Relationship between Overconfident Investor, Price Prediction Errors and Transaction Losses in the Indonesian Sharia Capital Market (Overestimation Calibration Experiment Approach)

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Abstract: - High overconfidence (a high degree of calculation error) among investors can lead to an overestimation of the price of securities, which can lead to unintentional purchases at a higher price or sales at a price below the underlying value, which can result in transaction losses. The purpose of this study is to examine the connection between overconfidence and the precision of stock price forecasts in the Sharia capital market of Indonesia. This study approach observes investors' reactions in an experimental laboratory setting after they are provided with important information. Based on self-confidence, the research design was split into three classification groups. Markets that get negative news and markets without information are the two categories of treatment. Based on the conducted experiments, the research findings demonstrated that in all experimental market sessions, investors with high overconfidence tended to overestimate the accuracy of their knowledge and information, resulting in higher average predictions and price errors than investors with low overconfidence. This data implies that investors with a high degree of confidence are susceptible to self-deception. The study's findings also demonstrate that, in contrast to investors with low overconfidence, those with strong overconfidence do not necessarily experience losses, even though their average prediction error or price is larger.

Key-Words: - Investor, overconfidence, price errors (predictions), self-deception, stock price, transaction losses.

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1 Introduction

As explained by [1], in the basic theory of financial standards, it is stated that the speed is efficient. Market efficiency means security prices remain at fair values, even if some investors make mistakes due to bias. In efficient markets, investors are considered rational, impartial, and consistent actors, who make optimal investment decisions, without being influenced by their souls or emotions, [2]. However, psychological research shows that investors as decision-makers are not always rational, [3]. Irrational investors disrupt the market, by buying when prices are high and selling when prices are low, whereas rational investors move prices closer to their fundamental value, by buying when prices are low and selling when prices are high, [4].

Lack of confidence is one of the irrational behaviors of investors. Overconfident investors exaggerate the information collected, overestimate their information, and predictive abilities, and ignore the facts, [5]. Based on [6], efine overconfidence is an overreaction to the accuracy of private information signals and an underreaction to public information signals. Research from [7], [8], [9] and [10], stated that overconfident investors tend to trade too much based on their information. Empirical research also shows that overconfidence leads to lower profits, [11], [12], [13], [14] and [15]. Overconfident behavior is also associated with trading volume and frequency, [16]. Another effect of overconfidence causes investors to underestimate risk or tend to ignore risk, [17]. One of the risks of investing in shares is the risk associated with a decline in share prices (capital loss). Information related to global markets, macroeconomics, and the issuer's fundamentals can be used to explain increases or decreases in share prices. The existence of good news and bad news can cause stock prices to rise and fall. Furthermore, investors' responses to the news will cause price prediction errors.

Due to overconfidence in the securities markets, investors frequently fail to maintain minimal prediction errors. Therefore, they are likely to experience trading losses, [10] and [18]. Investors who are too confident experience trading losses because they do not realize that their predictions deviate relatively far from the prevailing market price. This phenomenon shows that investors engage in self-deceptive behavior because they overestimate the knowledge and information they have, [19]. Although other empirical evidence shows that overconfident behavior does not always end in losses, [9], [20] and [21]. Research focusing on investor overconfidence in capital markets in developed countries has been widely carried out, both through experimental studies and questionnaires. However. this area is underexplored in emerging markets.

To the best of the researcher's knowledge, no researcher in Indonesia has used quasi-experiments to demonstrate the impact of overconfident conduct on price forecasts in the country's Sharia stock market. We selected this topic for several reasons. First, the Indonesian Sharia capital market exhibits overconfident behavior due to a methodological deficit. Furthermore, not much research has been done on the subject of overconfidence in the Indonesian Islamic capital market or the Islamic capital market in general. Second, the Sharia capital market has expanded quickly in the past few years, as evidenced by the IDR 3,666.69 trillion Sharia share capitalization and IDR 1.363.43 trillion non-share Sharia asset capitalization achieved in 2019. Being the world's largest Muslim nation, Indonesia appeals to Muslim investors who want to make investments and contrast the overconfidence of other Muslim nations. The findings of the study encourage effects further investigation into the of overconfidence behavior on the accuracy of stock price predictions made by investors, as well as the impact of negative news on stock price accuracy and the effects of overconfidence on investment outcomes as a phenomenon suggested by the Self-Deception Theory.

The size of the mistake in stock price prediction indicates this overconfident habit. An investor tends to make more mistakes the more overconfident he acts. According to [22], participants in this study were divided into three groups according to the degree of overconfidence they exhibited: (1) investors with strong overconfidence, or IOT; (2) investors with low overconfidence, or IOR; and (3) investors who exhibited moderately overconfident behavior (IOM). The results of this study will advance the theory of behavioral finance as it relates to predicting stock prices when making investments in the Islamic capital market.

2 Literature Review

The tendency of decision-makers to disregard publicly available information and, without recognizing it, place an excessive amount of weight on their knowledge and the accuracy of the information they already have is known as the overconfidence phenomenon, [23], [24] and [25]. Overconfidence is excessive certainty regarding the accuracy of one's beliefs, or what we will call overprecision. According [26]. [26]. to overconfidence usually appears in three different First, misestimation. This form forms. of overconfidence occurs when people misestimate quantities, usually for things that can be predicted. Second, misplacement. This form of overconfidence is related to relative comparisons which reflects the tendency to place themselves too high when comparing themselves with other people. Third, misprecision, namely the belief that predicting or estimating a quantity is more accurate than the facts. When receiving bad news or information, overconfident individuals tend to determine lower prediction values compared to more rational individuals, resulting in a higher average prediction error, [24], [25] and [27]. Differences in levels or levels of overconfidence will lead to differences in interpreting and evaluating information so that which will result in differences in finding solutions, [28]. Another effect of overconfidence behavior is the tendency of investors to trade too much in the stock market, [14], [29] and [30].

According to [22] and [31] a confidence level calibration test can be used to determine an individual's level of self-confidence. A calibration test is a process that uses questionnaires created especially for this purpose to assess and determine the knowledge and confidence levels combined to establish an individual's level of self-assurance. The overconfidence score, which is calculated by subtracting the average percentage of accurate answers from the average level of probability confidence, indicates the degree of overconfidence. This will produce a negative number that reflects unconfident conduct if the average probability of belief is less than the average proportion of truth in the judgment. On the contrary, if the average probability of belief is higher than the average proportion of truth in the judgment, this situation will result in a positive value of overconfidence. Overconfidence scores have three levels: low, medium, and high.

Variations in extreme trust levels will result in variations in how information is interpreted and assessed, which will lead to variations in the solutions that are produced, [32]. The majority of psychology research concludes that overconfident behavior Decision makers are more likely to make erroneous forecasts than logical, well-informed ones when they are encouraged by their nature to make such judgments. The notion of self-deception is supported by this conclusion, [19]. According to [19], people cannot perfectly control indicators of their true internal state. This opens up possibilities for the capacity to deduce someone else's mental state by observing nonverbal indicators including posture, eye contact, tone of voice, and speech tempo. The self-deception theory holds that people are wired to believe they are stronger, wiser, or better than they are. According to the theory, decision-makers will adjust their perceptions by seeking out evidence or arguments that validate their actions and disregarding information that deviates from their beliefs when they have an unconscious belief that they are more capable than average. Decision-makers in this scenario act in an overconfident manner that suggests self-deception since they are acting following their incorrect views.

2.1 Investor Reaction when the Market does not Provide any Information

According to psychological research, people often overconfidently in uncertain act situations. especially when they are dealing with exceptionally challenging issues, [22], [33] and [34]. significant overconfident investors tend to overestimate the accuracy of information and knowledge in uncertain conditions, such as the pre-opening period, which leads to significant forecast mistakes. Conversely, low-overconfident investors, who typically possess great deal more knowledge than high а overconfident investors, prefer to trade more cautiously since they are aware that they are just human beings with limited skills and expertise. Compared to investors with high levels of overconfidence, this conduct typically yields reduced forecast mistakes. This phenomenon demonstrates how overconfident, high-achieving investors have acted in a self-deceptive manner due to a mismatch between their perceived and actual abilities. According to empirical studies, investors often behave overconfidently in pre-opening markets, as seen by higher average predictions, [35], [36] and [37]. First hypothesis (H₁): Investors with high overconfidence have a higher average prediction error than investors with low overconfidence in the pre-opening market. Overconfident investors have a higher average prediction error, they will suffer transaction losses. This loss shows that there will be a transfer of wealth from high overconfident investors to low. [38]. Second hypothesis (H₂): Highly overconfident investors suffer transaction losses in the pre-opening period.

2.2 Investor Reaction when the Market Delivers Bad News

A person's optimism and pessimism regarding the veracity of the news or event in issue determines the extent of the price increase in the market as a result of it, [28]. Information that sends a negative message and lowers stock market values is bad news for investors. The amount of wealth owned by shareholders will decrease when stock market prices decline, [6] and [39]. Both more and less knowledgeable people will anticipate incorrectly when they receive terrible news, but highly overconfident people will produce a larger average price error than lowly overconfident people. According to empirical studies, high overconfident investors typically make more pricing errors than low overconfident investors when they receive negative news, which results in transaction losses, [35] and [40]. Third conjecture (H_3) : When the convevs unfavorable market news verv overconfident investors tend to make more price errors on average than investors who are lowly overconfident. Overconfident investors will have transaction losses since they have a larger average forecast error. This loss suggests that investors with high levels of overconfidence will shift their capital to investors with low levels of overconfidence. Fourth hypothesis (H₄): Highly overconfident investors suffer transaction losses when the market signals bad news.

3 Method

Table 1 (Appendix) provides a summary of the study's experimental design. This study uses overestimation calibration and is experimental. Undergraduate students who had completed courses on financial management, capital markets, and investment management but had never made a capital market investment were the study's participants. College students were chosen as the subjects because they accurately reflect the experiment's qualities, [38]. 30 participants had taken and passed the calibration test referring to [22]. The thirty participants will be divided into three groups, each with ten members, according to how overconfident they are. These groups are the investor group with the (1) highest, (2) moderate, and (3) lowest levels of overconfidence. To ascertain the price of stocks on the market, these three investor groups will exchange shares.

This study uses a hybrid design that alternates between and within subjects. The effect of the same treatment or therapy on various subject groups is compared using the between-subject design. In particular, after receiving the identical treatment, the between-subject design will evaluate the average share (price) prediction error and returns between two groups of investors with varying degrees of overconfidence. Using a repeated measure design, the within-subject design examines the impact of several treatments on the same cohort of subjects. The same patients or participants will receive various treatments on multiple occasions through repeated measurements, [38] and [41].

Software for stock trading is used in the experiment to address research questions. The market under study is Indonesia's Islamic capital market, where pre-opening trading takes place before the main trading session to record market prices that serve as a gauge for the prices anticipated from the majority of market participants on a given trading day. During the roughly five minutes of the pre-open market in this study, all investors were requested to submit orders indicating the quantity of securities they wished to purchase or sell at the anticipated value of those assets. Table 2 (Appendix) variable measurements and Table 3 (Appendix) hypothesis testing techniques.

4 Result and Discussion

4.1 Prediction Error (Price) in Pre-Opening Session

The results of the calculation are as follows, as shown in Table 4 (Appendix). In Appendix, Table

4's Panels A, B, and C demonstrate that, in the three pre-open markets, all investors made decisions about the value of the stock to profit when there was a lack of market information. When it comes to unpredictable situations, investors base their choices mostly on their confidence and knowledge. High overconfident investors outperform low overconfident investors in stock prediction values because they tend to overestimate the correctness of their information and knowledge. In these three prehigh overconfident investors markets. open therefore exhibit a higher average prediction error than low overconfident investors. The results of the t test for equality of means imply that the difference in average prediction errors between highoverconfident investors and low overconfident investors in each pre-opening market is significant. In other words, high-overconfidence investors produce significantly higher average prediction errors than low-overconfidence investors. These findings reflect that investors are overconfident High investors cannot prove that they obtain better knowledge and information than low overconfident investors because they fail to produce lower errors. Thus. high-overconfidence prediction investors engage in self-deceptive behavior throughout the three pre-opening markets. These findings confirm the research results of [21] and [38].

Overconfident investors engage in overconfident behavior because they generate higher prediction errors than low overconfident investors in these three pre-opening markets, supporting the first hypothesis. This research also finds that when the market provides bad news, high overconfident investors decrease their prediction accuracy, while low overconfident investors increase their prediction accuracy by reducing the average price error (see panels D and E in Table 4, Appendix). This phenomenon indicates that highly overconfident investors practice the self-deception hypothesis. When bad news enters the market, highoverconfidence investors increase their mean price in a higher proportion than lowerrors overconfidence investors decrease so that the difference in mean price errors gets wider. The results of these calculations imply that highly overconfident investors engage in overconfident behavior because they overestimate the accuracy of their knowledge and information to such an extent that it results in higher average price errors. Thus, they engage in self-deceptive behavior in those trading sessions. These results support the third hypothesis.

4.2 Profit and Loss on Trading Transactions

Table 5 (Appendix) displays the outcomes of trading transactions, representing the gains and losses experienced by investors throughout the trading session. Transaction losses are not usually experienced by overconfident investors who make mistakes in price prediction. Despite making more average forecast or pricing errors than low overconfident investors, they still have the chance to benefit, as seen in panels A, D, and E. These findings confirm the results of previous research, [9], [20] and [29]. This phenomenon implies that as long as investors can convey the predicted value of their shares accurately and quickly, they will have a greater chance of making a profit despite resulting in a higher average prediction error or price.

Moreover, in Appendix, as shown in Table 5's panels B and C, high overconfident investors experience trading losses since they produce higher average prediction mistakes than low overconfident investors. Overconfident investors don't make a lot of money. Even if the overconfident investors in panel A make money, their average profit margin is lower than that of the underconfident investors. Thus, there is a transfer of wealth from high overconfident investors to low overconfident investors and this supports the second hypothesis. When high overconfidence investors provide stock value predictions that are close to the prevailing market price, they will have a greater chance of making a profit, although their predictions produce an interesting thing to note that although some investors engage in self-deceptive behavior in the capital market, they do not always suffer transaction losses as has been concluded by previous empirical research, [18]. This study found the interesting result that when receiving bad news, high overconfidence investors made profits even though they had a higher average mispricing. Investors have the opportunity to gain profits only if they can provide accurate stock value predictions that are close to market prices that reflect the expected prices of most market participants. This fact implies that most market participants also engage in overconfident behavior similar to highly overconfident investors. So, high overconfidence investors take advantage of such situations to make money. They make a profit because they have sold securities at a market price that is higher than their fundamental price. These findings prove that overconfident investors do not necessarily suffer trading losses based on bad news. In addition, the facts show that highly overconfident investors gain profits when they receive bad news, resulting in a transfer of wealth from low-overconfident investors

to high overconfident investors. This finding does not contradict the fourth hypothesis (see panel E in Table 5, Appendix).

5 Conclusions

Our experimental investigation offers empirical support for behavioral finance theory as well as information about overconfident behavior in Islamic capital markets. This study can provide a theoretical contribution by presenting a fresh viewpoint on price discovery, which is heavily impacted by overconfident conduct that mimics dishonest activity. In pre-opening and negative news sessions, investors with strong overconfidence tend to overestimate the accuracy of their knowledge and information, leading to larger average prediction errors and prices than investors with low overconfidence. This phenomenon demonstrates the self-deceptive behavior of extremely overconfident investors. High overconfident investors experience trading losses as a result of larger average forecasts and price errors, which causes a wealth transfer high overconfident investors to from low overconfident investors. As long as they can promptly and precisely deliver a security forecast value that is near to the market price, high overconfidence investors can, in some cases, benefit even though they apply a higher average prediction error than low overconfidence investors. Therefore, because the majority of market players likewise exhibit overconfident behavior, high-confidence investors benefit from earnings.

This research has substantial implications, one of which is that overconfidence is a reaction to insufficient information. Investment firms must so educate and teach brokers, investors, and investment managers how to avoid making costly mistakes in their investments as a result of acting too confidently. This research has several drawbacks. First, only stock prices, trading profits and losses, and prediction mistakes are available as proxy variables for trading activity. The analysis excludes other variables, such as bid ask spread and other behavioral variables. It is rare for participants to put sell or purchase orders at the best offer. Limit orders, or placing orders in a queue, are what they prefer to do. Second, this experimental investigation took a lengthy time overall-four hours or 240 minutes. Extensive studies may result in maturation effects, which are behavioral shifts brought on by extraneous variables that affect the subjects but are not specifically related to the experimental therapy. Researchers can investigate measurements using over-placement and over-precision in addition to the overestimation calibration used in this study to quantify overconfidence.

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APPENDIX

Table 1. Design of Experiment

Step	Description
1	Test of calibration to ascertain the degree of overconfidence in the subject
2	Decide on 30 participants based on the results of the calibration test. Three groups of participants—high, medium, and low levels of overconfidence—were created. Ten individuals from each group who received a positive calibration value (>0)
3	Participants received instructions and an explanation of the simulation mechanism before the exercise.
4	Use software to test out trading simulations. Each research participant received a virtual starting capital of Rp 100,000,000. Three sessions totaling four hours were allocated to the experiment.
5	Those who made three or more trading profits at the end of the experiment would get a monetary reward. In the meantime, payment was given to additional participants for taking part in the simulation with a smaller amount than the simulation winner

Table 2. Measurement of Variables

Variables	Measurements				
Overconfidence	Measured using a test for calibration that is based on the model for calibration of, [22] and [38]				
Bad news	Notification of losses and advice not to purchase, for example of, [38] and [41]				
Prediction Error	Determined by dividing the stock fundamental price by the predicted price				
Pricing	Quantified by the following: Price (bid/ask) - Fundamental stock price) / Fundamental stock price				
Return	As determined by investors' gains or losses in stock trading simulations, calculated as follows: (ormed market price - fundamental price) / fundamental price				

Table 3. Method of Hypothesis Testing

Step	Description
1	The study employed One-way analysis of variance (ANOVA) to investigate the presence of a significant difference in overconfidence scores or grades among the groups.
2	Separate samples to determine whether there is a difference in stock price predictions between high and low- overconfidence investors, the t-test is employed to evaluate H1 and H2 (between participants). Does the profit and loss for investors with high and low levels of overconfidence differ?
3	Matched specimens to determine whether there is a difference in the stock price predictions made by high- overconfidence investors and low-overconfidence investors before and after adverse news, the t-test is employed to test hypotheses three and four. Does the profit and loss for investors with high and low levels of overconfidence differ?

Table 4. Price Prediction Error										
Market Situation		N	Average Prediction Error (Price)		Standard Deviation		P Value (P- Value) *			
	IoT	IOR	IoT	IOR	IoT	IOR	IoT	IOR		
A. Pre-Opening 1	82	82	0.876	0.653	0.473	0.397	0,000	0,000		
B. Pre-Opening 2	82	82	0.906	0.438	1,145	1,200	0,000	0,000		
C. Pre-Opening 3	82	82	0.579	-0.257	1,172	0.976	0,000	0,000		
D. No News	82	82	0.416	-0.636	1,610	1,610	0,000	0,000		
E. Bad News	82	82	1,387	-0.273	2,038	1,769	0,000	0,000		

Table 5. Profit and Loss from Trading Transactions								
Market Situation		Ν		Profit and Loss	Standard Deviation			
	IoT	IOR	IoT	IOR	IoT	IOR		
A. Pre Opening	32	32	0.422	0.463	0.584	0.653		
B. Pre Opening 2	34	34	-0.051	0.050	0.390	0.553		
C. Pre-Opening 3	18	18	-0.195	-0.213	0.251	0.220		
D. No News	24	24	0.638	0.609	2,504	2,509		
E. Bad news	24	24	0.053	-0.012	0.440	0.446		

Contribution of Individual Authors to the Creation of a Scientific Article (Ghostwriting Policy)

- Winda Rika Lestari made a research framework and wrote the research.
- Mahatma Kufepaksi proposed policy recommendations and collected literature reviews.
- Sri Hasnawati collected and processed research data.

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Conflict of Interest

The author has no conflicts of interest to declare.

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