

Mitigation of order-effects on investment decision making

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ABSTRACT

This study attests the belief-adjustment model to examine whether there are differences in investment decision making between the participants who obtain good news followed by bad news and those who obtain bad news followed by good news on the information pattern which is processed based on end-of-sequence and long series information. The experiment design in this study is the pattern of presentation 1x1x2 end-of-Sequence, a long series information and directions of evidence (good news followed by bad news and bad news followed by good news). The research hypotheses were tested using Mann Whitney test. The variables used in this research are investment decision, pattern of presentation in end-of-sequence, length of the series of information, and order of evidence. The participants involved in this research are 47 students (bachelor program) of STIE Perbanas Surabaya majoring in Accounting and Management who are taking or have taken courses of Financial Statement Analysis and/or Investment Management and Capital Markets. The results show that there is no significant difference in the judgment between the participants who obtain good news followed by bad news and those who obtain bad news followed by good news. In addition, there is no order-effect occurring in investment decision making.

ABSTRAK

Penelitian ini membuktikan belief-adjustment model untuk menguji apakah ada perbedaan pembuatan keputusan investasi antara peserta yang memperoleh berita baik diikuti oleh berita buruk dan mereka yang mendapatkan berita buruk diikuti oleh berita baik dari pola informasi yang diproses berdasarkan end-of-sequence and long series information. Desain eksperimen dalam penelitian ini adalah pola presentasi 1x1x2 end-of-sequence and long series information dan arah bukti (berita baik diikuti oleh berita buruk dan berita buruk diikuti oleh berita baik). The hypotheses penelitian diuji menggunakan uji Mann Whitney. Variabel yang digunakan dalam penelitian ini adalah keputusan investasi, pola presentasi di end-of-sequence and long series information, dan ketertiban bukti. Para peserta yang terlibat dalam penelitian ini adalah 47 siswa (Program sarjana) dari STIE Perbanas Surabaya jurusan Akuntansi dan Manajemen yang mengambil atau telah mengambil kursus Analisis Laporan Keuangan dan/atau Manajemen Investasi dan Pasar Modal. Hasil penelitian menunjukkan bahwa tidak ada perbedaan yang signifikan dalam penilaian antara peserta yang memperoleh berita baik diikuti oleh berita buruk dan mereka yang mendapatkan berita buruk diikuti oleh berita baik. Selain itu, tidak ada urutan-efek yang terjadi dalam pengambilan keputusan investasi.

1. INTRODUCTION

Capital market has an important role both as an alternative of financing and a means of investing. Index movement and stock price fluctuations provide an opportunity for investors to gain a considerable profit, but these fluctuations also bring a risk of loss for investors. Therefore, investing in

stocks is considered a high-risk business.

When making investment decisions, an investor requires a variety of resources. One of them is the company's financial statement. This means that the company's accounting information plays an important role for investors in making decisions. In addition, the company's financial statement tends

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to be easy to obtain and have been audited based on the applicable standards so that the correctness of the data presented is trustworthy.

The disclosure practices in Indonesia are quite diverse, for example, the diversity in annual reports published by companies listed on the Indonesia Stock Exchange (IDX). Some companies not only publish financial statements, but also non-financial statements. However, there are some companies that only deliver their financial statements in their annual reports. The diversity of the company's disclosure practices can have an impact on the investment decisions made by investors.

When an individual considers making decisions, he will start from the initial belief and then revise it. Weakening or strengthening the belief depends on the order of the audit evidence obtained by the investors. In general, when considering revising the belief, the attention is not on the essence or substance of the evidence, but on the order of the evidence. Research conducted by Pinsker (2007) shows that when a set of short series of information is consistently positive or negative, expressed sequentially, compared to simultaneous disclosure, the belief revision in the stock price decisions is significantly greater in the sequential condition.

This study is based on the concept of belief-adjustment theory proposed by Hogarth and Einhorn (1992). This model shows the behavior of individual reaction to the order and timing of two different information types. This theory predicts that when two existing information types have different content (mixed information: good news - bad news (+/-)) and are presented sequentially, the individual tends to do a revision of the initial belief of a decision. Hogarth and Einhorn (1992) found that in certain circumstances, an individual tends to weight the current information which is more important than the previous information, or in other words there is recentness effect.

Recentness effect makes a person tend to take biased decisions because his decisions are based on the recent information received, and not on the substance of the information itself. While in terms of knowledge, a person will tend to use his knowledge to take decisions and not to consider the knowledge that is actually required (Alvia 2009).

The pattern of presenting information examined in this study is end-of-sequence (EOS). End-of -sequence (EoS) is the pattern of presenting information based on the overall and complex information obtained at that time (for example: complete annual report which not only contains financial statements but also non-financial statements).

This study seeks to provide evidence that EOS pattern in presenting information can be used as a method to mitigate or reduce the order effects on investment decision making. Therefore, the researchers are interested in further examining the topic. Thus, this study is related to the mitigation of the order effect on investment decision making.

2. THEORETICAL FRAMEWORK AND HYPOTHESIS

Belief-Adjustment Model

Hogarth and Einhorn (1992) developed a belief adjustment model comprehensively that explained how the information is interpreted and processed. Processing information sequentially requires the process of adjustment. This model shows the reactions of individual behavior based on the order and timing of two different information types.

This theory predicts that there are no order effect for consistent evidence (overall positive or overall negative), but the recentness effect (sequence) occurs when individuals obtain evidence that have different content (mixed information), that is, good news and bad news, and is presented in sequence. For that reason, the individuals tend to revise the initial belief of a decision.

Different effects in belief revision are caused by the differences in the type of order and the time of presenting evidence. The different effects are recentness effect, primacy effect, and no-order effect. Recentness effect and primacy effect are applied to the mixed evidence (positive and negative) while no-order effect is applied to the consistent evidence (entirely positive/negative).

Belief adjustment model developed by Hogarth and Einhorn (1992) provides evidence that under certain circumstances people tend to weight that the recent information is more important than the previous information, or in other words there is recentness effect. The recentness effect causes a person to make biased decisions because the decisions are based on the recent information received, and not on the substance of the information itself.

Recentness effect occurs when the recent evidence gets more consideration than the initial evidence. Meanwhile, primacy effect is predicted for the end-of-sequence (EOS) pattern (simultaneously) in conjunction with a short series and simple evidence. Primacy effect occurs when the initial evidence is considered more important than the recent evidence. This means that the EOS pattern can be a method to mitigate or reduce the order effect or recentness effect. Components in the belief adjustment model developed by Hogarth and Einhorn

(1992) are as follows:

1. Sequential Process. Hogarth and Einhorn (1992) argued that belief adjustment is, in reality, a common activity done by humans. Sequential process is the assumptions underlying the belief-adjustment model.
2. Task Variables. Belief-adjustment model considers three variables, namely: complexity of the task, length of the series of evidence, and the pattern of presenting information.
 - a. Complexity of the task is the decline in the familiarity task function.
 - b. The length of the series of evidence item indicates the number of evidence items which shall be evaluated. The task that evaluates the evidence from two to twelve evidence items is called a short series of evidence. But if there are more than seven-teen evidence items, it is classified as a long series of evidence. This study is using a long series of evidence or information consisting of up to eight-teen evidence or information items.
 - c. The pattern of presenting information is the procedure of how the evidence will be evaluated. There are three patterns of presenting information introduced in the belief-adjustment theory: step-by-step (SBS) or sequential presentation patterns, end-of-sequence (EOS) or simultaneous presentation pattern, and self-review Debiaser (SRD).

The presentation of information on belief-adjustment model consists of three patterns, namely step-by-step (SBS), end-of-sequence (EOS), and the self-review debiaser (SRD). Step-by-step (SBS) is the pattern of presenting information in stages/sequentially when investors are doing stocks trade transaction based on simple or complex information. End-of-sequence (EOS) is the pattern of presenting information simultaneously/in overall obtained at that moment when investors are doing stocks trade transaction based on simple or complex information. Self-review Debiaser (SRD) is a combination of step-by-step pattern and end-of-sequence pattern. Self-review-debiaser pattern is the pattern of presenting information when investors review overall information acquired in making investment decisions. Investors will be given information in sequence (step-by-step) and immediately give judgment after the information is received. Furthermore, investors will be given the opportunity to review the information received previously which was given in overall (end-of-sequence) and give judgment (assessment of share price) after the whole of the information is received.

Primacy Effect and Recentness Effect

Belief--adjustment model classifies two possible order effects on the combined evidence, namely: recency effect and primacy effect. Recency effect occurs when the final evidence received is more considered than the first (initial) evidence received. Primacy effect occurs when the first (initial) evidence is considered more important than the recent evidence.

The prediction of recency effect or primacy effect depends on the properties of the task variables. According to Hogarth and Einhorn (1992), primacy effect is predicted for the end-of-sequence pattern (simultaneously) in conjunction with a short series and simple evidence. Meanwhile, recency effect is predicted for the step-by-step pattern (sequentially) in conjunction with a short series and simple evidence.

No-order effect is indicated to occur on consistent evidence (Ashton and Ashton, 1988 and Hogarth and Einhorn, 1992). Consistent evidence consists of the evidence of the same sign, that is, good news (positive evidence) followed by good news, or bad news (negative evidence) followed by bad news. No-order effect occurs if the sequence of the first negative evidence which is followed by the second negative evidence has the same effect on belief revision if the sequence of the second negative evidence is followed by the first negative evidence, and vice versa. Here is the description of the prediction of the order effect on the model developed by Hogarth and Einhorn (1992).

Table 1 shows that when end-of-sequence (EOS) pattern and a set of long mixed information (with the sequence -- ++ and ++ --), the prediction of order effect occurring is primacy effect.

This study seeks to provide evidence that EOS presentation pattern can be used as a method to mitigate or reduce the effect of the order in making investment decisions. According to Indonesian Dictionary, mitigation is defined as an effort aimed at reducing the impact of an act or acts. Belief adjustment model, with step-by-step (SBS) information presentation pattern, states that an individual will revise his belief after receiving new information. The belief adjustment model is expressed to the step-by-step pattern of presenting a short series and simple evidence item, and then the recency effect is predicted to occur.

Recency effect occurs when the recent evidence is more considered than the initial evidence. Meanwhile, primacy effect is predicted for the end-of-sequence pattern (simultaneously) in conjunction with a short series and simple evidence item.

Table 1
Expectation of Order Effect Based on Belief Adjustment Model

	Simple		Complex	
	End of Sequence*	Step by Step	End of Sequence	Step by Step
Mixed Information Set				
Short	Primacy	Recentness	Recentness	Recentness
Long*	Primacy*	Primacy	Primacy	Primacy
Consistent Information Set				
Short	Primacy	No Effect	No Effect	No Effect
Long	Primacy	Primacy	Primacy	Primacy

Source: Hogarth and Einhorn.

(*) is the focus of the research.

Primacy effect occurs when the previous or initial evidence is considered more important than the recent evidence.

Based on the above theories and experiment designs used in this study, it can be formulated the following hypotheses:

H1: There is a difference in investment decisions between the participants who obtain good news followed by bad news and the participants who obtain bad news followed by good news on end-of-sequence pattern and long series of evidence.

Early research suggests that when a set of short series of information is consistently positive or negative, expressed sequentially, compared to simultaneous disclosure, the belief revision in the decision of stock price is significantly greater in the sequential condition.

Results of the research conducted by Almilia and Supriyadi (2013) and Almilia et al (2013) show that there are differences in investment decisions between participants who receive the sequence of information: good news followed by bad news compared to participants who receive the sequence of information: bad news followed by good news on step-by-step pattern of presenting information. The results also show that there is no difference in investment decisions between participants who receive the sequence of information: good news followed by bad news, compared to participants who receive the sequence of information: bad news followed by good news on end-of-sequence pattern of presenting information. From the description above, it can be made the framework as presented in Figure 1.

3. RESEARCH METHOD

Experiment Design

Based on the type of the study according to the characteristics of the problem, this study is classified in experimental research. Experimental research is a research design to investigate a phenomenon by means of engineering the state or condi-

tion through certain procedures and then observe the engineered results and interpret them (Nahartyo 2012). This method is chosen because experimental method has the power to demonstrate a causal relationship between research variables. This experimental research design is 1x1x2, that is, end-of-sequence (EOS) pattern, length of the series of information, and sequence of evidence (++ -- or -- ++).

The variables used in this study are independent variables (consisting of end of sequence pattern, sequence of evidence, and length of the series of information) and dependent variable (consisting of investment decision). The participants in this research are divided into two groups, Scenario A and Scenario B, in which they will assess the stock price in accordance with the procedures of filling up the instrument.

Tasks and Procedures

This research is a Pencil-Based Experiment. It is an experiment conducted using the instrument or questionnaire answered by participants manually. The scenarios in this study are:

1. Scenario A. In this scenario, the end-of-sequence pattern is long series information with a sequence of evidence ++ -- (good news followed by bad news).
2. Scenario B. In this scenario, the end-of-sequence pattern is long series information with a sequence of evidence -- ++ (bad news followed by good news).

The next step is to test the results of investment decisions in scenarios A and B with a different test. The design of this experimental research is 1x1x2, that is, end-of-sequence pattern, long series of information, and sequence of evidence (++ -- or -- ++). The participants in this study implement one of the two scenarios of randomized experimental study, where:

1. The participants receive information with end of sequence (EOS) pattern ++ -- (good news fol-

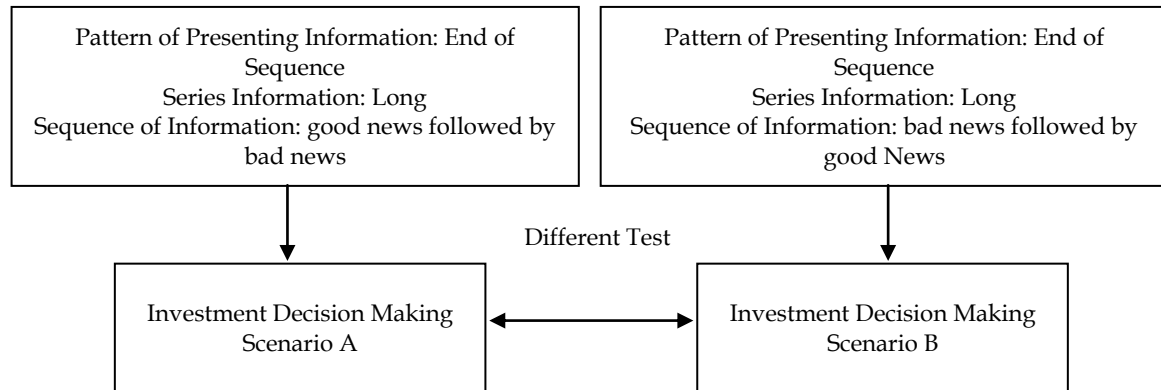


Figure 1
Theoretical Framework

lowed by bad news).

2. The participants receive information with end of sequence (EOS) pattern -- ++ (bad news followed by good news).

The task of the participants is to assess the company's shares of PT. GAP which is a company as hypothesis or conjecture but taken from the example of companies listed on the Indonesian Stock Exchange (IDX). The task in the experiment also asks the participants to answer multiple choice questions related to the ability in the field of investment and capital markets and financial statement analysis.

At the initial stage, the participants receive information about the background of the company and the initial value of the company's shares determined by IDR 6,750.00 as the reference value. The participants are asked to re-assess the value of the investment for the type of accounting information and end of sequence (EOS) presentation pattern with the initial value of the company's shares of IDR 6,750.00 and provide scale for each of the disclosures in the multiple price -500 (very bad news) and +500 (very good news). After reading and giving an assessment of the disclosure items, the subject performs manipulation check and answers general questions to measure the basic capabilities of the participants in the field of financial statements analysis and capital markets. The procedure to be made by the subject in the instrument assignment is based on end of sequence (EOS) presentation pattern and can be seen in Table 2.

The company background information which is given to the two groups of participants in this study is the same:

"PT. GAP is a manufacturer of various food and beverages based in Jakarta Indonesia. The company was founded on August 14, 1990 by Sudono Salim under the name of PT GAR. On February 5, 1994, it changed the name to PT

GAP and started IPO in 2014 with 763 shares, listed on the Indonesian Stock Exchange. The initial value of the company's shares in 2014 was IDR 6,750.00 as the reference value. The company exports its food materials to Australia, Asia, and Europe."

This study used 18 types of information taken from the company's financial statements, which were grouped into nine (9) types of information that have a direction of positive evidence, and nine (9) types of information that have a direction of negative evidence as follows:

1. The value of total assets increased compared to the previous period.
2. The company's total earnings retained increased compared to the previous period.
3. The value of the company's sales increased compared to the previous period.
4. The company's total equity increased compared to the previous period.
5. Total cash and cash equivalents increased compared to the previous period.
6. The company supplies increased compared to the previous period.
7. The company's ROE increased compared to the previous period.
8. The company's ROA increased compared to the previous period.
9. The value of company's dividend increase compared to the previous period.
10. The value of company's total assets decreased compared to the previous period.
11. The company's total earnings retained decreased compared to the previous period.
12. The company's sales value decreased compared to the previous period.
13. The company's total equity decreased compared to the previous period.
14. The company's total cash and cash equivalents decreased compared to the previous period.

Table 2
Procedures Performed by the Subject Based on the Pattern of Presenting Information

No.	End of Sequence Pattern of Presenting Information
1	Reading the company background.
2	Given the information related to initial value of the company's share price (using the share value of IDR 6,750.00
3	Given the information related to the disclosure of financial statements (18 items, consisting of 9 types of good information and 9 types of bad information).
4	Re-assessing the share value when the participants receive the financial statements.
5	The participants are asked to do manipulation check and answer general question to measure their basic capabilities in the field of financial statement analysis and share market.
6	Debriefing session

Table3
End of Sequence ++-- compared to End of Sequence --++ Long Series Information

Presentation Pattern	Sequence of Evidence	Mean	Sig. 2-tailed
End of sequence	++--	6727.273	0.104
End of sequence	--++	6990	

15. The company's inventory value decreased compared to the previous period.
16. The company's ROE decreased compared to the previous period.
17. The company's ROA decreased compared to the previous period.
18. The value of the company's dividend decreased compared to the previous period.

Research Variables

The independent variables are end-of-sequence pattern, sequence of Evidence, and long series information) while the dependent variable is investment decision.

Data Analysis Technique

The data were analyzed analysis using Different Normality Test to test the hypothesis. Normality test aims to test whether in the regression model, the dependent variable and independent variables have a normal distribution or not.

The parametric sample t-test was done after testing the data using normality test. If the data are not normally distributed, the test is done using non-parametric mann-whitney. T-test is used to compare the two groups that are not related to one another.

The condition used for the sample t-test is that if the significance level < 0.05 , the hypothesis is rejected. Conversely, if the significance level ≥ 0.05 , the hypothesis is accepted. On the other hand, Mann-Whitney test was used to determine the median differences in the two independent groups when the data scale of the dependent variable is ordinal or interval or ratio but not distributed normally.

4. DATA ANALYSIS AND DISCUSSION

Demographic Data and Manipulation Check

Criteria for the subjects in this study are: 1) having knowledge in the field of financial statements analysis and or investment and capital markets; 2) registered as the students majoring in Accounting and/or Management (Bachelor Program) who are taking and/or have taken the course of financial statements analysis and/or capital markets investment management.

The subjects willing to be the participants were 50 participants, consisting of 42 students (Bachelor Program) majoring in Accounting and 8 students (Bachelor Program) majoring in Management. The difference in the number of participants between accounting students and management students is not a deliberation because the selection of participants is based volunteerism, openness, confidentiality, and equality of treatment regardless the GPA and the academic achievement of the participants. Thus, the accounting students and/or management students (Bachelor Program) who are taking and/or have taken a course of capital markets investment management and/or financial statements analysis are allowed to participate in this experiment.

All the participants have to fill in the research instrument at the place and time that have been notified through the invitation circulated, that is, in Room D305 STIE Perbanas Surabaya, at 01:00 pm till finish. Total subjects that can be analyzed and pass the manipulation check are 47 participants.

The Effect of Pattern of Presenting Information and Long Series Information on Investment Decision Making

This study examines the effect-end of sequence

pattern of presenting information and long series of information on the investment decision. Data analysis techniques used in this research are normality test and different test of Mann Whitney.

The result of normality test for end of sequence pattern to all participants showed that the data were not normally distributed (sig. A < 0.05), then the data were tested using Different Test of Mann Whitney. The results are as shown in Table 3.

Table 3 presents the results of different test of Mann Whitney for end of sequence pattern for all participants. The hypothesis of this study is that there are differences in participants who receive the information with the sequence pattern ++-- compared to participants who received the information with the sequence pattern --++ on end of sequence pattern and long series information in making investment decisions.

The Mann Whitney different test was done to determine whether there is or there is no significant difference between scenario A and scenario B. The average data for the two groups (Table 3) prove that the average final judgment of the group the subjects who receive the sequence of information ++ -- is 6727.273, lower than the group of subjects who receive the sequence of information --++ of 6990 for accounting information.

The result of different test of Mann-Whitney on EOS presentation pattern for the participants of students' p is 0.104, for all participants of both scenarios A and B. This means that there is no significant difference in the average final judgment of the participants who receive information ++ -- compared to the participants who receive the information -- ++. The result of this study shows that there is no primacy effect or there is no order effect. This does not support the hypothesis of the study.

The Effect of the Pattern of Presenting Information and Long Series Information on Investment Decision Making

This study seeks to provide evidence that end of sequence pattern can be used as a method to mitigate or reduce the order effect in making investment decisions. According to Indonesian Dictionary, mitigation is an effort aimed at reducing the impact of an act or acts.

The hypothesis is to test whether there are differences in investment decision between participants who obtain good news followed by bad news and participants who obtain bad news followed by good news on the end of sequence pattern and long series information.

The results of the research conducted on all

participants indicate that when the information received is simple accounting information, there is no significant difference in the final judgment of the subjects who receive the sequence of information ++ -- compared to subjects who receive the sequence of information -- ++ on the end of sequence presentation pattern. The test result of Mann-Whitney test shows a significance level of 0.104, which means that there is no significant difference. This means that, in this study, there is no order effect. When the participants receive information on the whole, they tend to give a more objective assessment, because the participants use all the information they have received in making a final decision.

Ashton and Kennedy (2002) in their research state that there is no difference in the presentation pattern of end of sequence, which means that EOS can be an effective method for reducing the order effect in the auditor's decision.

The results of this study are consistent with the research conducted by Pinsker (2007) that the recency effect will be getting bigger on the step by step presentation pattern than on the end of sequence presentation pattern. The findings are also consistent with previous study conducted by Luciana Spica and Supriyadi (2013) that there is no difference in investment decisions between participants who receive the sequence of information on good news followed by bad news compared to participants who receive the sequence of information on bad news followed by good news for the end of sequence presentation pattern.

The research conducted by Liza Alvia and Dedhy Sulistiawan (2009) shows that there is recency effects in making stock investment decisions when the accounting information and non-accounting information containing good news and bad news (mixed information are presented sequentially. The results of the research conducted by Liza Alvia and Dedhy Sulistiawan (2009) show that by using the model of Hogarth and Einhorn (1992) there is recency effect occurring in the weighting of the information presented in sequence based on the type and nature of the information. This study shows the difference in technical analysis-based decision analysis between the group that gets the knowledge and the group that does not get the knowledge. But there is no difference in decision on the group that does not gain knowledge.

The results of this study indicate that the prediction of belief revision of Hogarth and Einhorn (1992) is not supported in this study, in which this study fails to provide the support that end of se-

quence presentation pattern will lead to primacy effect and recentness effect when receiving simple information

Based on the explanation above, the results of this study provide evidence that the end of sequence presentation pattern can be used as a method that can reduce the order effect in making investment decisions.

5. CONCLUSION, IMPLICATION, SUGGESTION, AND LIMITATIONS

In relation to the belief-adjustment model in making investment decisions, the researchers can conclude that there is no significant differences in the participants who obtain good news followed by bad news compared to the participants obtain bad news followed by good news. Besides that, there is no order-effect in making investment decisions.

In addition, the findings of this study indicate no difference in scenario A and scenario B of the end of sequence presentation pattern for long information. If the end of sequence pattern is simple, there is no order effect. Also, there is no biased judgment if the information presented is simple. It shows that end of sequence presentation pattern can be used as a method to mitigate or reduce the order effect. At the time the participants receive information on the whole, the participants will give a more objective assessment because the participants use all the information they have received either ++-- or --++ in making decisions. It indicates that the predictions of belief revision model of Hogarth and Einhorn (1992) are not supported in this study, in which this study fails to provide the support that end of sequence presentation pattern will lead to primacy effect and recentness effect when it receives a simple information.

This study has several limitations. First, when looking for participants, the schedule of experiment is in clash with the schedule of campus activities so that the researchers should seek other participants as the replacement who could follow the experimental assignment according to the schedule. Second, interaction between participants is un-

avoidable, although in every session of instruments completion, they are always reminded by a guide not to interact between participants. Third, some participants come late and cannot follow the assignment experiment.

Based on the existing conclusion and limitations, the advice that can be put forward for further research are: first, preparing backup participants in case of any cancelation, second, creating more conducive and quiet atmosphere so that the participants concentrate when completing the questionnaire, third, to call the participants to arrive on time.

It implies that the whole information obtained by the investor can reduce the biases related to the order effect of information. It means that complete and thorough information in the company's annual report can reduce the bias in investment decision.

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