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# The Effect of Overconfidence and Experience on Belief Adjustment Model in Investment Judgement

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ABSTRACT

This study examines the effect overconfidence and experience on increasing or reducing the information order effect in investment decision making. Subject criteria in this research are: professional investor (who having knowledge and experience in the field of investment and stock market) and nonprofessional investor (who having knowledge in the field of investment and stock market). Based on the subject criteria, then subjects in this research include: accounting students, capital market and investor. This research is using experimental method of 2 x 2 (between subjects). The researcher in conducting this experimental research is using web based. The characteristic of individual (high confidence and low confidence) is measured by calibration test. Independent variable used in this research consist of 2 active independent variables (manipulated) which are as the followings: (1) Pattern of information presentation (step by step and end of sequence); and (2) Presentation order (good news – bad news or bad news – good news). Dependent variable in this research is a revision of investment decision done by research subject. Participants in this study were 78 nonprofessional investor and 48 professional investors. The research result is consistent with that predicted that individuals who have a high level of confidence that will tend to ignore the information available, the impact on individuals with a high level of confidence will be spared from the effects of the information sequence.

SARI PATI

*Tujuan dari penelitian ini adalah menguji pengaruh* overconfidence *dan pengalaman yang dapat meningkatkan atau mengurangi efek urutan dalam pengambilan keputusan investasi. Kriteria subjek dalam penelitian ini adalah investor profesional (investor yang memiliki pengetahuan dan pengalaman di bidang investasi dan pasar modal) dan investor non profesional (investor yang memiliki pengetahuan di bidang investasi dan pasar modal. Berdasarkan kriteria tersebut yang menjadi subjek penelitian adalah mahasiswa akuntansi, praktisi*

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*dibidang pasar modal dan investor. Penelitian ini menggunakan metode eksperimen 2 x 2 (*between subjects*). Penelitian eksperimen yang dilakukan berbasis web. Karakteristik individual diukur dengan menggunakan tes kalibrasi. Variabel independen yang dimanipulasi dalam penelitian ini meliputi: (1) pola penyajian (*step by step dan end of sequence*); dan (2) urutan informasi (berita baik diikuti berita buruk atau berita buruk diikuti berita baik). Variabel dependen dalam penelitian ini adalah revisi keputusan investasi yang dilakukan oleh subjek penelitian. Partisipan dalam penelitian ini terdiri dari 78 investor non profesional dan 48 investor profesional. Hasil penelitian ini konsisten dengan prediksi bahwa individu yang memiliki tingkat kepercayaan diri yang tinggi cenderung mengabaikan informasi yang tersedia, hal ini berdampak bahwa individu dengan tingkat kepercayaan diri yang tinggi terhindar dari efek urutan.*



## INTRODUCTION

Enclosure practices in Indonesia are varied, for example an annual report published by a company listed on Indonesia Stock Exchange. A phenomenon associated with differences in the presentation of accounting information occurs in go public firms in Indonesia. In 2015, Kalbe Farma, Tbk presents financial statements and annual report separately while Indo Farma, Tbk presenting the financial statements and annual reports in one report. This will have an impact on decisions to be taken by the investor. Teoh and Shiu (1990) provide empirical evidence that financial information is more important than social responsibility report for investors in Australia. This cause an investor will most likely see the information about financial performance ahead of the non-financial information. At the presentation of the differences expressed by the two firms, investors are more likely to choose the company with the financial statements and annual reports separately. This happens because investors will see directly on the company's financial performance information contained in the financial statements without having to see the annual report formerly.

A number of previous researches (Pinsker, 2007; Baird and Zelin II, 2000; Tuttle, Coller and Burton, 1997) examined the effect of information order and enclosure pattern in investment judgment. Other researches (Chandra, 2009; Mital and Vyas, 2009; Chen *et al.* 2007; Barber and Odean, 2001) examined the overconfidence in the investment decision making on non professional investor. This research is a further research to test the existence of the investment decision model.

The phenomenon of judgment bias and various patterns of enclosure have been the motivation on why this research needs to be done. There has been no research trying to relate the dimension of individual characteristics on the context of belief adjustment, moreover there is the existence of various results on overconfidence phenomenon in decision making setting. The research result on the overconfidence phenomenon showed that the individual characteristics could cause overconfidence was: income level (Mital and Vyas, 2009; Chandra, 2009; Chen *et al.*, 2007); education level (Chandra, 2009); adult age (Chandra, 2009; Chen et al, 2007); male (Barber and Odean, 2001); experience (Chen *et al.*, 2007); active investor (Chen *et al.*, 2007). This research would try to combine the characteristics of investor which is overconfidence and the belief adjustment done by investor.

The objective of this research is to examine the effect of overconfidence in investment decision of professional and non-professional investors. The result of this research is expected to be able to give contribution meaning for financial accounting literature, methodology, practice, and policy. This research gives contribution in accounting literature. In the previous research done by the researcher, the overconfidence variable measured was not manipulated, in this research overconfidence variable is manipulated by using calibration test. Individual characteristic of overconfidence (manipulated by using calibration testing) are expected to be able to enrich the research findings related to belief adjustment model in investment decision making setting. Moreover, the testing of belief adjustment model in investment decision making setting will be more robust.

## LITERATURE AND HYPHOTESIS DEVELOPMENT

### Conceptual Judgment Model and Belief Adjustment Model

Conceptual judgment model developed by Hogarth (1994) consisted of three elements. The first element was the individual who made the judgment; the second was the task environment of individual who made the judgment; the third was the action that was the result of judgment, then, affected the individual and his or her task environment. Judgment was a cognitive aspect from the process of decision making.

Hogarth and Einhorn (1992) proposed a belief adjustment model that propotioning an individual processed information sequential would use anchoring and adjustment process. The main benefit of belief adjustment model developed by Hoharth and Einhorn (1992) was that not only three main characteristics from the evidence used in *Bayes' Theorem* (direction, power, and type) but also broaden *Bayes' Theorem* by including two additional characteristics ignored in *Bayes' Theorem* which were information order and information presentation model.

Almilia, *et al.* (2013a) examined (1) the effect of information order in investment judgment: (2) the effect of information presentation pattern in investment judgment. The research result showed that "judgment bias", especially the recency effect, would be higher when the information presentation pattern is sequentially.

Almilia (2013b) examined the existence of Belief Adjustment model developed by Hogarth and Einhorn (1992) in investment decision judgment; anchor test (the previous belief) in investment judgment; the benefit of accounting and non-accounting information; and the difference level of confidence that may cause the presence of differences in interpreting and processing information in order to produce different prediction of performance as well. Overall, the result of this research shows that belief revision model of Hogarth Einhorn (1992) was partially hold in investment judgment.

Almilia and Supriyadi (2013c) examined the order effect in investment judgment. The result of this research showed the presence of order effect in investment decision making setting, which was recency effect if the disclosure pattern was step by step (SbS). The result also gave the evidence that there was no recency effect if the disclosure pattern was end of sequence (EoS).

### The Effect of Evidence Order and Disclosure Pattern

Order effect occurs when individual decision is different after receiving evidence with different order. In the evidence order, it is mixed between confirmed information (positive) and disconfirmed information (negative). If the beginning information in the order has a great effect on individual belief, so the order effect is primacy effect. In contrary, if the last information gives a great effect, so it is recency effect.

Ashton and Ashton (1988) and Tubbs *et al.*, (1990) showed that the recency effect could not be

found if evidence received did not give consistent information both consistent conformation and disconfirmation. In contrary, the recency effect occurred when the evaluated evidence had mixed information that was confirmative and disconfirmative. This model predicted the recency effect when the individual evaluated short series of evidence that was complex and mixed evidence (positive and negative evidence). The short series of evidence consisted maximum of 12 items of evidence. Complexity related to familiarity of task and the length of evidence. The combined or mixed evidence was the evidence consisting positive and negative items.

Bamber *et al.* (1997) gave a strong support on the description validity of belief adjustment model. Belief adjustment model predicted the order effect on all cases of response model (step by step or end of sequence), the task complexity and its information length. The argument support of order effect in step by step disclosure pattern (SbS) was also supported by the research of Ahlawat (1999), Baird and Zelin II (2000); Guiral-Contreras *et. al.* (2007). Model Hogarth and Einhorn's (1992) predicted that the decision given after each evidence received that was known as Step by Step response model (SbS) tended that the presence of recency effect was found, while the decision given only once after all evidence received that was known as End of Sequence response model (EoS) tended that it did not produce recency effect. EoS could reduce the recency effect because the contrary effect appeared from the information presented in order could be eliminated by combining the positive and negative evidence effect, so it would eliminate the individual effect of positive and negative evidence. Kennedy (1993) found that accountability reduced the recency effect in the decision of business failure possibility, Cushing and Ahlawat (1996) gave evidence that the recency effect could be reduced when the auditor required the document of going concern decision to be done. The reseach done by Koonce (1992) also showed that debiasing method was the most effective method to reduce recency effect compared to accountability and data documentation.

Based on a number of research results mentioned above, it shows that there was inconsistency results related to the presence of effect order and factors that could reduce the order bias. The effect of experience on order bias was varied, some researches showed that experience would increase the order effect (Krull, Reckers and Wing, 1993; Arnold *et al.*, 2000), but some other researches showed that experience could reduce the order effect (Messier and Tubbs, 1994; Trotman and Wright, 1996). Other researches also resulted factors that could reduce order effect in decision making: training (Tubbs *et al.*, 1993); task documentation (Cushing and Ahlawat, 1996); decision done in groups (Ahlawat, 1999); the disclosure pattern of *self review debiaser* (Ashton and Kennedy, 2002).

Pinsker (2007) find that there was greater belief adjustment for information disclosure presented one by one (sequential) compared to information disclosure presented simultaneously both after the first series of consistent information (short series of information) and after the second serries of consistent information that had opposite direction (long series of information).

Trotman and Wright (1996) findings show that recency effect appeared on the participant with step by step (SbS) response model. The research of Ashton and Kennedy (2002) also give the similar evidence that end of sequence (EoS) method did not affect the presence of order effect. It indicated that end of sequence (EoS) disclosure pattern was the effective method in reducing recency effect in going concern decision done by auditor.

**Individual Characteristics**

Some researches presented some behaviour bias performed by investor. In the context of decision making in the field of finance, convidence had beed

studied by Mittal and Vyas (2009), Chandra (2009), and Chen *et al.* (2007). *Self-attribution bias* was often used as an explanation on the occurrence of overconfidence individual. Overconfidence is the tendency of individual to attribute the success or profitable result as the ability owned by individual, and assume that the unprofitable result or failure is out-of-control matter or is misfortune (Miller and Ross, 1975).

Statman *et al.* (2006) findings show that a higher overconfidence level caused a larger volume of trading as long as a high return in the past as the proxy of overconfidence. Overconfidence proxy in the research done by Barber and Odean (2001) was *gender*; they tested the psychological behaviour of investor and give the evidence that a overconfidence level for male was higher compared to female. Glaser and Weber (2007) findings show that investor who have ability of investment and the past performance above the average (but did not have the average performance in the past) would conduct more trading. Mittal and Vyas (2009) indicated that factors affecting overconfidence investor was the ability and earnings. Chen *et al.* (2007) examined differences based on characteristics of the investor. Chen *et al.* (2007) identified five characteristics of the investor who is believed to be the determining factor in behavioral biases and trading mistakes. Specifically, the researchers identified: (a) an experienced investor, (b) investors who has mature age, (c) an active investor, (d) investors who have the high wealth / prosperity, (e) Investors who are from the metropolitan city.

The arguments used by Chen *et al.* (2007) related to characteristics of investor and trading behavior bias is: **first**, investors who have a lot of experience learned to become more rational. So the experience may represent survivor bias. **Second**, investors who have adult age. Younger individuals tend to have a high education and hope to participate in capital markets, whereas older individuals have more experience of life. **Third**, active investors, the more often investors trade, the sooner investors gain experience. As mentioned earlier, the bias increasing of experienced investors may be lower. **Fourth**, property investors, individuals who are rich / wealthy have more knowledge about finance rather than other individuals. It is possible that individuals who are wealthy / rich may be more overconfident. **Fifth**, the investor who comes from the metropolis/big city, the investor from the big city is a better investor in terms of knowledge than other investors. Researcher provided evidence that the individual investor trading decisions is worse than an institutional investor in China. The results also showed surprising result that investors who are mature and investors who are rich / wealthy are not good investors in investment decisions making.

Self-Deception Theory is based on the argument that when a person behaves overconfident and gets feedback then he/she will know the mistakes that he/she had made. Specifically, when the involved person knows the results of the prediction and prediction standard, then, the awareness that he/she has been trapped in the forming of improper belief will arise. At this stage, the individual will realize that he/she has made self-deception by giving an excessive evaluation on the accuracy of knowledge level they have exceeding the actual level of knowledge, so that tends to give a high probability to the truth of judgment. This can be proven by the presence of prediction deviations that is relatively high from the average predictions or standard prediction to put in a position of obtaining lost. Based on the argument mentioned above, the hypothesis proposed in this research is:

**H1***: Overconfidence Investor tends to be not affected by the effects of sequence information.*

## METHODS

Subject criteria in this research are: having knowledge and experience in the field of investment and stock market and financial report analysis. Based on the subject criteria, then subjects in this research include: professional and nonprofessional investors. This research is using

an experiment which is a method to examine the causal relationship with some variables manipulated to answer the research problem.

This research is using experimental method of 2 x 2 (*between subjects*). The researcher in conducting this experimental research is using *web based,* which is an experiment that is done by the researcher by asking subjects to open a website address that has been designed by the researcher in the form of interactive media. The characteristic of individual (high confidence and low confidence) is measured by calibration testing. Independent variable used in this research consist of 2 active independent variables (manipulated) which are as the followings:

1. Pattern of information presentation (*step by step* and *end of sequence*).
2. Presentation order (++-- or --++)

Dependent variable in this research is a revision of investment judgment done by research subject. The judgment revision meant is the determination of corporate stock rate. The determination of stock rate meant is that the subject is asked to re-evaluate the investment value for each type of information and pattern of information presentation (*step by step, end of sequence* and *self review debiaser*) by evaluating corporate stock initial value of Rp19.000,00; and giving a scale for each disclosure by multiple price of -1.000 (very bad news) and +1.000 (very good news). The hypothesis testing in this research is using *independent sample t test* .

## RESULTS AND DISCUSSION

Participants in this study were accounting students who already have knowledge and experience in the field of investment and capital markets. The participant in this research includes 78 non-professional investors and 48 professional investors. Table 1 shows the distribution of participants in each experimental scenario. Table 1 also exhibits information on the distribution of the subjects that are divided into 4 types of scenario: 35 people are in scenario 1; 28 people are in scenario 2; 33 people are in scenario 3; and 30 people are in scenario 4.

The results of calibration test show that all individuals in this study had a high level of confidence. High level of confidence in this study indicated that the level of confidence higher than the level of individual correct answers in the calibration test. Calibration testing conducted in this study with the following procedures: each participant was asked to answer and fill 3 of 5 random questions. This calibration test questionnaire consisted of five groups of questions so that each respondent will select and answer 15 of 25 questions randomly. Each respondent had to answer the question by selecting one of the two answers are available and then determine the level of confidence in the correct answer in the range of 50% - 100%. Individuals were categorized overconfidence if the percentage of correct answers to the confidence level is higher than the percentage of correct answers.

The Belief adjustment model of Hogarth and Einhorn (1992) predicts that the *step by step* presentation pattern will create a *recency effect.* Table 2 panel A shows that Nonprofessional and overconfidence investors do not experience the order effects when receive information with step by step pattern. It is shown there is no difference between the final judgments of individuals who receive the good news information followed by bad news information with the individual who receives the bad news information followed by good news information.

Table 2 panel A also shows that Nonprofessional and overconfidence investors experiencing the order effects when receive information with end of sequence pattern. It is shown there is difference between the final judgments of individuals who receive the good news information followed by bad news information with the individual who receives the bad news information followed by good news information.

Table 1. Distribution of Participants Based on Experiment Scenario

| Scenario | Type of reporting information | Sequence | Professional Investors | Non-Professional Investors | Total Participants |
|---|---|---|---|---|---|
| 1 | Step-by-Step | ++-- | 12 | 23 | 35 |
| 2 | Step-by-Step | --++ | 12 | 16 | 28 |
| 3 | End-of-Sequence | ++-- | 11 | 22 | 33 |
| 4 | End-of-Sequence | --++ | 13 | 17 | 30 |
| | **Total Participants** | | **48** | **78** | **126** |

Table 2. : The results summary of Hypothesis 1 Testing

| Information disclosure types | Evidence Order | Mean | Results | t-stat | Sig. |
|---|---|---|---|---|---|
| **Panel A: Non-Professional Investors** | | | | | |
| Step by Step | ++-- | 17.530 | *No Order Effect* | -1.573 | 0.124 |
| | --++ | 19.262 | | | |
| End of Sequence | ++-- | 18.756 | *Recency Effect* | -2.211 | 0.033 |
| | --++ | 19.600 | | | |
| **Panel B: Professional Investors** | | | | | |
| Step by Step | ++-- | 13.333 | *Recency Effect* | -2.046 | 0.053 |
| | --++ | 18.833 | | | |
| End of Sequence | ++-- | 17.182 | *No Order Effect* | -0.853 | 0.403 |
| | --++ | 18.846 | | | |

Table 2 panel B shows that Professional and overconfidence investors experiencing the order effects when receive information with step by step pattern. It is shown there is a difference between the final judgments of individuals who receive the good news information followed by bad news information with the individual who receives the bad news information followed by good news information.

Table 2 panel B also shows that Professional and overconfidence investors do not experience the order effects when receive information with end of sequence pattern. It is shown there is no difference between the final judgments of individuals who receive the good news information followed by bad news information with the individual who receives the bad news information followed by good news information.

This result is not consistent with that predicted that individuals who have a high level of confidence that will tend to ignore the information available, the impact on individuals with a high level of confidence will be spared from the effects of the information sequence. The results showed there was effect of experience in investment decision making. In the nonprofessional investor, recency effect will occur when the participants received information in the *EoS* presentation pattern. In contrast, the recency effect will occur for when the professional investors received information in the

*SbS* presentation pattern. In general, the results of the study showed that the information order, the presentation pattern and the experience had a significant impact on the investment decision making, while the confident characteristics did not have any significant impact on the investment decision making. The results of this study indicate a bias in investment decision making.

Self-Deception Theory is based on the argument that when a person behaves overconfidence and obtain feedback then he will know the mistakes he had made. Specifically, when the people concerned know the results of prediction and prediction of default then there will be the realization that he has been caught up on the formation of an improper beliefs. Individuals who have a high level of confidence that will tend to ignore the information available, the impact on individuals with a high level of confidence will avoid from the order effects.

## MANAGERIAL IMPLICATIONS

The findings of this study have an impact on the practice of presenting enterprise information. The indivudual have limited capacity of the individual cognitive. The limeted capacity of individual cognitive have impact on individual decision making. The information presented is too long and complex, impact on investors as a whole cannot absorb the information because the limited cognitive capacity. However, if the information presented is concise, then investors can absorb the information overall. One form of disclosure practices that make it easier for investors is financial highlights, which gives a summary of the company's financial performance is important.

The practical implication of the study showed that the complexity of the information could cause the decision making bias, especially the investment decision making. In practice, investors and capital market players were exposed to various information and not only the finance performance information, but other non-financial information that would surely had significant impact on the complexity of the resulting judgment (i.e., biased judgment) because of the increasingly various information given by the company to its stakeholders.

The theoretical implication of the study was the importance of the overconfidence factors in the investment decision making. Prior studies did not compare comprehensively the role of overconfidence factors in Hogarth and Einhorn's belief adjustment in various information presentation patterns.

## CONCLUSION

Individual characteristic of overconfidence (manipulated by using calibration test) are expected to be able to enrich the research findings related to belief adjustment model in investment decision making setting. The research results show that: (1) subjects that overconfidence do not experience the order effects when receive information with step by step pattern; and (2) subjects that overconfidence experiencing the order effects when receive information with end of sequence pattern. The results of this study provide evidence that the individual characteristics of overconfidence have effect on investment decisions, it is shown that the step by step pattern does not take place sequence effect and the end of sequence pattern occur order effects. ■

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