# How overconfidence and mental accounting influence investments? The moderating role of financial literacy

Johny Budiman[1]*, Jason Yodiputra[2], Candy[3], Isnaini Nuzula Agustin[4]

[1,2,3]Management Department, Faculty of Business and Management, Universitas Internasional Batam, Batam, Indonesia

[4]Doctor of Philosophy, Graduate School of Business, Universiti Sains Malaysia, Penang, Malaysia

**Article History**
Received : 2024-06-10
Revised : 2024-09-09
Accepted : 2024-10-14
Published : 2025-02-04

**Keywords:**
Herding bias; investment decision; loss aversion; mental accounting; overconfidence.

***Corresponding author:**
johny.budiman@uib.ac.id

**DOI:**
10.20885/AMBR.vol5.iss1.art1

**Abstract**

This research aims to investigate the influence of behavioral finance on stock investment decision-making in Indonesia, considering both rational and irrational behaviors. Key behavioral finance factors, including overconfidence, herding bias, mental accounting, and loss aversion, are examined to understand their impact on stock investment decisions, the financial literacy as moderating variables has been added to the model. A self-administered questionnaires were distributed to 391 active trading stock investor in Indonesia. Using Partial Least Squares method, the results shows that loss aversion and overconfidence negatively influence the investment decision. Further, the analysis confirmed the role of financial literacy as moderating variable for mental accounting and overconfidence. It is also consistent with the notion that financial literacy at least in terms of mental accounting biases under some conditions might actually reinforce certain specific cognitive shortcuts. This study's results suggest policymakers and financial educators should work to increase investors' literacy about finance, as well as their ability to identify biases they hold which could be used against them when making investment decisions.

## Introduction

One notable development markets in emerging economies such as Indonesia is the rise of retail investors. Based on data compiled by Indonesia Central Securities Depository (KSEI) new SIDs have grown rapidly in the past few years. This number jumped from 7,489,337 in 2021 to 10,311,152 in 2024. The number of equity investors also jumped 68% to at 10,623,731 during the last year (Indonesia Central Securities Depository, 2023). This increase reflects the growing interest that Indonesians have in the stock market which is being fueled by a number of factors including the emergence of online trading platforms easier access to financial markets and expanding financial literacy campaigns (Islam Khan et al., 2016). Whilst this works well for financial literacy in the country, it would also appear that determinants of investment behavior do not operate as rationally and coherently amongst a significant cross section of Indonesian investors. This is contrary to conventional finance theories that investors are rational agents who process all relevant information and resources with respect (Barberis, 2019). Behavioral finance is a discipline that integrates psychological insights into financial theory and highlights the influence of emotional and cognitive biases provides a more sophisticated understanding of investor behavior (Kumar & Goyal, 2015). Though there is a wealth of literature addressing the rational aspects of investment decisions there is a significant knowledge gap about the impact of irrational behavior and cognitive biases on investment decisions particularly in the Indonesian context (Özen & Ersoy, 2019).

Previous research such as that done by Barberis et al. (2019) compiled extensive proof about a selection of behavioral prejudices that may lead traders to build suboptimal judgments

E ISSN 2775-202X

which includes mental accounting herding overconfidence and loss aversion. But to the extent our review of existing literature identified, there has been surprisingly little investigation into how they come about in less developed markets (such as Indonesia) since much academic research is already directed towards established ones (Mnif et al., 2022). Secondly, although it is increasingly recognized that financial literacy may counteract some of these behavioral biases, its impact on investment behavior has been largely ignored (Mitchell & Lusardi, 2015). Financial literacy refers to ability to understand and use various financial skills, which are required for making well-informed investment decisions. However, few empirical data are available to demonstrate how the fiscal literacy could used for mitigate cognitive biases effect of Indonesian stock trader (Lusardi & Mitchell, 2014). This study seeks to fill this gap by investigating whether behavioral biases interact with a financial literacy among Indonesian stock traders. The framework for the inquiry is grounded in the behavioral finance principle and concept of fiscal literacy. The principle of behavioral finance, that investigates cognitive elements towards fiscal decision creating and questions the conventional wisdom regarding rational investor behavior, has actually been produced by scholars including Daniel Kahneman and Amos Tversky in 2013.

Mental accounting wise or treating funds unequally based on their source and intended purpose, overconfidence where traders think they have a better handle than reality then that can be main concepts under this principle (Kahneman, 2011). Loss aversion befalls upon those who suffer from their losses far more than they delight from the same wins. Copy trading is a type of herding. Also those individuals with better monetary literacy may be able to get more logical and knowledge judgements about their funds based on the idea of fiscal literacy (Thaler, 1999). One of the most critical truths about financial literacy is understanding the concept of capital risk and some principles involved in investing. The research at hand combines the two hypotheses and bridges them in order to study how financial literacy may protect investment decisions against behavioral biases (Van Rooij et al., 2011a). This study examines how two behavioral finance factors, overconfidence and loss aversion influence Indonesian traders stock investment choices. One aim of the study's research is to examine whether financial literacy moderates in this case (Klapper et al., 2015). In these goals of the interrogation, the inquiry hopes to accomplish a number of truths. This in an emerging market context for the first time expands the purview of behavioral finance theories based on empirical evidence about how frequently and under what circumstances such biases have a bearing (Banerjee, 2020). The second thing it proves is that fiscal literacy can be useful in reducing irrational investment behavior not only by providing legislators, fiscal educators and Indonesian regulators with a wealth of knowledge (De Bondt & Thaler, 1985).

Focusing on trends can help stakeholders to identify patterns in trader behavior so that they may build targeted strategies for enhancing investor education and fostering sounder investment decisions. First, it advances the ongoing conversation berating trader behavior and fiscal literacy and secondly seeks to plug a hole in late literature. This study connects the dots between behavioral finance and fiscal literacy offering a comprehensive framework to scrutinize problems emanating in individual traders of emerging economies. The study hopes to contribute better investment results and formation of a knowledgeable, stronger trading base in Indonesia (Verkijika, 2020). Most prior studies have looked into the effect of fiscal literacy on trader conduct, while examining its interconnection with subtypes of cognitive bias and investment strategy has been under researched. This is interesting because these interactions have received relatively little attention in the literature, but they could provide new insights that lead to better frameworks for financial decision making and trader education. Newer studies, such as one conducted by Adil et al. (2022), Arran (2023), and Ani and Özarı (2020) highlight the need for higher quality studies on the connection between fiscal literacy and particular prejudices like overconfidence and mental accounting.

## Literature Review and Hypotheses Development

According to Kahneman and Tversky (2013), behavioral finance theory challenges the long held assumption that investors are always rational in making financial decisions. The mental accounting framework as how its creator Thaler (2015) puts it, which explains many cognitive biases underlying

investing decisions including individuals tendency to compartmentalize their assets in the head, along with people following others like sheep blindly shepherded, pain of a loss over joy from profit and finally high overestimated financial literacy. In contrast, the theory of financial literacy postulates that people with more knowledge about economic concepts are better able to make decisions which balance those targeted at higher returns against those minimizing risk. Largely they may be protected from the damaging impact of mental shortcuts a stronger ability to escape ineffective heuristics given their superior financial IQ. Previous studies, drawing on various theoretical perspectives, have explored household financial practices forecasting the possibility of legislation against counter biased investment behavior through an increased educational level.

**Overconfidence**

The cognitive bias of overconfidence is likely when investors place too much faith in their own intuition and data collection, prompting excessive trading activity that can result in lower financial performance (Thaler, 1999). This bias may lead to weak decisions on the part of speculators, as some believe they have more influence over group direction than actually exists (Islam Khan et al., 2016). Overconfidence with our abilities to understand investment strategies and respective returns, we think that we should time the market efficiently according to periods which provide us with good trading opportunities more than important information about investments (Barberis et al., 2019) increases trading costs and price volatility. Investors could decide to ignore adverse information or replacement investment tactics that might increase portfolio risk and remove diversification. The vast scope of its impact on monetary business sectors is shown in the way that overconfidence has been generally a certifiable event inside an assortment of budgetary situations from individual stock exchanging to complex venture methodologies (Cao et al., 2005).

**Loss Aversion**

Loss aversion is an inherent cognitive bias where people inherently prefer avoiding losses than acquiring equal gains (Kahneman & Tversky, 2013). Warren Buffet warned of this behavior so long ago, yet it is a hardwired tendency that could push an investor to take out their winners too early and hang onto the big losers longer than they should; hoping in vain. The loss aversion leads to inferior investment decisions and inferior performance over time, as research supports (Pokharel, 2020).

However, it is crucial to strike the right balance between ensuring off take and reducing cuts. Being too conservative would preclude opportunities for more promising returns. Moreover, (Odean, 1998) in addition to his predecessors asserts that the irrational responses of loss aversion toward short run market movements can also lead on hatsful judgement compromising long run financial stability. Discipline and patience will be served to the betterment of an investor with a far sighted view pain loss gain. The most prudent manner to secure wealth over the long term is often continuing with a well-rounded strategy matched for your personal risk tolerance despite setbacks along the way.

**Herding Bias**

According to (Banerjee, 2020), market inefficiencies are often associated with the herd mentality as financiers. Asset bubbles and bag holder can also be seen in markets where the shareholders obtain (or sell) holdings acquire more with reference to perceived market action, when their buying or selling itself encourages other investors idle capital bid for stocks that appear obviously overvalued. Herding might arise from peer pressure or groupthink related to fear of being left behind during market trends (Hirshleifer & Hong Teoh, 2003).

Herd behavior and large groups of shareholders entering or exiting at the same time can cause sudden price movements that contribute to market unpredictability. This collective behavior routinely leads to the mispricing of assets and divergences from fundamentals resulting in amplification of phases when the market is overvalued or undervaluation as pointed out by Anthropic researchers (Kumar & Goyal, 2015). De Bondt and Thaler (1985) contended that

herding affects not only individual shareholders but also it is associated with systematic problems concerning fiscal stability as well as market integrity.

## Mental Accounting

Mental accounting plays tricks on the human mind, leading individuals to view money differently based on inconsequential factors such as origins or purposes (Khan, 2020). One prime example involves treating discretionary cash like bonuses differently than routine wages or dividing available funds into segregated silos assigned rigid use restrictions. This cognitive pitfall results in suboptimal resource distribution and questionable investment choices that disregard pure financial optimization (Novandalina et al., 2022).

Investors prone to mental accounting tend to manufacture artificial distinctions between fundamentally identical investment vehicles, adopt inconsistent practices in their dealings, and miss opportunities to maximize returns. Typically, this behavior damages a portfolio's performance by giving undue favor to some holdings over others and assigning disproportionate weight to others. Further downsides of mental accounting encompass decreased overall financial efficiency and increased transaction expenses due to non-value-driven decisions (Thaler, 2015).

## Financial Literacy

Financial literacy means knowing the basics of how money works (Van Rooij et al., 2011a). Thirdly, they are able to evaluate investment opportunities in a comprehensive manner that is well received by their most pressing needs and allows them to understand the associated risks. This has the additional advantage of making people more informed about their funds and helps them in crafting a portfolio suiting their need to achieve targets and risk tolerance. Short term goals call for conservative choices, but long term objectives make way for any such possibilities at the cost of larger potential pay offs. Basic economic education ensures that with purpose and independent of their aims or the blessings an individual presently enjoys in life, empathy for utilization decision making will be accomplished to guide personal finance which over time shows some yearning financial stability (Mitchell & Lusardi, 2015).

Accredited investors have the sophistication to a) evaluate and understand intricate financial instruments; and b) appreciate market cycles. By advocating for more informed and rational decision making processes, it mitigates the mental biases prevalent in our minds. Even stronger general business sense can help one better evaluate risks, hedge holdings and manufacture some much desired "hold" positions. Second, those with an economics background are often more sophisticated in their analysis of downstream effects and nuances before deciding how to invest capital. On the other hand, literacy dampens such tendency for quick decisions on an inadequate basis (Lusardi & Mitchell, 2014).

## Overconfidence and Investment Decisions

Overconfident investors might naturally earn lower returns through their increased trading and higher transaction costs. Furthermore, the high turnover in trading amplifies market exposure and error potential (Barberis et al., 2019). In consequence, it was expected that overconfident investors should underperform as they end up paying a premium. For instance with Barber and Odean (2019) it has been shown that overconfidence in investors leads to increased turnover, displacing the lower net returns. In the same vein, Hinzen et al. (2022) affirmed that over confident traders make speculative trades which frequently result in. They have some evidence that investing is discouraged by a belief in one's own invulnerability.

$H_1$: Overconfidence has a significant negative impact on stock investment decision in Indonesia.

## Loss Aversion and Investment Decisions

Indeed, logically loss aversion may lead to a distortion in the investment portfolio. Investors may put too much emphasis on avoiding losses at the expense of pursuing gains, resulting in conservative portfolios with limited growth potential. This can also lead to irrational reactions by

the investors in face of market movements and hurting their investment performance even more (Thomas & Spataro, 2018). Several studies indicate that it discourages investment decisions. Odean (1998) finds that investors who exhibit loss aversion tend to hold losing stocks and sell winning shares prematurely, predicting lower aggregate returns. Moreover, Barberis (2019) empirically illustrated that loss aversion often results in risk averse behavior at the expense of portfolio growth.
$H_2$: Loss aversion has a significant negative impact on stock investment decision in Indonesia.

**Herding Bias and Investment Decisions**

Herding creates a logical pathway for asset price bubbles and subsequent market turnarounds. When investors are running with the herd it can lead to very high asset prices that are not linked strongly to fundamental values, and so there is more scope for market volatility (Hirshleifer & Hong Teoh, 2003). As a result, we can expect herding bias to play its part in market inefficiency and deliver poor investment results. Thus, the research (Hinzen et al., 2022) relating herding and market trends claims that increased volatility of capital lead to less efficient price formation. Herding may also lead to asset overvaluation or undervaluation, and ultimately market corrections (De Bondt & Thaler 1985; Candy & Novita, 2021).
$H_3$: Herding bias has a significant positive impact on stock investment decision in Indonesia.

**Mental Accounting and Investment Decisions**

Logically, mental accounting can cause investors to make decisions that are not in their best financial interest. Moreover, perceiving money coming from different sources differently could also lead to changes in investment strategies followed and missed opportunities of improved rates. This bias can also result in an overemphasis on certain investments while neglecting others, reducing overall portfolio performance (Thaler, 2015). Studies have found that mental accounting profoundly influences how we handle our money. Shefrin and Statman (2000) find that mental accounting causes investors to make the mistake of not selling losses and also to sell winners too early, a very negative impact behavior with respect to returns. Mental accounting also causes suboptimal asset allocation and higher broader transaction costs (Ajzen, 2020).
$H_4$: Mental accounting has a significant positive impact on stock investment decision in Indonesia.

**Moderating Role of Financial Literacy**

In theory, financial literacy should serve to offset some of the negative consequences associated with mental accounting by helping investors make better informed and more rational decisions. Aware of these finance and investment principles, financially literate individuals are less likely to irrationally categorize or treat money according to its source (Lusardi & Mitchell, 2014). This knowledge allows investors to better allocate resources and prevent the side effects of mental accounting. Klapper et al. (2015) established that higher financial literacy helps to mitigate mental accounting in suboptimal investment decision making by fostering better hygiene behaviors. Moreover, Van Rooij et al. (2011b) and Candy and Vira (2024) showed that financial literacy can assist investors in identifying and mitigating cognitive biases which hence bore for a more systematic or sound investment selection.
$H_5$: Financial literacy moderates the impact of mental accounting on stock investment decision in Indonesia.

More conceptually, financial literacy should serve as a common factor moderating the impact of overconfidence on investment decisions by providing market practitioners with increased accuracy in their estimation. Having better financial wisdom leads investors to be more likely in middle aged periods, but we expect it helps them assess their skills and act on sounder economic concepts rather than having too high trust when they reach a 25% stake (Hastings et al., 2013). More advanced knowledge that has a subsequent dimension this lowers the potential for over trading and increased risk taking connected with confidence. Empirical studies conducted by Lusardi and Mitchell (2014) showed that financial literacy alleviates the negative effects of

overconfidence by encouraging more reasonable decision making output. In addition, Van Rooij et al. (2011b) found that in less overconfident investment applications is likely to lead to a better financial performance of an individual who possessed higher literacy levels.

$H_6$: Financial literacy moderates the impact of overconfidence on stock investment decision in Indonesia.

This study considers overconfidence, mental accounting and the moderating effect of financial literacy. We chose these factors to represent the various discussions around investment choices and due to their well-established empirical evidences in behavioral finance. Overconfidence typically results in bad investment selection as overconfidence mostly comes from an investor that they know everything and has always been right (Malik et al., 2019). The concept of mental accounting explains that people view and manage certain types of cash in different ways, which regularly leads to irrational financial behavior (Gilenko & Chernova, 2021). By focusing on these variables the aim is to deliver a better comprehension in how financial literacy moderates the effects of them and thus make findings more immediately useful for improving investment decision-making (Stolper & Walter, 2017).

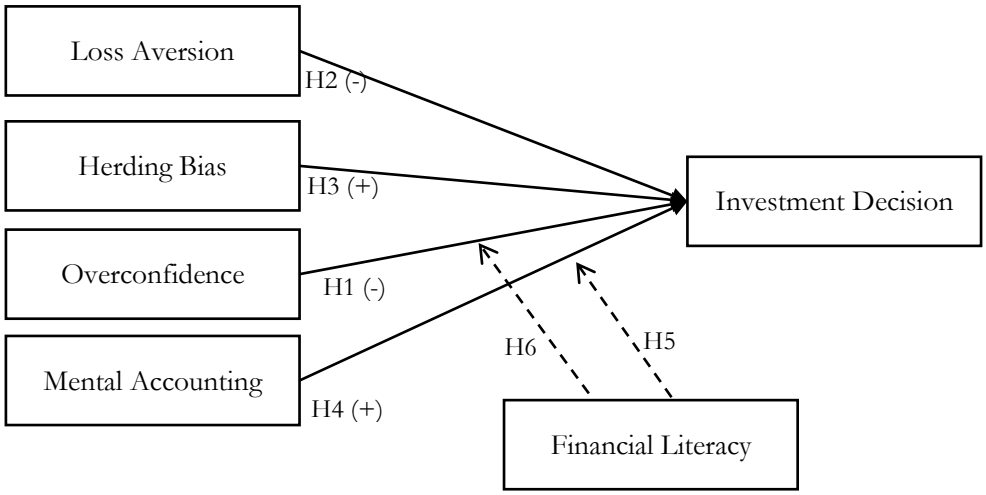


**Figure 1.** Research Conceptual Model

## Research Methods

Method of this research is quantitative by measuring whether financial literacy has a moderate effect and or not affects behavior beside the influence of behavioral finances in Indonesian stock investment decisions. The target audience was 17–40 years old Indonesian stock investors who are known for their active trading in stocks (Geloso & Kufenko, 2019). We choose a sample size 391 participants to balance between having enough statistical power and the generalizability of the findings (Hastings et al., 2013). Convenience sampling was used due to time efficiency and practical in getting different respondents (Etikan et al., 2016). The researchers used Google Forms to administer a structured questionnaire to distant households thus reducing the time and skill requirements (Anagol et al., 2021).

The survey consisted of measures for financial literacy, loss aversion, herding bias (as a proxy to behavioral biases), overconfidence and mental accounting. For each perceptual measure, a 5 point Likert scale was used (1=strongly disagree until 5=strongly agree) to ensure uniformity in responses across all the evaluated perceptions (Joshi et al., 2015). Procedural remedies were used to minimize the bias due to routine procedures and include assurances of respondent confidentiality, as well varying scale endpoints (Podsakoff et al., 2016; Sivaramakrishnan et al., 2017). Here, examining the inner (structural) and outer models in PLS SEM is achievable using SmartPLS a strong tool (Hair et al., 2020). Where the inner model analyzed path coefficients and significance relationships, the outer model assessed validity/reliability (Ringle et al., 2012).

## Results and Discussion

The demographic information gathered for this study is as follows. This data gives a general picture of the respondents characteristics and includes a number of significant variables that will require additional analysis.

**Table 1.** Demographic Data of Respondents

| Descriptions | Frequency (n=391) | Percentage |
|---|---|---|
| *Gender:* | | |
| Men | 328 | 84% |
| Women | 63 | 16% |
| *Age:* | | |
| <22 years old | 141 | 50.9% |
| 23-28 years old | 94 | 33.9% |
| 29-34 years old | 29 | 10.5% |
| 35-40 years old | 8 | 2.9% |
| >40 years old | 5 | 1.8% |
| *Job Status:* | | |
| Entrepreneurs | 141 | 36.1% |
| Private employees | 216 | 55.2% |
| Civil servants | 27 | 6.9% |
| Students | 2 | 0.5% |
| Unemployment | 4 | 0.11% |
| *Educational Background:* | | |
| Middle school or lower | 53 | 13.6% |
| Senior high school | 233 | 59.6% |
| Diploma or bachelor's degree | 93 | 23.8% |
| Postgraduate or above | 12 | 3.1% |

50.7% of respondents are under the age of 22 and 34.1 percent are between the ages of 23 and 28. These figures are based on the demographic data that was gathered. The proportion of respondents who are over 40 has significantly decreased with only 1.8% of respondents being over 40 years of age. In terms of educational background 23.8% of respondents hold a diploma or bachelors degree while the majority of respondents 59.6% have completed senior high school. Thirteen percent of participants have completed junior high school or less and three percent have completed postgraduate education. The majority of respondents 36.1% are either private employees or entrepreneurs making up 55.2% of the workforce. Sixty six percent are employed in other occupations and the remaining nineteen percent are civil servants. According to the gender distribution there are 21.7 percent women and 78.3 percent men among the respondents. Conclusions about the general traits of survey respondents or research subjects using this data are aided by this information.

**Table 2.** Collinearity Statistics

| Constructs | Variance Inflation Factor (VIF) |
|---|---|
| Financial Literacy | 2.619 |
| Herding Bias | 3.287 |
| Mental Accounting | 2.389 |
| Overconfidence | 1.307 |
| Loss Aversion | 2.576 |

By using both convergent and discriminant validity tests this study confirmed the measurement models robustness. For every construct convergent validity was verified by average variance extracted (AVE) values greater than 0.50 and outer loadings greater than 0.70 (Hair et al., 2021). Using the Fornell-Larcker criterion discriminant validity was demonstrated when the AVE square root of each construct was greater than its highest correlation with any other construct. In

order to ensure accurate and trustworthy results SmartPLS data analysis entailed assessing the validity reliability and path coefficients of both the inner and outer models (Ringle et al., 2012).

Multicollinearity was assessed using the variance inflation factor (VIF) to confirm that the loss aversion, herding bias, overconfidence, and mental accounting independent variables did not have a significant effect on predicting ability of models. The results showed VIF values much <5; this means that multicollinearity is not a concern for the present study. Among those were mental accounting (VIF = 2.389), overconfidence (1.307), herding bias (3.287), and loss aversion (2.576). Hence, the findings suggest that collinearity will not have a negative effect on predicting an investment decision as dependent variable to the independent variables (Hair et al., 2020). This ensure that the independent variables will have absolutely no adverse impact on multicollinearity which could allow us to remove or manage such effect (Ringle et al., 2012).

**Table 3.** Effect Size of $R^2$ Test

| Endogenous Variable | R Square | R Square Adjusted |
|---|---|---|
| Investment Decision | 0.742 | 0.738 |

Strong explanatory power is demonstrated by the models R Square value of 0.742 which indicates that it accounts for 74.2 percent of the variance in investment decisions. The models robustness and dependability are validated by the Adjusted R Square value of 0.738 that accounts for the number of predictors. This small adjustment emphasizes the overall effectiveness of the model by indicating that the predictors incorporated in it are useful in explaining the variability in investment decisions.

**Table 4.** Effect size of $F^2$ Test for the Investment Decision Variable

| Variables | Effect Size $F^2$ |
|---|---|
| Loss Aversion | 0.742 |
| Herding Bias | 0.014 |
| Overconfidence | 0.017 |
| Mental Accounting | 0.018 |

The effect size of $F^2$ test was conducted to determine the impact of various biases on investment decisions. The variable loss aversion shows a significant effect size of 0.742, indicating a strong influence on investment decisions. In contrast, herding bias, overconfidence, and mental accounting exhibit much smaller effect sizes of 0.014, 0.017, and 0.018, respectively. These smaller effect sizes suggest that while these factors do contribute to investment decisions, their impact is considerably less substantial compared to loss aversion. This analysis underscores the dominant role of loss aversion in shaping investment behavior.

**Table 5.** Discriminant Validity Test (Fornell-Larcker)

| | FL | HB | ID | LA | ME 1 | ME 2 | MA | OC |
|---|---|---|---|---|---|---|---|---|
| Financial Literacy | **.8344** | | | | | | | |
| Herding Bias | .6480 | **.8447** | | | | | | |
| Investment Decision | .8240 | .6584 | **.8489** | | | | | |
| Loss Aversion | .5644 | .7231 | .5234 | **.8891** | | | | |
| ME 1 | -.7434 | -.7125 | -.7542 | -.5893 | **1.0000** | | | |
| ME 2 | .4731 | .4885 | .4380 | .4030 | -.6324 | **1.0000** | | |
| Mental Accounting | .6232 | .7080 | .6252 | .6308 | -.6087 | .3319 | **.8823** | |
| Overconfidence | -.2160 | -.2066 | -.2208 | -.3613 | .0895 | .1070 | -.1618 | **.8433** |

Note. ME = Moderating Effect 1 and 2 of Financial Literacy

The Fornell-Larcker criterion results show that each construct in the model, such as financial literacy (0.8344), herding bias (0.8447), investment decision (0.8489), and loss aversion (0.8891). This shows that the model has good discriminant validity it means, in simple words, that

these constructs are divergent and they do not correlate with each other a lot. The results also supported the constructs to be well defined, and that they are being modelled in a way which is capturing what makes them unique again validating these aspects of reliability for this research.

**Table 6.** Discriminant Validity Test (HTMT Ratio)

| | FL | HB | ID | LA | ME 1 | ME 2 | MA | OC |
|---|---|---|---|---|---|---|---|---|
| Financial Literacy | | | | | | | | |
| Herding Bias | .7551 | | | | | | | |
| Investment Decision | .9560 | .7602 | | | | | | |
| Loss Aversion | .6539 | .834 | .6014 | | | | | |
| ME 1 | .8043 | .7669 | .8091 | .6326 | | | | |
| ME 2 | .5129 | .5246 | .4701 | .4296 | .6324 | | | |
| Mental Accounting | .7098 | .7995 | .706 | .7121 | .6404 | .349 | | |
| Overconfidence | .1984 | .1802 | .1962 | .3666 | .0924 | .1318 | .1387 | |

Note. ME = Moderating Effect 1 and 2 of Financial Literacy

The discriminant validity results of the Heterotrait-Monotrait Ratio (HTMT) indicate that the majority of the values between constructs, such as the value between financial literacy and herding bias (0.7551) or herding bias and investment decision (0.7602), are below the generally accepted threshold of 0.90, indicating good discriminant validity. The HTMT value between investment decision and herding bias (0.9560) surpasses this threshold, indicating a potential issue with discriminant validity between these two constructs. This finding suggests that, despite the fact that the majority of the constructs in the model are distinct, the high HTMT value for investment decision and herding bias may indicate that these two constructs are not sufficiently distinct from one another, potentially resulting in overlapping content or measurement issues.

**Table 7.** Convergent Validity Test

| Variables | Indicators | Outer Loading | AVE | Result |
|---|---|---|---|---|
| Loss Aversion | LA1 | 0.914 | 0.664 | Valid |
| | LA2 | 0.873 | | |
| | LA3 | 0.881 | | |
| Overconfidence | OC1 | 0.843 | 0.728 | Valid |
| | OC2 | 0.898 | | |
| | OC3 | 0.874 | | |
| | OC4 | 0.829 | | |
| | OC5 | 0.842 | | |
| | OC6 | 0.819 | | |
| | OC7 | 0.794 | | |
| Herding Behavior | HB1 | 0.886 | 0.718 | Valid |
| | HB2 | 0.766 | | |
| | HB3 | 0.844 | | |
| | HB4 | 0.877 | | |
| Investment Decision | ID1 | 0.856 | 0.514 | Valid |
| | ID2 | 0.797 | | |
| | ID3 | 0.861 | | |
| | ID4 | 0.880 | | |
| Mental Accounting | MA1 | 0.888 | 0.608 | Valid |
| | MA2 | 0.868 | | |
| | MA3 | 0.853 | | |
| | MA4 | 0.918 | | |
| Financial Literacy | FL1 | 0.866 | 0.531 | Valid |
| | FL2 | 0.769 | | |
| | FL3 | 0.864 | | |
| | FL4 | 0.834 | | |

Table 7 displays the results of the convergent validity test, to clarify the data loss aversion (LA), overconfidence (OC), herding behavior (HB), investment decision (ID), mental accounting (MA), and financial literacy (FL), this data indicating that the loading factor for each variable consistently exceeds 0.70. The next step involves assessing discriminant validity, where the average variance extracted (AVE) for each variable also surpasses 0.50, confirming the validity of the collected data. A good outer loading must be above 0.70 because this value shows that the indicator has a strong correlation with the construct it measures. The higher the outer loading value, the better the indicator represents the construct. Meanwhile, average variance extracted must be above 0.5 because it shows that more than 50% of the variability in the indicator can be explained by the construct it measures, thus ensuring adequate construct validity.

**Table 8.** Measurement Items

| Construct | Item Code | Measurement Items | Sources |
|---|---|---|---|
| Loss Aversion | LA1 | The losses you have previously experienced greatly affect your ability to take risks. | (Almeida & Gonçalves, 2023) |
| | LA2 | You tend to avoid selling stocks that have reached low prices. | |
| | LA3 | You tend to avoid selling stocks that have reached high prices. | |
| | LA4 | You usually sell stocks that have reached high values. | |
| Herding Bias | HB1 | You prefer to invest in stocks that have been invested in by friends and relatives. | |
| | HB2 | You analyze company customer preferences before investing in their stocks. | |
| | HB3 | You follow market trends in buying or selling stocks. | |
| | HB4 | Investment recommendations from other investors affect your stock purchase decisions. | |
| Investment Decision | ID1 | You feel satisfied with your investment decisions in the stock market. | |
| | ID2 | Your latest stock investments have met your return expectations. | |
| | ID3 | Your investments have higher risks compared to the market in general. | |
| | ID4 | The return rate of your investments is higher than the average market return rate. | |
| Financial Literacy | FL1 | The stock market helps in predicting stock prices and income. | (Ozen & Ersoy, 2019) |
| | FL2 | If considering a long-term period (e.g., 10-20 years), stocks usually provide the highest return rates. | |
| | FL3 | Generally, stocks show the highest fluctuation rates over time. | |
| | FL4 | When an investor spreads their funds across various assets, the risk of losing money increases. | |
| Mental Accounting | MA1 | I hesitate to sell stocks that have provided high returns in the past, even though their prices are now declining. | (Khan, 2020) |
| | MA2 | I do not care about the overall performance of my investment portfolio, but I care about the returns from each separate account. | |
| | MA3 | You tend to treat each element of your investment portfolio separately. | |
| | MA4 | You ignore the relationship between risk and returns in your investments. | |
| Overconfidence | OC1 | When I make a plan, I am confident that it will succeed. | (Al-Tamimi et al., 2020) |
| | OC2 | My predictions about stocks are always correct. | |
| | OC3 | I can identify good stocks that will perform well in the future. | |
| | OC4 | My investment performance is far better than that of other investors. | |
| | OC5 | My investment skills are much better than those of other investors. | |
| | OC6 | My investment experience is far greater than that of other investors. | |
| | OC7 | I know more about investing than other investors. | |

Table 8 contains the results of a questionnaire on factors influencing investment decision-making, including loss aversion, herding bias, investment decision, financial literacy, mental accounting, and overconfidence. Each factor is measured through specific questions aimed at identifying investor behavior and preferences in financial decision-making. The data sources are based on previous studies, providing a solid foundation for further analysis.

**Table 9.** Reliability Test

| Variables | Cronbach's Alpha | Composite Reliability | Result |
|---|---|---|---|
| Financial Literacy | 0.854 | 0.901 | Reliable |
| Herding Bias | 0.865 | 0.909 | Reliable |
| Investment Decision | 0.870 | 0.912 | Reliable |
| Loss Aversion | 0.868 | 0.919 | Reliable |
| Mental Accounting | 0.905 | 0.934 | Reliable |
| Overconfidence | 0.938 | 0.945 | Reliable |

Table 9 presents a thorough and in depth analysis of the reliability test results showing that the composite reliability of every variable consistently exceeds the accepted threshold of 0.70. Since it demonstrates the dependability and resilience of the data under examination this accomplishment is especially noteworthy. Each variables high level of reliability offers a strong basis for confidence in the accuracy and consistency of the data analysis results. Consequently this enhances the general dependability and credibility of the results lending greater credibility and dependability to the study's findings and conclusions. The study's findings are therefore more compelling and offer a strong basis for additional investigation and real-world implementation.

**Table 10.** Direct Path Coefficient Test

| Direct Relationship | Beta Coefficient | P-Value | Std.Dev | Confidence Intervals | | Result |
|---|---|---|---|---|---|---|
| | | | | Lower Bound | Upper Bound | |
| Overconfidence → Investment Decision | -0.078 | 0.034 | 0.032 | -0.143 | -0.005 | Significant |
| Loss Aversion → Investment Decision | -0.102 | 0.018 | 0.042 | -0.187 | -0.009 | Significant |
| Herding Bias → Investment Decision | 0.105 | 0.080 | 0.067 | -0.040 | 0.216 | Unsig. |
| Mental Accounting → Investment Decision | 0.114 | 0.057 | 0.061 | 0.005 | 0.245 | Unsig. |

According to the data test results which show a sample mean value of -0.078 and a p-value of 0.034 overconfidence has a significant negative impact on stock investment decisions in Indonesia. This effect can be attributed to a number of contributing factors. First of all overconfidences psychological component is significant in that it causes people to overestimate their financial knowledge and skills particularly male respondents under the age of 20. Because of their overconfidence they may take on unwarranted risks and make rash or irrational investment decisions which could have negative effects on the Indonesian stock market. Furthermore the characteristics of younger investors such as their comparatively low level of experience and exposure to the financial markets can amplify the detrimental effects of overconfidence. These investors run the risk of making emotional and behaviorally driven decisions ignoring long term investment principles and fundamental analysis if they lack a solid understanding of risk management techniques and the intricacies of the market. Furthermore overconfidence may have worse effects due to the unique dynamics of the Indonesian stock market such as market volatility and speculative trading practices. The frequency of overconfident investment decisions among younger male investors may also be attributed to limited access to high quality financial education and a lack of risk awareness. This discovery is consistent with previous research studies by Michailova et al. (2017) demonstrating the lasting effect of overconfidence in stock investment decisions particularly novice investors in Indonesia. Overconfidence, as demonstrated in the study, can diminish decision quality and detract from investment returns. This detrimental impacts are

more so evident when the investors base too much their decisions on gut feeling without doing a proper environment scan at all of time (Ahmad & Shah, 2022).

The well known negative correlation of stock decision making with loss aversion bias. Data test results showing sample mean value of -0 have lots of underlying reasons. Like many other cognitive biases in decision-making theory is responsible for risk averse behavior losses disliked more than gains are liked. This behavior is driven by emotional reactions based on fear or anxiety, in particular over the potential for hypothetical losses of investment. In turn, to reduce the suffering of potential losses investors who are very loss averse might decide on safer but lower yielding investment alternatives. When investment decisions are made low risk tolerance combined with a lack of confidence in that one will recoup any losses is linked to loss aversion bias. Even if the potential rewards are greater than their likely losses, investors can still be unwilling to take a risk. This cautiousness in investing may mean there are less successful market opportunities where conservative investment strategies area concerned. Findings across studies varied, as did findings, which actually speak to the relative consistency with earlier trends (Aigbovo & Ilaboya, 2019) and (Bouteska & Regaieg, 2020). The general influence of loss aversion bias on risk averse investment decisions continues to be a significant feature of investor behavior in the Indonesian stock market even though it may be the result of sample sizes or methodology issues.

With a sample mean value of 0.105 and a p-value of 0.080 the effect of herding bias on investment decisions is not statistically positive for a number of reasons. The degree of awareness and sophistication among investors is one important consideration. In this context independent analysis and more independent investing strategies seem to be the norm especially among young men. This implies that when making investment decisions these investors are less prone to groupthink or the herd mentality.

Furthermore, the availability of information and market circumstances are crucial determinants. Investors are less likely to conform to popular opinion when they have access to several sources of information and possess a deep understanding of market dynamics. Alternatively, in order to make prudent investing selections, individuals may priorities doing thorough research and analysis. The findings align with prior research conducted Metawa et al. (2019); Kartini and Nahda (2021); and Khan (2020) which also stress how crucial independent investment strategies and individual analysis are to reducing the impact of herding bias. The observed low impact of herding bias on stock investment decisions among some Indonesian investor groups can probably be attributed in part to the interaction of investor awareness market conditions and financial education.

With a sample mean value of 0.114 and a p-value of 0.057 the impact of mental accounting on stock investment decisions in Indonesia is not statistically significant. This can be explained by a number of factors. The relative importance that investors give to mental accounting factors in comparison to other criteria for making decisions may be one important factor. Investors may occasionally give other factors like market trends financial analysis or risk assessment priority over the psychological classification of funds.

Furthermore investor behavior and market conditions are important factors. The influence of subjective psychological elements like mental accounting on investment decisions may decrease if investors place more emphasis on analytical methods and objective measurements. Furthermore the importance of mental accounting in decision-making processes can also be influenced by individual investor traits like risk tolerance investing objectives and financial literacy. These results are consistent with previous research by Seiler et al. (2012) which indicates that depending on the situation mental accounting considerations might not have a major influence on stock investment decisions. Overall the lack of significance in the observed influence of mental accounting on stock investment decisions in the Indonesian market is probably due to a combination of investor preferences market dynamics and individual characteristics.

Figure 2a (ME_MA) demonstrates the moderation effect of mental accounting process on financial literacy and investment decision. The three lines correspond to low (-1 SD), middle (mean), and high levels of financial literacy (+1 SD). Mental accounting grows, the investment decision improves markedly more for people with low financial literacy (blue line) than those of

average literacies (red notes and even further higher levels of literary greens). It implies that the positive relationship between mental accounting and financial investment decisions is more significant for lesser financial literate investors.

Figure 2b (ME_OV) shows the effect of moderation by overconfidence. As overconfidence goes up, in this case investment decisions drop by increasing levels of financial literacy (green line), we see more pronounced variations compared to those with average financial knowledge (red) or below average (blue). Considering higher financial literacy, it suggests that more overconfidence can have harmful effect on investment decision.

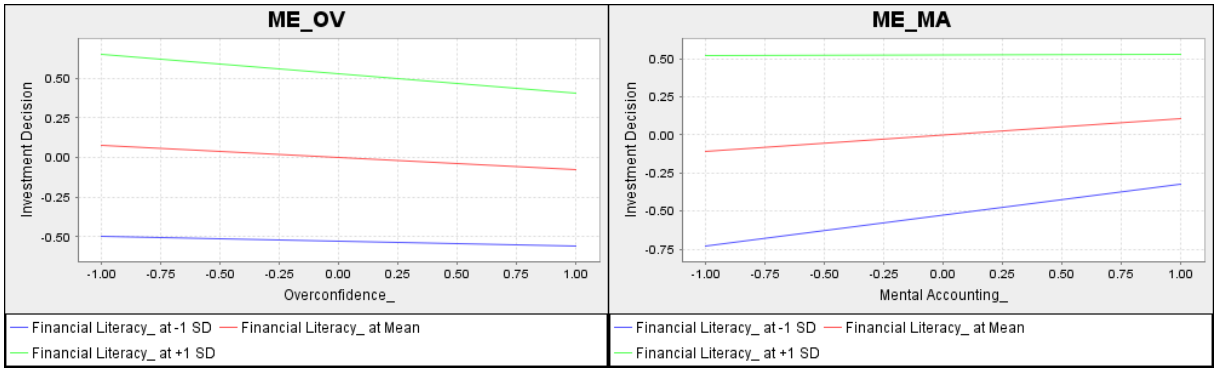


**Figure 2.** Simple Slope Analysis

**Table 11.** Indirect Path Coefficient Test

| Indirect Relationship | Beta Coefficient | P-Value | Std. Dev | Confidence Intervals | | Result |
|---|---|---|---|---|---|---|
| | | | | Lower Bound | Upper Bound | |
| Moderating Effect 1 (FL*MA -> ID) | -0.098 | 0.000 | 0.018 | -0.133 | -0.063 | Sig. |
| Moderating Effect 2 (FL*OC -> ID) | -0.048 | 0.034 | 0.048 | -0.143 | -0.005 | Sig. |

Note. FL = Financial literacy; MA = Mental accounting; OC = Overconfidence; ID = Investment decision

Both moderating effects are negative, with Moderating Effect 1 (-0.0991) slightly stronger than Moderating Effect 2 (-0.0469). This suggests that both effects reduce the strength of the relationship between the variables in the model, though the overall impact is relatively small. The results imply that the moderating variables have a subtle but weakening influence on the dependent variable. This study finds that in the Indonesian context, mental accounting significantly reduces stock investment decisions; regrettably this impact of mental accounting is conditioned by an individual's financial literacy level an average value of -0. 098 and a p-value of 0. 000, supports the importance of financial literacy as determinant for investment behavior. They furthermore reveal that financial literacy plays an important role as a moderator on mental accounting and investment decisions. This favorite result is due to various factors. First of all, people who are wealthier usually have more knowledgeable about managing their money like investing/diversification. They are more likely to base their decisions on financial principles than they are only purely psychological features like mental accounting (Khan, 2017).

The ability to critically analyze investment options weigh risks and make well-informed decisions are all possible with financial literacy. Having the ability to avoid behavioral biases like mental accounting when making investment decisions can result in more responsible financial behavior. The results align with the earlier investigations conducted by Khan (2017); Adil et al. (2022), and Ahmed et al. (2021), which highlight the benefits of financial literacy for the process of making investment decisions. Overall the knowledge abilities and attitudes that come with financial literacy greatly help to moderate the impact of mental accounting on investing decisions leading to people making more informed and sensible financial decisions.

Overconfidences influence on Indonesian stock investment decisions is mitigated by financial literacy. A sample mean value of -0.078 and a p-value of 0.034 show that the data can

reduce overconfidence and the likelihood of mistakes. Even in cases when people are overconfident overconfidence can have negative effects on their decision making which can be mitigated by having a higher level of financial literacy. These results are consistent with earlier research by Khan (2017); Adil et al. (2022), and Ahmed et al. (2021).

This makes sense because there is a correlation between a higher level of financial literacy and improved knowledge of risk management investing principles and financial concepts. This makes it possible for people to assess their investment choices critically and stay away from overconfidences traps. Furthermore a more disciplined and logical approach to financial matters is encouraged by financial literacy which results in careful study evaluation of multiple investment options and balancing potential risks and rewards prior to making decisions (Adil et al., 2022).

Awareness of prejudices and constraints such as the propensity for overconfidence is improved by financial literacy. Financially literate people can identify and mitigate the effects of overconfidence by developing this self-awareness which enables them to make more sensible and grounded financial decisions. All things considered the knowledge critical thinking abilities and self-awareness that come with financial literacy are invaluable in minimizing the detrimental effects of overconfidence and encouraging more responsible financial behavior.

## Implication and Conclusion

This study integrates behavioral finance and prospect theory which makes a substantial theoretical contribution to the understanding of investment behavior. It gives a more thorough framework for examining investor behavior by highlighting the ways in which cognitive biases—like overconfidence mental accounting and herding affect investment decisions. By integrating psychological and financial viewpoints to explain stock investors decision making processes this method adds to the body of existing literature. Financial advisors and investors alike can benefit practically from the findings. Investors may make better financial decisions by identifying and resolving behavioral biases which can assist them in making more thoughtful and systematic decisions. Financial institutions can create focused educational initiatives and resources to lessen the negative effects of these biases by using these insights. This study has limitations that may affect the generalizability of the findings despite its contributions. Specifically the study relies on self-reported data and has a limited sample size. To further validate these findings future research should examine a variety of samples and make use of longitudinal data. Further analysis of additional behavioral variables and how they interact with market circumstances may also shed light on investor behavior.

## References

Adil, M., Singh, Y., & Ansari, M. S. (2022). How financial literacy moderate the association between behavior biases and investment decision? *Asian Journal of Accounting Research, 7*(1), 17–30. https://doi.org/10.1108/AJAR-09-2020-0086

Ahmad, M., & Shah, S. Z. A. (2022). Overconfidence heuristic-driven bias in investment decision-making and performance: mediating effects of risk perception and moderating effects of financial literacy. *Journal of Economic and Administrative Sciences, 38*(1), 60–90. https://doi.org/10.1108/JEAS-07-2020-0116

Ahmed, R., Riaz, S., Aqdas, R., Ibn, S., & Hassan, U. L. (2021). The relationship among overconfidence, economic expectation, social factors and investment decision making behavior with the mediating and moderating effects. *Journal of Contemporary Issues in Business and Government, 27*(02), 1075-1088. https://doi.org/10.47750/cibg.2021.27.02.127

Aigbovo, O., & Ilaboya, O. J. (2019). Does behavioral biases influences individual investment decisions. *Management Science Review, 10*(1), 68–89.

Ajzen, I. (2020). The theory of planned behavior: frequently asked questions. *Human Behavior and Emerging Technologies, 2*(4), 314–324. https://doi.org/10.1002/hbe2.195

Almeida, R., & Gonçalves, F. (2023). The impact of cognitive biases on stock market investments. *Financial Research Letters, 47*. https://doi.org/https://doi.org/10.1016/j.finre.2023.01.001

Al-Tamimi, H., Hassan, A., & Obeidat, S. M. (2020). Factors influencing individual investor behavior: evidence from the UAE. *International Journal of Islamic and Middle Eastern Finance and Management, 13*(2), 299–318. https://doi.org/https://doi.org/10.1108/IMEFM-03-2020-0149

Anagol, S., Balasubramaniam, V., & Ramadorai, T. (2021). Learning from noise: evidence from India's IPO lotteries. *Journal of Financial Economics, 140*(3), 965–986. https://doi.org/10.1016/j.jfineco.2021.02.003

Ani, N. C., & Özarı, Ç. (2020). Behavioral finance: investors psychology. *IOSR Journal of Economics and Finance, 11*(1), 46–50. https://doi.org/10.9790/5933-1101024650

Arran, R. (2023). Behavioral finance: the psychology behind financial decision-making. *Business Studies Journal, 15*(5), 1–2.

Banerjee, A. V. (2020). A simple model of herd behavior. *The Quarterly Journal of Economics, 107*(3), 797–817. https://doi.org/10.2307/2118364

Barber, B. M., & Odean, T. (2019). Trading is hazardous to your wealth: the common stock investment performance of individual investors. *The Journal of Finance, 55*(2), 773–806. https://doi.org/10.1111/0022-1082.00226

Barberis, N. (2019). Behavioral finance: an overview. *Annual Review of Financial Economics, 11*, 1–35. https://doi.org/https://doi.org/10.1016/j.jfineco.2019.03.006

Barberis, N., Shleifer, A., & Vishny, R. (2019). A model of investor sentiment. *Journal of Financial Economics, 49*(3), 307–343. https://doi.org/https://doi.org/10.1016/S0304-405X(98)00027-

Bouteska, A., & Regaieg, B. (2020). Loss aversion, overconfidence of investors and their impact on market performance: evidence from the US stock markets. *Journal of Economics, Finance and Administrative Science, 25*(50), 451–478. https://doi.org/10.1108/JEFAS-07-2017-0081

Candy, C., & Novita, I. (2021). Herding behavior of indonesia investor: role of personality traits and motivation factors. *International Journal of Economics, Business and Accounting Research (IJEBAR), 5*(2), 296–303.

Candy, C., & Vira, V. (2024). Financial behavior as key factors affecting Indonesian gen-Z entrepreneurial intention. *International Journal of Applied Business Research*, *6*(02), 152-172. https://doi.org/10.35313/ijabr.v6i02.363

Cao, C., Leggio, K., & Schniederjans, M. (2005). A comparison between Fama and French's model and artificial neural networks in predicting the Chinese stock market. *Computers & Operations Research, 58*, 233–240. https://doi.org/https://doi.org/10.1016/j.cor.2021.02.013

De Bondt, W. F., & Thaler, R. (1985). Does the stock market overreact?. *The Journal of finance*, *40*(3), 793-805. https://doi.org/10.1111/j.1540-6261.1985.tb05004.x

Etikan, I., Musa, S. A., & Alkassim, R. S. (2016). Comparison of convenience sampling and purposive sampling. *American Journal of Theoretical and Applied Statistics, 5*(1), 1-4. https://doi.org/10.11648/j.ajtas.20160501.11

Geloso, V., & Kufenko, V. (2019). Can markets foster rebellion? the case of the 1837–38 rebellions in Lower Canada. *Journal of Economic Behavior & Organization, 166*, 263–287. https://doi.org/10.1016/j.jebo.2019.06.005

Gilenko, E., & Chernova, A. (2021). Saving behavior and financial literacy of Russian high school students: an application of a copula-based bivariate probit-regression approach. *Children and Youth Services Review, 127*. https://doi.org/10.1016/j.childyouth.2021.106122

Hair, J. F., Hult, G. T. M., Ringle, C. M., Sarstedt, M., Danks, N. P., & Ray, S. (2021). *Partial Least Squares Structural Equation Modeling (PLS-SEM) Using R*. Switzerland: Springer International Publishing. https://doi.org/10.1007/978-3-030-80519-7

Hair, J. F., Risher, J. J., Sarstedt, M., & Ringle, C. M. (2020). When to use and how to report the results of PLS-SEM. *European Business Review, 31*(1), 2–24. https://doi.org/10.1108/EBR-11-2018-0203

Hastings, J. S., Madrian, B. C., & Skimmyhorn, W. L. (2013). Financial literacy, financial education, and economic outcomes. *Annual Review of Economics, 5*(1), 347–373. https://doi.org/10.1146/annurev-economics-082312-125807

Hinzen, F. J., John, K., & Saleh, F. (2022). Bitcoin's limited adoption problem. *Journal of Financial Economics, 144*(2), 347–369. https://doi.org/10.1016/j.jfineco.2022.01.003

Hirshleifer, D., & Hong Teoh, S. (2003). Herd behaviour and cascading in capital markets: a review and synthesis. *European Financial Management, 9*(1), 25–66. https://doi.org/10.1111/1468-036X.00207

Indonesia Central Securities Depository (2023, October). *Siaran Pers: Antusiasme Investor Muda Berinvestasi Terus Meningkat*. Retrieved from https://www.ksei.co.id/files/uploads/press_releases/press_file/id-id/232_berita_pers_antusiasme_investor_muda_berinvestasi_terus_meningkat_20231031134735.pdf

Islam Khan, M. T., Tan, S. H., & Chong, L. L. (2016). The effects of stated preferences for firm characteristics, optimism and overconfidence on trading activities. *International Journal of Bank Marketing, 34*(7), 1114-1130. https://doi.org/10.1108/IJBM-10-2015-0154

Joshi, A., Kale, S., Chandel, S., & Pal, D. (2015). Likert scale: explored and explained. *British Journal of Applied Science & Technology, 7*(4), 396–403. https://doi.org/10.9734/BJAST/2015/14975

Kahneman, D. (2011). *Thinking, Fast, and Slow*. New York: Farrar, Straus and Giroux.

Kahneman, D., & Tversky, A. (2013). Prospect theory: an analysis of decision under risk. In MacLean, L. C., Ziemba, W. T. (Eds.), *Handbook of the Fundamentals of Financial Decision Making: Part I* (pp. 99-127). Singapore: World Scientific Publishing Company. https://doi.org/10.1142/9789814417358_0006

Kartini, K., & Nahda, K. (2021). Behavioral biases on investment decision: a case study in Indonesia. *Journal of Asian Finance, Economics and Business, 8*(3), 1231–1240. https://doi.org/10.13106/jafeb.2021.vol8.no3.1231

Khan, D. (2020). Cognitive driven biases, investment decision making: the moderating role of financial literacy. *SSRN Electronic Journal*, 1–25. https://dx.doi.org/10.2139/ssrn.3514086

Khan, M. U. (2017). Impact of availability bias and loss aversion bias on investment decision making, moderating role of risk perception. *Management & Administration (IMPACT: JMDGMA)*, *1*(1), 17-28.

Klapper, L., Lusardi, A., & Van Oudheusden, P. (2015). Financial literacy around the world: insights from the standard & poor's ratings services global financial literacy survey. *World Bank. Washington DC: World Bank*, *2*, 218-237.

Kumar, S., & Goyal, N. (2015). Behavioral biases in investment decision making: a systematic review. *Qualitative Research in Financial Markets, 11*(3), 323–345. https://doi.org/https://doi.org/10.1108/QRFM-07-2018-0084

Lusardi, A., & Mitchell, O. S. (2014). The economic importance of financial literacy: theory and evidence. *Journal of Economic Literature, 56*(1), 5–44. https://doi.org/https://doi.org/10.1257/jel.20161752

Malik, M. S., Hanif, M. I., & Azhar, M. Z. (2019). The impact of overconfidence bias on investment decisions: mediating role of risk tolerance. *International Journal of Research and Innovation in Social Science*, *3*(8), 154-160.

Metawa, N., Hassan, M. K., Metawa, S., & Safa, M. F. (2019). Impact of behavioral factors on investors' financial decisions: case of the Egyptian stock market. *International Journal of Islamic and Middle Eastern Finance and Management, 12*(1), 30–55. https://doi.org/10.1108/IMEFM-12-2017-0333

Michailova, J., Mačiulis, A., & Tvaronavičienė, M. (2017). Overconfidence, risk aversion and individual financial decisions in experimental asset markets. *Economic Research-Ekonomska Istrazivanja, 30*(1), 1119–1131. https://doi.org/10.1080/1331677X.2017.1311234

Mitchell, O. S., & Lusardi, A. (2015). Financial literacy and economic outcomes: evidence and policy implications. *The Journal of Retirement*, *3*(1), 107. https://doi.org/10.3905/jor.2015.3.1.107

Mnif, E., Mensi, W., & Yoon, S. M. (2022). How does financial literacy impact stock market participation? evidence from emerging markets. *Research in International Business and Finance, 60*. https://doi.org/https://doi.org/10.1016/j.ribaf.2022.101636

Novandalina, A., Ernawati, F. Y., & Adriyanto, A. T. (2022). Risk attitudes, mental accounting and overconfidence in investment placement decision during and post Covid-19. *International Journal of Economics, Business and Accounting Research (IJEBAR)*, *6*(1), 498-506. http://dx.doi.org/10.29040/ijebar.v6i1.4453

Odean, T. (1998). Are investors reluctant to realize their losses? *The Journal of Finance, 53*(5), 1775–1798. https://doi.org/10.1111/0022-1082.00072

Özen, E., & Ersoy, G. (2019). The impact of financial literacy on cognitive biases of individual investors. *Contemporary Issues in Behavioral Finance*, 101, 77-95.

Podsakoff, P. M., MacKenzie, S. B., & Podsakoff, N. P. (2016). Recommendations for creating better concept definitions in the organizational, behavioral, and social sciences. *Organizational Research Methods, 22*(4), 754–774. https://doi.org/https://doi.org/10.1177/1094428118764975

Pokharel, P. R. (2020). Behavioral factors and investment decision: a case of Nepal. *SSRN Electronic Journal*. https://doi.org/10.2139/ssrn.3687104

Ringle, C. M., Sarstedt, M., & Straub, D. W. (2012). Editor's comments: a critical look at the use of PLS-SEM in MIS Quarterly. *MIS Quarterly, 36*(1), 3–14. https://doi.org/https://doi.org/10.25300/MISQ/2020/16214

Seiler, M. J., Seiler, V. L., & Lane, M. A. (2012). Mental accounting and false reference points in real estate investment decision-making. *Journal of Behavioral finance*, *13*(1), 17-26. https://doi.org/10.1080/15427560.2012.653293

Shefrin, H., & Statman, M. (2000). Behavioral portfolio theory. *Journal of Financial and Quantitative Analysis*, *35*(2), 127-151. https://doi.org/10.2307/2676187

Sivaramakrishnan, S., Srivastava, M., & Rastogi, A. (2017). Attitudinal factors, financial literacy, and stock market participation. *International Journal of Bank Marketing*, *35*(5), 818-841. https://doi.org/10.1108/IJBM-01-2016-0012

Stolper, O. A., & Walter, A. (2017). Financial literacy, financial advice, and financial behavior. *Journal of Business Economics, 87*(5), 581–643. https://doi.org/10.1007/s11573-017-0853-9

Thaler, R. H. (1999). Mental accounting matters. *Journal of Behavioral Decision Making*, *12*(3), 183-206. https://doi.org/10.1002/(SICI)1099-0771(199909)12:3%3C183::AID-BDM318%3E3.0.CO;2-F

Thaler, R. H. (2015). *Misbehaving: The Making of Behavioral Economics*. United Kingdom: Penguin Books Limited.

Thomas, A., & Spataro, L. (2018). Financial literacy, human capital and stock market participation in Europe. *Journal of Family and Economic Issues*, *39*(4), 532-550. https://doi.org/10.1007/s10834-018-9576-5

Van Rooij, M. C., Lusardi, A., & Alessie, R. J. (2011a). Financial literacy and retirement planning in the Netherlands. *Journal of Economic Psychology*, *32*(4), 593-608. https://doi.org/10.1016/j.joep.2011.02.004

Van Rooij, M., Lusardi, A., & Alessie, R. (2011b). Financial literacy and stock market participation. *Journal of Financial Economics*, *101*(2), 449-472. https://doi.org/10.1016/j.jfineco.2011.03.006

Verkijika, S. F. (2020). An affective response model for understanding the acceptance of mobile payment systems. *Electronic Commerce Research and Applications, 39*, 100905. https://doi.org/10.1016/j.elerap.2019.100905