



The Contribution of Self-Deceptive Behavior on Price Discovery: An Experimental Approach

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Abstract

Research in psychology suggests that less informed individuals may suffer from overconfidence. Empirical research shows that overconfident investors tend to overvalue the price of the securities so that they unconsciously buy the security at a higher price or sell the security at a lower price than its fundamental value leading to transaction losses. As an experimental research project, this paper addresses these issues. According to the research design, all investors are classified into three groups based on their scores of overconfidence, namely the less informed investors, the rational (average) investors, and the more informed investors. In order to observe the responses of the groups of investors when they receive valuable information, the research employs four different types of treatments consisting of the condition of no market information, the provision of guidance of security prediction, the good news and the bad news. The research findings demonstrate that the less informed investors are inclined to assess the precision of their knowledge and information excessively so that they produce a higher mean of prediction and price errors than those of the more informed investors in all experimental market sessions, except in the market session of good news. The phenomenon indicates that less informed investors conduct a self deceptive behavior. The result of the research also shows that less informed investors do not always suffer from transaction losses although they have a higher mean of prediction or price errors than those of the more informed investors. The less informed investors have a chance to gain profit as long as they are able to deliver the predicted value of the security accurately which is closer to the market price that reflects the expected price of the majority of the market players.

Keywords: Overconfidence, self-deception, price (prediction) error, transaction losses

1. Introduction

The gain and loss in a security market is determined by the accuracy of predicted value of the security and the time needed to deliver it into the order book. Those who are able to deliver the predicted value accurately and swiftly would have a greater opportunity to make money in the market, and vice versa. The accuracy relates to how the investors predict the value of the security in such a way that is closer to the market price that reflects the price discovery in every single trading session. However, it is not easy for them to do so. People in the market believe that the market price of a security is the equilibrium price of a security that reflects the expected price of the majority of the market players. They also assume that the market price is the nearest price to the real value of a security, namely the intrinsic or the fundamental value of a security (Fama, 1970).

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Investors believe that the best strategy to win the market is to maintain low prediction errors. In other words, the investors have to maintain the difference between the predicted value and the market price is at a minimum level. The underlying assumption in a security trading is that all of the market players are rational so that they will trade based on the rational paradigm. When the market players are rational, they would also produce rational market price. However, psychological research suggests that decision makers are not always rational (Thaler, 1992). They show inconsistent behavior when dealing with uncertainty. It implies that people generally tend to behave rationally but they will show their irrationality under a specific condition based on their risk preferences. One of the irrational behavior aspects that most people suffer from is overconfidence.

This research is all about how the overconfident behavior influences the investors, especially when they predict and correct the value of the securities in the capital market to obtain profits. The phenomenon of overconfidence is the tendency of decision makers to weigh the accuracy of their knowledge and information more excessively than they really do. Such behavior is unconsciously conducted so that the investors who suffer from overconfident behavior tend to ignore the available public information. Decision makers who ignore the available information will lose valuable information and finally could not take advantage of the information to make proper decisions. Psychological research shows that less informed individuals may suffer from overconfidence (Burson et al., 2006; Moore and Cain, 2007; Kruger and Dunning, 2002). Those who suffer from overconfidence tend to overestimate the precision of their knowledge so that they produce biased decisions leading to decision errors (Camerer, 1995; Kruger and Dunning, 1999). Such signal of overconfidence has been observed in many professional fields such as clinical psychologists (Oskamp, 1965), managers (Russo and Schoemaker, 1992), entrepreneurs (Camerer and Lovallo, 1999), engineers (Kidd, 1970), lawyers (Wagenaar and Karen, 1986). For further discussion, please refer to Lichtenstein et al. (1982). Psychological research also suggests that overconfidence is a situational phenomenon that takes place especially when people have to make decision under uncertainty (Quattrone, 1982; Klayman and Ha, 1987). In addition, most individuals see themselves as better than average person and most individuals see themselves better than others see them (Taylor and Brown 1988).

Empirical research shows that investors tend to fail maintaining low prediction errors since they conduct overconfident behavior in the security market. Therefore, they tend to suffer from trading losses (Odean, 1999; Barber and Odean, 2000; Raghubir and Das, 1999). Those findings suggest that those overconfident investors suffer from trading losses due to their tendency to value their information and knowledge excessively so that they do not realize that their predictions deviate relatively so far from the prevailed market price. The phenomena show that the investors conduct a self-deceptive behavior as they overvalue their knowledge and information. In addition, since the investors trade the securities among themselves, the profit acquired by an investor will also be the loss for others at the same amount. Therefore, when an investor makes money, there will be a transfer of wealth from the loser to the winner. However, other evidences show that overconfident behavior does not always end up with losses (DeLong et al., 1990, 1991; Hirshleifer and Luo, 2001; Gervais and Odean, 2001).

2. Theory and hypotheses

According to Winkler and Murphy (1968), there is a reverse relationship between the level of knowledge and level of confidence when people deal with uncertainty. The decision makers who have high level of knowledge tend to reduce their level of confidence by decreasing the probability of their true beliefs. On the other side, decision makers who have low level of knowledge tend to increase their level of confidence by inflating the probability

of their true beliefs. Klayman et al. (1999) also suggests that the combination of level of knowledge and level of confidence would determine the level of overconfidence. Therefore, level of overconfidence varies among individuals.

The differences among those levels of overconfidence would lead to the differences in interpreting and evaluating the information that produce different solutions (Kahneman and Tversky, 1973, 2001; Griffin and Tversky, 1992). Most of the psychological findings have the same conclusion that overconfident behavior tends to drive the decision makers to perform inaccurate predictions that produce prediction errors more than those of the rational (more informed) ones. That conclusion confirms the theory of self-deception (Trivers, 2004). The theory explains and predicts that when decision makers unconsciously perceive that they have the capability above average, their pattern of thinking will guide them to manage their perception by finding other information or arguments to support their behavior as well as ignoring other information that contradicts their behavior. In this situation, the decision makers follow their false beliefs directing them to perform overconfident behavior that implies a self-deception. According to Trivers (2004), people can not perfectly control indicators of their true internal states. This creates the selection for the ability to read subtle cues such as facial expression, eye contact, posture, and tone of voice and speech tempo to infer the mental states of other individuals. According to self-deception theory, individuals are designed to think that they are better (smarter, stronger) than they really are. Truly believing this helps the individual fool others about these qualities.

2.1 The investor reactions when the market does not provide any information

Psychological research shows that people tend to conduct overconfident behavior when they deal with uncertain conditions, especially when they find that the problem is very difficult (Juslin et al., 1999; Klayman et al., 1999; Soll and Klayman, 2004). Since the security trading in a capital market deals with uncertainty, it is suspected that there is a group of investors performing overconfident behavior in the market, especially when the market does not provide any information as those in the pre-opening markets. Empirical research demonstrates that the investors tend to practice overconfident behavior in the pre-opening market reflected by the higher mean of prediction errors than those of the rational ones (Bloomfield et al., 1999; Kirchler and Maciejovsky, 2002; Friedman, 1993). The first hypothesis examines whether less informed investors conduct overconfident behavior in the pre-opening market.

H_{1a}: The less informed investors perform a higher mean of prediction errors than those of the more informed ones in the pre-opening market.

The prediction error is defined as (predicted value of the security - fundamental value of the security) / fundamental value of the security. As the less informed investors suffer from the transaction losses due to the overconfidence, there is a transfer of wealth from the less to the more informed investors. The next hypothesis will be as follows.

H_{1b}: There is a transfer of wealth from the less to the more informed investors in the pre-opening market.

2.2 The investor reactions when the market provides a specific feedback

As adaptive organism, the decision makers normally evaluate their performance and make necessary adjustments to improve their performance. Feedbacks play significant roles in improving the performance. Psychological evidences show that feedbacks will decrease the level of overconfidence and produce less prediction errors (Subbotin, 1996; Flannelly and Flannelly, 2000; Russo and Schoemaker, 1992). However, the empirical research shows that feedbacks do not reveal the same conclusive results. Providing the less informed investors with a guidance of prediction of security price, they tend to decrease the level of overconfidence leading to a lower mean of the prediction errors accordingly (Larrick et al.,

1990; Bloomfield et al., 1999). On the other side, given the training for security trading, the investors failed to decrease the values of the security which subsequently leads to losses (Kagel and Levin, 1986). In this paper, the investors are provided with the guidance of prediction as a task property feedback to predict the value of the security known as its fundamental value following Bernard (1994). According to Bernard (1994), the fundamental value of a security is influenced by its ROE, the growth of ROE, the growth of book value/share in the future. Benefiting from the guidance of security prediction, it is expected that the investors will predict the value of the security accurately in order to obtain profits.

The next hypothesis examines whether the guidance of prediction would increase the accuracy of prediction by decreasing the mean of price errors to both the less and the more informed investors.

H_{2a}: The guidance of prediction reduces the mean of price errors of the less informed investors in a higher proportion than those of the more informed ones.

H_{2b}: There is a transfer of wealth from the more to the less informed investors

2.3 The investor reactions when the market provides good and bad news

Referring to Kahneman and Tversky (1973), intuitive predictions are generated according to a simple matching rule: the predicted value is selected so that the standing of the case in the distribution of outcomes matches its standing in the distribution of impressions. In other words, people tend to undertake intuitive prediction by relating the predictability and the distribution of impressions. Therefore, as the less and the more informed individuals receive the signal of good news, their predicted values will not be accurate. However, the less informed individuals will produce a higher mean of price errors than those of the more informed ones. In addition, when both of them perceive the good news as extremely rare information, they will inflate their predicted values even further (Griffin and Tversky, 1992). Empirical research supports the psychological findings that less informed investors produce higher mean of price errors than those of the more informed ones and finally suffer from the transaction losses (Bloomfield et al., 1999; Bloomfield and Libby, 1996; Camerer, 1987). Due to the transaction loss, there is a transfer of wealth from the less to the more informed investors

H_{3a}: The less informed investors perform a higher mean of price errors than those of the more informed ones when the market provides a signal of good news.

H_{3b}: The signal of good news evokes a transfer of wealth from the less to the more informed investors.

In H_{3a}, the price error is defined as (bid/ask price – fundamental value of the security)/fundamental value of security. On the other side, when the less and the more informed individuals receive bad news, their predicted values will not be accurate either but the less informed individuals will produce a higher mean of price errors than those of the more informed ones. Empirical research shows that when acquiring bad news, the less informed investors tend to show a greater mean of price errors than those of the more informed investors which leads to transaction losses (Bloomfield et al., 1999; Bloomfield and Libby, 1996; Camerer, 1987). Due to the transaction loss, there is a transfer of wealth from the less to the more informed investors.

H_{4a}: The less informed investors perform a higher mean of price errors than those of the more informed ones when the market provides a signal of bad news

H_{4b}: The signal of bad news evokes a transfer of wealth from the less to the more informed investor

3. Method

This research is a two-group-pretest-posttest quasi-designed research (Isaac and Michael, 1985; Christensen, 1988). It is a 4x2 mixed design combining within and between subject-designed. The research design is presented in the appendix 1.

3.1 Subjects

There were 30 participants in this research. They were the students of The Master Program of Management and The Master Program of Science at Gadjah Mada University majoring in Finance and Accounting who had already taken at least one of the following courses: Portfolio Theory, Advanced Financial Management, and Finance Seminar. They had no previous experience in taking part in any security trading activities.

3.2 Security values

In this experimental design, all investors make judgments or predictions about securities whose values are derived from values of real world securities, given financial information to generate the fundamental values of the securities. The fundamental value of the security is generated from the price book value approach, following Bernard (1994). According to Bernard (1994), the value of a security is determined by its rate of return on equity (ROE), growth of the ROE, book value and growth of book value. There were 36 different kinds of securities traded in 12 trading rounds each of which implemented in 3 trading sessions. The real names of the securities were hidden and symbolized into specific numbers to eliminate the bias due to the reputations of the represented companies.

3.3 The trading

The subjects trade the securities in computerized markets similar to those of Bloomfield et al., 1999 and Bloomfield and Libby (1996). The prevailed markets in this research reflect those as in the Jakarta Stock Exchange, in which a pre-opening market is implemented prior to the main trading sessions to capture the market price that would become a barometer of the expected price of the majority of market players in every single trading day. The pre-opening market in this research takes place in about 5 minutes such that all investors are required to deliver their orders representing the numbers of securities they want to buy or sell at predicted values of the securities. In this sense, all investors determine and deliver the fundamental values of three different securities in every trading session based on the previous available market prices (see appendix 1). When the market prices occur in a trading session, the investors have to move together to the next one. In the following trading sessions, all investors receive other manipulated information. In addition, short selling is not allowed. In order to motivate the investors to trade seriously, the rewards were available for the three winners based on their profits.

3.4 Treatments

This experimental research was implemented by exercising four different kinds of treatments. In this research, the experimenter manipulated the information to observe its effects on the price and prediction error. The treatments deal with different kinds of information that entered into the market which might influence the way the investors determine the values of the securities. Those treatments consist of the state of no market information, the provision of guidance of prediction, the good news and the bad news. The guidance of prediction refers to the information about how to predict and correct the value of the securities properly following Bernard (1994). The good and the bad news were also provided based on the previous empirical research (Jain and Kini, 1994; Stickel, 1995; Loughran and Ritter, 1997; Daniel et al., 1998; Teoh et al., 1998). It is expected that the

treatments would bring different effects on the prediction and price error to both the less and the more informed investors as they had different levels of knowledge and confidence.

3.5 Variable measurements

The causal relationship in this research is that the level of overconfidence influences the magnitude of the prediction or price error. Thus, the dependent variable in this experiment is the prediction or price error. The prediction error reflects how much the predicted value of a security deviates from its fundamental value in the pre-opening periods (Bloomfield et al., 2000). The price error reflects how much bid/ask price of a security deviates from its fundamental value in the main trading periods. Thus,

$$\text{prediction error} = \frac{\text{predicted value} - \text{fundamental value}}{\text{fundamental value}}$$

$$\text{price error} = \frac{(\text{bid/ask price} - \text{fundamental value})}{\text{fundamental value}}$$

The independent variable in this experiment is the level of overconfidence. Following Klayman et al. (1999), the level of overconfidence can be observed by conducting test for calibration of confidence. Such kind of test is a standard procedure to observe and measure the level of overconfidence by comparing the average of correct answers and the average level of the confidence based on the sets of two-choice questions such as “Which of these nations has higher population: (a) China, or (b) India?” The participants should answer 60 out of 100 sets of questions that are randomly chosen. For each set of question, participants choose the answer that they think is more likely to be right and indicate a scale from 50% to 100%, how sure they are about having chosen correctly.

When the average level of confidence is higher than the average of correct answers, there will be a positive score of overconfidence, and vice versa. The participants who have negative score of overconfidence were classified as under-confident ones. They were not allowed to participate in the current research since the real investors do not have such kind of characteristics. The qualified participants were classified into three groups based on their positive levels of overconfidence. According to the research design, ten investors in the top level of overconfidence were classified as the less informed investor and the other ten investors in the bottom level of overconfidence were classified as the more informed investors. All investors, including those who were in between - representing the rational investors, participated in the process of price discovery to determine the market price of the securities. However, the analysis will cover only the more and the less investors to achieve the greatest difference.

3.6 Profit and loss measurement

The level of accuracy of prediction would determine the accuracy of the prevailed market price. The inaccurate predicted value of securities in the pre-opening periods or the inaccurate bid/ask price in the main trading periods would lead to an inaccurate market price that deviates from its fundamental value. According to Bloomfield et al., (1999), the profit or loss of a security trading is measured by how much the market price deviates from its fundamental value. The profit and loss are calculated based on the assumption that capital gain/loss is ignored

4. Result

4.1 Prediction or price error

Panels A, B, and C in Table 1 show that along the three pre-opening markets, all investors make judgments dealing with the value of the securities to obtain profits based on the setting of no available market information. Referring to such an uncertain setting, the investors focus their decision on their knowledge and confidence. Since the less informed investors tend to overestimate the precision of their knowledge and the accuracy of their information, they perform higher predicted values of the securities than those of the more informed investors. Therefore, the less informed investors show a higher mean of prediction errors than those of the more informed investors in those three pre-opening markets. T test for the equality of means implies that the difference of the mean of prediction errors between the less and the more informed investors in each pre-opening market is significant. In other words, the less informed investors significantly produce a higher mean of prediction errors than those of the more informed investors. Those findings reflect that those less informed investors could not prove that they acquire better knowledge and information than those of the more informed investors since they fail to produce lower prediction errors. Thus, the less informed investors conduct self-deceptive behavior along those three pre-opening markets.

In the presence of guidance of prediction as well as in the presence of bad news (panels E and I in Table 1), the less informed investors show higher means of price errors than those of the more informed investors significantly. Those figures imply that the less informed investors conduct overconfident behavior since they overvalue the precision of their knowledge and information in such a way that produces a higher mean of price errors. Thus, they conduct a self deceptive behavior in those trading sessions.

Conversely, in the presence of good news (panel G in Table 1), the difference of price error between those two groups of investors is not significant. Figure 1 shows that when the good news enters into the market, the more and the less informed investors have the same mean of price errors in the first trading round. In the next trading rounds, the means of price errors of both groups of investors decrease so that their price error lines move upward. Although the less informed investors show a greater mean of price errors than those of the more informed investors as reflected by their lower line, the gap or the distance between the two lines reduces leading to insignificant difference.

4.2 Profit and loss

The profit and loss of all investors during the trading sessions are presented in Table 2. Table 2 shows that the less informed investors who perform overconfident behavior do not always suffer from transaction losses. They have the opportunity to obtain profits as presented in panels C, E, and F, although they perform a higher mean of prediction or price errors than those of the more informed ones. Those findings confirm the results of previous research (DeLong et al., 1990, 1991; Hirshleifer and Luo, 2001; Gervais and Odean, 2001). These phenomena imply that as long as the investors are able to deliver their predicted value of the security accurately and swiftly, they will have a greater opportunity to obtain profits although they produce a higher mean of prediction or price errors.

Table 1. Summary of the test of means of prediction and price errors

Prevailed markets	N		Mean of prediction (price) errors		Standard deviation		P-Value* at 5% sig level
	LII	MII	LII	MII	LII	MII	
A. The first pre-opening market	65	65	-2.251	-1.669	0.974	0.835	0.000
B. The second pre-opening market	65	65	-2.438	-1.588	0.899	0.725	0.000
C. The third pre-opening market	65	65	-2.895	-2.094	1.067	1.003	0.000
D. The absence of guidance	65	65	-2.659	-2.152	0.999	1.034	0.005
E. The presence of guidance	65	65	-2.920	-2.035	0.306	1.010	0.000
F. The absence of good news	65	65	-2.735	-2.139	1.248	1.028	0.004
G. The presence of good news	65	65	-2.746	-2.571	1.247	1.320	0.439
H. The absence of bad news	65	65	-2.465	-1.821	1.007	0.766	0.000
I. The presence of bad news	65	65	-2.191	-1.663	0.883	0.661	0.000

LII = the less informed investors MII= the more informed investors

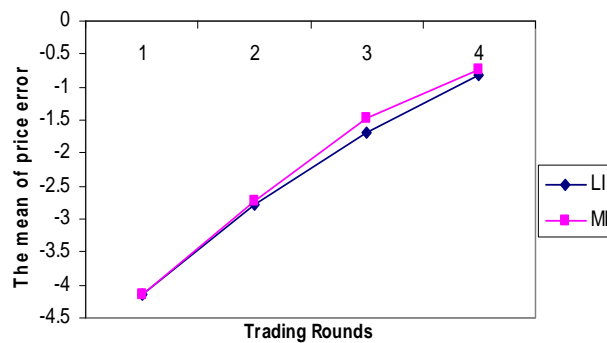


Figure 1. The means of price errors when the market provides good news

5. Discussion

According to panels A, B, and C in Table 1, the less informed investors conduct overconfident behavior since they produce higher means of prediction errors than those of the more informed investors in those three pre-opening markets, supporting hypothesis 1a.

Table 2. The summary of means of the profits and losses during the market sessions

Prevailed market sessions	N	Mean	Std. dev
A. The first pre-opening market			
The less informed investors	30	-0.029	0.285
The more informed investors	30	0.029	0.285
B. Guidance market			
The less informed investors	29	-0.014	0.224
The more informed investors	29	0.014	0.224
C. The second pre-opening market			
The less informed investors	29	0.103	0.240
The more informed investors	29	-0.103	0.240
D. The third pre-opening market			
The less informed investors	35	-0.021	0.184
The more informed investors	35	0.021	0.184
E. Good news market			
The less informed investors	18	0.032	0.235
The more informed investors	18	-0.032	0.235
F. Bad news market			
The less informed investors	27	0.007	0.150
The more informed investors	27	-0.007	0.150

Therefore, they are committed to a self-deception so that in the first and the third pre-opening markets, they suffer from the transaction losses. Thus, there are transfers of wealth from the less to the more informed investors in those markets, supporting hypothesis 1b. However, an interesting point to note is that although some investors conduct a self-deceptive behavior in the capital market, they do not necessarily suffer from the transaction losses as previous empirical research has already concluded (Odean, 1999; Barber and Odean, 2000; Raghubir and Das, 1999). When the less informed investors deliver the predicted values of the securities accurately, they will have a greater chance to obtain profits, although their predictions produce a higher mean of prediction errors than those of the more informed investors as presented in the second pre-opening market (see panel C in Table 2). This phenomenon implies that the majority of the market players also conduct overconfident behavior in the second pre-opening market just as the same as those less informed investors. As the majority of the market players conduct overconfident behavior, the less informed investors take advantage of that situation by delivering the accurate values of the securities in such a way that they could obtain the profits.

Referring to panels D and E in Table 1, the guidance of prediction decreases the mean of price errors of more informed investors and increases the mean of price errors of less informed investors that contradicts hypothesis 2a. The investors should have reduced the price errors when they became smarter in acquiring the additional knowledge such as the guidance of prediction. The fact shows that more informed investors learn and use the guidance very well so that they could reduce their confidence by decreasing their true beliefs to conform to the axioms of probability theory. Therefore, their mean of price errors declines so that the price error line moves upward as depicted in Figure 2. On the other hand, acquiring the guidance of prediction, less informed investors increase their predicted values reflecting the amount of knowledge of the topic area contained in the assessments. They tend to increase their true beliefs leading to a higher mean of price errors. This result

suggests that less informed investors conduct a self-deceptive behavior. Since less informed investors increase their mean of price errors, their price error line moves downward. Thus, the guidance of prediction increases the difference of the mean of price errors between those two groups of investors.

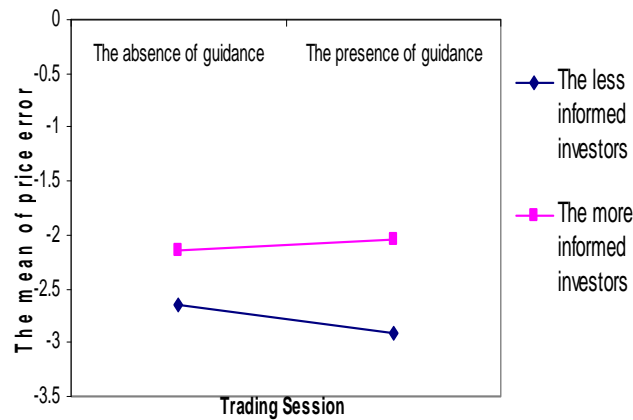


Figure 2. The mean of price errors of the more and the less informed investors in trading session based on the absence and the presence of guidance

In psychology, the tendency to increase the true belief after acquiring additional information or knowledge is known as a phenomenon of self-attribution. A phenomenon of self-attribution is a signal of the overconfidence (Daniel et al., 1998). Due to the self-attribution, the less informed investors suffer from transaction loss (see panel B in Table 2). Therefore, there is a transfer of wealth from the less to the more informed investors that contradicts hypothesis 2b.

According to panel G in Table 1, the good news does not make the means of price errors of both groups of investors statistically different. The fact shows that when the market provides good news, less informed investors tend to sell more and buy less security. Empirical research found that overconfident investors (in this paper, less informed investors) tend to sell the profitable securities (*the winners*) and retain the unprofitable ones (*the losers*), see Barber and Odean (1999), Harris (1988), Odean (1998), Shefrin and Statman (1985). In other words, when the good news enters into the market, less informed investors tend to create net sale transactions. This contradicts the hypothesis of self deception that people tend to buy the securities when the good news enters into the market. According to their perception, when the market brings a positive signal due to the good news, it will be a proper time to sell the acquired securities. They were noted to create net buying transactions in the previous trading sessions. They perceive that selling the securities in the bullish market will not jeopardize their wealth. Therefore, their net sale transactions increase the mean of price errors less than those of the more informed investors as presented in the following Table 3. Table 3 shows the summary of paired samples test of price errors of both less and more informed investors in trading session based on the absence and the presence of good news.

According to Panel A in Table 3, the good news increases the mean of price errors of the less and the more informed investors from -2.735 to - 2.746 (approximately 0.04%) and from -2.139 to - 2.571 (approximately 20.2%) respectively. Panel B shows that the increasing mean of price errors of the less informed investors is not significant, whereas the increasing mean of price errors of the more informed investors is significant at 5% level of confidence.

Table 3. Summary of paired samples test
Panel A -Paired sample statistics

		Mean of price errors	N	Standard deviation
Less informed investors (LII)	The absence of good news	-2.735	65	1.248
	The presence of good news	-2.746	65	1.247
More informed investors (MII)	The absence of good news	-2.139	65	1.028
	The presence of good news	-2.571	65	1.320

Panel B - Paired samples test

		Paired differences		T	d.f.	Sig. 2-tailed
		Mean	Std. Dev			
LII	The absence of good news_1 – the presence of good news_1	0.011	0.174	0.529	64	0.599
MII	The absence of good news_3 – the presence of good news_3	0.432	0.348	10.03	64	0.000

According to the less informed investors, this phenomenon suggests that the good news does not make those consecutive means of price errors significantly different so that the price error line relatively does not change as depicted in Figure 3. On the other hand, due to significant increasing mean of price errors, the more informed investors move the price error line downward that reduces the gap or the distance between the two lines. Therefore, the difference of mean of price errors between those two groups of investors is statistically not significant. The phenomenon does not support hypothesis 3a. In addition, since less informed investors deliver the ask price accurately, they sell the securities at a higher price than its fundamental value so that they obtain profits (see panel E in Table 2). Thus, there is a transfer of wealth from the more to the less informed investors. This finding contradicts hypothesis 3b.

This research also found that when the market provides bad news, the less and the more informed investors improve the accuracy of prediction by reducing the mean of price errors (see panels H and I in Table 1) so that they move the error lines upward in the same direction as depicted in Figure 4. According to Figure 4, in the absence of bad news, less informed investors perform a higher mean of price errors than those of more informed ones as depicted by their lower price error line. This phenomenon suggests that less informed investors practice the hypothesis of self-deception. When the bad news enters into the market, less informed investors decrease the mean of errors in a higher proportion than those of more informed ones so that the difference of mean of price errors reduces. However, less informed investors perform a higher mean of price errors than those of more informed ones (see panel I in Table 1). Thus, this finding supports hypothesis 4a. In addition, the fact shows that less informed investors obtain profits when they receive the bad news so that there is a transfer of wealth from the more to the less informed investors, contradicting hypothesis 4b (see panel F in Table 2).

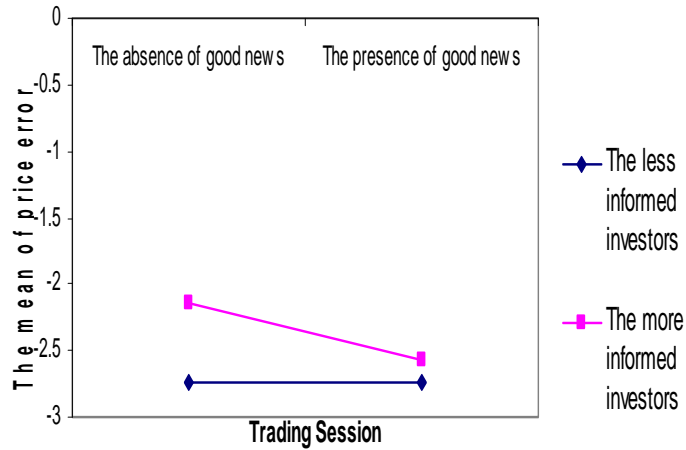


Figure 3. The mean of price errors of the more and the less informed investors in trading session based on the absence and the presence of good news

This research found an interesting result that when receiving the bad news, less informed investors obtained profits although they had a higher mean of price errors. The investors have an opportunity to obtain profits only if they are able to deliver the predicted value of the security accurately which is closer to the market price that reflects the expected price of the majority of the market players. The fact implies that the majority of the market players also conducted overconfident behavior similar to those less informed investors. Thus, less informed investors took advantage of such situation to make money. They obtained profits since they have sold the securities at a higher market price than its fundamental one. This finding proves that overconfident investors do not necessarily suffer from trading losses, although their predicted values produce a higher mean of price errors.

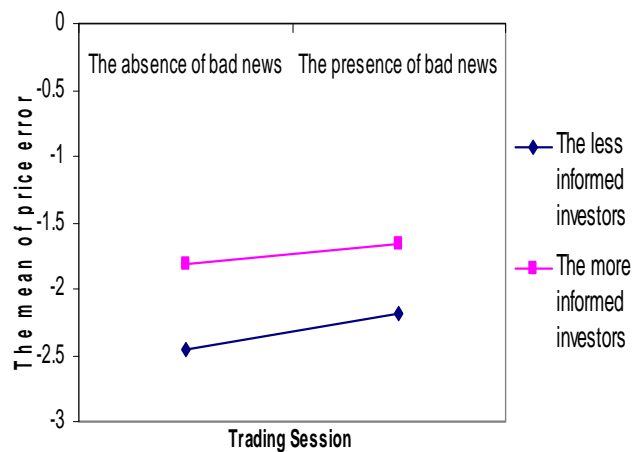


Figure 4. The mean of price errors of the more and the less informed investors in trading session based on the absence and the presence of bad news

6. Conclusions

This paper focuses on the way the overconfident investors predict and correct the value of the securities considering the implemented treatments. The results show that less informed investors tend to overestimate the value of the securities so that they produce a higher mean of prediction or price errors than those of more informed investors in all experimental markets except that in the presence of good news. Therefore, they are committed to a self deception since they tend to value the precision of their knowledge and

information more excessively than they really do leading to a high mean of prediction or price errors. However, the result shows that less informed investors do not necessarily suffer from trading losses although they have a higher mean of prediction or price errors. The important thing to note is that the investors will obtain the profits as long as they are able to deliver the predicted value of the securities accurately and swiftly which is closer to the market price that represents the expected price of the majority of the market players.

This research design does not allow the investors to use short selling technique when they conduct the trading activities. The future researchers are encouraged to explore overconfident behavior in an experimental setting when short selling is allowed so they might obtain different results to compare with. The future researchers may also involve the students who have previous experience in taking part in the security trading activities as research samples in order to gain a natural market setting. However, they have to take a special effort to keep the potential extraneous variables constant. In addition, the future researchers could also develop the signals of the good and bad news as well as the feedbacks to enrich the results of the research on overconfident behavior in capital market.

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Appendix I. Experimental design

Trading period	Trading round	Pre-opening periods		Main trading periods				
		No treatment	No treatment	Guidance of prediction		Treatments		
I	1	S-1	Session 1 S-2 S-3 = S-25	S-1	Session 2 S-2 S-25	S-1	Session 3 S-2 S-25	
	2	S-4	S-5 S-6	S-4	S-5 S-6	S-4	S-5 S-6	
	3	S-7	S-8 S-9 = S-23	S-7	S-8 S-23	S-7	S-8 S-23	
	4	S-10	S-11 S-12	S-10	S-11 S-12	S-10	S-11 S-12	
II	1	S-13	Session 1 S-14 S-15 = S-26	S-13	Session 2 S-14 S-26	S-13	Good news Session 3 S-14 S-26	Bad news Session 3 S-16 S-29
	2	S-16	S-17 S-18 = S-29	S-16	S-17 S-29	S-16	S-17 S-29	
	3	S-19	S-20 S-21	S-19	S-20 S-21	S-19	S-20 S-21	
	4	S-22	S-23 S-24 = S-14	S-22	S-23 S-14	S-22	S-23 S-14	
III	1	S-25	Session 1 S-26 S-27 = S-1	S-25	Session 2 S-26 S-1	S-25	Bad news Session 3 S-26 S-1	Good news Session 3 S-1 S-1
	2	S-28	S-29 S-30	S-28	S-29 S-30	S-28	S-29 S-30	
	3	S-31	S-32 S-33	S-31	S-32 S-33	S-31	S-32 S-33	
	4	S-34	S-35 S-36	S-34	S-35 S-36	Price error	S-34 S-35 S-36	

Note : S-i = The market price of the security i

