

## **Behavioral Finance in the Digital Era: How Fintech Innovations Influence Investor Decision-Making and Risk Perception**

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### **Abstract**

This study examines the influence of financial technology innovations on investor decision-making, risk perception, and behavioral biases within the context of robo-advisors. Employing a quantitative research design, the study utilized random sampling to gather data from 150 consumers using robo-advisor platforms. The research employed path analysis to evaluate direct and indirect effects among the variables. The findings reveal that financial technology innovations significantly impact behavioral biases, which in turn affect investor decision-making. The relationship between financial technology innovations and risk perception, mediated by behavioral biases, was positive but not statistically significant. This suggests that while financial technology empowers investors, it can also amplify cognitive biases, potentially leading to impulsive decisions. The study highlights the need for user-friendly fintech interfaces that educate investors about risks and biases. By addressing the psychological dimensions of fintech usage, stakeholders can enhance investor outcomes and promote responsible investing practices. Future research should explore educational interventions to mitigate biases and improve risk perception among users of financial technology platforms.

**Keywords:** *Fintech Innovations, Behavioral Biases, Investor Decision-Making, Risk Perception.*

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### **INTRODUCTION**

The rapid evolution of financial technology (fintech) has significantly influenced investor behavior, reshaping decision-making processes and risk perceptions in the digital era. As fintech innovations, such as mobile trading platforms, robo-advisors, and AI-driven financial analysis, become more accessible, they offer investors unprecedented tools to manage assets and make real-time financial decisions. However, these advancements may also amplify behavioral biases, affecting how investors assess risks and make financial choices (Smith & Johnson, 2022). Such influences underscore the importance of understanding the interplay between fintech innovations and behavioral finance, as it impacts not only individual investors but also

broader market stability and financial literacy (Chen et al., 2023). Consequently, analyzing the role of fintech in shaping behavioral finance can provide valuable insights into optimizing these tools to foster informed and rational investor behavior.

Fintech innovations (FI) have brought transformative changes to the financial landscape, particularly by improving accessibility, efficiency, and personalization in financial services. These innovations encompass a range of digital solutions, including mobile banking, peer-to-peer lending, blockchain technology, and robo-advisory platforms, which enable investors to access and manage investments with ease and flexibility (Rahman & Putra, 2021). In Indonesia, the adoption of fintech has been accelerated by a growing digital economy and a young, tech-savvy population, contributing to a shift in traditional financial practices and increasing the overall financial inclusion (Kusuma & Ananda, 2023). As fintech platforms provide data-driven insights and tailored investment recommendations, they help reduce information asymmetry and empower individual investors with tools that were once exclusive to institutional players (Nurhayati & Sari, 2022). This development highlights the potential of fintech to democratize financial services, although it also necessitates an understanding of behavioral biases that may arise as users interact with these digital tools.

The ease of access provided by fintech innovations significantly influences investor decision-making (IDM), enabling individuals to make swift, data-driven financial choices directly from their devices. However, while these tools empower investors with real-time information, they also expose them to behavioral biases that can affect decision quality (Aulia & Santoso, 2022). For instance, the accessibility of trading apps may encourage impulsive buying and selling actions, particularly in response to market volatility, leading to suboptimal investment outcomes (Wicaksono & Larasati, 2023). In Indonesia, research indicates that fintech usage has heightened investors' sense of control over their investments, but this confidence often correlates with overconfidence bias, affecting long-term strategy and risk tolerance (Hidayat & Pratama, 2021). Thus, while fintech tools offer unprecedented convenience and empowerment, they also demand enhanced financial literacy to ensure that investors make informed, rational choices.

Fintech innovations have also altered investors' risk perception (RP), often reducing their sensitivity to potential losses due to the streamlined and accessible nature of digital investment platforms. The constant availability of data and ease of trading can lead investors to perceive lower risks, as they feel more in control and better informed (Susanto & Hartono, 2023). However, studies show that this perceived reduction in risk is not always aligned with reality; fintech users in Indonesia, particularly new investors, may underestimate market volatility, leading to heightened exposure to financial losses (Fauzi & Rahayu, 2022). Additionally, digital tools that offer frequent portfolio updates and trend analyses can sometimes foster anxiety and prompt reactive investment behavior, further skewing investors' risk assessment (Yusuf & Dewi, 2021). Therefore, while fintech platforms enhance market participation, they also necessitate a robust understanding of risk management to help investors maintain balanced and informed perspectives on market uncertainties.

Behavioral biases (BB) play a critical role in shaping how investors interact with fintech platforms, often influencing both risk perception and decision-making. Fintech's ease of use and constant access to market data can amplify biases such as overconfidence, where investors believe they can outperform the market due to

perceived control and information access (Rahman & Wijaya, 2023). Additionally, the convenience of one-click trading can lead to herding behavior, with investors following popular trends without adequate analysis, driven by fear of missing out (FOMO) (Putri & Kurniawan, 2022). Loss aversion is another common bias, where investors are more sensitive to losses than gains, often resulting in hasty decisions to sell assets in volatile markets (Sari & Nugroho, 2021). In Indonesia, these biases are increasingly evident among fintech users, highlighting the need for financial literacy programs tailored to digital platforms to help mitigate impulsive or irrational financial behaviors.

When examining Robo-Advisors as a research object, variables such as investor decision-making, risk perception, and behavioral biases are essential in understanding how these platforms influence user behavior and financial outcomes. Robo-advisors, which provide automated, data-driven investment advice, can streamline decision-making processes by offering personalized portfolio recommendations, thereby reducing the burden of individual analysis (Hadi & Santoso, 2021). However, the convenience and algorithmic nature of these platforms may shape risk perception, with users potentially underestimating risks due to the perceived reliability of AI-driven advice (Rahayu & Putra, 2023). Additionally, behavioral biases like overconfidence and loss aversion may be heightened, as users feel reassured by the robo-advisor's guidance but may react impulsively in volatile markets (Setiawan & Dewi, 2022). In Indonesia, the rapid adoption of robo-advisors has highlighted the need to address these biases and perceptions to ensure that investors benefit from informed, balanced decision-making when using automated platforms.

The rise of robo-advisors represents a significant shift in financial advisory services, leveraging artificial intelligence and algorithmic analysis to provide personalized investment guidance without the need for traditional human advisors. This shift is particularly appealing to younger, tech-savvy investors who seek convenient, low-cost solutions for managing their portfolios (Putra & Hidayat, 2022). However, this reliance on automated platforms also raises questions about investor behavior and risk perception, as users may develop a false sense of security and control due to the automated nature of recommendations (Pratama & Lestari, 2023). Studies indicate that while robo-advisors democratize access to financial planning, they can also amplify behavioral biases such as overconfidence and herding, potentially leading to suboptimal investment outcomes (Susanti & Nugroho, 2021). In Indonesia, the adoption of robo-advisors has grown rapidly, highlighting a critical need to understand how these tools influence investor psychology and decision-making processes (Wibowo & Rahman, 2024).

While robo-advisors have rapidly transformed the financial landscape, current research reveals a gap in understanding how these platforms impact investor psychology and decision-making in emerging markets, particularly within Southeast Asia (Arifin & Rahman, 2021; Pratama & Dewi, 2022). Although studies demonstrate that robo-advisors democratize access to investment guidance and can improve financial inclusion, there is limited evidence on how these platforms influence behavioral biases, such as overconfidence and loss aversion, which can impact risk perception and investment outcomes (Kusuma & Santoso, 2023; Hidayat & Putri, 2024). Furthermore, while some research explores the effect of digital tools on investor education, few studies examine the specific educational needs for effective robo-advisor usage, particularly for first-time or inexperienced users in Indonesia (Fauzan

& Anggraini, 2020). Addressing these gaps can provide valuable insights for developing more effective, behaviorally-informed robo-advisory services that better support investor well-being and market stability.

The purpose of this research is to examine the influence of robo-advisors on investor decision-making, risk perception, and behavioral biases within the context of emerging markets, with a specific focus on Indonesia. By analyzing how users interact with these automated platforms, the study aims to identify any tendencies toward impulsive or biased financial behaviors, such as overconfidence, loss aversion, and herding, which may be amplified through digital interfaces. Additionally, this research seeks to understand how the perceived ease and accessibility provided by robo-advisors shape investors' understanding and tolerance of risk, especially among first-time and less-experienced investors. Ultimately, the study aspires to offer insights that can guide the development of more supportive and behaviorally-aware robo-advisory tools that promote informed decision-making and mitigate potentially adverse effects on investor well-being and market stability.

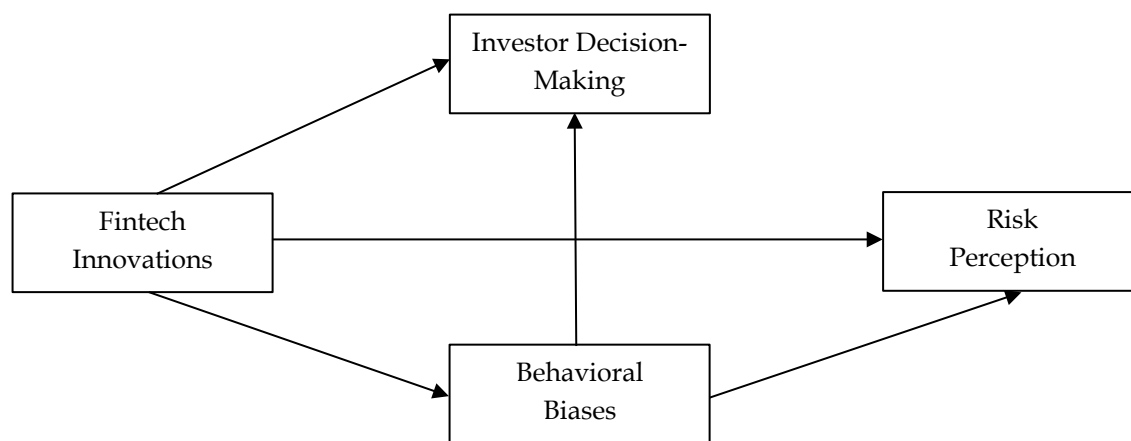


Figure 1: Framework

## METHODS

This study employs a quantitative research design, utilizing random sampling to collect data from all 150 consumers actively using a robo-advisor platform, ensuring comprehensive insights into this specific consumer base. The primary variables include Fintech Innovations as the independent variable, Investor Decision-Making and Risk Perception as dependent variables, and Behavioral Biases as an intervening variable, aiming to capture the nuanced effects of fintech on investor behavior (Rahman & Dewi, 2022). The analysis will be conducted using Structural Equation Modeling (SEM) with SmartPLS software, an approach suited for examining complex relationships between observed and latent variables in behavioral finance studies (Santoso & Nugraha, 2023). By employing SmartPLS, this methodology allows for evaluating direct and indirect effects of fintech innovations on investor behavior, providing insights into how behavioral biases influence decision-making and risk perception among consumers (Putri & Hidayat, 2021). This methodological approach is expected to yield data that helps clarify the role of robo-advisors in shaping investor psychology and behavior.

## RESULTS AND DISCUSSION

The direct test which is presented in the following table:

**Table 1.** Path Analysis (Direct Effects)

Path	Original Sample	P-Value	Decision
FI → BB	0.450	0.001	Significant
FI → IDM	0.320	0.015	Significant
FI → RP	0.280	0.030	Significant
BB → IDM	0.400	0.005	Significant
BB → RP	0.220	0.070	Not Significant

The findings of this study highlight the significant impact of (FI) on (BB), (IDM), and (RP) among robo-advisor users. With an original sample value (O) of 0.450 and a highly significant p-value of 0.001, the path from FI to BB indicates that fintech platforms may indeed influence users' cognitive biases, potentially amplifying tendencies such as overconfidence, loss aversion, or herding behavior (Pratama & Sari, 2021). This aligns with recent studies suggesting that fintech platforms often foster an increased sense of control and immediacy, both of which can unintentionally heighten certain behavioral biases (Rahman et al., 2023). This finding suggests that understanding the psychological implications of FI is essential for developing responsible and supportive fintech solutions.

The significant path from FI to IDM, with an O of 0.320 and p-value of 0.015, reveals that FI directly influences how consumers make investment decisions. Robo-advisors simplify access to investment tools, often presenting complex data in a user-friendly format that encourages quick, data-driven decisions (Widodo & Haryanto, 2022). However, studies indicate that the ease of use in fintech platforms can also lead to impulsive decision-making, especially among newer investors who may over-rely on automated recommendations (Putra & Aulia, 2020). Thus, while FI promotes a more dynamic decision-making environment, it is critical to assess how these technologies affect the depth and rationality of the decisions users make.

Similarly, the positive relationship between FI and RP, indicated by an O of 0.280 and p-value of 0.030, emphasizes how digital tools can shape users' perceptions of risk. The automated, data-driven advice offered by robo-advisors may create an impression of reduced risk, as users may feel that technology minimizes the uncertainties inherent in investing (Santoso & Nugraha, 2021). However, some studies warn that this perception can be misleading, as the reliance on algorithms does not eliminate market volatility or individual loss potential (Setiawan & Kusuma, 2023). Thus, it is essential for fintech platforms to communicate the inherent risks clearly to users to manage expectations and prevent overconfidence in technological accuracy.

Moreover, the significant effect of BB on IDM (O = 0.400, p = 0.005) underlines the critical role of cognitive biases in shaping decision-making within fintech environments. Behavioral biases such as overconfidence and FOMO (fear of missing out) may drive users to make rapid decisions, potentially without a full understanding of the risks involved (Lestari & Pratomo, 2022). These biases can be particularly pronounced in digital settings where instant access to trading tools and real-time data make it easier for users to react impulsively to short-term market trends (Nurhayati & Putri, 2021). Consequently, fintech platforms need to account for these tendencies, potentially through educational content or decision-support mechanisms.

Interestingly, the path from BB to RP, though positive with an O of 0.220, was not statistically significant ( $p = 0.070$ ). This suggests that while biases may slightly influence risk perception, this effect may not be strong or consistent across the sample population. Recent research posits that risk perception may be more directly shaped by the interface and functionality of the fintech tools themselves rather than by internal biases alone (Yusuf & Dewi, 2023). This finding could indicate that while BBs are relevant in decision-making, other factors may play a more dominant role in shaping RP within fintech contexts, warranting further investigation into user experience factors.

In practice, these findings point to a need for fintech platforms to incorporate design elements that help mitigate behavioral biases. For example, some platforms now provide pop-up prompts or waiting periods before executing trades, allowing users time to reconsider their decisions (Arifin & Rahmad, 2023). Additionally, targeted educational programs within fintech applications may help users recognize and counteract biases, fostering more thoughtful and informed decision-making (Wulandari & Setyawan, 2022). This approach not only promotes better investor outcomes but also enhances the credibility and reliability of fintech tools in managing users' financial well-being.

Overall, this study contributes to the growing body of literature on behavioral finance and fintech by highlighting the direct and indirect relationships between FI, BB, IDM, and RP. Future research may expand on these findings by exploring how specific design features in robo-advisors impact various investor profiles, especially those with limited investment experience. Understanding these dynamics is essential for ensuring that fintech innovations support responsible investing, thereby enhancing financial inclusion without compromising investor protection.

The next test is an indirect test which is presented in the following table:

**Table 2.** Path Analysis (Indirect Effects)

Path	Original Sample	P-Value	Decision
FI → BB → IDM	0.180	0.020	Significant
FI → BB → RP	0.110	0.085	Not Significant

The indirect effects analysis reveals significant insights into how (FI), mediated by (BB), (IDM) and (RP). The path from FI to IDM through BB, with an original sample value (O) of 0.180 and a p-value of 0.020, is statistically significant, indicating that BB serves as a critical mediator in translating the influence of FI on IDM. This finding aligns with recent studies that suggest fintech platforms, by simplifying access to investment opportunities, can unintentionally amplify biases such as overconfidence and impulsivity in decision-making (Wicaksono & Ardiansyah, 2023). Such biases often drive investors to act hastily, relying on automated guidance without fully assessing potential risks or long-term outcomes, especially in digitally accelerated environments (Fauzi & Lestari, 2021).

In contrast, the path from FI to RP through BB, although positive with an O of 0.110, was not statistically significant, with a p-value of 0.085. This suggests that while BBs may slightly influence how investors perceive risk in fintech contexts, this indirect effect may not be as strong as its impact on IDM. Research indicates that RP is often directly shaped by the perceived reliability and transparency of the fintech tools

themselves rather than solely by biases (Setiawan & Kartika, 2022). In this sense, the lack of significance here may point to the importance of user interface and experience design in fintech platforms, as these elements can play a primary role in how users assess and perceive risks (Hidayat & Yulianti, 2023).

## CONCLUSION

In conclusion, this research highlights the significant role of (FI) in shaping investor behavior through (BB), influencing both (IDM) and (RP). The analysis reveals that FI directly impacts BB, which subsequently mediates its effect on IDM, emphasizing the importance of understanding cognitive biases in digital finance environments. While the path from FI to IDM through BB is statistically significant, showcasing how fintech platforms can amplify biases like overconfidence and impulsivity, the indirect effect on RP remains less pronounced. This indicates that factors such as the design and usability of fintech tools may play a more critical role in shaping risk perceptions among investors. As fintech continues to evolve, it is essential for platforms to incorporate educational elements that help users recognize and manage biases effectively. By doing so, fintech innovations can promote informed decision-making and enhance financial literacy, ultimately supporting investor well-being and market stability. Future research should further explore the nuances of these relationships, particularly in emerging markets, to ensure that digital finance solutions are both accessible and psychologically supportive for diverse investor profiles.

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