DO ROBO-ADVISORS AS MODERATING VARIABLES WEAKEN THE OVERCONFIDENCE AND LOSS AVERSION BEHAVIOR BIAS OF YOUNG INVESTORS' MUTUAL FUND INVESTMENT DECISIONS?

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Abstract:

Background: Behavioral bias factors influence individual decision-making. Technological innovations in the financial services industry have introduced automated financial advisors, or robo-advisors, to assist in mutual fund investment decisions and reduce behavioral biases.

Purpose: This study aims to prove the influence of overconfidence and loss aversion behavior bias on mutual fund investment decisions by using robo-advisors as moderator variables.

Design/methodology/approach: The research sample was 100 respondents with the criteria of young investors in the age range of 18 to 25 who invested in mutual funds for the last five years and were officially registered with the Financial Services Authority. The data processing method uses multiple linear analysis with moderation dummy variable, using a robo-advisor or not.

Finding/Result: The results indicate that overconfidence and loss aversion biases significantly impact mutual fund investment decisions positively. Apart from that, the results also show that robo-advisors succeed in weakening the relationship between overconfidence bias and mutual fund investment decisions. Meanwhile, robo-advisors show results that cannot moderate the relationship between loss aversion and mutual fund investment decisions.

Conclusion: Robo-advisors moderate the relationship between overconfidence bias and investment decisions but do not moderate the relationship between loss aversion and mutual fund investment decisions. The high overconfidence is caused by the ease of access to information related to investment assets that is widely spread through social media. Young investors are expected to be able to screen all information related to investment knowledge to reduce loss aversion from young investors. It can help investors make more rational decisions.

Originality/value (State of the art): This research is unique because it examines the behavioral biases associated with robo-advisors on investment decisions, especially investments in mutual funds. This research is novel and includes artificial intelligence technology developing in finance using robo-advisor and mutual fund investment. These have managerial implications, such as the high overconfidence in the younger generation due to easy access to information related to investment assets, which is widely spread via social media. Knowledge related to finance is considered capable of reducing loss aversion from young investors to help them make more rational and better decisions. Robo-advisor technology has reduced the irrationality of mutual fund investors' investment decisions. The research results show that overconfidence and loss aversion bias positively and significantly influence investment decisions. Apart from that, the results also show that robo-advisors succeed in weakening the relationship between overconfidence bias and investment decisions. Meanwhile, robo-advisors show results that cannot moderate the relationship between loss aversion and investment decisions.

Keywords: Robo-advisor, behavioral bias, overconfidence, loss aversion, mutual fund investment decision

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INTRODUCTION

The rising number of investors and rapid technological advancements have significantly increased the number of Single Investor Identifications (SIDs) in 2021. According to data obtained from KSEI, the number of capital market investors in August 2021 amounted to 6,100,525 accounts, as seen through indicators of SID growth. The increase in the number of SIDs experienced a growth of 57.20% compared to the previous year, namely 2020. The classic economic theory of finance, namely the Efficient Market Hypothesis (EMH) by Fama (1970), assumes that investors in financial markets act rationally (Shleifer, 2000). However, Shiller (2003) opposes this classical theory. Investors are not always rational when making financial decisions, as they can be influenced by behavioral biases (Wijaya & Zunairoh, 2021). Behavioral bias factors that influence an individual's decision-making can be translated into overconfidence (Kahneman & Tversky, 1973), herd behavior (Nofsinger & Sias, 1999), loss aversion (Tversky & Kahneman, 1991), mental accounting (Thaler, 1980) regret aversion (Loomes & Sugden, 1982), and many others.

The global economy has recently been hit by the COVID-19 pandemic, which had a significant impact. The pandemic impacts every sector of the economy, either goods or services. Technological innovations in the financial services industry have paved the way for automated financial advisors, in this case, robo-advisors, that are less prone to potential conflicts of interest than human financial advisors (Fisch et al. 2019). Robo-advisor services are currently gaining most attention in financial decision making. The increasing development of the digital world means that everything becomes automated, whether related to net-banking platforms, digital transactions, online shopping, online taxi services, etc (Bhatia et al. 2021). Automation has become normal and has almost touched every business sector and is starting to influence financial decision making.

Decision making can be influenced by all kinds of biases and has implications, especially for the investment sector. Bias is closely related to how we process information. Robo-advisor services emerged as online investment advice platforms. Robo-advisors analyze data collected from investors by prompting them to answer a series of questions that indicate their risk profile. The profile helps understand the investor's investment objectives, financial situation, attitude and risk tolerance to assess risk appetite and conduct comprehensive risk analysis. Robo advisor is an automatic financial adviser who can help humans as investors make investment decisions that are expected to minimize behavioral biases. Capital market investors' behavioral biases can affect their investment decisions' results. The use of robo-advisors can influence the outcome of behavioral biases toward investment decision-making.

Research related to the influence of behavioral biases, such as overconfidence bias and loss aversion on investment decisions, especially young investors using robo-advisors as moderation, is still not widely done. The use of robo-advisors as financial advisors has started to enter Indonesia since mid-2019, such as Bibit, Bareksa, and Bambu, which are a manifestation of one of the technological innovations in the financial sector and are expected to be able to provide alternative financial advisors for investors who have so far only relied on human, financial advisors. The significant increase in the number of investors during the 2021 period was due to the massive digitization of the IDX (Indonesian Stock Exchange) along with the role of the IDX GI (Galeri Investasi) and the role of the mass media, which continues to educate the public regarding the importance of investing in the capital market. The number of investors in Java is 68.99% of the total investors in Indonesia (KSEI, 2021). The development of East Java SID based on age shows that the age range of 18-25 provides the highest portion of the increase in the number of National SIDs, from 75,976 to 140,861 in August 2023 (Kanalsatu, 2023). This phenomenon becomes interesting for more in-depth research regarding the influence of cognitive-behavioral biases, namely overconfidence and loss aversion to the investment decisions of young investors using robo-advisors as moderating variable.

Decision bias can be reduced by designing optimal Robo-consulting services (Bhatia et al. 2021). Artificial intelligence can alter ego distribution, usually in relatively small but significant ways, associated with behavioral biases. Robo-advisors alleviate investor concerns, making decision-making processes smoother. Human consultation allows investors to discuss their emotional and behavioral concerns with the advisors looking after their portfolios. Lack of consultation

ability will make investors feel insecure and bias inaccurate behavior and potentially be detrimental due to wrong decisions.

Previous research shows some results that are still inconsistent. Bhatia et al. (2021) shows that overconfidence bias and loss-aversion bias have a positive effect on investment decisions. However, the moderating effect of robo-advisors used by investors shows that the results are not significant between loss aversion bias and irrationality of investment decision making. Meanwhile, the overconfidence bias variable still shows consistent results with the previous one, namely a significant positive relationship with irrationality in investment decision making. The results of overconfidence bias and loss aversion bias in investors who are not users of robo-advisor services show a significant positive relationship with irrationality in investment decision making. The results of this research show that robo-advisor services are still unable to influence the relationship between behavioral biases and investment decision making.

Metawa et al. (2019) and Sutejo et al. (2024) tested the relationship between investor demographic characteristics such as experience, gender, age, and level of education on investment decision making through several behavioral factors such as overconfidence, herd behavior, underreaction and overreaction, and sentiment as mediating variables. The results found that overconfidence, investor sentiment, herd behavior, and over/underreaction have a significant positive influence on investment decision making by investors. Armansyah (2021) also shows that overconfidence has a significant positive influence on investors' investment decisions, but on the other hand, loss aversion shows no influence on investment decision making. The gap research in the findings of previous studies is a flaw in the novelty of this study by appointing robo advisors as a moderation variable that connects overconfidence behavior bias and loss aversion to the rationality of investment decisions. Specifically, the investment instrument studied is mutual funds implemented on young investors as representatives of the sophisticated techno-minded generation.

This research aims to conduct deeper testing on investors' financial behavioral biases, namely overconfidence and loss aversion, which influence mutual fund investment decisions with robo-advisors as moderating variables. Apart from that, they also

become more aware of the existence of robo-advisor services to reduce their behavioral biases. The research will further contribute insight into behavioral biases, especially overconfidence and loss aversion, and robo-advisors, which can impact their decision-making.

METHODS

The approach to this research uses quantitative methods to collect primary data through a questionnaire. The research period is September–October 2023 in Indonesia. The questionnaire was developed using indicators adopted from previous studies (Investment decisions are measured by 11 indicators adopted from Cuandra & Rinaldo (2021), Khan (2017), Bhatia et al. (2021); overconfidence can be measured using four assessment indicators obtained from Nur Ainia & Lutfi (2019); loss aversion can be measured using four assessment indicators obtained from Cuandra & Rinaldo; robo advisors are measured using an indicator assessment, namely whether the respondent accepts the advice given by the robo advisor whose answer is a dichotomy of "Yes" or "No". Questionnaires are distributed via online platforms such as Instagram, WhatsApp, line chat and several other social media to respondents who meet the criteria. Levels and measurement scales use a five-point Likert.

This study uses a population of investors who have invested in mutual fund products officially registered with the Financial Services Authority (OJK). In obtaining the necessary data, this study uses a technique based on specific criteria with known population characteristics, namely the non-probability sampling technique. The sampling technique takes samples based on specific predetermined criteria. Some of the criteria for respondents used in this study are individual investors aged 18-25 years using the age range described by Asikin Ashar (East Java IDX Trainer) through Kanalsatu (2021) and has invested in mutual funds for five last year.

The sample size was determined based on the number of question items, resulting in 100 respondents. In determining the number of samples needed through this survey is based on Bhatia et al. (2021), where there are four construct variables, namely overconfidence bias, loss aversion bias, robo advisory, and investment decision making where it is determined that if the number of construct variables ≤ 5, then a minimum of

100 respondents is required. According to Hair et al. (2010), the determination of the number of samples can also be seen from the number of question indicators using the assumption of n x 5 observed variables. In this study, it was found that there were 20 items, so based on the information described above, the number of respondents required is a minimum of 100 respondents. This research is causal research that explains the cause-and-effect relationship between variables. The variables used in this study consisted of two independent variables, one dependent variable, and a moderating variable. The independent variables were overconfidence and loss aversion, while the dependent variable was investment decision-making. In addition, this study also uses robo-advisors as a moderating variable.

Multiple linear regression analysis was used in this study. The result of this linear regression is to find out the direction of the positive or negative relationship between the independent variables and the dependent variable. Effects of robo services advisor tested using software IBM SPSS Statistics 29. The method for carrying out the moderation analysis of this study is by breaking the sample into two categories consisting of recipients of suggestions from robo-advisors with non-user suggestions from robo-advisors.

Hypothesis Development

Overconfidence in Investment Decision Making

In general, people tend to overestimate the accuracy of their beliefs or predictions, and they tend to overestimate their abilities (Hardjopranoto, 2020). Studies in behavioral finance show that individuals tend to overestimate the chances of success and underestimate the chances of failure or risk (Hirshleifer et al. 2012). According to Simon et al. (2000), overconfidence arises because individual investors think their judgments are certain and do not sufficiently revise their initial judgments after receiving new information. Therefore, investors do not realize their mistake.

Purchasing securities by investors is significantly influenced by conservatism, availability, and overconfidence (Nofsinger & Varma, 2013). Heuristic factor overconfidence in exploration harms investment performance (Kengatharan & Kengatharan, 2014). Research conducted by Bakar & Yi (2016) also found that overconfidence bias significantly negatively

impacts investor decision-making. Overconfidence bias significantly affects investors' investment decisions (Metawa et al. 2019). Gervais & Odean (2001) found that overconfidence and over-optimism is a personality trait that influences an individual's decision-making. Hunguru et al. (2020) and Pikulina et al. (2017) also support the relationship between overconfidence and investment decision-making.

H1: Overconfidence bias has a negative effect on investment decision-making.

Loss aversion towards Investment Decision Making

Loss aversion refers to the fact that a person tends to show a more sensitive response to losses compared to gains. Kahneman & Tversky (1979) said that loss aversion is equivalent to a utility function. This means that someone is more worried about losses than profits. Someone who is said to not want to experience losses can be seen through their awareness that losses are much greater when compared to profits (Haigh & List, 2005). Loss aversion is an investor's tendency to fear and avoid losses to the detriment of profits, which results in actions to prevent investors from exiting losing stocks (Hunguru et al. 2020). Loss Aversion is a phenomenon demonstrated by Tversky & Kahneman, (1991) through an interesting experiment. The results of this experiment illustrate that the feeling of annoyance at a loss is greater than when you get it.

According to Kahneman et al. (1991), loss aversion can be seen clearly in investors. Researchers conduct experiments to distinguish between favorable and unfavorable economic variables, which can help make more accurate predictions economically. Before making investment decisions, investors refrain from adjusting to new information (Disatnik & Steinhart, 2015). Investors must deal with the factors that lead to their cognitive shutdown because they make irrational decisions. Investors showing loss aversion hurt rational choice when deciding on an investment alternative, and it cannot affect prices in the long run (Easley & Yang, 2015).

H2: Loss aversion bias has a negative effect on investment decision-making.

Robo-Advisors

Robo-advisors is a platform that works automatically during the development stage to assist investors in decision-making Bhatia et al. (2021). This innovation

is expected to be able to provide more economic value through technology that can serve many investors at the same time without incurring additional costs and is also expected to be able to reduce investor behavioral bias. Continuous developments in technological innovation make robo advisors an important element in managing wealth and the banking sector (Uhl & Rohner, 2018). Robo advisor services can overcome behavioral biases by investors when they make investment decisions (Bhatia et al. 2021; Jung et al. 2018).

Machine learning mechanisms can be used for calculations that tend to be complicated, allow for broad information searches, and are cost-effective (Sedal et al. 2019). Investors can maintain excess trades through the robo platform advisors (Hildebrand & Bergner, 2021). Therefore, using robo services advisors will enable investors to rethink the investment decisions of user groups, and investment decisions will be more rational. **H3:** Robo-advisors weaken the relationship between overconfidence bias and investment decision-making from user groups or non-users.

Robo's advisor still needs to be in the mature stage. Investors must still be convinced about trustworthiness, data security, and techniques robos advisors use to provide portfolio recommendations. In addition, the selection of robo-advisors regarding passive investment strategies such as ETF (Exchange Traded Fund) still needs to be used. Da & Shive (2018) said that ETFs are like mutual funds in their types and can be categorized as investment options with a long-term perspective. This can help investors stop thinking more about the losses they are experiencing and hold on to stocks experiencing losses. Using a robo advisor is expected to overcome the loss aversion to improve the quality of the investment robo user group decision-making advisors.
H4: Robo Advisor weakens the relationship between loss aversion bias and investment decision-making from user groups or non-users.

Investor behavior bias consists of overconfidence and loss aversion biases that negatively affect investment decisions. This can happen because these two types of bias reduce the ability of investors to rationalize when making investment decisions. Investors are more affected by psychological aspects than using fundamental analysis that requires sophisticated data

processing because it involves big data that fluctuates in the capital market. The need for this analysis is supported by financial technology, namely robo-advisors so that the presence of robo-advisors can reduce overconfidence bias and loss aversion bias (Figure 1).

RESULTS

Validity and Reliability Test

This test is the initial stage of the outer model, where the items that can be used as indicators are declared valid and reliable. The results indicated that the model passed the validity and reliability tests, both overconfidence bias and loss aversion bias (Table 1). As for investment decisions, the invalid item is the 10th item. The reliability test results are presented in Table 2, wherein the fourth step, cronbach's alpha, proves that overconfidence bias, loss aversion bias, and investment decisions are reliable.

Statistic Descriptive

In addition, as many as three classic assumption tests, namely normality, multicollinearity, and heteroscedasticity, have been carried out (Table 3). The results found that the research model can be continued to the next stage.
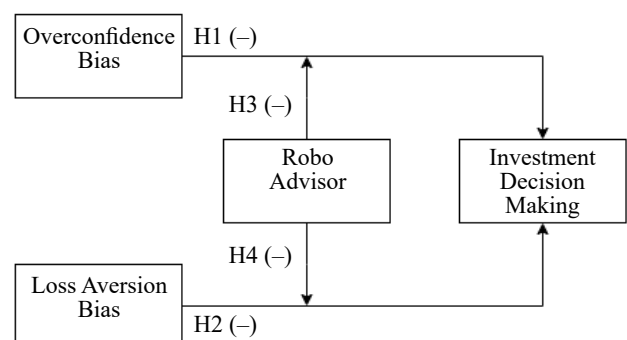
Regression Result

Figure 1. Research Model

Table 1. Validity Test Result

Overconfidence Bias			Loss Aversion Bias			Investment Decision Making		
Item	R-Stat.	Results	Item	R-Stat.	Results	Item	R-Stat.	Results
I believe that my ability is better than anyone else in choosing investment assets.	0.817	Valid	I am always cautious about the losses incurred by changes in market prices.	0.694	Valid	I know about interest rates, fee finance, and credit terms.	0.344	Valid
I can fully control the outcome of my investment decisions.	0.717	Valid	I am willing to invest in an asset that shows a definite profit.	0.608	Valid	Money is the most important goal in my life.	0.423	Valid
The success of my investments in the past is due to the unique skills I have.	0.760	Valid	I am willing to invest in an asset that shows a definite profit.	0.702	Valid	I understand how to invest my money.	0.413	Valid
I am confident in the performance of the investments I make.	0.705	Valid	I hope to profit from investments that have shown losses.	0.570	Valid	I know how to manage finances.	0.423	Valid
						I feel more happy investing than saving.	0.411	Valid
						I will invest a large amount of money available.	0.421	Valid
						The uncertainty in the market, whether going up or down, keeps me from investing in mutual funds.	0.320	Valid
						I budget my money well.	0.441	Valid
						I invest for short-term goals. (*)	0.356	Valid
						I am confident in making my investment decisions. (*)	0.125	Not Valid
						I listen to my intuition when investing. (*)	0.240	Valid

Table 2. Reliability Test

Variable	First Step Cronbach's Alpha	Result	Second Step Cronbach's Alpha	Result	Third Step Cronbach's Alpha	Result	Fourth Step Cronbach's Alpha	Result
Overconfidence	0.739	Reliable	0.739	Reliable	0.739	Reliable	0.739	Reliable
Loss aversion	0.508	Not Reliable	0.617	Reliable	0.618	Reliable	0.618	Reliable
Investment Decision Making	0.364	Not Reliable	0.435	Not Reliable	0.540	Not Reliable	0.602	Reliable

Table 3. Statistic Descriptive

Overconfidence	Mean	Std. Deviation	Loss Aversion	Mean	Std. Deviation	Investment	Mean	Std. Deviation
OC1	3.22	0.0905	LA1	4.16	0.0721	DM1	3.76	0.0866
OC2	3.76	0.0955	LA2	4.32	0.0737	DM2	3.74	0.0105
OC3	3.32	0.0104	LA3	4.03	0.0810	DM3	3.92	0.0734
OC4	3.65	0.0892				DM4	3.92	0.0692
						DM5	4.09	0.0900
						DM6	3.77	0.0920
						DM8	3.80	0.0739
Average	3.49			4.17			3.86	

Based on the ANOVA results in Table 4, the value for the simultaneous test (F test) in this study has a significance level below 0.05, so it can be concluded that overconfidence bias and loss aversion bias together have a positive and significant influence on the investment decision making of young investors in mutual fund investment instruments in Indonesia.

Overconfidence, Loss aversion, Investment Decision

Based on the table of multiple regression test results in Table 5, the value for the t-test (t-tests) has a significance level below 0.05 for each variable. The test results for the fit of the research model using multiple linear regression are shown in Table 6, which explains that the research model fits with a p-value of 0.000, meaning that the research model is suitable. The value used is adjusted R square, which means that the variables of investor behavior bias can explain the variation of investment decisions by 20.1%, while other variables explain the rest.

Overconfidence and loss aversion biases positively and significantly influence the investment decisions of young mutual fund investors. Through this regression, young investors who make rational investment decisions in Surabaya have high self-confidence and behavior that is more sensitive to losses when compared to profits in investing. Related research results from This overconfidence are following Metawa et al. (2019), Armansyah (2021), Gill et al. (2018), Ullah et al. (2020), Qasim et al. (2019), Aini & Lutfi (2019),

and Cuandra & Rinaldo (2021). A good understanding of the younger generation regarding technology makes them like and trust technology which they also use to share information (Rastati, 2018). Utilizing all technology or being tech-savvy can help someone decide (Cheung et al. 2021). The results of testing investors who invest specifically in mutual funds align with Cuandra & Rinaldo (2021), which proves that the results of optimistic overconfidence cause investors to tend to invest in mutual funds only because of their self-confidence, not because of an understanding of the risk profile owned by investors.

Related research results loss aversion is also under what was done by Ngoc (2013), Khan (2017) , and Cuandra & Rinaldo (2021). loss aversion is a condition that occurs in investors who are more affected by losses while they are less fond of the same losses and gains (Barberis & Thaler, 2003). The younger generation has risk characteristics averse to investing (Clare, 2022). Young investors choose to invest in mutual funds because they are classified as risk averse, so by selecting mutual funds as investment instruments, they have avoided risk from the start. Investors who have losses high aversion will tend to invest little in assets that have high risk, even not the slightest (Polkovnichenko, 2005). Cuandra & Rinaldo (2021) also found the same results, which showed that mutual fund investors avoided more losses than profits. A loss of high aversion makes investors focus more on avoiding losses than making profits. Young investors who invest in mutual funds are risk-averse compared to investors with more experience (Methylda, 2014).

Table 4. ANOVA Results

Model	Sum of Squares	Df	F	Sig.
Regression	225.659	2	13.473	.000
residual	812.341	97		
Total	1.038.000	99		

Table 5. Multiple Regression Test Results

Model	B	Std. Error	Betas	t	Sig.
(Constant)	15.373	2.557		6012	0
OCVR	0.47	0.103	0.409	4549	0
LAVR	0.405	0.17	0.214	2379	0.019

Table 6. Goodness of Fit for Multiple Regression

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	p-value
1	0.466	0.217	0.201	2.894	0.000

Robo-advisors as Moderating

Moderation Regression between variables X1 and X2 against variable Y by using the Robo Advisor moderation variable with category (2). Table 7 shows the results for young investors who do not use robo services. Advisors have an R^2 value of 0.213; while young investors use robo services. The advisor has a value of R^2 of 0.126. Therefore, it can be concluded that the moderator variable, the robo advisor weakens the relationship between overconfidence variables' bias toward investment decision-making. In addition, the results also show that young investors who do not use robo-services advisors have an R^2 value of 0.123; while young investors who use robo services advisor have a value of R^2 of 0.025. Therefore, it can be concluded that the moderator variable robo advisor weakens the relationship between loss aversion bias towards investment decision-making. The use of robo-advisors in Indonesia is still limited to risk-profiling; young investors cannot rely on robo-advisors as true financial advisors. Information from robo-advisors ultimately plays a small role in making investment decisions.

In Table 8, the results obtained are robo service users' advisor (category 1) has a t value of 2.673 with a significance level (< 0.05). This result is the same as that of Bhatia et al. (2021), who state that robo advisor weakens the relationship between overconfidence against investment decision-making. However, the variable loss aversion, specifically for the user of robo advisor (category 1), showed insignificant results with a t-value of 1.238 and a significance level of 0.222. Insignificant results are caused by young investors' selection of mutual funds as investment instruments, indirectly making these investors classified as risky. Averse and conservative. Therefore, a robo advisor cannot moderate the effect of the loss aversion bias toward investment decision-making of young investors. The goodness of fit for moderation regression category 1 and category 2 can be seen at Table 9 and Table 10.

Managerial Implications

Managerial implications refer to the results of this study, so there are several direct consequences that will be experienced by young investors. The high level of overconfidence is caused by the ease of access to information related to investment assets that is widely spread through social media such as Instagram, YouTube, Telegram, and others. Therefore, young investors are expected to be able to screen all forms of information related to investment knowledge. Knowledge related to finance is considered capable of reducing loss aversion from young investors, so that it can help investors in making more rational and good decisions.

Table 7. Moderation Direction Test Results

Construct	Direction	Construct	R	R^2
Robo Service Users Advisors (n=50)				
Investment decision	<	overconfidence	0.355	0.126
Investment Decisions	<	loss aversions	0.158	0.025
Not a user of robo-advisors (n=50)				
Investment Decisions	<	overconfidence	0.461	0.213
Investment Decisions	<	loss aversions	0.351	0.123

Table 8. Influence Test Results

Construct	Direction	Construct	Q	Sig.	Results
Robo Service Users Advisors (n=50)					
Investment decision	<	overconfidence	2.673	0.100	Significant
Investment Decisions	<	loss aversions	1.238	0,222	Not significant
Not a user of robo-advisors (n=50)					
Investment Decisions	<	overconfidence	3.501	0.010	Significant
Investment Decisions	<	loss aversions	2.495	0,016	Significant

Table 9. Goodness of Fit for Moderation Regression Category 1

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	p-value
1	0.392	0.154	0.118	3.09642	0.000

Table 10. Goodness of Fit for Moderation Regression Category 2

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	p-value
1	0.552	0.305	0.275	2.71019	0.000

In addition, robo-advisors also have a role in moderating the relationship between behavioral biases towards investment decision making. This research proves that Robo-advisors are successful in reducing the irrationality of investors' investment decisions, considering that the capital market in Indonesia, which is included in developing countries, is more prone to be affected by biased behavior that is dominant by investors when compared to developed countries that already use robo-advisors technology in various aspects of capital market instruments.

CONCLUSIONS AND RECOMMENDATIONS

Conclusions

Referring to the results of data processing and hypothesis testing that has been done before, it can be concluded that four hypotheses have been completed to be tested using Multiple Linear Regression Analysis with the help of IBM SPSS Statistics software 29 and Microsoft Excel 365. The results found that overconfidence bias has a positive and significant effect on the investment decision-making of young investors, so H1 is rejected. The second finding is related to loss aversion and shows that bias has a positive and significant effect on the investment decision-making of young investors, so H2 is rejected. In addition, it was found that robo advisor weakens the relationship between overconfidence bias and investment decision-making, so H3 is accepted. However, the robo-advisors found that unable to moderate the relationship between losses aversion bias with investment decision making. Thus, digital innovation in wealth management will provide more accurate results by using robo-advisor services in making investment decisions and reducing behavioral biases, including overconfidence and loss aversion. Mutual fund investors with a positive overconfidence result cause investors to invest in

mutual funds only because of the confidence factor, not because of an understanding of the investor's risk profile. In addition, a positive loss aversion causes investors to have a higher level of sensitivity regarding losses compared to profits, which causes investors to evaluate their investment results more often.

Recommendations

Recommendations refer to the results obtained that are aimed at investors and increasing the use of robo-advisors. Investors are encouraged to recognize and mitigate behavioral biases frequently influencing their investment activities, so they can be more rational when making investment decisions, especially mutual fund instruments. It would be suitable for young investors who have behavioral biases to consider or review their investment decisions through risk profiling and deepen information via social media that is spread online regarding the investment assets they want so that it is hoped that investors will be better prepared if they experience losses when investing. Meanwhile, the use of robo-advisors can be improved again so that robo-advisors can be even better in the future, considering that robo-advisors are still relatively young and in the development stage.

Robo advisors are expected to provide more advanced information regarding the selection of their mutual fund investment assets, such as being able to project unfavorable events that are likely to occur and the basis for more sensitive risk profiling so that the information that investors can obtain is more perfect and comprehensive. Indirectness can minimize possible biases that may occur. The limitation of this study is that it only uses two behavioral biases in predicting the dependent variable, namely overconfidence bias and loss aversion bias. Therefore, it is hoped that future research can add to the number of behavioral biases that may occur in young investors, such as herding behavior, anchoring bias, etc. Subsequent researchers can review some of the previously mentioned limitations to obtain more relevant and valuable research results for investors investing in the Indonesian capital market, specifically in mutual fund investment instruments.

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