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THE EFFECT OF OVERCONFIDENCE AND OPTIMISM BIAS ON STOCK INVESTMENT DECISIONS WITH FINANCIAL LITERATURE AS MODERATING VARIABLE

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ABSTRACT
Market anomalies that occur due to inefficient market conditions underlie the emergence of behavioral finance. Behavioral finance emphasizes investors' irrational behavior towards their decisions. Investors who are in an inefficient market can take abnormal returns. Investors use heuristics in financial decisions whenever they are faced with an uncertain situation. Investment decision making will involve cognitive, psychological, social and behavioral aspects. This study examines the effect of overconfidence and optimism bias on stock investment decisions with financial literacy as a moderator. The research population is active students at the Faculty of Economics and Business, Udayana University who are also stock investors. The sampling technique used was non-probability sampling with an accidental sampling approach. The analysis technique uses Partial Least Square (PLS). The results of the study show that Overconfidence has a significant positive effect on stock investment decisions; Optimism bias has a significant positive effect on stock investment decisions; Financial literacy does not moderate the effect of overconfidence on stock investment decisions, however, financial literacy moderates the effect of optimism bias on stock investment decisions. Based on these results, investors, especially beginners, should learn more about financial literacy so that when deciding to invest they can minimize losses.

KEY WORDS
Overconfidence bias, optimism bias, investment decisions, financial literacy.

The Corona virus (Covid-19) pandemic that occurred in 2020 affected stock price movements and became a volatile year for stock investors. The decision to choose to place funds in stocks involves cognitive factors as well as human emotions as investors. Someone making investment decisions is influenced by financial behavior both by rational and irrational attitudes (Sofi Ariani et al., 2016). Ton and Dao (2014) in their research model reveal several psychological factors that are popularly used in research on financial behavior, namely Overconfidence, herding behavior, excessive optimism, excessive pessimism and risk tendencies.

Overconfidence is a condition where an investor tends to be too confident in his abilities and knowledge in making decisions. Mahanthe and Sugathadasa's research (2018); Pradhana (2018); Setiawan, Atahau, and Robiyanto (2018); and Tanusdjaja (2018) found that Overconfidence has an effect on investment decisions. Excessive optimism is also one of the popular behavioral biases used in research. Excessive optimism is an overconfidence and belief that the future will be better than the actual situation (Ton & Dao, 2014).

An investor must have good and adequate knowledge as an important aspect in investment decisions. Liebowitz (2016:6) explains that financial literacy is knowledge and understanding of financial concepts and risks, and the skills, motivation and confidence to apply this knowledge and understanding to make effective decisions in various financial contexts, to improve individual financial well-being. The results of the same study were also found in Herawati & Dewi (2020) research which stated that a person's interest in investing is influenced by his financial literacy. This study involves two behavioral variables or psychological factors in testing the interaction effect of financial literacy, namely overconfidence and optimism bias.

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LITERATURE REVIEW AND CONCEPTUAL MODEL

Behavioral Finance is a person's ability to manage (planning, budgeting, checking, managing, controlling, searching, and storing daily financial funds (Salwah, 2020: 68). Prospect theory asserts that a person does not always act rationally under risk and uncertainty, a person will be influenced by psychological factors and erratic behavior in making rational decisions (Ellen Pradikasari & Isbanah, 2018). Tversky and Kahneman quoted by Luong and Ha (2011) define heuristics as rules of thumb that facilitate decision-making by reducing the level of complexity in making probability assessments and predicting values more easily. Financial Literacy can be interpreted as a person's knowledge of financial management properly (Ellen Pradikasari & Isbanah, 2018). In accordance with the objectives and the number of identified constructs, a model concept of the relationship of Overconfidence and optimism bias towards investment decisions can be built with financial literacy as a moderator.

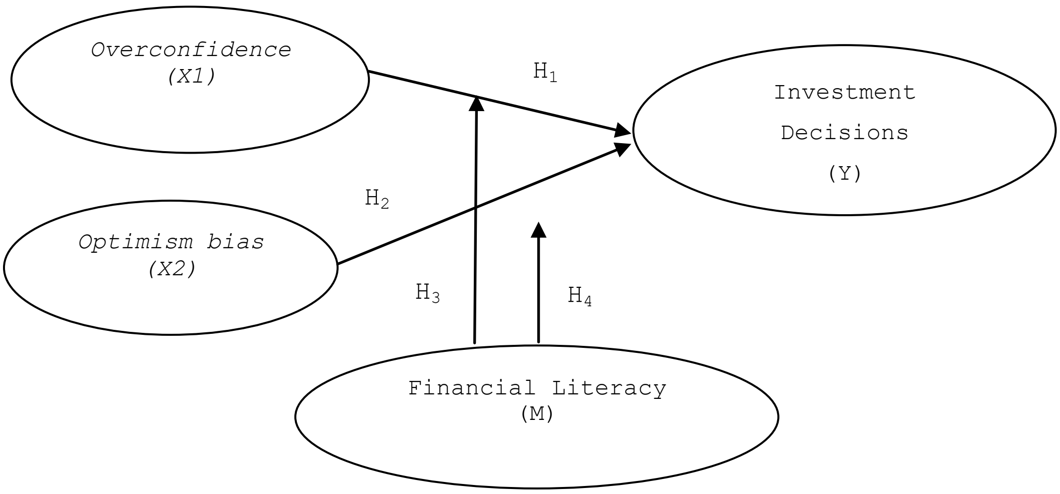

Figure 1 – Conceptual Framework

The Effect of Overconfidence on Stock Investment Decisions

Researchers Kanojia, Singh, and Goswami (2019: 32) argue that overconfidence means that an investor recognizes the accuracy of information, potential and intelligence and underestimates the risks that will occur. Research by Grover and Singh (2015); Javed and Marghoob (2020); Lisa (2019); Rehan and Umer (2017); Shusha and Touny (2016); Subramaniam and Velnampy (2017); Alquraan, Alqisie, & Shofa, (2016); Kartini and Nugraha (2015); Pradikasari and Isbanah (2018); and Wendy (2021); Sochi (2018); Madaan and Singh (2019); Areiqat, Abu-Rumman, and Al-Alani (2019); Halale and Gadekar (2019); Novianggie and Asandimitra (2019); Iqbal (2015) also shows that overconfidence has a positive and significant effect on investment decisions. Overconfidence behavior has the potential to cause individuals to experience psychological bias because the decision-making process is not based on the highest prospects. Based on the explanation that has been described, the hypothesis of the relationship between Overconfidence and investment decisions is as follows:

H1: Overconfidence has a positive effect on stock investment decisions.

The Effect of Optimism Bias on Stock Investment Decisions

The results of the research by Budiman and Damingun (2021) and the results of the research by Alhazami (2019) indicate that the optimism bias affects investment decisions. The same results have also been found in several previous studies such as Iqbal's research (2015); Khan et al. (2016); Shah et al. (2012); and Ullah, Ullah, and Rehman (2017) which show that there is a positive influence of optimism bias on investment decisions. Based on the explanation that has been described, the relationship between optimism bias on investment decisions is as follows:

H2: Optimism bias has a positive effect on stock investment decisions.

Moderating Effect of Financial Literacy on the Effect of Overconfidence on Stock Investment Decisions

The results of the research by Altamimi (2019) in Wendy (2021) show that financial literacy has an effect on investment decisions. The results of Wendy's (2021) research explain and show strong support for the role of financial literacy as a moderator in reducing the psychological bias of investment decision making. The results of research by Ahmad and Shah (2020) which state that financial literacy moderates the overconfidence relationship with investment decisions. The results are in line with the research results of Budiarto and Susanti (2017) and Pradhana (2018) which show that there is a moderating interaction between financial literacy on the effect of Overconfidence on investment decisions. Based on the explanation that has been described, the proposed hypothesis regarding the role of financial literacy in moderating the effect of Overconfidence on investment decisions is as follows:

H3: Financial Literacy Moderates the Effect of Overconfidence on stock investment decisions.

Moderating Effect of Financial Literacy on the Effect of Optimism Bias on Stock Investment Decisions

The results of research by Waqas and Fatima (2016) state that financial literacy moderates the relationship between optimistic bias and investment decision making. Increased financial literacy and available information provide better education for making ideal investment decisions (Hilgert et al (2003) in Waqas & Fatima, 2016). Individuals with higher financial literacy are more effective in their decision making (Waqas & Fatima, 2016). Based on the explanation that has been described, the hypothesis of the role of financial literacy in moderating the effect of optimism bias on investment decisions is as follows:

H4: Financial Literacy Moderates the Effect of Optimism Bias on stock investment decisions.

METHODS OF RESEARCH

This research is a causality study where there is a relationship between two or more variables. This research was conducted at the Faculty of Economics and Business, Udayana University. The population in this study is active students at the Faculty of Economics and Business, Udayana University who are also stock investors. The sampling technique used was non-probability sampling with an accidental sampling approach. Sampling is based on the fact that the respondents appeared by chance.

RESULTS AND DISCUSSION

Convergent Validity test:

- Financial Literacy (M) indicators all have loading factors above 0.6 with an AVE value of 0.503, the value is greater than 0.5.
- The Overconfidence construct (X1) all of its indicators have a loading factor value above 0.6 and in table 5.8 the Overconfidence construct indicator (X1) has an Average Variance Extracted (AVE) value of 0.678, the value is greater than 0.5.
- Optimism Bias constructs (X2) all have values above 0.6 and in table 5.8 the indicators of optimism bias constructs (X2) have an Average Variance Extracted (AVE) construct of 0.507, the value is greater than 0.5.
- Stock Investment Decision Indicators (Y) all have loading factors values above 0.6 with an Average Variance Extracted (AVE) value of 0.630, the value is greater than 0.5.

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Discriminant Validity test:

- The cross loading correlation of all financial literacy indicators (M) to the latent variable is greater than the cross loading correlation value of other latent variables because the values range from 0.816 to 0.632, then all financial literacy indicators (M) can be declared valid.
- The cross loading correlation of all Overconfidence (X1) indicators to their latent variables is greater than the cross loading correlation values of other latent variables because their values range from 0.884 - 0.747, so all Overconfidence (X1) indicators can be declared valid.
- The cross loading correlation of all indicators of optimism bias (X2) on the latent variable is greater than the value of the cross loading correlation of other latent variables because the values range from 0.804-0.643, so all indicators of optimism bias (X2) can be declared valid.
- The cross loading correlation of all stock investment decision indicators (Y) to the latent variable is greater than the cross loading correlation value of other latent variables because the value ranges from 0.854 - 0.722, then all stock investment decision indicators (Y) can be declared valid.

Table 1 – Reliability Result

No	Variable	*Composite Reliability*	*Cronbach's Alpha*	*Information*
1	Financial Literacy (M)	0,909	0,893	Reliable
2	Overconfidence (X1)	0,936	0,920	Reliable
3	Optimism Bias (X2)	0,877	0,835	Reliable
4	Stock Investment Decision (Y)	0,894	0,852	Reliable

Source: Data Processed, 2021.

Based on table 1 above, it can be seen that all Composite reliability values in each variable are greater than 0.7. Thus it can be stated that the data in the research is reliable.

Figure 1 – PLS Test Result (Source: Data Proccesed, 2021)

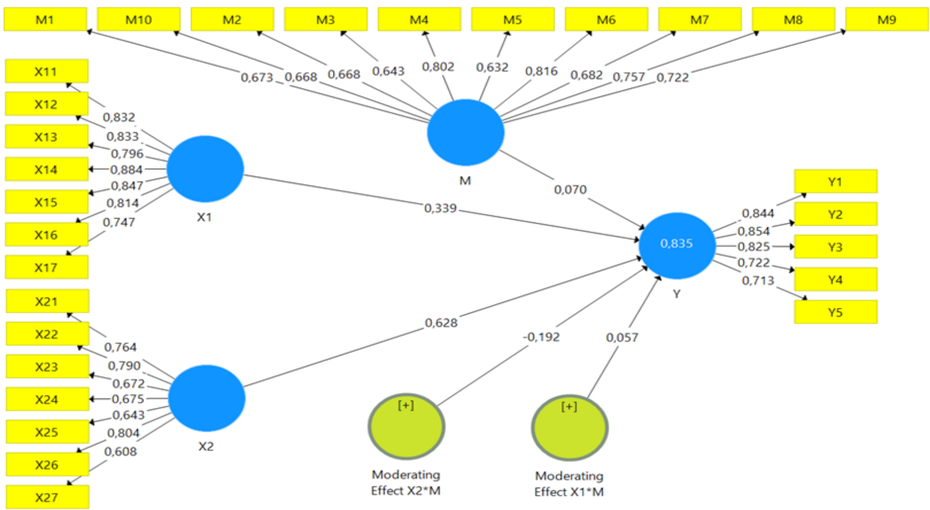

Table 2 – R Square

Variable	*R Square*	*Adjusted R Square*	*Information*
Stock Investment Decision (Y)	0,841	0,835	Strong

Source: Data Processed, 2021.

The coefficient of determination R2 is 0.841, it shows that the variability of stock investment decisions (Y) which can be explained by Overconfidence (X1), optimism bias (X2) and financial literacy (M) is 84.10% while the remaining 15.90% is explained by other variables not examined in the model. Q-square calculation can be seen as follows:

$$Q2 = 1 – [(1-R_1 2) = 0,707$$

Based on the above calculation, the Q-square value of 0.707 is obtained, which is more than 0 and close to 1, so it can be concluded that the model has predictive relevance or the model deserves to be said to have relevant predictive values.

Table 3 – Direct Effect Test

No	Hypothesis Testing	Original Sample (O)	T Statistic (| O/STDEV |)	P Values	Information
1	Overconfidence (X1) -> Stock Investment Decision (Y)	0,339	0,075	0,000	Significant
2	Optimism Bias (X1) -> Stock Investment Decision (Y)	0,628	0,067	0,000	Significant
3	Moderating Effect of Financial Literacy on the Effect of Overconfidence on Stock Investment Decisions	0,057	1,039	0,150	Not significant
4	Moderating Effect of Financial Literacy on the Effect of Optimism Bias on Stock Investment Decisions	-0,192	3,462	0,000	Significant

Source: Data Processed, 2021.

Table 4 – Moderation Effect Test

Influence between variables	*Path coefficients (Original Sample/O)*	*p-value*	Information
Effect of Overconfidence (X1) on Stock Investment Decisions (Y)	0,339	0,000	Significant
Moderating Effect of Financial Literacy on the Effect of Overconfidence on Stock Investment Decisions	0,057	0,150	Not significant
The Effect of Optimism Bias (X1) on Stock Investment Decisions (Y)	0,628	0,000	Significant
Moderating Effect of Financial Literacy on the Effect of Optimism Bias on Stock Investment Decisions	-0.192	0,000	Significant

Source: Data Processed, 2021.

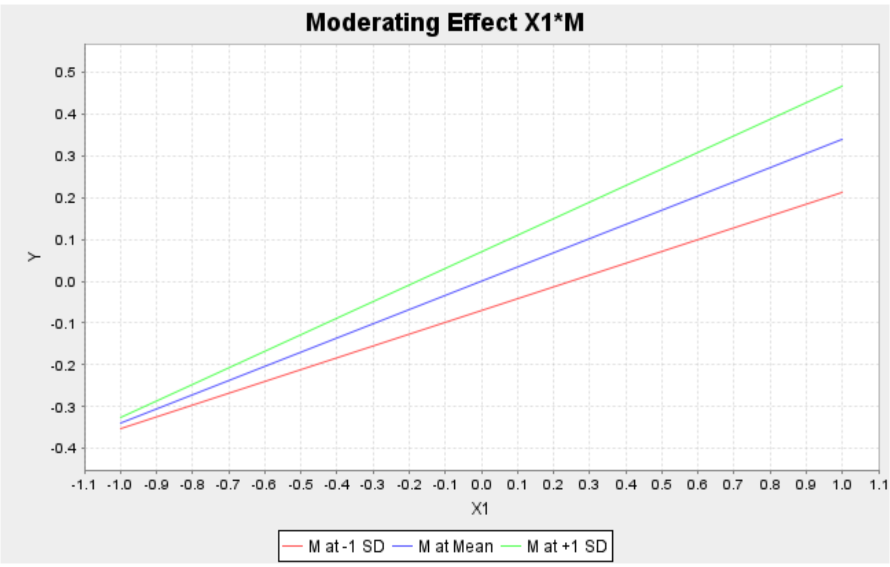

Figure 2 – Moderating Effect of Financial Literacy on the Effect of Overconfidence on Stock Investment (Source: Data Processed, 2021)

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The figure shows the relationship between Overconfidence (X1) and Stock Investment Decisions (Y) accompanied by the interaction of Financial Literacy (M). The red line shows the interaction of Overconfidence (X1) with Stock Investment Decisions (Y) where Financial Literacy (M) has a small value. The red line still has a slope that does not cross the blue line where the blue line shows a higher Financial Literacy (M) value than the red line. This means that there is no significant moderating effect.

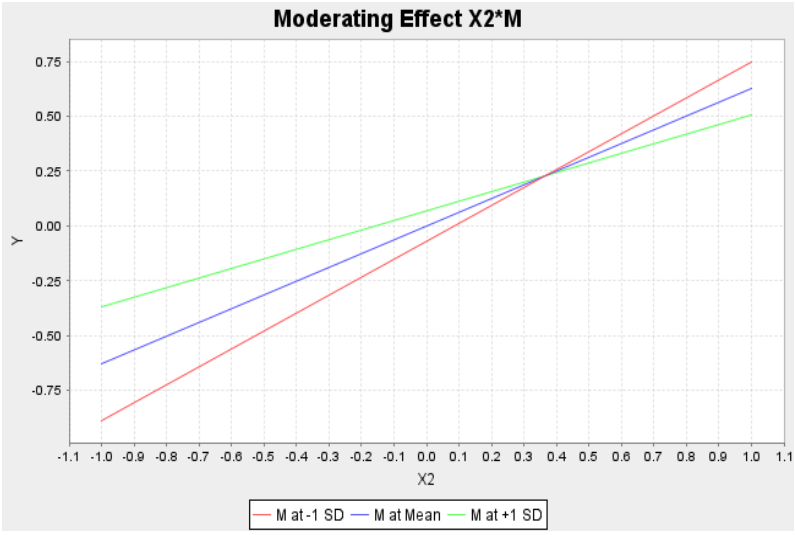

Figure 3 – Moderating Effect of Financial Literacy on the Effect of Optimism Bias on Stock Investment Decisions (Source: Data Processed, 2021)

From the picture it can be seen that the blue and green lines intersect the red line where the red line is the interaction of optimism bias (X2) with Stock Investment Decisions (Y) with low Financial Literacy (M). A high value of Financial Literacy (M) is able to reduce the interaction bias of optimism (X2) against Y to below the red line, which means there is an interaction effect that reduces the biased relationship of optimism (X2) to Stock Investment Decisions (Y). This means that Financial Literacy (M) weakens the relationship of optimism bias (X2) to Stock Investment Decisions (Y) which is significant. From the value of f square of 0.106, which means that the magnitude of the effect can be categorized as small.

The Effect of Overconfidence on Stock Investment Decisions

The test results show that the first hypothesis is accepted. Overconfidence has a positive and significant effect on stock investment decisions. This result means that the higher a person's confidence in an investment, the higher the investment decision. The results of this study are in line with the heuristic theory which states that overconfident investors tend to be overreacted, so that investors will increase their investment decisions even though their investment decisions tend to be suboptimal. The results of this study are in line with the results of Addinpujoartanto and Darmawan (2020); Ady and Hidayat (2019); Dewi and Krisnawati (2020); Wisdom and Wisdom (2020); Hunguru et al. (2020); Armansyah (2021); Ahmed and Noreen (2021); Cuandra and Tan (2021) found that there was a significant positive effect of Overconfidence on investment decisions.

The Effect of Optimism Bias on Stock Investment Decisions

The test results show that the second hypothesis can be accepted. This result means that the higher one's optimism bias in an investment, the higher the investment decision. The results of this study are in line with prospect theory which explains that an individual does not always act in accordance with financial theory standards under risk and certainty. The results of this study are the same as those of Budiman and Damingun (2021); Alhazami (2019); Pratiwi and Leon (2019) which showed that the positive optimism bias had an effect on investment decisions. These results also support the results of Iqbal's research (2015); Khan et al. (2016); Shah et al. (2012); and Ullah et al., (2017) who also show that there is a positive influence of optimism bias on investment decisions.

Moderate Effect of Financial Literacy on the Effect of Overconfidence on Stock Investment Decisions

The test results show that the third hypothesis is rejected. Financial literacy does not moderate the effect of overconfidence on stock investment decisions. Bhandari and Deaves (2006) research; Jamshidinavid, Chavoshani, and Amiri (2012); and Lin (2011) that educated investors make investments based on their own knowledge, abilities and confidence. Heath and Tversky (1991) state that the higher the level of education will increase the level of self-confidence because the higher the education makes an investor feel more competent in almost all fields including finance, this means that the higher the education of investors, the more vulnerable they are to Overconfidence. From the analysis results, it is also found that the moderating effect has a positive direction or strengthens the influence of Overconfidence on investment decisions but is not statistically significant. This implies that there is a tendency for financial literacy to be possessed when combined with a young age will make a person more vulnerable to Overconfidence.

Moderating Effect of Financial Literacy on the Effect of Optimism Bias on Stock Investment Decisions

The test results show that the fourth hypothesis is accepted. This result means that the higher the optimism bias of an investor, when the investor has high financial literacy, the optimism bias will decrease so that the lower the investor's decision to invest. The results of the moderating effect test show support for financial literacy as a moderator. The results of this study are in line with prospect theory. This theory is a model of decision making by considering risk factors in decision making. This theory states that there is a bias that is continuously motivated by psychological factors affecting individual choices in conditions of uncertainty (Afriani & Halmawati, 2019), one of which is the optimism bias. The results of research by Budiarto and Susanti (2017); Pradhana (2018) which shows the role of financial literacy as a moderator in reducing the psychological bias of investment decision making.

CONCLUSION

Based on the results of the analysis and discussion in the previous chapter, it can be concluded as follows: Overconfidence has an effect on stock investment decisions, the higher the overconfidence, the higher the investor's investment decisions. Optimism bias affects stock investment decisions, the higher the optimism bias, the higher stock investors' investment decisions. Financial literacy does not moderate the effect of overconfidence on stock investment decisions, which means that even though investors have financial literacy, they are not able to reduce (reduce) the effect of overconfidence on stock investment decisions. Financial literacy moderates the effect of optimism bias on stock investment decisions; financial literacy reduces (weakens) the effect of optimism bias on stock investment decisions. Where a person's high financial literacy is, the more he can reduce the optimism bias in terms of stock investment decisions.

For investors, it is better not to use their own opinion in dealing with difficulties and uncertainties, and to seek more accurate information so as to avoid overconfidence behavior. Further researchers can examine further from the results of this study which have not been able to prove the relationship between financial literacy moderation and the effect of overconfidence on investment decisions.

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