo-advisors. This section examines the primary adoption drivers, such as perceived usefulness, trust, social influence, and usability, and explores how robo-advisors foster client engagement to sustain long-term relationships. The main sub-themes can be seen in Table 8.

Table 8: Client Engagement and Adoption Drivers Sub-Themes.

Main Sub-Theme	Description
Perceived Usefulness and Trust	Clients adopt robo-advisors when they perceive benefits like efficiency, cost savings, and reliability.

Social Influence and Demographics	Peer recommendations and digital savviness among younger users drive the adoption of robo-advisors.
Usability and User Experience	Intuitive, user-friendly platforms enhance engagement and adoption by simplifying financial decision-making.
Emotional Engagement	Positive interactions, regular updates, and personalized notifications foster loyalty and client satisfaction.

Source: Own elaboration.

Perceived Usefulness and Trust as Adoption Drivers

Perceived usefulness remains one of the most influential factors in clients' decisions to adopt robo-advisors. Clients are more likely to engage with these platforms when they see clear benefits like efficient portfolio management, automated processes, and cost savings. Research indicates that when clients perceive these tangible advantages, they are more inclined to consider robo-advisors as a valuable alternative to traditional advisory services (Xia et al., 2023, p. 2857). Trust is another crucial adoption driver; clients must feel confident in the robo-advisor's ability to provide secure, reliable, and fair financial guidance. This trust is cultivated through transparency, secure data practices, and reputable branding, all of which strengthen the client-advisor relationship and increase adoption likelihood (Nguyen et al., 2023, p. 1; Roh et al., 2023, p. 29).

Social Influence and Demographic Factors

Social influence, or the impact of peers and social networks, plays a notable role in client adoption of robo-advisors, especially among younger, tech-savvy demographics. Clients are more likely to adopt these platforms if they perceive them as widely accepted or recommended within their social circles. Studies show that robo-advisors benefit significantly from positive peer recommendations, particularly among younger users who are inclined toward digital tools for financial management (Yi et al., 2023, p. 1). This demographic alignment with digital-native clients highlights the appeal of robo-advisors as modern, accessible financial solutions for younger, cost-sensitive users (Luo et al., 2024, p. 1).

Usability and User Experience

Ease of use and a user-friendly interface are essential to both client engagement and adoption. robo-advisors that offer streamlined, intuitive platforms help clients feel empowered and in control of their investments, leading to higher engagement and satisfaction. Studies emphasize that an accessible and easy-to-navigate interface increases adoption rates, as clients experience reduced complexity in managing their financial decisions (Nguyen et al., 2023, p. 1). Positive user experience also fosters trust, as clients who find the platform easy to navigate are more likely to view it as a reliable and effective tool (Xia et al., 2023, p. 2857). This usability of robo-advisors' focus aligns well with the expectations of clients who prioritize seamless, efficient services.

Emotional Engagement and Client Satisfaction

Emotional engagement through client satisfaction and positive interactions is central to retaining clients over time. Robo-advisors enhance engagement by offering regular updates, personalized notifications, and interactive tools that make it easy for clients to track their financial goals and monitor portfolios. Emotional engagement is particularly effective in fostering client loyalty, as satisfied users tend to stay with platforms that respond to their needs and preferences (Yi et al., 2023, p. 1). Studies show that positive emotional experiences, like satisfaction and trust in the platform's reliability, significantly increase engagement and retention (Roh et al., 2023, p. 29; Au et al., 2021, p. 1).

4.3.6. Regulation and Ethics

The emergence of robo-advisors has brought both regulatory and ethical challenges to the forefront of the financial advisory industry. As these platforms automate complex financial decisions, concerns surrounding data security, transparency, fairness, and regulatory compliance are increasingly critical. This section examines the regulatory and ethical issues that accompany robo-advisors and highlights the importance of robust frameworks to guide their responsible development and use. The main sub-themes can be seen in the following Table 9.

Table 9: Regulation and Ethics Sub-Themes.

Main Sub-Theme	Description
Transparency in Algorithmic Decisions	Clear disclosure of data sources and decision criteria fosters trust and accountability in robo-advisors.
Data Privacy and Security	Stringent data protection practices are crucial for safeguarding client information and building confidence.
Fairness and Bias	Addressing algorithmic biases ensures fair, impartial recommendations and upholds ethical standards.
Regulatory Compliance	Robust frameworks promote responsible operations, safeguard consumer interests, and ensure service quality.

Source: Own elaboration.

Transparency and Accountability in Algorithmic Decisions

A key ethical concern in robo-advisor platforms is the transparency of their algorithmic decision-making processes. Clients must understand the underlying logic of recommendations if they are to trust and rely on them. However, the complexity of algorithms can make it challenging for users to interpret the financial advice they receive, leading to potential mistrust. Studies suggest that clear disclosure of data sources, decision criteria, and the methodology behind recommendations can foster trust and improve accountability (Nguyen et al., 2023, p. 1). By increasing algorithmic transparency, robo-advisors can enhance client confidence in the fairness and reliability of automated advice (Wexler & Oberlander, 2021, p. 351).

Data Privacy and Security Requirements

The protection of client data is a primary regulatory obligation for robo-advisors, given the vast amounts of personal and financial information they collect. Effective data security practices are essential to maintain client confidence and prevent data breaches. Research shows that clients are more willing to engage with robo-advisors when they feel assured of their privacy and data security (Leow et al., 2021, p. 1). To meet both ethical and regulatory expectations, robo-advisors must implement stringent data

protection practices, including encryption and clear privacy policies, to safeguard client information and comply with legal requirements (Liu et al., 2023, p. 3174).

Fairness and Bias in Recommendations

Algorithmic fairness is another ethical imperative, as robo-advisors must ensure that their recommendations are free from bias. Algorithms trained on historical data or specific parameters may inadvertently produce recommendations that disadvantage certain client groups. Studies emphasize the importance of designing algorithms that can detect and address potential biases, allowing robo-advisors to deliver impartial, fair advice to all users (Cheng et al., 2019, p. 1). Regular audits and continuous monitoring of algorithmic outputs are necessary to maintain ethical standards and minimize unintended biases that could undermine trust (Roh et al., 2023, p. 29; Wexler & Oberlander, 2021, p. 351).

Regulatory Compliance and Consumer Protection

Regulatory compliance is essential to ensure that robo-advisors operate responsibly and protect clients' interests. As the regulatory landscape continues to evolve, frameworks must focus on maintaining service quality, data security, and consumer protection. Research indicates that well-established regulations provide guidance to robo-advisors, promoting transparent and ethical operations that prioritize client welfare (Nguyen et al., 2023, p. 1). Robust regulatory standards can create a safer environment for clients by ensuring that automated services adhere to consumer protection requirements, promoting broader adoption and trust (Wexler & Oberlander, 2021, p. 351).

4.3.7. Employment and Human Advisors

The rise of robo-advisors is reshaping the employment landscape within the financial advisory industry, raising questions about the future role of human advisors. As automation increasingly takes over routine tasks, traditional roles and responsibilities are shifting, affecting both employment prospects and the nature of human advisor-client relationships. This section explores the implications of robo-advisors for employment within the sector, as well as the comparative advantages that human advisors continue to hold. The sub-themes and a short description for these can be seen in the following Table 10.

Table 10: Employment and Human Advisors Sub-Themes.

Main Sub-Theme	Description
Impact on Employment and Role Evolution	Automation reduces routine tasks, transforming human advisors' roles toward complex, personalized services.
The Role of Human Advisors in Complex Financial Needs	Human advisors excel in handling intricate financial situations requiring tailored strategies and personal judgment.
Hybrid Models and Collaboration	Hybrid models combine robo-advisors' efficiency with human advisors' personalization to enhance client service.
Human Advisors and Trust Dynamics	Clients value human advisors for their trustworthiness, empathy, and emotional support in complex financial decisions.

Source: Own elaboration.

Impact on Employment and Role Evolution

The integration of robo-advisors into financial services is redefining employment dynamics, particularly for entry-level and routine advisory roles. Automation streamlines repetitive tasks such as portfolio rebalancing and risk assessment, functions traditionally managed by junior advisors. Studies indicate that this shift reduces demand for basic advisory roles, as robo-advisors can efficiently handle these tasks at a lower cost, with minimal human intervention (Maier et al., 2022, p. 1). However, rather than entirely replacing human advisors, this automation trend is transforming their roles, directing human advisors toward more complex and personalized services that require empathy, adaptability, and nuanced judgment (Alsabah et al., 2021, p. 369).

The Role of Human Advisors in Complex Financial Needs

While robo-advisors offer a cost-effective solution for clients with straightforward investment needs, human advisors retain a comparative advantage in addressing more intricate financial situations. High-net-worth individuals and clients requiring customized financial planning often prefer human advisors, as they provide the personalized attention and expertise necessary for managing complex portfolios and strategic

planning (Roh et al., 2023, p. 29). Research shows that clients with prevention-focused mindsets, who prioritize stability and are more cautious, tend to favor human advisors over robo-advisors, as they value the flexibility and personal insight human advisors offer in tailoring advice (Chang & Wang, 2023, p. 1). This distinction underscores the unique capabilities of human advisors in meeting complex client needs, particularly where personalized judgment is crucial.

Hybrid Models and the Collaboration Between Human and robo-advisors

The emergence of hybrid advisory models, which combine the efficiency of robo-advisors with the personal touch of human advisors, reflects a shift in the industry's approach to client service. Hybrid models allow human advisors to leverage automated tools for routine tasks while focusing on areas that require deeper client engagement and personalized advice. This collaboration enhances efficiency, allowing human advisors to allocate more time to relationship-building and holistic financial planning (Zhang et al., 2021, p. 634). Such models exemplify the complementary nature of human and robo-advisors, demonstrating that technology can support rather than replace human roles, especially in providing more comprehensive and value-added services.

Human Advisors and Trust Dynamics

Trust remains a crucial factor in client preferences between robo-advisors and human advisors. While clients increasingly turn to robo-advisors for cost-effective, objective advice, many still value the trust and reassurance offered by experienced human advisors. Studies indicate that clients perceive human advisors as more trustworthy, especially when dealing with significant life events or complex financial decisions that benefit from empathy and human understanding (Zhang et al., 2021, p. 634). This perceived trust advantage positions human advisors as essential for clients who prioritize a personal connection and emotional support in financial planning.

4.3.8. Market Conditions, Investment Strategy, and Portfolio Allocation

Robo-advisors operate within a dynamic financial environment where market conditions, investment strategies, and portfolio allocation play essential roles in determining their performance and effectiveness. This section examines how robo-advisors respond to varying market conditions, the strategies they employ to optimize investment outcomes, and the portfolio allocation methods they use to align with clients' risk and return profiles. A summary of the main sub-themes can be seen in Table 11.

Table 11: Market Conditions, Investment Strategy, and Portfolio Allocation Sub-Themes.

Main Sub-Theme	Description
Adapting to Market Conditions	Robo-advisors adjust portfolios during volatility, such as crises, to minimize risk and maintain performance.
Investment Strategies for Optimization	Advanced strategies, including modern portfolio theory and machine learning, enhance risk-return profiles.
Portfolio Allocation and Customization	Robo-advisors create diversified, tailored portfolios but show variability across platforms due to algorithmic differences.
Balancing Stability and Growth	Robo-advisors focus on rebalancing and periodic adjustments to align portfolios with both stability and growth goals.

Source: Own elaboration.

Adapting to Market Conditions

The ability of robo-advisors to adapt to different market conditions, including volatility and crises, is a critical factor in their effectiveness. During stable market periods, robo-advisors can effectively manage portfolios through automated, rules-based strategies, which often align well with broad market indices (Ge et al., 2021, p. 774). However, in times of market instability, such as during economic downturns or financial crises, robo-advisors’ performance is tested. Research shows that some robo-advisors adjust by reallocating assets to less risky funds, thereby mitigating losses during market downturns (Liu et al., 2023, p. 3174). For instance, during the COVID-19 pandemic, certain robo-advisors demonstrated resilience by adjusting portfolios to minimize risk exposure, which helped them perform relatively well compared to static strategies (Hu et al., 2024, p. 983).

Investment Strategies for Optimization

Robo-advisors employ a variety of investment strategies to optimize risk-return profiles and align with clients’ financial goals. Many platforms use modern portfolio theory and

algorithmic decision-making to create balanced portfolios that maximize returns for a given level of risk. Studies indicate that robo-advisors often implement mean-variance optimization, which relies on historical data to project expected returns and determine the best asset allocation for different risk profiles (Helms et al., 2022, p. 1028). Other strategies, such as those integrating sentiment analysis or using machine learning algorithms, have also been developed to enhance robo-advisors' ability to respond to current market data and client behavior patterns (Leow et al., 2021, p. 1). Despite these advanced strategies, researchers highlight that the effectiveness of these models may vary, especially when market conditions deviate from historical norms, posing challenges to the reliability of purely data-driven approaches (Boreiko & Massarotti, 2020, p. 1).

Portfolio Allocation and Customization

Portfolio allocation is central to robo-advisors' service offerings, as they aim to provide diversified portfolios tailored to individual client preferences and risk tolerance. Robo-advisors commonly use a top-down approach, beginning with asset class allocation and then selecting specific securities to achieve optimal diversification. Research indicates that while most robo-advisors effectively differentiate between client risk profiles, substantial variability exists in portfolio recommendations across platforms, even within similar client segments (Boreiko & Massarotti, 2020, p. 1). This variability reflects differences in algorithms, geographic market focuses, and the specific asset classes prioritized by different robo-advisors (Lee et al., 2020, p. 687). Studies also suggest that robo-advisors that offer greater transparency in portfolio allocation and rebalance mechanisms tend to build more trust with clients, as users appreciate understanding how their portfolios are constructed and adjusted in response to market changes (Liu et al., 2023, p. 3174).

Balancing Stability and Growth

A key challenge for robo-advisors is balancing the need for portfolio stability with clients' desires for growth. While low-cost, diversified portfolios are appealing for many clients, certain market conditions require robo-advisors to adapt their strategies to preserve capital and limit losses. Robo-advisors that prioritize consistent rebalancing and periodic adjustments to portfolio composition are often more successful in maintaining alignment with clients' goals across different market cycles (Hu et al., 2024, p. 983).

By periodically re-evaluating and adjusting their asset allocations, robo-advisors can enhance resilience against market fluctuations while still aiming for long-term growth, thus meeting clients' expectations for both stability and performance.

4.3.9. Sustainability

As sustainability becomes increasingly important in investment decisions, robo-advisors are adapting their offerings to meet the growing demand for sustainable investment options. This section explores how robo-advisors are integrating sustainability into their portfolio strategies and the factors influencing clients' interest in sustainable investing. A summary of the main sub-themes can be seen in the following Table 12.

Table 12: Sustainability Sub-Themes.

Main Sub-Theme	Description
Demand for Sustainable Investment Options	Rising client interest in ESG portfolios drives robo-advisors to integrate sustainability into their strategies.
Behavior and Engagement in Sustainable Investments	Clients with sustainable habits are more likely to invest in ESG-focused portfolios, aligning values with financial choices.
The Strategic Value of Offering Sustainable Options	ESG portfolios provide a competitive edge for robo-advisors, attracting socially conscious clients and enhancing loyalty.

Source: Own elaboration.

Demand for Sustainable Investment Options

The demand for sustainable investment solutions is on the rise, driven by growing awareness of environmental, social, and governance (ESG) factors. Robo-advisors have responded to this trend by incorporating sustainable investment options into their portfolios. Research shows that clients are particularly interested in ESG investments that align with their values and contribute positively to social and environmental goals (Brunen & Laubach, 2022, p. 1). Offering sustainable portfolio options allows robo-advisors to appeal to clients who prioritize impact investing, particularly younger investors and those with strong environmental and social values. This trend indicates that

sustainable investment options are not just a differentiator but a necessity for platforms that aim to capture and retain socially conscious clients.

Behavior and Engagement in Sustainable Investments

The way clients engage with sustainable investment options often reflects their broader behaviors and values. Studies indicate that clients who exhibit sustainable behavior in other areas of their lives are more likely to choose sustainable portfolios offered by robo-advisors. For instance, clients with a strong track record of sustainable consumption are also more inclined to invest in ESG-focused portfolios, suggesting an alignment between personal values and financial choices (Au et al., 2021, p. 1). This preference for sustainable options underscores the role of robo-advisors in empowering clients to make investments that reflect their ethical priorities, bridging the gap between personal values and financial goals.

The Strategic Value of Offering Sustainable Options

For robo-advisors, integrating sustainability into their offerings represents a strategic opportunity. By offering ESG-aligned portfolios, robo-advisors can differentiate themselves in an increasingly competitive market, attracting clients who are seeking both financial returns and positive societal impact. Studies emphasize that sustainable portfolios can serve as a unique selling point, enhancing brand appeal among clients who prioritize ethical considerations in their financial decisions (Brunen & Laubach, 2022, p. 1). This alignment with sustainable values not only strengthens client loyalty but also broadens the client base by appealing to environmentally and socially conscious demographics.

4.4. Summary of the Literature Review

The literature review revealed that robo-advisors are reshaping the asset management industry through their accessible, cost-effective, and data-driven advisory services. These AI-driven platforms are challenging traditional advisory models by offering low-cost solutions and broadening financial accessibility, particularly to retail investors and younger demographics. However, this transformative potential is accompanied by significant challenges, particularly in areas like client trust, regulatory compliance, performance across varying market conditions, and ethical considerations.

Client trust emerged as a crucial element for the successful adoption of robo-advisors. While clients often favor human advisors for their expertise and personalized attention,

robo-advisors are gaining acceptance, especially among those seeking cost-efficient, straightforward advisory options. Institutional reputation, transparency in decision-making algorithms, and rigorous data security practices are essential factors for building trust in these platforms. However, overcoming algorithm aversion and addressing client concerns about data privacy and transparency remain essential to further enhance credibility).

Performance consistency, especially during times of economic instability, is another critical factor highlighted in the literature. Studies reveal that while robo-advisors effectively manage portfolios under stable market conditions, periods of volatility, such as the COVID-19 crisis, test their adaptive capabilities. Automated rebalancing and data-driven asset allocation enable robo-advisors to provide resilience during such times, yet human advisors often retain an advantage in adapting to complex, rapidly changing circumstances.

Cost efficiency is one of the most significant advantages of robo-advisors, enabling them to offer advisory services at a fraction of the fees associated with traditional advisors. The automation and scalability of robo-advisors make these low-cost structures possible, allowing a wider range of clients to access financial advice. This affordability is particularly appealing to younger, tech-savvy investors who are both budget-conscious and comfortable with digital solutions.

Additionally, robo-advisors are democratizing financial services by providing accessible, user-friendly platforms with minimal entry requirements. This aligns well with younger demographics and those traditionally underserved by high-cost advisory models, thus promoting financial inclusion and engagement across a broader client base.

However, regulatory and ethical considerations present ongoing challenges. Robo-advisors must ensure transparency in their algorithms and fairness in their recommendations to address biases, meet data protection standards, and enhance accountability. Ethical considerations are also extending to sustainable investing, with an increasing demand for ESG-aligned portfolios. By offering socially responsible investment options, robo-advisors are appealing to clients who prioritize sustainability, particularly those who value investments with positive social impact.

5. Discussion

In this chapter, the findings from the literature review are interpreted in relation to the research goals and questions outlined earlier. The implications of AI-driven robo-advisors for the financial industry, client relationship dynamics, and employment within the sector are discussed. By synthesizing key themes such as performance, client trust, regulatory challenges, and employment impacts, a comprehensive understanding is provided of how robo-advisors are transforming asset management and what this means for various stakeholders. Lastly, the research questions are answered as well.

5.1. Interpretation of the Findings

The findings from the literature review indicate that AI-driven robo-advisors are significantly transforming the asset management industry across multiple dimensions. One of the most prominent impacts is the democratization of financial services. Robo-advisors offer accessible and cost-effective investment options to a broader audience, particularly young and tech-savvy investors (Yi et al., 2023, p. 1). By lowering fees and eliminating high minimum investment requirements, they have broadened access to professional investment advice, which was traditionally available only to high-net-worth individuals (Nguyen et al., 2023, p. 1). This aligns with the research question regarding the extent to which robo-advisors offer more cost-effective and democratized financial advice, influencing the accessibility and inclusiveness of asset management services.

Furthermore, performance analysis suggests that robo-advisors are effective in stable market conditions, leveraging data-driven strategies to deliver competitive returns (Helms et al., 2022, p. 1028). They efficiently track benchmarks and provide automated rebalancing to maintain portfolio alignment with clients' risk preferences (Liu et al., 2023, p. 3174). However, their adaptability during volatile periods, such as financial crises, is mixed. While some robo-advisors have demonstrated resilience by adjusting portfolios to minimize risk exposure, they may lack the nuanced judgment required during extreme market volatility, where human advisors can adapt strategies based on qualitative insights (Hu et al., 2024, p. 983). This finding addresses the research question on how AI-driven robo-advisors perform in various market conditions compared to traditional asset managers, particularly in terms of adaptability and resilience.

Client trust emerges as a crucial factor influencing the adoption and sustained use of robo-advisors. Trust is fostered through institutional credibility, transparency in

decision-making processes, and robust data security measures (Roh et al., 2023, p. 29). Clients are more inclined to trust robo-advisors offered by reputable institutions, facilitating a transfer of trust from the institution to the technology (Cheng et al., 2019, p. 1). Transparency in algorithms and addressing privacy concerns are vital, as clients need assurance that their financial information is safeguarded (Nguyen et al., 2023, p. 1). However, challenges such as algorithm aversion persist, indicating that overcoming these barriers is essential for enhancing client trust and perception (Chang & Wang, 2023, p. 1). This relates to the research question about the impact of AI integration on client perceptions, trust levels, and engagement compared to traditional human advisors.

Regarding cost structures, the findings confirm that robo-advisors offer significant cost advantages over traditional advisory services. By charging lower fees, typically between 0.25% and 0.75% of assets under management, and leveraging automation to reduce operational costs, robo-advisors make investment services more affordable and accessible (Helms et al., 2022, p. 1028). This cost efficiency influences client decision-making, particularly for cost-sensitive investors, and contributes to the democratization of financial advice (Au et al., 2021, p. 1). This supports the research question concerning how robo-advisors offer more cost-effective and democratized financial advice.

Regulatory and ethical challenges are highlighted as critical considerations in the rise of robo-advisors. Ensuring transparency in algorithmic decisions, protecting data privacy, and addressing potential biases in recommendations are essential for maintaining client trust and meeting regulatory obligations (Wexler & Oberlander, 2021, p. 351). Clients are more willing to engage with robo-advisors when they feel assured of their privacy and data security (Leow et al., 2021, p. 1). This addresses the research question concerning the key regulatory and ethical challenges associated with robo-advisors, particularly regarding data privacy, algorithm transparency, and automated decision-making.

The impact on employment and the role of financial advisors is another significant finding. While robo-advisors automate routine tasks, reducing the demand for basic advisory roles, they do not entirely replace human advisors. Instead, human advisors are shifting towards providing more complex and personalized services that require empathy, adaptability, and nuanced judgment (Alsabab et al., 2021, p. 369). High-net-worth

individuals and clients with complex financial needs often prefer human advisors for their ability to offer personalized attention and expertise (Roh et al., 2023, p. 29). This evolution addresses the research question about how robo-advisors are affecting employment and the essential skills in the evolving landscape. Based on these findings, the research questions can be answered.

5.2. Implications for the Financial Industry

The integration of AI-driven robo-advisors into the financial industry has far-reaching implications, reshaping traditional paradigms and introducing new opportunities and challenges. These automated platforms are not only democratizing access to financial services but also compelling traditional financial institutions to innovate and adapt to a rapidly evolving technological landscape.

One significant implication is the democratization of investment management, which has historically been dominated by high-cost, human-led advisory models. Robo-advisors, with their low fees and minimal investment thresholds, make professional financial advice accessible to a wider range of clients, including retail investors and those with limited financial literacy (Phoon & Koh, 2018, p. 16). This shift is particularly evident in the German market, where platforms like Scalable Capital and Liquid have emerged as key players, lowering barriers to entry for a broader demographic (Nicolaisen, 2017).

Cost efficiency is another transformative factor. By automating routine tasks such as portfolio rebalancing and tax optimization, robo-advisors significantly reduce operational costs, enabling them to offer customer services at fees ranging from 0.25% to 0.75% of assets under management compared to the 1%–2% fees typically charged by human advisors (Holtfort et al., 2022, p. 44). This cost advantage pressures traditional organizations to either reduce their fees or adopt hybrid models that combine human expertise with AI-driven efficiencies (Phoon & Koh, 2018, p. 83). Consequently, financial institutions are investing in technology in order to remain competitive, integrating robo-advisory features into their offerings so that the evolving client expectations can be met.

The implications extend to client relationships and service delivery. AI-driven platforms excel in providing consistent, unbiased, and data-driven recommendations, which can enhance trust among younger, tech-savvy clients (Belanche et al., 2019, p. 1418).

However, traditional firms must address the challenge of maintaining personalized relationships that many clients still value, particularly those with complex financial needs or prevention-focused mindsets (Chang & Wang, 2023, p. 1). Hybrid advisory models are emerging as a solution, blending the scalability of AI with the nuanced judgment of human advisors to cater to a diverse client base (Phoon & Koh, 2018, p. 94).

Regulatory and ethical considerations also shape the industry's trajectory. Issues such as algorithm transparency, data security, and bias mitigation are critical for fostering client trust and ensuring compliance with regulatory standards (Seiler & Fanenbruck, 2021, p. 3). Institutions must address these concerns proactively, adopting robust frameworks to govern AI-driven operations while ensuring fairness and accountability in decision-making processes (Cheng et al., 2019, p. 1).

Finally, the adoption of robo-advisors is transforming employment dynamics within the industry. While automation reduces the need for routine advisory roles, it creates demand for new skill sets, including data analytics, AI integration, and client-centric relationship management (Shanmuganathan, 2020, p. 8). This shift underscores the need for continuous professional development to prepare the workforce for a more technology-driven financial landscape.

5.3. Implications for Client Relationship Dynamics

The advent of AI-driven robo-advisors is reshaping client relationship dynamics in the financial industry, transforming how clients interact with advisory platforms and perceive financial services. While robo-advisors offer cost-effective, scalable solutions, they also challenge traditional notions of trust, personalization, and engagement that have long defined client-advisor relationships.

One of the most profound implications of AI-driven advisors is the shift in how trust is established and maintained. Traditional human advisors build trust through personalized interactions, emotional intelligence, and relationship-building over time. Robo-advisors, in contrast, rely on transparency, algorithmic reliability, and institutional credibility to foster client confidence (Belanche et al., 2019, p. 1418). Transparency, particularly in algorithmic decision-making, plays a crucial role in building trust. Clients value understanding how recommendations are generated, and platforms that provide clear insights into their methodologies are better positioned to retain client trust (Nguyen et al., 2023, p. 1). However, overcoming algorithm aversion—clients' reluctance to rely

on automated systems—remains a critical challenge, particularly among those who prioritize human judgment in complex financial decisions (Chang & Wang, 2023, p. 1).

Client engagement is also being redefined. Robo-advisors leverage digital interfaces to provide consistent, data-driven communication, enabling clients to monitor and adjust their portfolios with ease. These platforms use interactive tools, personalized notifications, and real-time updates to keep clients informed and engaged, which aligns well with the expectations of tech-savvy demographics (Capponi et al., 2020, p. 5). However, the lack of human interaction may limit their ability to address clients' emotional needs, particularly during periods of financial uncertainty or market volatility. This can ultimately impact the perceived quality of service for clients who value personalized advice, guidance, and the reassurance of a human advisor (Phoon & Koh, 2018, p. 94).

Hybrid advisory models are emerging as a strategic solution, combining the efficiency of robo-advisors with the personalized touch of human advisors. These models enable financial institutions to cater to diverse client needs, offering automated solutions for straightforward financial planning while retaining human advisors for complex cases (Shanmuganathan, 2020, p. 8). Such models address the limitations of purely automated systems by maintaining a human connection, which remains critical for building long-term client relationships, particularly with high-net-worth individuals and prevention-focused clients (Chang & Wang, 2023, p. 1).

The impact of robo-advisors on trust and engagement also varies across demographic groups. Younger, tech-savvy clients often perceive robo-advisors as efficient and user-friendly, valuing their cost-effectiveness and accessibility (Yi et al., 2023, p. 1). In contrast, older clients or those less familiar with digital tools may be more hesitant, perceiving automated platforms as impersonal and less capable of handling complex needs (Belanche et al., 2019, p. 1412). Financial institutions must adapt their strategies to accommodate these differences, offering tailored approaches that balance automation with personalization.

5.4. Implications for the Employees

The rise of AI-driven robo-advisors is transforming the financial industry's workforce, particularly the roles and responsibilities of employees in the asset management sector. Automation, powered by advanced algorithms, is reducing the demand for

traditional tasks performed by human advisors, such as portfolio management and routine financial planning. This evolution is leading, according to the reviewed literature, to a redefinition of skills, creating new opportunities while simultaneously posing challenges for employees adapting to this shift.

One major implication is the decline in demand for entry-level roles that involve repetitive and manual tasks. Robo-advisors efficiently automate activities such as portfolio rebalancing, tax optimization, and basic financial planning, tasks traditionally handled by junior advisors (Shanmuganathan, 2020, p. 8). This automation allows firms to cut costs and scale their services, but it also reduces opportunities for professionals entering the industry. As a result, entry-level employees must now acquire skills in areas such as data analytics, technology integration, and client relationship management to remain relevant.

While automation replaces certain functions, it also creates opportunities for employees to focus on more strategic and complex tasks. Human advisors continue to play a critical role in addressing the needs of high-net-worth clients and individuals with complex financial situations requiring personalized advice. This includes estate planning, tax strategies, and holistic financial management, areas where emotional intelligence, adaptability, and human judgment remain irreplaceable (Phoon & Koh, 2018, p. 83). Employees must therefore pivot toward offering value-added services that complement automated solutions, focusing on tasks that require nuanced understanding and interpersonal skills.

The emergence of hybrid advisory models, which combine AI-driven platforms with human expertise, has further implications for employees. In these models, human advisors work alongside robo-advisors to provide a seamless client experience, leveraging technology for efficiency while offering personalized interactions where necessary (Zhang et al., 2021, p. 634). For example, human advisors may interpret algorithmic recommendations for clients, contextualize automated insights, and assist in complex decision-making processes. This collaboration requires employees to develop technical proficiency in using robo-advisor platforms and a deeper understanding of AI-driven tools.

Training and upskilling are critical to addressing the challenges posed by automation. Employees in the financial sector must acquire knowledge in data science, machine

learning, and financial technology to effectively integrate robo-advisors into their workflows (Shanmuganathan, 2020, p. 7). Financial institutions need to invest in professional development programs that equip their workforce with these skills, ensuring that employees can leverage technology to enhance client services. In addition to technical expertise, training programs should focus on soft skills such as communication, empathy, and problem-solving to help employees excel in client-facing roles that require human interaction.

The transformation brought about by robo-advisors also raises concerns about job displacement and resistance to change among employees. While automation creates efficiencies, it can lead to anxiety among workers who fear losing their jobs to technology. This resistance can hinder the adoption of robo-advisors within organizations, particularly among employees who feel unprepared for the transition. To mitigate these challenges, financial institutions must foster a culture of adaptability and continuous learning, emphasizing the complementary roles of technology and human expertise in delivering client value (Reher & Sokolinski, 2024, p. 4).

Moreover, the growing reliance on AI-driven platforms shifts the skills required for success in the financial industry. Employees must move away from traditional advisory functions and focus on roles that involve critical thinking, strategic planning, and the ability to interpret and contextualize data-driven insights (Bourgeron et al., 2018, p. 2). Financial professionals who embrace these changes and position themselves as value creators in the hybrid advisory ecosystem are more likely to thrive in this evolving landscape.

5.5. Limitations of the Study

While this study provides valuable insights into the transformative impact of robo-advisors on the asset management industry, several limitations must be acknowledged. First, the study relies heavily on secondary data and a systematic literature review, which, while comprehensive, does not incorporate primary empirical evidence. The absence of direct input from industry professionals, clients, or financial institutions limits the study's ability to capture real-world practices, challenges, and innovations. Future studies could benefit from incorporating interviews, surveys, or case studies to provide a more nuanced understanding of how robo-advisors operate in practice.

Second, the findings are subject to contextual constraints, as the analysis is influenced by the geographic and regulatory environments predominantly discussed in the reviewed literature. For instance, the emphasis on markets such as the United States, Germany, and other advanced economies may not fully represent the dynamics of robo-advisor adoption and performance in emerging markets, where financial behaviors and regulatory frameworks differ significantly.

Third, the rapidly advancing nature of AI and financial technologies poses a limitation in the relevance and longevity of the findings. Technologies underpinning robo-advisors, such as machine learning algorithms and data analytics, are evolving at a pace that may render some insights outdated. This creates a challenge in capturing the full potential and risks of future innovations in robo-advisory services.

Fourth, the study's focus on theoretical frameworks may oversimplify certain complexities inherent in client behavior and institutional adaptation. For example, client trust, engagement, and behavioral biases are multifaceted and influenced by cultural, psychological, and situational factors that are challenging to encapsulate fully within a theoretical model.

Lastly, the ethical and regulatory challenges discussed, while significant, are explored predominantly from a conceptual standpoint. A more detailed investigation of practical regulatory enforcement and the lived experiences of clients facing ethical dilemmas with robo-advisors would provide a richer perspective.

6. Conclusion

In this chapter, the study concludes by summarizing the key findings and contributions to knowledge regarding the impact of AI-driven robo-advisors on asset management. Recommendations for practice and policy are offered, highlighting strategic considerations for financial institutions and regulators in adapting to this technological shift. Finally, areas for future research are suggested, emphasizing the need to explore long-term performance, hybrid models, emerging technologies, and societal implications to further understand and maximize the benefits of robo-advisors in the financial industry.

6.1. Summary of the Key Findings

This study examined the transformative impact of AI-driven robo-advisors on the asset management industry, highlighting their influence on performance, cost efficiency, client relationships, regulatory considerations, and employment dynamics. The key findings provide a comprehensive understanding of the opportunities and challenges posed by these automated platforms.

First, robo-advisors demonstrate strong performance under stable market conditions, delivering cost-effective, data-driven portfolio management. Automated processes, such as rebalancing and tax optimization, contribute to consistent performance and efficient risk management (Liu et al., 2023, p. 3174). However, their adaptability and resilience during volatile market scenarios remain limited compared to human advisors, who can leverage intuition and experience to address complex financial environments.

Cost efficiency emerged as a significant advantage. With fees ranging between 0.25% and 0.75% of assets under management, robo-advisors are more affordable than traditional financial advisors, democratizing access to investment services. This accessibility appeals particularly to younger, tech-savvy investors and those with smaller portfolios, promoting financial inclusion (Helms et al., 2022, p. 1028).

Client relationships are evolving as trust in robo-advisors grows. While transparency in algorithms and data security are essential for building trust, human advisors retain an edge in complex financial situations requiring empathy and nuanced judgment (Zhang et al., 2021, p. 634). Hybrid advisory models, which combine AI and human expertise, are becoming increasingly popular.

Regulatory and ethical challenges are critical areas of focus. Issues such as algorithm transparency, data privacy, and fairness in decision-making require robust oversight to ensure trust and compliance (Wexler & Oberlander, 2021, p. 351). Sustainable investing is also gaining traction, with many platforms incorporating ESG-focused portfolios to meet client demand (Brunen & Laubach, 2022, p. 1).

Lastly, the implications for employment are profound. While automation reduces demand for routine roles, it creates opportunities for human advisors to focus on strategic, client-centered services. Employees must adapt by developing technical and interpersonal skills to thrive in this evolving landscape (Shanmuganathan, 2020, p. 8). These findings underscore the importance of integrating technology while retaining human expertise to navigate the future of asset management.

Based on these key insights, the research questions can be answered.

- **How do AI-driven robo-advisors perform in various market conditions compared to traditional asset managers, particularly in terms of adaptability, resilience, and long-term investment strategies?** Robo-advisors perform effectively in stable market conditions, offering consistent, data-driven portfolio management through automation, such as rebalancing and tax optimization. However, they lack the adaptability and intuitive judgment of human advisors in volatile market scenarios or crises, where qualitative insights are critical for strategic adjustments.
- **To what extent do robo-advisors offer more cost-effective and democratized financial advice, and how is this influencing the accessibility and inclusiveness of asset management services?** Robo-advisors significantly reduce costs, charging 0.25%–0.75% of AUM compared to the 1%–2% fees of traditional advisors. This cost efficiency, combined with low entry barriers, democratizes financial advice, making professional asset management accessible to younger, tech-savvy, and cost-sensitive clients, as well as those with smaller portfolios.
- **How does the integration of AI in asset management impact client perceptions, trust levels, and engagement compared to traditional human advisors?** AI-driven platforms influence client trust through transparency, institutional credibility, and robust data security measures. While clients appreciate the objectivity and cost efficiency of robo-advisors, human advisors retain an

advantage in complex financial situations requiring empathy and personalized advice. Engagement is high among tech-savvy clients, but algorithm aversion remains a barrier for some demographics.

- **What are the key regulatory and ethical challenges associated with the rise of robo-advisors, particularly concerning data privacy, algorithm transparency, and automated decision-making?** Key challenges include ensuring algorithm transparency, safeguarding data privacy, and addressing biases in decision-making processes. Regulatory frameworks must evolve to enforce accountability and fairness while ensuring compliance with ethical standards, particularly regarding data protection and the explainability of AI-generated recommendations.
- **How are robo-advisors affecting employment and the role of financial advisors in the asset management industry, and what skills are becoming essential in this evolving landscape?** Automation by robo-advisors reduces demand for routine advisory roles, shifting human advisors toward more strategic and client-centric tasks, such as complex financial planning and relationship management. Essential skills now include data analytics, AI literacy, and interpersonal communication, supporting the integration of hybrid advisory models that combine human expertise with AI-driven tools.

6.2. Contribution to Knowledge and Literature

This research contributes to the growing body of knowledge on the transformative role of AI-driven robo-advisors in the asset management industry. By examining their performance, cost efficiency, client relationships, regulatory challenges, and impact on employment dynamics, the study provides a holistic understanding of how these platforms are reshaping financial services.

A key contribution is the detailed analysis of robo-advisors' performance in various market conditions. The findings clarify their strengths in stable environments and their limitations in volatile markets compared to human advisors, offering valuable insights into their adaptability and resilience (Liu et al., 2023, p. 3174). The study also advances understanding of cost efficiency, demonstrating how robo-advisors democratize access to investment services through lower fees and reduced entry barriers (Helms et al., 2022, p. 1028).

The research highlights the evolving nature of client relationships in the digital age, emphasizing the role of trust, transparency, and hybrid advisory models that blend AI with human expertise (Zhang et al., 2021, p. 634). Additionally, it sheds light on the regulatory and ethical complexities of algorithmic decision-making and data security, underlining the need for robust oversight (Wexler & Oberlander, 2021, p. 351).

Moreover, this study directly addresses the research gaps and the need for a comprehensive study (Abdi & Aysan, 2024, p. 536). This has been done by examining the long-term performance of robo-advisors under diverse economic and client conditions, going beyond single-market perspectives to include the role of algorithmic transparency, bias mitigation, and robust regulatory frameworks (Belanche et al., 2019, p. 1412). These additions offer new insights into how AI-driven models can be effectively integrated in asset management while maintaining client trust and adapting to rapidly changing market environments. This expanded focus on both technical and human-centric considerations provides a more comprehensive view of robo-advisors' disruptive impact than what is currently seen in narrower studies.

Finally, the study addresses employment implications, providing insights into the skills and strategies necessary for professionals to adapt in an AI-integrated industry, fostering a more informed discourse on the future of asset management.

6.3. Recommendations for Practice and Policy

To ensure the effective integration of robo-advisors into the asset management industry, several steps must be taken by industry practitioners and policymakers. Transparency in algorithmic decision-making is relevant, as clients need to understand how robo-advisors generate recommendations. Thus, providing clear and accessible explanations of data sources and methodologies can help alleviate concerns about bias and reliability, fostering greater trust in these platforms.

Combining the efficiency of AI-driven robo-advisors with the personalized insights of human advisors through hybrid models is another essential strategy. Hybrid platforms allow firms to retain the human touch that clients with complex financial needs value while leveraging the scalability and cost-effectiveness of AI. Such models could also support the financial inclusion goals of the industry, ensuring that even clients with smaller portfolios can access professional investment advice.

Sustainability is a growing priority for investors, and financial firms should respond by incorporating Environmental, Social, and Governance (ESG) investment options into robo-advisor offerings. Addressing this demand can attract socially conscious investors, particularly younger demographics who seek alignment between their financial goals and personal values. Offering customizable ESG-focused portfolios would not only enhance client satisfaction but also differentiate firms in a competitive market.

Education is another key element for fostering deeper client engagement. Providing tools and resources that improve financial literacy and help clients understand robo-advisor functionalities can empower users, enhancing their experience and trust in these platforms. Interactive tutorials and personalized support channels could bridge the gap for clients unfamiliar with digital investment tools.

From a policy perspective, a robust regulatory framework is essential. Policymakers should establish clear guidelines around algorithm transparency, data privacy, and bias mitigation to ensure ethical and equitable practices. These regulations should enforce the same fiduciary standards that apply to traditional advisors, ensuring fairness and accountability. Moreover, to prepare the workforce for AI integration, training initiatives should focus on equipping financial professionals with the skills needed to thrive in hybrid advisory models. Programs emphasizing data analytics, AI tools, and relationship management can help advisors adapt to the evolving landscape.

6.4. Futures Areas of Research

The future of research on robo-advisors offers an array of compelling avenues to explore their expanding role in the financial industry. A critical area for investigation is the comparative performance of robo-advisors and traditional financial advisors across diverse market conditions. While existing research suggests that robo-advisors perform well during stable market periods, questions remain about their adaptability and resilience in volatile or unpredictable environments. Future studies could examine how algorithmic decision-making can be enhanced to navigate market turbulence effectively, particularly in scenarios where historical data may not predict future trends.

Another significant research avenue lies in understanding client behavior and adoption dynamics. As technology adoption varies across demographics, researchers could investigate the psychological and sociocultural factors influencing client preferences for robo-advisors. These studies could focus on how perceived usefulness, trust, and ease

of use affect adoption rates, particularly in different cultural and economic contexts. Additionally, understanding resistance to algorithmic decision-making, often linked to concerns over transparency and personalization, would help identify strategies for increasing client confidence and long-term engagement.

The future workforce implications of the widespread adoption of robo-advisors also demand further exploration. Automation has already shifted the roles of human advisors toward more complex, relationship-driven tasks. Future research could examine how this shift will impact skill requirements and job opportunities in the financial sector. The emergence of hybrid models combining robo-advisors with human expertise suggests a need for new competencies, blending technological literacy with interpersonal skills. Studies in this area could also evaluate how financial institutions can train their workforce to adapt to these evolving demands and maintain a competitive edge.

Hybrid advisory models offer a fertile ground for research. These models aim to merge the efficiency of robo-advisors with the personalized touch of human advisors, but their effectiveness remains underexplored. Research could focus on identifying best practices for integrating these models, ensuring a seamless experience for clients while leveraging the strengths of both human and AI capabilities. Additionally, studies could assess the client segments most suited for hybrid models and measure their satisfaction levels compared to purely human or AI-driven advisory services.

References

- Abdi, Q. M., & Aysan, A. F. (2024). The Ascent of Robo-Advisory: Scientometrics Analysis and Prospects for Robo-Advisory Research. In M. H. Bilgin, H. Danis, E. Demir, E. A. Alp, & S. Çankaya (Eds.), *Eurasian Studies in Business and Economics: Vol. 27. Eurasian Business and Economics Perspectives* (pp. 535-550). Springer.
- Alsabah, H., Capponi, A., Lacadelli, O. R., & Stern, M. (2021). Robo-Advising: Learning Investors' Risk Preferences via Portfolio Choices. *Journal of Financial Econometrics*, 19(2), 369-392. <https://doi.org/10.1093/jjfinec/nbz040>
- Au, C.-D., Klingenberger, L., Svoboda, M., & Frère, E. (2021). Business Model of Sustainable Robo-Advisors: Empirical Insights for Practical Implementation. *Sustainability*, 13(23), Article 13009. <https://doi.org/10.3390/su132313009>
- Basile, I., & Ferrari, P. (Eds.). (2016). *Asset Management and Institutional Investors*. Springer. <https://doi.org/10.1007/978-3-319-32796-9>
- Belanche, D., Casaló, L. V., & Flavián, C. (2019). Artificial Intelligence in FinTech: understanding robo-advisors adoption among customers. *Industrial Management & Data Systems*, 119(7), 1411-1430. <https://doi.org/10.1108/IMDS-08-2018-0368>
- Boreiko, D., & Massarotti, F. (2020). How Risk Profiles of Investors Affect Robo-Advised Portfolios. *Frontiers in Artificial Intelligence*, 3, Article 60. <https://doi.org/10.3389/frai.2020.00060>
- Bourgeron, T., Lezmi, E., & Roncalli, T. (2018). Robust Asset Allocation for Robo-Advisors. *SSRN*, 1-67. <https://doi.org/10.2139/ssrn.3261635>
- Brunen, A.-C., & Laubach, O. (2022). Do sustainable consumers prefer socially responsible investments? A study among the users of robo advisors. *Journal of Banking & Finance*, 136, Article 106314. <https://doi.org/10.1016/j.jbankfin.2021.106314>
- Capponi, A., Olafsson, S., & Zariphopoulou, T. (2020). Personalized Robo-Advising: Enhancing Investment through Client Interactions. *SSRN*, 1-54. <https://doi.org/10.2139/ssrn.3453975>

- Cardillo, G., & Chiappini, H. (2024). Robo-advisors: A systematic literature review. *Finance Research Letters*, 62(Part A), Article 105119. <https://doi.org/10.1016/j.frl.2024.105119>
- Chang, Y., & Wang, R. (2023). Conservatives endorse Fintech? Individual regulatory focus attenuates the algorithm aversion effects in automated wealth management. *Computers in Human Behavior*, 148, Article 107872. <https://doi.org/10.1016/j.chb.2023.107872>
- Cheng, X., Guo, F., Chen, J., Li, K., Zhang, Y., & Gao, P. (2019). Exploring the Trust Influencing Mechanism of Robo-Advisor Service: A Mixed Method Approach. *Sustainability*, 11(18), Article 4917. <https://doi.org/10.3390/su11184917>
- Clarke, D. (2020). Robo-Advisors - Market Impact and Fiduciary Duty of Care to Retail Investors. *SSRN*, 1-25. <https://doi.org/10.2139/ssrn.3539122>
- Ge, R., Zhen, Z., Tian, X., & Liao, L. (2021). Human–Robot Interaction: When Investors Adjust the Usage of Robo-Advisors in Peer-to-Peer Lending. *Information Systems Research*, 32(3), 774-785. <https://doi.org/10.1287/isre.2021.1009>
- Grealish, A., & Kolm, P. N. (2023). Robo-Advisory: From Investing Principles and Algorithms to Future Developments. In A. Capponi, & C.-A. Lehalle (Eds.), *Machine Learning and Data Sciences for Financial Markets: A Guide to Contemporary Practices* (pp. 60 - 85). Cambridge University Press. <https://doi.org/10.1017/9781009028943.005>
- Haberly, D., MacDonald-Korth, D., Urban, M., & Wójcik, D. (2019). Asset Management as a Digital Platform Industry: A Global Financial Network Perspective. *Geoforum*, 106, 167-181. <https://doi.org/10.1016/j.geoforum.2019.08.009>
- Helms, N., Hölscher, R., & Nelde, M. (2022). Automated investment management: Comparing the design and performance of international robo-managers. *European Financial Management*, 28(4), 1028-1078. <https://doi.org/10.1111/eufm.12333>
- Hildebrand, C., & Bergner, A. (2020). Conversational robo advisors as surrogates of trust: onboarding experience, firm perception, and consumer financial decision making. *Journal of the Academy of Marketing Science*, 49(4), 659-676. <https://doi.org/10.1007/s11747-020-00753-z>

- Holtfort, T., Horsch, A., & Schwarz, J. (2022). Robo-advisors as part of industry 4.0 in financial markets: Evolutionary development, methods, and first performance insights. *Risk Governance and Control: Financial Markets & Institutions*, 12(2), 38–46. <https://doi.org/10.22495/rgcv12i2p3>
- Horn, M. (2024). *Technology Acceptance, Path Dependence, and the Demand for Robo-Advisory Services*. Springer Gabler. <https://doi.org/10.1007/978-3-658-44679-6>
- Hu, X., Kang, S., Ren, L., & Zhu, S. (2024). Interactive preference analysis: A reinforcement learning framework. *European Journal of Operational Research*, 319(3), 983-998. <https://doi.org/10.1016/j.ejor.2024.06.033>
- Kofman, P. (2024). Scoring the Ethics of AI Robo-Advice: Why We Need Gateways and Ratings. *Journal of Business Ethics*, 1-13. <https://doi.org/10.1007/s10551-024-05753-5>
- Lee, J. (2020). Access to Finance for Artificial Intelligence Regulation in the Financial Services Industry. *European Business Organization Law Review*, 21(4), 731-757. <https://doi.org/10.1007/s40804-020-00200-0>
- Lee, Y., Kim, M. J., Kim, J. H., Jang, J. R., & Kim, W. C. (2020). Sparse and robust portfolio selection via semi-definite relaxation. *Journal of the Operational Research Society*, 71(5), 687-699. <https://doi.org/10.1080/01605682.2019.1581408>
- Leow, E. K., Nguyen, B. P., & Chua, M. C. (2021). Robo-advisor using genetic algorithm and BERT sentiments from tweets for hybrid portfolio optimisation. *Expert Systems with Applications*, 179, Article 115060. <https://doi.org/10.1016/j.eswa.2021.115060>
- Liu, C.-W., Yang, M., & Wen, M.-H. (2023). Judge me on my losers: Do robo-advisors outperform human investors during the COVID-19 financial market crash? *Production and Operations Management*, 32(10), 3174-3192. <https://doi.org/10.1111/poms.14029>
- Luo, H., Liu, X., Lv, X., Hu, Y., & Ahmad, A. J. (2024). Investors' willingness to use robo-advisors: Extrapolating influencing factors based on the fiduciary duty of

- investment advisors. *International Review of Economics & Finance*, 94, Article 103411. <https://doi.org/10.1016/j.iref.2024.103411>
- Maier, T., Menold, J., & McComb, C. (2022). The Relationship Between Performance and Trust in AI in E-Finance. *Frontiers in Artificial Intelligence*, 5, Article 891529. <https://doi.org/10.3389/frai.2022.891529>
- Nguyen, T. P., Chew, L. W., Muthaiyah, S., Teh, B. H., & Ong, T. S. (2023). Factors influencing acceptance of Robo-Advisors for wealth management in Malaysia. *Cogent Engineering*, 10(1), Article 2188992. <https://doi.org/10.1080/23311916.2023.2188992>
- Nicolaisen, C. (2017, December 14). *Deutsche Robo Advisor knacken Marke von einer Milliarde Euro*. Retrieved October 10, 2024, from Private Banking Magazin: <https://www.private-banking-magazin.de/assets-under-management-deutsche-robo-advisor-knacken-marke-von-1-milliarde-euro-1/>
- Okoli, C. (2015). A Guide to Conducting a Standalone Systematic Literature Review. *Communications of the Association for Information Systems*, 37, 879-910. <https://doi.org/10.17705/1CAIS.03743>
- Phoon, K. F., & Koh, C. C. (2018). Robo-advisors and wealth management. *Journal of Alternative Investments*, 20(3), 79-94. <https://doi.org/10.3905/jai.2018.20.3.079>
- Puhle, M. (2019). The Performance and Asset Allocation of German Robo-Advisors. *Society and Economy*, 41(3), 331-351. <https://doi.org/10.1556/204.2019.41.3.4>
- Reher, M., & Sokolinski, S. (2024). Robo advisors and access to wealth management. *Journal of Financial Economics*, 155, Article 103829. <https://doi.org/10.1016/j.jfineco.2024.103829>
- Roh, T., Park, B. I., & Xiao, S. (2023). Adoption of AI-enabled Robo-advisors in fintech: Simultaneous employment of UTAUT and the theory of reasoned action. *Journal of Electronic Commerce Research*, 24(1), 29-47. Retrieved from <http://www.jecr.org/node/676>
- Rossi, A. G., & Utkus, S. P. (2020). Who Benefits from Robo-advising? Evidence from Machine Learning. *SSRN*, 1-72. <https://doi.org/10.2139/ssrn.3552671>
- Scherer, B., & Lehner, S. (2023). Trust me, I am a Robo-advisor. *Journal of Asset Management*, 24(2), 85-96. <https://doi.org/10.1057/s41260-022-00284-y>

- Seiler, V., & Fanenbruck, K. M. (2021). Acceptance of digital investment solutions: The case of robo advisory in Germany. *Research in International Business and Finance*, 58, Article 101490. <https://doi.org/10.1016/j.ribaf.2021.101490>
- Shanmuganathan, M. (2020). Behavioural finance in an era of artificial intelligence: Longitudinal case study of robo-advisors in investment decisions. *Journal of Behavioral and Experimental Finance*, 27, Article 100297. <https://doi.org/10.1016/j.jbef.2020.100297>
- Statista Research Department. (2023, August 18). *Portfolio returns of selected robo-advisors worldwide in the 1st half of 2021*. Retrieved from Statista: <https://www.statista.com/statistics/755599/performance-of-selected-robo-advisors/>
- Tan, G. K. (2020). Robo-advisors and the financialization of lay investors. *Geoforum*, 117, 46-60. <https://doi.org/10.1016/j.geoforum.2020.09.004>
- Tao, R., Su, C.-W., Xiao, Y., Dai, K., & Khalid, F. (2021). Robo advisors, algorithmic trading and investment management: Wonders of fourth industrial revolution in financial markets. *Technological Forecasting and Social Change*, 163, Article 120421. <https://doi.org/10.1016/j.techfore.2020.120421>
- Wexler, M. N., & Oberlander, J. (2021). Robo-advisors (RAs): the programmed self-service market for professional advice. *Journal of Service Theory and Practice*, 31(3), 351-365. <https://doi.org/10.1108/JSTP-07-2020-0153>
- Xia, H., Zhang, Q., Zhang, J. Z., & Zheng, L. J. (2023). Exploring investors' willingness to use robo-advisors: mediating role of emotional response. *Industrial Management & Data Systems*, 123(11), 2857-2881. <https://doi.org/10.1108/IMDS-07-2022-0400>
- Yeh, H.-C., Yu, M.-C., Liu, C.-H., & Huang, C.-I. (2023). Robo-advisor based on unified theory of acceptance and use of technology. *Asia Pacific Journal of Marketing and Logistics*, 35(4), 962-979. <https://doi.org/10.1108/APJML-07-2021-0493>
- Yi, T. Z., Mohd Rom, N. A., Hassan, N. M., Samsurijan, M. S., & Ebekozen, A. (2023). The Adoption of Robo-Advisory among Millennials in the 21st Century: Trust, Usability and Knowledge Perception. *Sustainability*, 15(7), Article 6016. <https://doi.org/10.3390/su15076016>

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. <https://doi.org/10.1108/JSM-05-2020-0162>

Deutschsprachiges Abstract

Der Einsatz von KI-gestützten Robo-Advisors verändert das traditionelle Asset Management grundlegend, indem etablierte Praktiken hinterfragt und Kundeninteraktionen neu gestaltet werden. Diese Arbeit adressiert bestehende Forschungslücken hinsichtlich der vergleichenden Performance, Kosteneffizienz und der Implikationen von Robo-Advisors unter unterschiedlichen Marktbedingungen sowie deren Einfluss auf das Vertrauen der Kunden, regulatorische Rahmenbedingungen und arbeitsmarktbezogene Aspekte. Hierfür wurde eine systematische Literaturübersicht unter Verwendung strukturierter Methoden durchgeführt, wobei begutachtete Fachartikel und Branchenberichte der letzten fünf Jahre analysiert wurden. Die Ergebnisse zeigen, dass Robo-Advisors insbesondere durch Kosteneffizienz und erleichterten Zugang zur Vermögensverwaltung zur finanziellen Inklusion beitragen. Sie zeigen sich in stabilen Marktphasen leistungsfähig, während sie in volatilen Märkten Anpassungsprobleme aufweisen. Transparenz, Datensicherheit und algorithmische Fairness sind zentrale Faktoren für den Vertrauensaufbau. Hybride Modelle, die KI mit menschlicher Expertise verbinden, erscheinen besonders geeignet, um komplexe Kundenbedürfnisse zu bedienen. Die Arbeit trägt zur Erweiterung des bestehenden Forschungsstandes bei, indem sie technische und menschenzentrierte Dimensionen von Robo-Advisory-Diensten integriert analysiert und deren Implikationen für die Asset-Management-Branche umfassend darstellt.

Schlagwörter: Robo-Advisors, Vermögensverwaltung, Finanztechnologie