ARBITRASE: Journal of Economics and Accounting
ISSN 2722-841X (Media Online)
Vol 7, No 1, July 2026, Page 521-530
DOI: 10.47065/arbitrase.v7i1.3426
https://djournals.com/arbitrase

The Moderating Effect of Gender on Overconfidence in Investment Decisions

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Abstract–This study examined the influence of overconfidence on the investment decisions of Indonesian individual or retail investors. The research design used in this study uses quantitative survey approach. The questionnaire was distributed online using the Populix platform. The analysis used Hayes' Moderation Model 1, utilizing a quantitative survey of 500 retail investors from the Indonesia Stock Exchange (IDX). This study explored the moderating effect of gender on the relationship of overconfidence and investment decisions. The results showed that overconfidence significantly increased investment decisions, with the relationship being more pronounced in men than in women. Overconfidence positively influenced investment decisions for both genders, with a more pronounced effect on male investors, as evidenced by the conditional effect. These findings advance behavioral finance by demonstrating gender-specific effects of overconfidence in emerging markets and suggest that investor education and risk communication strategies should be tailored to demographic characteristics of investors, particularly gender, to more effectively address overconfidence bias.

Keywords: Overconfidence; Investment Decisions; Gender; Indonesia Stock Exchange; Behavioral Finance

1. INTRODUCTION

Behavioral finance has shown that investment decisions often deviate from rational norms due to the influence of inherent cognitive biases on investors. People are more likely to give probabilities to descriptions of events than to the events themselves. People use heuristics to make their preferences or data sets easier to understand, but heuristics are better understood as tools that make it easier to make decisions when there are many options. When confronted with uncertainty that hinders the efficacy of complex logical computations, heuristics assume a vital function (Tversky & Koehler, 1994).

Previous study has linked behavioral biases to investment decision-making behavior. In traditional finance, investors are generally assumed to be rational and knowledgeable enough to make rational investment decisions, but in reality, some investors may have limited knowledge (Kimeu et al., 2016; Masini & Menichetti, 2013; Nga & Ken Yien, 2013; H. P. Singh et al., 2016). A survey of brokerage accounts in China demonstrates that investors in emerging markets have various biases. One of the biases is overconfidence. Overconfidence can lead to ineffective trading decisions. Investors seem to be participating in over trading relative to their level of risk and diversification (Chen et al., 2007; Kumar & Prince, 2023; D. Singh et al., 2024).

Overconfident investors often overestimate their knowledge, misread risk, and engage in aggressive trading, which typically results in poor outcomes. Overconfidence has been validated through several methodological approach. Empirical study demonstrates that calibration-based overconfidence results in increased trading activity, while different type of overconfidence, such as the superior effect, equally increase trading intensity. The experimental research indicates that gender differences could vary across various context, highlighting the necessity for careful modeling of gender as a conditional variable rather than a universal factor. Inconsistent findings require a thorough investigation of the impact of gender on the relationship between overconfidence and investment decisions (Deaves et al., 2009).

Study show that gender, job status, and how money is spent have a big effect on investment decisions (Barber & Odean, 2001; Rahman & Gan, 2020). US brokerage data set shows that overconfident trading behavior has high costs because men trade more often than women, and this higher trading activity lowers net profits. This supports the idea that overconfidence leads to more trading and lower results (Rahman & Gan, 2020). Evidence from India strengthens the correlation between gender and overconfidence. The study shows that overconfidence was more common among men and women and increased with investment experience and education. Demonstrating that demographic factors and experience simultaneously influence the level of bias (Mishra & Metilda, 2015).

However, gender effects are not consistently the same. Experimental research indicates that while overconfidence enhances trading activity, gender does not reliably predict trading behavior when overconfidence is measured directly (Deaves et al., 2009). Psychological study shows that men generally tend to have higher overconfidence than women in financial contexts. Empirical research using brokerage data shows that men trade more, indicating that overconfidence influences gender differences in investment decisions (Barber & Odean, 2001). Many studies suggest the importance of exploring gender as a moderating variable that may affect the relationship of overconfidence and investment decisions. Therefore, research that focuses on gender as a moderating variable is necessary to determine whether the relationship between overconfidence and decision-making is more pronounced in men or women.

Investor behavior in emerging markets is often characterized by rapid retail participation, varying levels of education, and information asymmetry. Overconfidence is more pronounced in emerging market contexts, and demographic variables, such as gender, can significantly influence behavioral outcomes. Study show the presence of the

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disposition effect and representativeness bias, indicating that bias-influences investment decisions surpass overconfidence, forming a broader behavioral pattern in emerging markets (Chen et al., 2007).

The influence of overconfidence may vary according to investor characteristics and decision-making processes. Study from Generation Y individual investors in Malaysia shows that overconfidence negatively impacts investments decisions (Rahman & Gan, 2020). The influence varies across demographic factors, including gender and job tittle. Study suggests that the correlation between behavioral characteristics and investment decisions may depend on investor profile. This further strengthens the case for understanding gender as a moderating variable in the relationship between overconfidence and investment decisions.

Behavioral finance literature in emerging markets emphasizes the necessity of investigating investment decisions beyond the traditional US or European samples, as these countries originate from developed market contexts. One example is the gender differences in overconfidence in India mutual funds (Mishra & Metilda, 2015). The differences are particularly high in Southeast Asia, where more people have been buying and selling stocks in the retail market during the previous ten years. Although Indonesia is thought to be a fast growing and dynamic market, there isn't much study that looks directly at how overconfidence affects investment decisions, especially when gender is considered. Thus, empirical study is necessary to determine if the gender disparity in overconfidence and decisions-making process observed in other contexts is applicable to Indonesian individual investors.

Research in behavioral finance has demonstrated that overconfidence has a substantial impact on investment decisions, although the extent of this influence varies among different investor groups. The necessity for further investigation in this context is underscored by evidence from emergent markets, which indicates that retail investors frequently make suboptimal trading decisions and exhibit overconfidence (Chen et al., 2007). Men frequently manifest overconfidence and engage in an increased amount of trading, according to research conducted in the United States and India. Nevertheless, experimental research indicates that gender disparities in trading behavior are not consistently evident when overconfidence is explicitly evaluated (Barber & Odean, 2001).

The moderated paradigm enables these findings by permitting the relationship between overconfidence and investment decisions to vary between gender categories. This study addresses differences in the literature by viewing gender as moderator rather than merely categorical control variable. This study analyzes Indonesian retail investors to assess whether gender moderates the influence of overconfidence on investing decisions. This model effectively analyzes conditional effects, enabling the evaluation of whether the relationship between overconfidence and investing decisions differs across male and female investors. Although men frequently have heightened overconfidence and participate in more trade, some experimental findings indicate that gender disparities may diminish when overconfidence is evaluated directly (Barber & Odean, 2001). This study uses moderated regression analysis to investigate Indonesian retail investors, offering a theoretically grounded and focused analysis the impact of gender on the relationship between overconfidence and investment decisions. Therefore, it addresses a gap in the literature and provides practical insights for investor education in emerging markets.

Based on data conducted by the Indonesia Stock Exchange (IDX) over the past five years, the number of Indonesian capital market investors has increased by nearly 300%. At the end of 2020, the number of new capital market investors was around 3.88 million, and it reached over 20 million by the end of 2025, indicating exponential growth over five years. Additionally, The Indonesian Stock Exchange (IDX) is now one of the "billion-dollar exchange" which are global exchanges that have daily transaction values of more than US$1 billion (Indonesia Stock Exchange, n.d.). The Indonesian stock market's growing number of investors is a positive factor that can provide support for Indonesia's economic development objectives.

The influence of overconfidence on investment decisions made by retail investors in Indonesia shows significant results (Kartini & Nahda, 2021; Puspawati & Yohanda, 2022; Wijoyo & Arifin, 2024). Prior study indicates that investors' excessive trading behavior is unconsciously influenced by overconfidence (Brav et al., 2005; Daniel et al., 1998; Inghelbrecht & Tedde, 2024; Odean, 1998; Pompian, 2006; Toma, 2015; Ullah et al., 2017). According to Statman et al. (2006) (Marciano et al., 2025; Statman et al., 2006), have observed that trading volume increases as overconfidence levels increase. These results indicate that investment decision-making is positively affected by overconfidence. These findings confirm that overconfidence has a positive effect on investment decision-making. Additionally, the data above from the Indonesian Stock Exchange indicates that the number of individual investors has increased at a rapid pace. Nevertheless, the potential of overconfidence influencing investment decisions increases because of the increased trading volume alongside with the growth of individual investors. Furthermore, the objective of enhancing the growth of the economy will not be obtained.

According to Bakar and Yi (2016) showed that the level of overconfidence that occurs depends on an individual's gender (Bakar & Yi, 2016; Lawrence et al., 2024; Piehlmaier, 2025). In Indonesia, retail participation in the stock market has expanded rapidly, yet empirical evidence on gender as a moderating effect remains limited. Existing Indonesian studies often focus on general behavioral bias effects or financial literacy without isolating specific mechanisms such as overconfidence in investment decisions, and few examine gender as a moderator. Moreover, many local studies lack robust moderation analysis. As a result, there is insufficient evidence on whether overconfidence operates differently for male and female retail investors in the IDX, particularly among the young investor cohort that now dominates market growth. This study addresses these gaps by testing a focused moderated model using a large sample of active Indonesian retail investors.

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Despite growing behavioral finance literature, most existing studies on overconfidence and investment decisions were conducted in developed markets (US, Europe), and studies in Indonesian emerging market contexts rarely isolated gender as a moderating variable. Local Indonesian studies tend to examine general behavioral bias effects or financial literacy without testing specific moderation mechanisms. The novelty of this study lies in conceptualizing gender not merely as a categorical control variable but as a true moderating variable, revealing that the same level of overconfidence produces meaningfully different investment behavior depending on investor gender. Recent systematic reviews confirm overconfidence as one of the most prevalent behavioral biases in retail investing, with its impact documented across diverse market contexts (Kumar & Prince, 2023; D. Singh et al., 2024). Comparative studies across Asian emerging markets including Indonesian, Japan, and Thailand similarly demonstrate that overconfidence and availability bias significantly influence investment decisions (Marciano et al., 2025), while research in India highlights the moderating roles of financial literacy and investor experience on such behavioral tendencies (Abideen et al., 2023; Divakara Reddy et al., 2025).

Finally, this study contributes to the behavioral finance literature by explicitly conceptualizing gender as a moderating variable rather than merely contrasting the average levels of overconfidence. This provides a more profound comprehension of the degree to which gender influences the impact of overconfidence on investment decision-making. Secondly, it contributes to the field of behavioral finance by assessing a conditional model of overconfidence in an emerging market context. Even though prior research has demonstrated that investors in emerging markets exhibit overconfidence and a variety of biases, there are few studies that investigate the role of demographic characteristics in these effects (Chen et al., 2007). Third, this investigation offers practical advantages for brokerage policy and investor education. Investor education programs can be customized to address the specific biases that are most prevalent in each gender if the correlation between overconfidence and decision-making is more pronounced in one gender.

2. RESEARCH METHODS

2.1 Type of Research and Population and Sample

This study used a quantitative methodology using survey, targeting retail investors registered on the Indonesia Stock Exchange (IDX) with an active Single Investor Identification (SID). The research population was all individual investors who were registered on the Indonesia Stock Exchange (BEI) and had an active Single Investor Identification (SID). Based on data from PT Kustodian Sentral Efek Indonesia (KSEI), the number of individual investors in Indonesia would reach more than 20 million by the end of 2025, with growth of almost 300% in the last five years. All individual investors who were responsible for making investment decisions in the Indonesian capital market were the target population for this research.

2.2 Research Hypotheses

Traditional financial theory is based on Modern Portfolio Theory (MPT) and the Capital Asset Pricing Model (CAPM). MPT and CAPM essentially assume rational investors who optimize mean-variance and utilize available information in their investment decisions. These models influence the methodologies used by academics and professionals to assess investment performance and price risk, highlighting efficient portfolios and balanced risk-return relationships. Behavioral finance underpins this subject as it addresses the reasons why investors deviate from the logical, utility-maximizing principles of traditional finance. This discipline highlights that market outcomes and individual decisions can be influenced by psychological factors and arbitrage limitations, which prevent fully rational traders from correcting all pricing errors caused by biased investors (Barberis, Nicholas & Thaler, 2002).

Prospect theory is a fundamental principle of behavioral finance that suggests that individuals evaluate outcomes in relation to a reference point such as exhibiting loss aversion, risk aversion when faced with gains, and risk-seeking behavior in the context of losses (Kahneman & Tversky, 1979). This psychological tendency suggests that investment decisions are influenced by subjective perceptions and not just by objective probabilities. As a result, behavioral finance offers a comprehensive macro rationale for how biases such as overconfidence can consistently influence investment choices. Prospect theory argues that investor behavior will exhibit bounded rationality and systematic errors, which provides a basis for analyzing individual biases and their conditional impact across different demographic groups. This theoretical framework is suitable for the context of Indonesian retail investors, where rapid market engagement and the diversity of investor experience can strengthen the behavioral aspects of decision-making.

The second theory that supports this research is the heuristics and biases framework, which explains how individuals simplify complex decisions when faced with uncertainty. Kahneman and Tversky (1979) identified three major heuristics—representativeness, availability, and anchoring—that reduce cognitive effort while producing systematic errors in judgment and decision making. In financial contexts, these heuristics help investors process uncertain and complex information quickly, but they also increase the likelihood of systemic errors. The heuristics framework therefore bridges behavioral finance and specific investor biases by explaining how biases originate in the decision process. Under this framework, overconfidence is not simply a personality trait; it can also be viewed as a heuristic-driven miscalibration in self-assessment.

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In the financial environment, heuristic helps investors process uncertain and complex information quickly, although it also increases the likelihood of systemic errors. The heuristic framework links behavioral finance to certain investor biases by explaining the origins of these biases in the decision-making process. In this approach, overconfidence can be viewed as a calibration error caused by heuristics in self-evaluation. Heuristics are particularly relevant to financial markets because they operate under uncertainty, which is characterized by probabilistic outcomes, inadequate information, and the need for investors to make quick decisions.

Overconfidence is a well-documented tendency in behavioral finance. This indicates investors' tendency to overestimate their knowledge, underestimate risks, and display excessive confidence in their judgments. In theoretical market models, overconfidence amplifies trading volume, market depth, and information misinterpretation, which often reduces the predicted utility of overconfident traders (Odean, 1998).

H1: Overconfidence positively influences investment decisions.

A landmark study using US brokerage accounts, Barber and Odean (2001) showed that men traded more than women and achieved lower net returns, thus reinforcing the idea that overconfidence is more prevalent among male investors, resulting in poor performance outcomes. Theoretical and empirical research offers convincing evidence that overconfidence leads to excessive trading and suboptimal performance (Barber & Odean, 2001). Gervais and Odean (2001) illustrate that investors can develop overconfidence by attributing initial success to skill rather than luck, resulting in continued overtrading and misjudgment of their abilities (Gervais & Odean, 2001). Overconfidence is also influenced by learning dynamics.

Deaves and Luo (2009) showed that overconfidence based on calibration amplifies trading activity, although gender differences in trading were not consistently significant when overconfidence was assessed directly (Deaves et al., 2009). This suggests that gender may influence the impact of overconfidence rather than directly determine trading behavior, thus strengthening the justification for examining gender as a moderating variable.

Developing-market evidence further supports the relevance of overconfidence. In emerging-market investor data, Chen (2007) document that overconfidence co-exists biases such as the disposition effect and representativeness, indicating that behavioral biases are pervasive in markets outside the west (Chen et al., 2007; Chishti et al., 2025). Similarly, evidence from India shows that gender and investment experience are related to overconfidence, suggesting that demographic effects matter in developing-market contexts (Mishra & Metilda, 2015). Taken together, these studies support the argument that overconfidence is a meaningful predictor of investment decisions, and that its behavioral impact may vary across gender.

Behavioral finance predicts that psychological biases affect financial decisions making, while the heuristics framework explain how such biases emerge under uncertainty. Overconfidence, as an applied bias, has repeatedly been linked to greater trading activity and suboptimal investment outcomes in both developed and developing markets (Barber & Odean, 2001; Chen et al., 2007; Odean, 1998). Therefore, a positive relationship between overconfidence and investment decisions is expected.

Psychological and empirical data suggest that men exhibit higher overconfidence in financial situations, and that differences in behavior based on gender may represent varying degrees of bias rather than simply differences in information (Barber & Odean, 2001). Experimental data show that gender effects are not always observed when overconfidence is assessed directly, suggesting that gender may mitigate, rather than exclude, the influence of overconfidence on investment decisions (Deaves et al., 2009).

H2: Gender moderates the relationship between overconfidence and investment decisions.

2.3 Conceptual Framework

Based on previous literature, this research designs a conceptual diagram as in Figure 1 using the overconfidence variable as the independent variable, as well as the gender moderator variable which will be tested for its influence on investment decisions as the dependent variable, as follows.

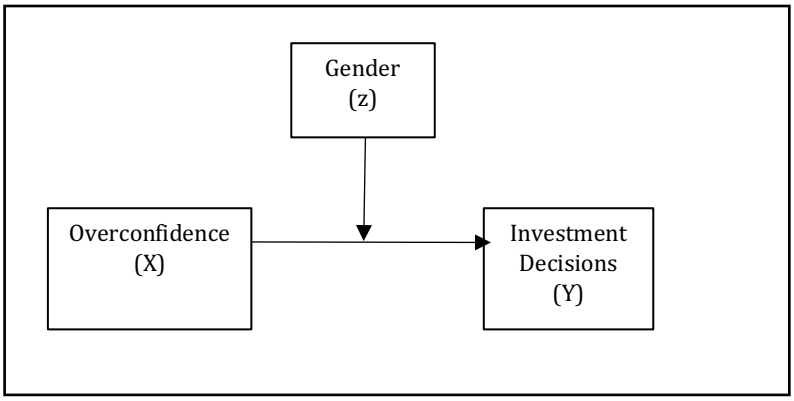

Figure 1. Conceptual Framework (Hayes Model 1)

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2.4 Data Analysis and Testing Techniques

The research design used in this study uses quantitative survey approach. The questionnaire was distributed online using the Populix platform. Participation was anonymous and the data was only used for academic purposes. Data were collected via structured questionnaire distributed to 500 respondents using simple random sampling at a 5% margin of error. The sample size of 500 respondents was determined using Yamane formula at a 5% margin error:

$$n = N/(1 + N(e)^2) \qquad (1)$$

With N > 20,000,000 and e = 0.05, the minimum sample size is n = 400. We collected 500 respondents to increase statistical power and account for potential incomplete responses during data cleaning. Investment decicion (Y) were measured using 4 items adapted from Ogunlusi & Obademi (2021), covering: (a) expected investment return, (b) cash flow growth assessment, (c) risk profile evaluation, and (d) investment security level. The overconfidence variable (X) was measured using 4 items adapted from previous validated studies (Baker et al., 2019; Glaser et al., 2007; Jain et al., 2019; Ogunlusi & Obademi, 2019; Prosad et al., 2015; Ritika & Kishor, 2022). The overconfidence indicators consisted of: (a) excessive confidence in one's own investment predictions (e.g., "I believe my investment analysis is more accurate than most other investors."); (b) optimism about investment outcomes (e.g., "I believe my portfolio will generate returns above the market average."); (c) perceived superiority in investment ability (e.g., "I feel my ability to pick stocks is better than the average investor."); (d) perceived superiority in investment knowledge and expertise (e.g., "I have a better knowledge of the stock market than other investors."). The selection of these indicators was based on Deaves et al.'s (2009) conceptualization of calibration-based overconfidence, where bias is manifested as a systematic miscalibration between an investor's subjective confidence and their actual performance.

Data validation was carried out in two stages: (1) Common Method Bias (CMB) test using Harman's Single Factor Test. All indicator variables were entered into a single factor analysis using Principal Axis Factoring. The results showed that the first factor explained only 29.09% of the variance, well below the established 50% threshold. These results prove empirically that the data collected through questionnaires does not contain significant method bias, so that the relationships between variables are not contaminated by systematic errors in data collection techniques. (2) Hypothesis testing using PROCESS Macro Model 1 in SPSS v26, with 5,000 bootstrap resamplings to produce a bias-corrected confidence interval for the interaction effect (Overconfidence × Gender) (Hayes, 2018).

3. RESULT AND DISCUSSION

3.1 Research Results

This research covered 500 retail investors on the Indonesia Stock Exchange (IDX). The sample consisted of young investors who were retail-focused and in the early stages of their investment journey. The gender distribution was quite balanced, with 269 females (53.80%) and 231 males (46.20%). Most respondents were young adults, with 36.40% aged 18-24 years and 29.40% aged 25-30 years. The dominant group consists of novice investors with 1-5 years of financial experience (78.80%). The age profile of the respondents, who are still youthful, is consistent with this fact, which is indicative of the exploration phase in personal financial management.

The vast majority of respondents, 91.40%, utilized personal assets for investment, demonstrating a significant degree of financial autonomy and an understanding of the necessity to distinguish investing capital from other financial commitments. Simultaneously, the utilization of loans or a mix of both funding sources encompassed merely a small percentage of the population, under 10%. This enhances the research's relevance in examining overconfidence bias, as the judgements taken are directly connected to the danger to the respondents' personal finances.

Table 1. Descriptive Analysis Overconfidence and Investment Decisions

Gender	Statistics	Overconfidence (%)	Investment Decisions (%)
Men	*Mean*	68.83	78.03
	Std. Deviation	27.92	25.03
	Median	75.00	75.00
	Minimum	0.00	0.00
	Maximum	100.00	100.00
Women	*Mean*	70.54	92.19
	Std. Deviation	27.12	14.79
	Median	75.00	100.00
	Minimum	0.00	25.00
	Maximum	100.00	100.00
	Mean	69.75	85.65

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Gender	Statistics	Overconfidence (%)	Investment Decisions (%)
Total	*Std. Deviation*	27.48	21.36
	Median	75.00	100.00
	Minimum	0.00	0.00
	Maximum	100.00	100.00

The descriptive statistics in Table 1 reveal notable insights into the distribution of overconfidence scores and investment decisions among both gender groups. The respondents exhibited high levels of overconfidence, with a mean score of 69.75%. when analysed by gender, women had a little elevated average overconfidence score (70.54%) relative to males (68.83%), however the disparity was not statistically significant. This suggests that the inclination towards overconfidence in the investment environment is a phenomenon encountered equally by both male and female participants, with median scores of 75.00% for each group. The consistent standard deviation of 27% across both groups suggest that the variances in self-confidence levels among individuals within either gender are nearly equivalent.

Conversely, there are significant disparities in investment decision characteristics between two gender groups. The female group had a markedly superior average investment decision score 92.19%, accompanied by greater consistency, as indicated by a lower standard deviation 14.79%. In contrast, the male group had a lower average investment decision score of 78.03%, accompanied by a significantly more heterogeneous data distribution, as seen by standard deviation of 25.03%. The male group's minimal score was 0.00%, whilst the female group's score was 25.00%. This descriptive data suggests that, despite comparable levels of self-confidence, the female group in this study exhibited more proactive or focused investment decision-making processes than their male counterparts.

3.1.1 Harman's Single Factor Analysis

Based on the results of Harman's Single Factor test presented in Table 2 the analysis indicates that this research data does not exhibit any indication of Common Method Bias (CMB). In this test, all indicators representing the overconfidence and investment decisions variables were entered into a single factor analysis using the Principal Axis Factoring. The extraction results indicated that the first factor only explained 29.088% of the variance. This figure is well below the established tolerance threshold of 50%, thus concluding that no single dominant factor explains most of the variance in this research model.

The results, which fall below the critical value, provide empirical evidence that the data collected through the questionnaire have a good validity related to the measurement method. In other words, the relationship between the overconfidence indicators and investment decisions in this study is not contaminated by systematic bias.

Table 2. Harman's Single Factor Test

Total Variance Explained

	Initial Eigenvalues			Extraction Sums of Squared Loadings		
Factor	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	2.986	37.322	37.322	2.327	29.088	29.088
2	1.147	14.333	51.654			
3	.952	11.895	63.550			
4	.901	11.257	74.806			
5	.691	8.637	83.444			
6	.603	7.542	90.985			
7	.435	5.442	96.427			
8	.286	3.573	100.000			

Extraction Method: Principal Axis Factoring.

3.1.2 Moderated Regression Analysis (Hayes Model 1)

The analysis used for hypothesis testing is by using a moderated regression statistical analysis test. The test was conducted using an SPSS extension called PROCESS macro developed by Andrew F. Hayes, which is an extension of a statistical program like SPSS that calculates regression analyses containing various combinations of mediators, moderators, and covariates. Researchers use simple moderation data processing and analysis techniques using Moderation Process Analysis: model 1 by Hayes with 5,000 bootstrap analyses using SPSS version 26 (Hayes, 2018). Macro model 1 is used if researchers determine a moderated regression research model, with one independent variable, one moderating variable and one independent variable. Moderation Process Analysis by Hayes basically has the same function as simple linear regression through SPSS, however, through this method, researchers can immediately see whether there is an interaction effect occurring and the significance of the relationship in a single process (Andrew F. Hayes, 2022) .

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Table 3. Hypothesis Testing Moderated Regression Gender on Overconfidence and Investment Decisions

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Model Summary
          R       R-sq        MSE          F        df1        df2          p
       .893       .797       .149    649.584      3.000    496.000       .000

Model
              coeff         se          t          p       LLCI       ULCI
constant       -.634       .150     -4.217       .000      -.930      -.339
X             1.169       .050     23.160       .000      1.070      1.269
Gender        1.530       .094     16.226       .000      1.345      1.716
Int_1         -.361       .031    -11.470       .000      -.423      -.299

Product terms key:
 Int_1    :        X        x        Gender

Test(s) of highest order unconditional interaction(s):
       R2-chng          F        df1        df2          p
X*W       .054    131.560      1.000    496.000       .000

Focal predict: X        (X)
      Mod var: Gender   (W)

Conditional effects of the focal predictor at values of the moderator(s):

     Gender     Effect         se          t          p       LLCI       ULCI
      1.000       .808       .023     35.468       .000       .763       .853
      2.000       .447       .022     20.569       .000       .404       .490
```

Based on the test results in Table 3, Overconfidence is proven to have a positive and highly significant influence on Investment Decisions with a coefficient value of 1.169 and a significance level of p = 0.0000. This indicates that partially, any increase in an investor's level of overconfidence will be followed by an increase in courage in making investment decisions. This finding emphasizes that psychological bias in the form of overconfidence in one's own abilities is the main driver for individual investors in executing actions in the capital market, where the very large t-value (23.160) indicates that this influence is not only statistically significant, but also very strong in substance.

3.2 Discussion

Consistent with behavioral finance theory, the study's results demonstrate a significant positive effect of overconfidence on investment decisions. Overconfidence is generally recognized as a catalyst for more assertive trading behavior and decision-making, often reinforcing activity and confidence in one's judgment. This finding aligns with data from models and empirical research showing that overconfident investors engage in more frequent trading and interpret information with overconfidence (Daniel et al., 1998).

Previous studies have shown that overconfidence can increase trading volume and decrease performance, as evidenced by extensive broker and market data analysis (Barber & Odean, 2000). Cross-country evidence further strengthens the idea that overconfidence encourages frequent trading and increased risk-taking (Grinblatt & Keloharju, 2009). In emerging markets, overconfidence is recognized as a prominent behavioral bias, which is often associated with inadequate diversification and increased turnover (Chen et al., 2007). The positive correlation identified in this study is consistent with evidence from both developed and emerging markets.

Gender as a predictor also showed significant results with a coefficient of 1.530 and a p-value of 0.0000. This positive value reflects a significant difference in preferences or underlying behaviors in investment decision-making between men and women, regardless of their level of overconfidence. Given that women were coded higher (2) than men (1), this positive coefficient aligns with the descriptive data in Table 1, which shows that the female group in this sample, on average, had higher and more consistent investment decision scores than the male group. This suggests that gender identity exerts a unique influence in shaping an individual's investment character.

Gender significantly influences the correlation between overconfidence and investment decisions. The positive impact of overconfidence is more pronounced in men than in women. This finding aligns with previous research showing that men exhibit greater financial confidence and engage in more aggressive trading (Barber & Odean, 2001). Gender differences in risk preferences and financial behavior are well documented. Men typically have a higher risk tolerance and competitive tendencies in economic contexts, which may exacerbate the behavioral effects of overconfidence (Croson & Gneezy, 2009). Simultaneously, empirical data suggest that gender effects are not always uniform when overconfidence is assessed directly, implying that the moderating influence may be context-dependent (Deaves et al., 2009).

The most important analysis of this model is the Interaction variable (Int_1), which is the result of multiplying Overconfidence and Gender, with a negative coefficient of -0.361 and a significance of p = 0.0000. The existence of this significant interaction is empirical evidence that the influence of overconfidence on investment decisions is not universal,

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but rather depends on the gender of the investor. The negative coefficient indicates a weakening effect; This means that, although overconfidence encourages investment, the presence of the female gender variable dampens or weakens the strength of this bias compared to men. The addition of this interaction effect also proved to improve the quality of the research model, with a 5.4% increase in R-squared through the R2-change value. This means that by including the Gender variable as a moderator, it successfully increased the model's ability to explain investment decisions by 5.4%.

A more specific analysis through conditional effects shows the dynamics of the influence of overconfidence on each gender category more sharply. In the male group (1), overconfidence bias has a very large driving force on investment decisions with an effect value reaching 0.808. This means that for every one level of overconfidence increase, investment decisions increased by 0.808. Men are highly reactive to their overconfidence in making financial decisions.

On the other hand, in the Women group (2), the influence of this bias decreased significantly to 0.447. This indicates that for every one level of overconfidence increase, investment decisions only increased by 0.447. The effect is almost half as small as that of men. This difference in figures explains that male investors are much more reactive and "driven" by their overconfidence in acting, while female investors tend to be better able to control this bias, so that the investment decisions they take do not suddenly explode just because they feel confident.

Men tend to be more influenced by psychological bias (overconfidence) in taking financial risks. Meanwhile, women often have stronger or more conservative risk control mechanisms, so even though they feel overconfident, they are still more careful in executing investment decisions than men. In other words, women are less likely to act on overconfidence in investing than men. This confirms that female gender plays a role in mitigating or weakening the impact of overconfidence bias on the aggressiveness of investment decision making. These data show that women are much more resistant to overconfidence bias. Even though they feel very confident, they are not immediately reckless in raising their investment decisions as high as men. Men are far more susceptible to letting their ego/overconfidence dictate their financial decisions.

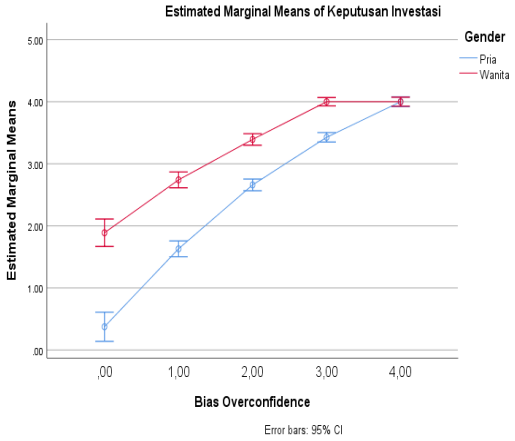

Figure 2. Estimated Marginal Means of Investment Decisions

Based on the Estimated Marginal Means graph presented (Figure 2), a significant interaction pattern between overconfidence and gender in determining the level of investment decisions is visible. The graph shows that at low to medium levels of overconfidence, the female group consistently has a higher average investment decision than the male group, as represented by the red line that is above the blue line. However, there is a striking difference in the slope of the two lines; the blue line (male) shows a much steeper and more aggressive increase as the overconfidence score increases, especially from level 0 to level 3, indicating that men are much more sensitive and responsive to psycological impulses of overconfidence in acting. Interestingly, at the highest level of overconfidence (score 4.00), the two lines finally meet and intersect at almost the same point, indicating that when someone has reached the peak of overconfidence, gender differences tend to fade because both groups have the same maximum investment tendency. This non-pararel line pattern emphasizes the role of gender as a moderating variable that weakens or strengthens the psycological influence on the economic behavior of research subjects. The current findings indicate a significant and consistent moderation among Indonesian retail investors. Overconfidence affects both genders, but with a more pronounced effect on men. These results support the basic theories of behavioral finance that investment decisions are influenced by information and cognitive heuristics and overconfidence (Barberis, Nicholas & Thaler, 2002). Overconfidence is crucial in explaining excessive trading and suboptimal decision-making in the market, as supported by theoretical and empirical evidence (Daniel et al., 1998).

4. CONCLUSION

Based on the results of data analysis and hypothesis testing, this study concludes that gender is proven to moderate the influence of overconfidence on investment decisions. More specifically, the analysis shows that overconfidence bias independently has a positive and significant influence on investment decisions. This means that the higher the level of

overconfidence an investor has, the greater their courage in making investment decisions. Gender acts as a moderating variable that has a weakening effect (negative moderation). This is shown by the negative interaction coefficient, which indicates that the influence of overconfidence on investment decisions is not equally strong for each gender. The effect of overconfidence on investment decisions was found to be much stronger in men (effect = 0.808) than in women (effect = 0.447). These findings demonstrate that although women have levels of overconfidence that tend to be equal to those of men, they have better risk control mechanisms so that the impact of this bias on investment actions is not as aggressive as in men. Based on the findings above, here are some suggestions for individual investors. Male investors need to increase their self-awareness of their potential overconfidence. Given the strong influence of this bias in driving investment decisions in men, it is highly recommended to conduct an objective evaluation or use additional technical/fundamental analysis instruments before executing an investment decision to reduce impulsive impulses caused by overconfidence. Financial institutions and investment managers are recommended to offer tailored education according to gender profiles. Male investors should prioritize instruction in risk management and emotional regulation (trading psychology). Simultaneously, educational initiatives for female investors should focus on enhancing self-confidence in portfolio diversification to ensure that prospective gains are both optimal and quantifiable. For Further Research: While this model can explain 79.70% of the variation in investment decisions, there are still approximately 20.30% of other factors that have not been studied. Further researchers are advised to explore other moderating or independent variables such as financial literacy levels, risk tolerance, or the influence of social media that may also interact with gender in shaping investment decisions in the digital era. This research has several theoretical and practical implications. Theoretically, this research advances the behavioral finance literature by establishing gender as a significant moderating variable, not just a demographic control, in the relationship between overconfidence and investment decisions in an emerging market context. Practically, these findings have direct implications for investor education policies. Financial regulators and securities companies in Indonesia (OJK, BEI) are advised to design gender-based financial literacy programs: male investors need greater emphasis on overconfidence awareness, emotional regulation, and risk management discipline, given their much higher susceptibility to the influence of overconfidence in investment decisions (conditional effect = 0.808). Meanwhile, female investors who are more resistant to decisions based on overconfidence can be encouraged to increase their confidence in portfolio diversification in order to optimize returns. For the millions of young Indonesian retail investors who now dominate market growth, understanding the interaction of gender and cognitive bias is crucial to reducing systemically suboptimal investment decision making.

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