Belief Adjustment Model with self-review debiaser presentation patterns on investment decision making

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Abstract

This study aims to examine and find out the influence of related variables, namely evidence sequence (good news followed by bad news and bad news followed by good news) and information series (long and short information) on the self-review debiaser presentation pattern based on accounting information for investment decision making. The experimental design used in this study is a 2 x 2 mixed design factorial experimental design (between subject and within subject) that manipulates the independent variable evidence sequence (good news followed by bad news and bad news followed by good news) and information series (long and short) on the Self-review debiaser presentation pattern. Participants in this study were 124 S1 Accounting Students of STIE Perbanas Surabaya. This study used the normality test and the Mann Whitney Test. The overall results of the hypothesis are partially held. The results of this study indicate that the self-review debiaser presentation pattern is proven to reduce the effect of sequences on long information series. However, self-review debiaser presentation pattern has proven unable to reduce the effect of sequence or no order effet on short information series.

Abstrak

Penelitian ini bertujuan menguji dan mengetahui pengaruh variabel terkait yaitu urutan bukti (good news *diikuti* bad news *dan* bad news *diikuti* good news) *dan rangkaian informasi (informasi panjang dan pendek) terhadap pola penyajian* self-review debiaser. *Berdasarkan informasi akuntansi untuk pengambilan keputusan investasi. Rancangan percobaan yang digunakan dalam penelitian ini adalah rancangan percobaan faktorial 2 x 2* mixed design *(antara subjek dan dalam subjek) yang memanipulasi urutan bukti variabel independen* (good news *diikuti* bad news *dan* bad news *diikuti* good news) *dan rangkaian informasi (panjang dan pendek) pada pola presentasi* self-review debiaser. *Partisipan dalam penelitian ini adalah 124 Mahasiswa S1 Akuntansi STIE Perbanas Surabaya. Penelitian ini menggunakan uji normalitas dan uji Mann Whitney. Hasil keseluruhan hipotesis dipegang sebagian. Hasil penelitian ini menunjukkan bahwa pola penyajian self review debiaser terbukti dapat mengurangi pengaruh urutan pada rangkaian informasi yang panjang. Namun demikian, pola penyajian* self-review debiaser *terbukti tidak mampu mengurangi pengaruh* sequence *atau* no order effet *pada rangkaian informasi pendek.*

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1. Introduction

A rapidly developing era makes it easy for people to invest. Investment is a capital that is invested in a company in order to get profits for the company. The current phenomenon that occurs in Indonesia is the rapid development of investment because it is in a favorable condition so that it becomes a good condition for investors to invest, especially in stock market investment. The Indonesia Stock Exchange (IDX) reports positive growth on the number of investors in the Indonesian capital market (Movanita, 2019). Accounting and non-accounting information are several types of information that investors need. Accounting information can be in the form of a company's financial statements while non-accounting information can be in the form of corporate social responsibility (CSR) and corporate governance. Rokhayati Nahartyo, & Haryono (2019) suggest that investor make greater investment on company that focus CSR disclosure, particulary on a prevention focus. However, the researchers now only focus on accounting information. Information is an important notification before an investor makes an investment decision. An investor will consider many things in investing in a company and it depends on the information presentation obtained and interpreted in a decision or that is called an investment decision. Investors can assess the performance of a company through financial reports that have been listed on the IDX where the number of companies listed to publish financial statements increases significantly each year. This is because companies listed on the Indonesia Stock Exchange must comply with Announcement No: SE-00004/ BEI/ 08-2011 dated August 5, 2011 concerning Adjustment of Deadline for Submission of Interim Financial Statements and Audited Financial Statements. Publishing reports in a timely manner can make it easier for investors to get the information they need.

The belief adjustment model develop by Hogarth & Einhorn (1992) explains the two main aspects that Bayes Theorem ignore but these aspects still need to be considered, namely: presentation pattern and evidence sequence. The belief adjustment model explains how information is interpreted and processed. The information presentation pattern consists of Step by Step (SbS), End of Sequence (EoS), and Self-review Debiaser (SrD). The presentation pattern applied in this study is the self review debiaser presentation pattern. SrD presentation pattern is the information presentation pattern that is present when investors carry out a review of all information obtained in investment decision making. This study also discusses evidence sequence and information series. The evidence sequence consists of good news followed by bad news and bad news followed by good news. There are two types of evidence; the first is positive evidence (good news). This evidence is stated to be good information from the company (for example: increase in profits), secondly, negative evidence (bad news). This evidence is stated to be information that is not good from the company (for example: decrease in company performance). Providing information for evidence to be evaluated is the definition of the information series (Rofiyah & Almilia, 2017). In this study, the long information series is composed of e"17 information and the short information series is d"12 information used. This study examines whether examining the presentation pattern of self-review debiaser in making investment decisions can reduce the effect of sequences on long and short information series.

2. Hypotheses Development

The Belief Adjustment Model discusses decision making (Hogarth & Einhorn, 1992). Belief adjusment models discusses decision making that assumes that individuals who have limited memory capacity and ability to process information in order tend to change their beliefs/decisions because they receive new information. Belief adjustment of this model also has an important role in Bayes' Theo-

rem who states that there are three characteristics, namely: type, strength, and direction. The direction of the evidence shows that there is none or no support for an individual's current beliefs. The second characteristic is the level or strength of evidence that can be supported or not supported by the current beliefs. Finally, the type of evidence that can be classified as permanent and mixed evidence. This study uses consistent evidence that is accounting information only. Consistent evidence is an evidence that only shows accounting information. Accounting information is the information obtained from the company's financial statements.

According to Hogarth & Einhorn (1992), there are different effects in the revision of beliefs that are based on different types, order and time of evidence presentation. Some of the different effects are recency effects, primacy effects, and no order effects. Primacy effect is an effect that takes place when an individual gives more weight to the combined positive and negative information obtained at the beginning, compared to the information obtained at the end. Meanwhile, the recency effect takes place when inviduals give more weight to the combined positive and negative information obtained at the end, compared to the information obtained at the beginning. In contrast to the no order effect, it takes place when individuals are not affected by the evidence sequence because the information is single. The consistent evidence of no order effect can be applied if the recency effect can be applied to mixed evidence. Research conducted by Ashton & Kennedy (2002) provides evidence that the Self-review Debiaser (SrD) method is not affected by the influence of evidence sequence. Thus, it can be indicated that the self-review debiaser presentation pattern is the most effective method in reducing the recency effect.

Mita & Almilia (2019) examine whether there is a different judgment between the investor who receives good news followed by bad news and the one who receies bad news followed by good news

information order in step-by-step and the end-of-sequence disclosure pattern by using financial information type and non financial information type and overconfidence characteristics on investment decioan making. The results in this research are not consistent with Belief Adjustment Model Theory (Hogarth & Einhorn, 1992). Belief Adjustment Model proposed by Hogarth & Einhorn (1992) predicts that by using long series information, simple information and both by using the step-by-step information disclosure pattern and the end of sequence information disclosure pattern, the primacy effect exists.

Fuzzy trace theory states that memory can be well understood if we consider two types of memory representations: (1) verbatim memory traces and (2) gist. Verbatim memory traces consist of precise details about information, while gist refers to the core idea of information. The theory of probabilistic mental models explains that if a person is faced with two options, a person will form local mental models based on his long-term memory, and will be used to compare each problem with basic logic operations and mental accounting focusing on how one should respond and evaluate a situation when there are two or more possible outcomes, specifically how to combine these possible outcomes, in evaluating a choice that has many attributes, then people usually develop a mental calculation by detailing the advantages and disadvantages of these alternatives when compared to a refrens. In this case the basic logic possessed by someone is a factor that influences someone in making a decision.

Hadi, Almilia, & Nita (2019) show that belief adjustment model, fuzzy trace theory and probabilistic mental theory are partially hold in investment decision making. Latief (2017) shows different results from belief-adjustment model by Hogarth & Einhorn (1992) predicting that primacy effect occurs on all experimental conditions over long series of information. In this study, however, the results obtained are the recency effect and there is no order effect (taking into account that framing influences

individual decisions). On the other hand, the results of this study support the prospect theory, probabilistic mental model, and fuzzy trace theory where the results show that the framing of information gives influence to individual decision making that causes differences in decisions taken by the individual concerned. Hanafi (2017) show that the decision among the participants who receive information in the sequence of good news followed by bad news and bad news followed by good news in the step-by-step presentation pattern with the condition of framing effects according to information is different. Haryanto (2018) prove that the auditor makes an audit judgment that is affected by framing factors and there is a polarization of individual-group decisions in making audit judgment. Also when the auditor changes the audit beliefs, it will be influenced by the evidence sequence and the polarization of individual-group decisions will occur due to the interaction with the evidence sequence. The results of this study support prospect theory and belief adjustment model theory. Almilia, Dewi, & Wulanditya (2019) indicate that the effect of visualization in decision making is influential only when the decision makers receive assignments with low assignment complexity, whereas the effects of assignment complexity affect decision making both as measured by accuracy, belief, and calibration levels. Almilia, Wulanditya, & Nita (2018) examine the influence of the investment decision frame and Belief-adjustment Model on investment decision making. The results show that no different responses are found between participants who receive accounting information (financial decision frames) and participants who receive non-accounting information (expressive decision frames) in the end-of-sequence presentation pattern. However, when participants are given accounting information compared to participants who are given non-accounting information in a step-by-step presentation pattern, there is a difference in response. Rofiyah & Almilia (2017) and Nisa (2017) show that there is a sequence effect on the step-by-step presentation pattern for long and short information series. This is also reflected in the end of sequence which shows that no sequence effect occurs in the long series, but there is a sequence effect that occurs in the short series. Ayuananda & Utami (2015) show that there is a recency effect on SPI decisions when information is provided in a sequential pattern and there is a review effect in the form of a chart on audit decision making. Hellman, Yeow, & Mello (2017) examine the effect of textual and graphical presentation sequences on the assessment of non-professional investors. Adopting an experimental approach and drawing on a Belief Adjustment Model, this study captures whether the novelty effect is valid and whether this effect can be moderated by the inclusion of graphs. In addition, this study uses eye tracking to provide new insights into the processes used by individuals to assess financial information and form valuations. The results show that non-professional investors are vulnerable to the effects of novelty because of the strategic presentation sequence of narrative information. Non-professional investors give lower performance ratings if negative information is presented last. The novelty effect is not reduced through the inclusion of graphics. Almilia & Wulanditya (2016) examine the influence of overconfidence and experience that can provide an increase or decrease to the effects of sequence in investment decision making. The research results show that there is consistency with the prediction that individuals with high levels of self-confidence could avoid the effects of sequence. Belief Adjustment Model developed by Hogart & Einhorn (1992) by looking at the influence of information presentation pattern, evidence sequence (step by step and end of sequence), and types of information (accounting or non accounting information) in investment decision making. The research results show that judgment bias especially the recency effect becomes greater if the information presentation pattern analyzed is made in step by step, meanwhile, if it is presented with the end-of-sequence information presentation pattern, there will be no difference. Self-review debiaser pattern

is an information presentation pattern that takes place when an investor reviews all the information obtained in making investment decisions. Previous studies provide empirical evidence that the recency effect does not occur if the information presentation pattern is end of sequence (Pinsker, 2011) and the information presentation pattern is self-review debiaser (Ashton & Kennedy, 2002). This study also extends research conducted by Ashton & Kennedy (2002) in terms of: this study uses the context of the company's stock valuation conducted by investors and examines whether self-review debiaser is a method that can be used to reduce the sequence effect bias. Based on the phenomena and previous studies, the researchers formulate the hypothesis as follows:

H_1: self-review debiaser presentation pattern in investment decision making can reduce sequence effects on long information series.

H_2: self-review debiaser presentation pattern in investment decision making can reduce sequence effects on short information series.

3. Data, Method, and Analysis

The subjects in this study were the undergraduate (S1) accounting students of STIE Perbanas Surabaya who had taken or were taking courses in Financial Statement Analysis and Investment and Capital Market Management. Treatment in this study was based on evidence sequence (++— and —++) and information series (long and short). There were a total of 124 participants and all of them passed the manipulation check and general questions. All of the 124 participants could be categorized as follows: 62 participants received information in the evidence sequence (++— and —++) and a long information series; 62 participants received information in the evidence sequence (++— and —++) and short information series. This research is an experimental research with the causality of two/more variables with control, manipulation and treatment from the researchers using empirical research

data in which this data are obtained based on observation or experience. Nahartyo (2012) states that an experimental research is a research design used to conduct an investigation of events by manipulating the situation through certain procedures whose results are observed and interpreted. Experimental research aims to specifically study and find out the effect of the related variables, namely the evidence sequence (good news followed by bad news and bad news followed by good news) and information series (long and short information) on the self-review debiaser presentation pattern based on accounting information for investment decision making. The "in research" experimental design used in this study was a 2 x 2 mixed design factorial experimental design (between subject and within subject) that manipulated the independent variable of the evidence sequence (good news followed by bad news and bad news followed by good news) and information series (long and short) on the Self-review Debiaser presentation pattern. Experimental research in this study was paper based, which was an experiment conducted by providing research instruments in the form of questions and then are answered by participants/research subjects manually. The general procedure carried out by participants was to assume that they (the participants) were investors who conducted an assessment of the work capabilities of a company based on the company's financial information obtained so that the investors (the participants) could analyze and make a decision related to the performance of the company. After the participant filled in the research instrument, the participant's examineed the outcome of the participants' investment decisions. The experimental design in this study was 2 x 2, namely the information evidence sequence (good news followed by bad news and bad news followed by good news) and Information Series (long and short) in the self-review debiaser presentation pattern. The participants' task was to reassess a share of PT SGI, a custom company, but the data displayed were the actual data. The researchers took the data from the

company's website and the Indonesia Stock Exchange (IDX) website. This custom company was the first State-Owned Enterprise (BUMN) that went public on the Indonesia Stock Exchange. The company was founded in 1957 in Gresik. The researchers did not get a limit to determine the custom company. So, the researchers were not bound in determining the custom company that researchers used in the experimental research.

The first phase conducted by the researchers to participants was providing information about the background and initial stock value of the company which provided the provisions as a reference that is Rp 11,500. After that, the participants were asked to provide investment decisions on each information type that was presented with a self-review debiaser presentation pattern. The participants would be given information about the initial stock price as a reference, which was Rp. 11,500. Next, participants were asked to provide a Likert scale in order to determine their willingness to invest from strongly don't want to invest (1) to strongly want to invest (7). After all the information above had been understood and responded by the participants, the participants filled out manipulation checks and questions about knowledge in the field of Investment and Capital Market Management and Financial Statement Analysis to measure the ability of the participants. The procedure that was accomplished by the participants to carry out the Self-review Debiaser (SrD) presentation pattern was: (1) Reading the background of the company; (2) The information related to the company's initial stock value (using the stock value of IDR 11.500,-) was given; (3) The information related to accounting was given, namely information on the disclosure of financial statements consisting of: (a) Long information series (18 items) namely nine good news information, nine bad news information in the information sequence of good news followed by bad news contained in scenario I, nine good news information, nine bad news information in the sequence of bad news followed by good news contained in scenario

II; (b) Short information series (six items) namely three good news information, and three bad news information for the information sequence of good news followed by bad news contained in scenario III, three good news information, and three bad news information with the information sequence of bad news followed by good news coutained in scenario IV; (4) Doing judgment for 18 times + once (for scenario I and scenario II) and six times + once (for scenario III and scenario IV); 5) Participants were asked to respond to manipulation check questions and basic accounting knowledge questions to measure the basic abilities of participants in Financial Statement Analysis and Capital Market Investment Management; 6) Debriefing Session.

Some related information would be given to participants to be able to fill out the questionnaire, namely: PT SGI that was a company in the basic and chemical industry sector was a cement industry which was founded in 1957 in Gresik. On July 8, 1991 PT. SGI received an effective statement from Bapepam-LK to carry out an Initial Public Offering (IPO) to the community of 40,000,000 with a nominal value of IDR 7,000 per share. The initial value of the company's shares in 2018 was IDR 11,500 as a reference value. This research used two information series, which were 18 long information (good news/bad news) and six short information (good news /bad news).

The dependent variable manipulated in this study was investment decisions. The independent variables that were actively manipulated were the evidence sequence (++− and −++) and the information series (long and short), while the passive independent variable was the Self-review Debiaser presentation pattern.

Behavioral research requires that research subjects must understand and interpret the manipulations they receive. If the research subek has an understanding and even adequate internalization of manipulation, then researchers can only expect the height of the effectiveness of manipulation carried

out in experimental research. This research conducts manipulation checks to ensure the success of an experimental manipulation. In addition to manipulation checks, researchers also require several criteria so that the research results are robust. The criteria for subjects that can be said to pass and be processed on an ongoing basis are as follows: (1) Subjects can answer questions correctly related to manipulation checks of at least three questions; (2) Subjects can answer correctly related to general knowledge accounting questions of at least three questions; (3) Subjects who work on and complete the tasks given in full. These criteria are used as a reference for researchers to determine whether the subject can be said to pass or not.

Data analysis techniques in this study used the normality hypothesis test. This hypothesis test aimed to determine and examine whether the data in the regression model had a normal data distribution or not. After the data were examineed, the parametric sample t-test was performed. If the data that was not normally distributed were found, the test using non-parametric mann-whiteney test was conducted. This t-test was carried out to compare two groups which had no relationship with one an-

other. The criteria used to carry out the t-test were: a) If the significance level was <0.05 then the hypothesis was accepted. This showed the variance; (b) If the significance level was > 0.05 then the hypothesis was rejected. This showed the variance.

Meanwhile, the Mann-Whiteney U test was used to determine and test the median differences of the two free groups that were not normally distributed. Hypothesis testing in this study was carried out by comparing each cell with other cells in table 1. Hypothesis testing 1 and 2 in this study could be said systematically supported if cell 1 = cell 2 and cell 3 = cell 4 which were statically significant. The results of the test would be compared using the t-test if the data were normally distributed and would be tested using mann-whitney if the data were not normally distributed.

4. Results

The criterion for the subjects in this research was having knowledge in the field of financial statement analysis and/or capital market investment. The number of subjects who were willing to become participants was 124 student participants.

Table 1. Hypothesis test cells

Information Type	Information Series	Evidence Sequence	Presentation Pattern Self-review Debiaser
Accounting (Financial Statemtn)	Long Information Series	Evidence sequence ++--	Cell 1
		Evidence sequence --++	Cell 2
	Short Information Series	Evidence sequence ++--	Cell 3
		Evidence sequence --++	Cell 4

Table 2. The data of the number of participants based on experiment scenarios

Scenario	Presentation Pattern	Information Series	Evidence Sequence	Number of Participants	Total	Note
I	Self review Debiaser	Long	++--	31	31	Mixed Design
II			--++	31	31	Mixed Design
III	Self review Debiaser	Short	++--	31	31	Mixed Design
IV			--++	31	31	Mixed Design
The number of participants				**124**	**124**	

From the total participants of 124 students, they can be further processed because they have been able to answer manipulation checks and general knowledge accounting questions with a minimum of three correct answer questions. Check manipulation to find out the assignment of experiments given has been understood and responded correctly by the participants.

Table 2 presents the information about the distribution of research subjects into four types of scenarios. In scenario I, as many as 31 participants received a self-review debiaser presentation pattern with a long series of information and an evidence sequence of good news followed by bad news (++--). In scenario II, as many as 31 participants received a self-review debiaser presentation pattern with a long information series and an evidence sequence of bad news followed by good news (−++). In sce-

nario III as many as 31 participants received a Self-review Debiaser presentation pattern with a short information series and an evidence sequence of good news followed by bad news (++--), while in scenario IV 31 participants received a self-review debiaser presentation pattern with a short information series and an evidence sequence of bad news followed by good news (−++).

Table 3 presents the participant demographic information. All participants were 62 STIE Perbanas Surabaya students consisting of 48 participants from batch 2016 and 14 participants from batch 2017. The table also presents the grade point average of the 62 participants consisting of 24 participants who had a grade point average of > 3.5 and 35 participants who had a grade point average of 3–3.5 and three participants who had a grade point average of < 3. In addition, the table above presents 17 male participants and 45 female participants.

Table 3. Participant demographic information

Demographic Data	Number of Participants	Percentage (%)
Batch:		
- 2016	48	77.42
- 2017	14	22.58
Total	62	100
Gender:		
- Male	17	27.42
- Female	45	72.58
Total	62	100
Grade Point Average:		
- ≥ 3,5	24	38.71
- 3 - 3,5	35	56.45
- ≤ 3	3	4.84
Total	62	100
Course that Had Been/Being Taken:		
- Financial Statement	25	40.32
- Capital Market Investment Management	0	0
- Financial Statement & Capital Market Investment Management	37	59.68
Total	62	100
- Investment Choices:		
- Savings and Deposits	24	38.71
- Securities	9	14.52
- Foreign Exchange	0	0
- Gold	11	17.74
- Housing / Real Estate	18	29.03
Total	62	100

Table 3 also displays the information about the courses taken by participants. Out of 62 participants, there were 25 participants who took courses in financial statement analysis and 37 participants who took courses in financial statement analysis and capital market investment management. Furthermore, there were investment choices chosen by the participants, 24 participants chose savings and de-

Table 4. The test results of the effect of information evidence sequence on information decisions in the long and short information series

Dependent Variables	Presentation Pattern	Evidence Sequence	Mean	Z	Sig	Testing Type
Panel A: The test of evidence sequence ++-- compared to --++ with step-by-step presentation pattern in long information series						
Investment Decision	Step by Step	++--	3.16	-4.535	0.000	Testing the Effect of Sequence on Decision Making
		--++	5.13			
Panel B: The test of evidence sequence ++-- compared to --++ with end-of-sequence presentation pattern in long information series						
Investment Decision	End of Sequence	++--	4.55	-0.612	0.540	Testing the Effect of Sequence on Decision Making
		--++	4.48			
Panel C: The test of evidence sequence ++-- compared to --++ with step-by-step presentation pattern in short information series						
Investment Decision	Step by Step	++--	3.26	-5.630	0.000	Testing the Effect of Sequence on Decision Making
		--++	5.65			
Panel D: The Test of Evidence Sequence ++-- compared to --++ with End-of-Sequence Presentation Pattern in Short Information Series						
Investment Decision	End of Sequence	++--	3.84	-1.875	0.061	Testing the Effect of Sequence on Decision Making
		--++	4.35			

Table 5. The average final judgement on Step-by-Step (SbS) presentation pattern in long information series

Evidence Sequence	Judgement									
	0th	1st	2nd	3rd	4th	5th	6th	7th	8th	9th
++--	4	6.5	5.9	5.9	5.6	5.8	5.7	6.4	5.8	5.0
--++	4	2.5	2.6	2.6	3.2	3.0	3.0	2.7	2.5	3.4

Evidence Sequence	Judgement								
	10th	11th	12th	13th	14th	15th	16th	17th	18th
++--	3.5	3.4	3.5	3.8	3.3	3.4	2.8	2.7	3.2
--++	5.8	5.6	5.3	4.9	5.4	5.2	5.8	5.6	5.1

posits, 9 participants chose securities, while 11 participants chose gold and 18 participants chose housing / real estate.

In the demographic information of participants obtained, it can be clearly seen that the student participants chose investment options in the form of savings and deposits. These student participants which were as non-professional investors did not yet have enough mature experience and knowledge so they were included to be risk averse. Risk averse is defined as a person who is not happy to face a risk and even tends to avoid the risk; hence the investors in this study chose savings and deposits to invest.

Testing the evidence sequence ++— compared to —++ with the step-by-step presentation pattern in the long information series

Panel A shows that the average final judgment of a group of participants with the step-by-step presentation pattern that receives the evidence sequence ++— is 3.16 lower than the group of participants that receives the evidence sequence —++ which is 5.13. Based on Table 4, the step-by-step presentation pattern shows a Z of -4.535 and a significance of 0.000 in scenario I in the evidence sequence ++— and scenario II in the evidence sequence —++. The examine results show that there are significant differences in participants who receive the evidence sequence ++— compared to the participants who receive the evidence sequence —++ because the significance value is 0,000. In this study, there is an effect on the differences of the evidence sequence in investment decision making, so that the step-by-step presentation pattern creates a recency effect. This result does not support the Hogarth & Einhorn's (1992) Belief Adjusment model which predicts the effect that will occur if the information is in long series, mixed, and in step-by-step presentation pattern is primacy effect. In this study the effect that occurs is recency effect. These test results

are also supported by Figure 1 which shows the fishtail pattern in the step-by-step presentation pattern on investment decisions made by investors.
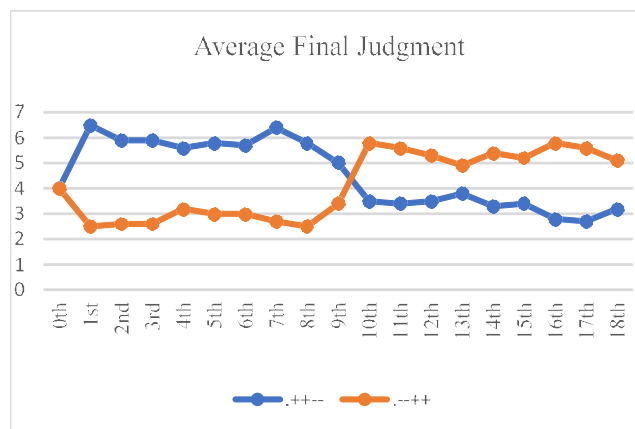

Figure 1. Fishtail pattern on the revised belief made by investors in step-by-step presentation pattern

Figure 1 shows the fishtail pattern with the X axis is the information series presented, namely the 1st to 18th. The Y-axis is the magnitude of the final decision. The results of this study are supported by a research conducted by Hanafi (2017) which states that the recency effect will occur among investors who receives the evidence sequence ++— and investors who receive —++ in the step-by-step presentation pattern. The results of this study also corroborate the research conducted by Nisa (2017) and Rofiyah & Almilia (2017), all of which indicate that there is a recency effect on investors who receive the evidence sequence ++— compared to the ones who receive —++ in the step-by-step presentation pattern. This study also corroborates the results of Ayuananda & Utami's (2015) research which shows that auditors tend to revise their beliefs when they receive information that is different and that causes recency effects. This also corroborates Pinsker's (2011) argument stating that the recency effect occurs over all conditions, namely in the step-by-step and end-of-sequence presentation patterns.

Testing the evidence sequence ++— compared to —++ with the end-of-sequence presentation pattern in the long information series

Panel B shows that the average final judgment of the participant group with the End-of-Sequence presentation pattern who receive the evidence sequence ++-- is 4.55 higher than the group of participants who receive the evidence sequence —++ which is 4.48. Based on Table 4, the end-of-sequence presentation pattern shows a Z of -0.612 and a significance of 0.540 in scenario I with the evidence sequence ++-- and scenario II with —++. This means that there is no difference between participants who receive the evidence sequence ++-- and the participants who receive the evidence sequence —++ because the significance value is 0.540. This result shows that the different evidence sequence has no effect on investment decision making when the presentation pattern is end of sequence. The results of this study are supported by the research of Nisa (2017) and Rofiyah & Almilia (2017) stating that no order effect will occur among investors who receive the evidence sequence ++— and investors who receive —++ in the end-of-sequence presentation pattern. This study also supports the research conducted by Almilia & Wulanditya (2016), Hanafi (2017) which proves that there is no sequence effect on the final investment decision among participants who receive the evidence sequence ++-- when the pattern of presentation is end of sequence.

Testing the evidence sequence ++— compared to —++ with the step-by-step presentation pattern in the short information series

Panel C presents that the average of the final judgment of the participant group with the step-by-step presentation pattern who receive the evidence sequence ++— is 3.26 lower than the group of participants who receive the evidence sequence - -++ which is 5.65. Based on Table 4, the step-by-step presentation pattern shows a Z of -5,630 and a significance of 0,000 in scenario III in the evidence sequence ++— and scenario IV in the evidence sequence —++. This means that there is a difference between participants who receive the evidence sequence ++— and the participants who receive the evidence sequence —++ because the significance value is 0,000. The research with a step-by-step presentation pattern has a recency effect. The results of this study are supported by the Belief Adjustment model of Hogarth & Einhorn (1992) which predicts that the effect that will occur when the information is in short series, mixed, and, in step-by-step presentation pattern is a recency effect. In this study the effect that arises is the recency effect. This result is supported by Figure 2 which shows fishtail pattern indicated in investment decisions made by investors.

Figure 2 shows a fishtail pattern with an X axis showing an information series presented, namely the 1st to 6th. The Y-axis is the magnitude of the final decision. The results of this study are supported by research conducted by Hanafi (2017) which shows that recency effects will occur between investors who receive ++-- and investors who receive —++ in the step-by-step presentation pattern. The results of this study also corroborate the research conducted by Nisa (2017) and Rofiyah & Almilia (2017), all of which show that the recency effect happens to investors who receive the evidence sequence ++-- compared to those who receive —++ in the step-by-step presentation pattern. This study also corroborates the reserach by Ayuananda & Utami

Table 6. The Average of final Judgement on Step-by-Step (SbS) presentation pattern in short information series

Evidence Sequence	Judgement						
	0th	1st	2nd	3rd	4th	5th	6th
++--	4	5.9	5.6	5.5	3.2	3.4	3.3
--++	4	3.3	3.1	3.1	5.6	5.5	5.6

(2015) which shows that auditors tend to revise their beliefs when they receive different information and that causes a recency effect. This also reinforces Pinsker's (2011) argument that the recency effect occurs over all conditions, namely the step-by-step and end-of-sequence presentation patterns.
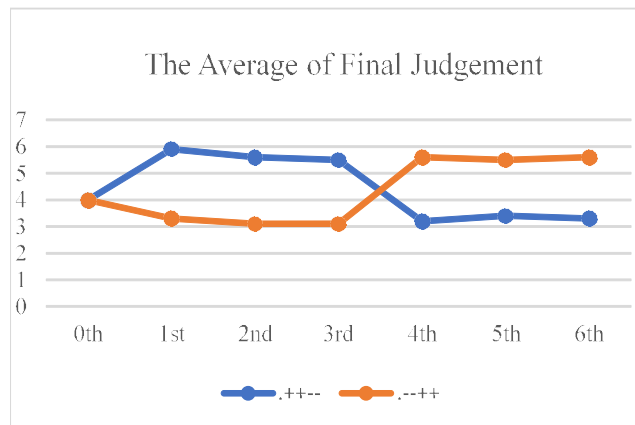

Figure 2. Fishtail pattern on revised belief made by investor in step-by-step presentation pattern

Testing the evidence sequence ++— compared to —++ with the end-of-sequence presentation pattern in the short information series

Panel D proves that the average final judgment of the participant group with the end-of-sequence presentation pattern and those who receive the evidence sequence ++— is 3.84 lower than the participant group who receive the evidence sequence —++ which is 4.35. Based on Table 4, the end-of-sequence presentation pattern shows a Z of -1,875 and a significance of 0.061 in scenario III with the evidence sequence of good news followed by bad news and scenario IV with the evidence sequence bad news followed by good news. This means that there is no difference between participants who receive the evidence sequence ++— and participants who receive the evidence sequence —++ because the significance value is 0.061. This test shows that the different evidence sequence has no effect on investment decisions when the presentation pattern is end

of sequence. The results of this study support the research conducted by Nisa (2017) and Rofiyah & Almilia (2017) stating that no order effect will occur between investors who receive the evidence sequence ++— and investors who receive —++ in the end-of-sequence presentation pattern. This study also supports the research conducted by Almilia & Wulanditya (2016), Hanafi (2017) which shows that there is no sequence effect on the final investment decision between participants who receive ++-- and participants who receive —++ when the presentation pattern is end of sequence.

Table 7 shows the test results of hypothesis 1 (H1). Panel 1 in Table 7 with the end-of-sequence presentation pattern shows a Z of -0.612 and a significance of 0.540 in scenario I in the evidence sequence ++— and scenario II in the evidence sequence —++. This means that there is no difference in participants who receive the evidence sequence ++— compared to participants who receive the evidence sequence —++ because the significance value is 0.540. Panel 2 in Table 7 with the step-by-step presentation pattern compared to the end-of-sequence and with the evidence sequence ++— shows Z of -3,939 and a significance of 0,000 in scenario I with the step-by-step and end-of-sequence presentation patterns and with the evidence sequence ++—. This means that there are significant differences between participants who receive the Step-by-Step presentation pattern and those who receive the end-of-sequence presentation pattern in the evidence sequence ++— because the significant value is 0,000. Panel 3 in Table 7 with the step-by-step (SbS) presentation pattern compared to the End-of-Sequence (EoS) with the evidence sequence —++ shows Z of -2.288 and a significance of 0.022 in scenario II with the step-by-step and end-of-sequence presentation patterns and with the evidence sequence —++. This means that there are significant differences between participants who receive the step-by-step presentation pattern and participants who receive the end-of-sequence presentation pattern with the evidence sequence —

++ because the significance value is 0.022. Panel 4 in Table 7 shows the average of final judgment of the participant group with the Step-by-Step presentation pattern who receive the evidence sequence ++— is 3.16 lower than the group of participants with the End-of-Sequence presentation pattern that receive the evidence sequence ++ — which is 4.55. Panel 5

in Table 7 shows that the average of final judgment of the participant group with the step-by-step presentation pattern that receive the evidence sequence —++ is 5.13 higher than the participant group with the end-of-sequence presentation pattern that receive the evidence sequence —++ which is 4.48.

Table 7. The testing result of hypothesis 1

Dependent Variabel	Presentation Pattern	Evidence Sequence	Z	Sig	Hypothesis Criteria	Result
Panel 1: Testing evidence sequence ++-- compared to --++ with end-of-sequence presentation pattern in long information series						
Investment Decision	End of sequence	++-- --++	-0.612	0.540	Testing the evidence sequence ++-- compared to --++ with end-of-sequence presentation pattern results in no significant differences	Fulfilled, based on a significant value of more than 0.05
Panel 2: Testing step-by-step presentation pattern compared to end-of-sequence with evidence sequence ++-- in long information series						
Investment Decision	Step by step End of sequence	++-- ++--	-3.939	0.000	Testing step-by-step presentation pattern compared to end-of-sequence one with evidence sequence ++-- results in significant differences	Fulfilled, based on a significant value of less than 0.05
Panel 3: Testing step-by-step presentation pattern compared to end-of-sequence with evidence sequence --++ in long information series						
Investment Decision	Step by step End of sequence	--++ --++	-2.288	0.022	Testing step-by-step presentation pattern compared to end-of-sequence one with evidence sequence --++ results in significant differences	Fulfilled, based on a significant value of less than 0.05
Panel 4: The average of step-by-step presentation pattern compared to end-of-sequence with evidence sequence ++-- in long information series						
Investment Decision	Step by step End of sequence	++-- ++--	3.16 4.55		The average of step-by-step presentation pattern with evidence sequence ++-- is smaller than end-of-sequence presentation pattern with evidence sequence ++--	Fulfilled based on the Mean coloumn
Panel 5 : The average of step-by-step presentation pattern compared to end-of-sequence with evidence sequence --++ in long information series						
Investment Decision	Step by step End of sequence	--++ --++	5.13 4.48		The average of step-by-step presentation pattern with evidence sequence --++ is greater than end-of-sequence presentation pattern with evidence sequence --++	Fulfilled based on the mean coloumn

Table 8 shows the test results of hypothesis 2 (H_2). Panel 1 based on Table 8, the end-of-sequence presentation pattern shows a Z of -1.875 and a significance value of 0.061 in scenario III with the evidence sequence ++− and scenario IV with the evidence sequence −++. This means that there is no difference between participants who receive the evidence sequence ++− and participants who re- ceive the evidence sequence −++ because the significance value is 0.061. Panel 2 based on table 8, the step-by-step presentation pattern compared to the end-of-sequence with the evidence sequence ++− shows a Z of -1.612 and a significant value of 0.107 in scenario III with the step-by-step presentation pattern and with the evidence sequence ++− and scenario III with the end-of-sequence presentation

Table 8. The test result of hypothesis 2

Dependent Variable	Presentation Pattern	Evidence Sequence	Z	Sig	Hypothesis Criteria	Result
Panel 1: Testing evidence sequence ++-- compared to --++ with end-of-sequence presentation pattern in short information series						
Investment Decision	End of sequence	++-- --++	-1.875	0.061	Testing evidence sequence ++-- compared to end-of-sequence presentation pattern results in no significant differences	Fulfilled, based on a significant value of more than 0.05
Panel 2: Testing step-by-step presentation pattern compared to end-of-sequence with evidence sequence ++-- in short information series						
Investment Decision	Step by step End of sequence	++-- ++--	-1.612	0.107	Testing step-by-step presentation pattern compared to end-of-sequence one with evidence sequence ++-- results in significant differences	Unfulfilled because the significant value is more than 0.05 (There is no difference)
Panel 3: Testing step-by-step presentation pattern compared to end-of-sequence with evidence sequence --++ in short information series						
Investment Decision	Step by Step End of sequence	--++ --++	-4.699	0.000	Testing step-by-step presentation pattern compared to end-of-sequence one with evidence sequence --++ results in significant differences	Fulfilled, based on a significant value of less than 0.05
Panel 4: The average of step-by-step presentation pattern compared to end-of-sequence with evidence sequence ++-- in short information series						
Investment Decision	Step by step End of sequence	**++--** **++--**	3.26 3.84		The average of step-by-step presentation pattern with evidence sequence ++-- is smaller than end-of-sequence presentation pattern	Fulfilled based on the Mean coloumn
Panel 5: The average of step-by-step presentation pattern compared to end-of-sequence with evidence sequence --++ in short information series						
Investment Decision	Step by step End of sequence	**--++** **--++**	5.65 4.35		The average of step-by-step presentation pattern with evidence sequence --++ is greater than end-of-sequence presentation pattern with evidence sequence --++	Fulfilled based on the Mean coloumn

pattern and with the evidence sequence ++−. This means that there is no difference between participants who receive the step-by-step presentation pattern and participants who receive the end-of-sequence presentation pattern in the evidence sequence ++− because the significance value is 0.107. Panel 3 based on Table 8, the step-by-step presentation pattern compared to the end-of-sequence with the evidence sequence −++ shows Z of -4.699 and a significant value of 0.000 in scenario IV with the step-by-step presentation pattern and with the evidence sequence −++ and scenario IV with the end-of-sequence presentation pattern and the evidence sequence −++. This means that there is a difference between participants who receive the step-by-step presentation pattern and participants who receive the end-of-sequence presentation pattern with the evidence sequence −++ because the significance value is 0.000. Panel 4 in Table 8 proves that the average of the final judgment of a participant group with the step-by-step presentation pattern who receives the evidene sequence ++− is 3.26 lower than the participant group who receive the end-of-sequence presentation pattern and who receive the evidence sequence ++− which is 3.84. Panel 5 in table 8 proves that the average of the final judg-

ment of the participant who receive the step-by-step presentation pattern and who receive the evidence sequence −++ is 5.65 higher than the participant group who receive the end-of-sequence presentation pattern and who receive the evidence sequence −++ which is 4.35.

Based on the established criteria to find out whether hypotheses 1 and 2 with the self-review debiaser presentation pattern can reduce the effect of sequences on investment decision making with long and short information series, the criteria and summary of the test results are presented on Table 9.

Table 9 shows that all the criteria established to support hypothesis 1 are fulfilled so that hypothesis 1 is supported, namely the hypothesis stating that the self-review debiaser pattern can reduce the effect of sequences on investment decision making with long information series. This is due to the review process of all information presented as a whole in the end-of-sequence presentation pattern after the step-by-step presentation pattern is given. The process of reviewing all this information can mitigate or reduce the effect of sequences that occur in the self-review debiaser pattern. This process also makes the average of the final decision on the step-

Table 9. The summary of hypothesis 1 and hypothesis 2 results

Criteria	H_1	Table 7	H_2	Table 8
Testing the Evidence Sequence ++-- compared to --++ with End-of-Sequence Presentation Pattern has no significant differences	Fulfilled	Panel 1	Fulfilled	Panel 1
Testing Step-by-Step Presentation Pattern compared to End-of-Sequence one with Evidence Sequence ++-- has significant differences	Fulfilled	Panel 2	Unfulfilled	Panel 2
Testing Step-by-Step Presentation Pattern compared to End-of-Sequence one with Evidence Sequence --++ has significant differences	Fulfilled	Panel 3	Fulfilled	Panel 3
The average of Step-by-Step presentation pattern with the Evidence Sequence ++-- is smaller than End-of-Sequence presentation pattern with Evidence Sequence ++--.	Fulfilled	Panel 4	Fulfilled	Panel 4
The average of Step-by-Step presentation pattern with Evidence Sequence --++ is greater than End-of-Sequence presentation pattern with Evidence Sequence --++	Fulfilled	Panel 5	Fulfilled	Panel 5

by-step presentation pattern smaller than the end-of-sequence presentation pattern when the evidence sequence is good news followed by bad news (++—), whereas conversely, the average of the final decision on the step-by-step presentation pattern will be greater than the end-of-sequence presentation pattern when the evidence sequence is bad news followed by good news (—++). Testing with self-review debiaser presentation pattern is supported by arguments stated by Ashton & Kennedy (2002) which state about effective methods for reducing sequence effects.

Table 9 also shows that all the criteria set for hypothesis 2 are partially supported so that the self-review debiaser presentation pattern cannot reduce the sequence effect on investment decision making with short information series. This is because in the second criterion there is no significant difference between the step-by-step presentation pattern and the end-of-sequence presentation pattern with the evidence sequence of good news followed by bad news (++--) and with short information series. Thus, the second criterion is not fulfilled. In the self-review debiaser presentation pattern there is a review process of all information presented as a whole in the End-of-Sequence presentation pattern after being given the step-by-step presentation pattern. The process of reviewing all this information can mitigate or reduce the effect of sequences that occur in the self-review debiaser presentation pattern. Testing with self-review debiaser presentation pattern is not supported by the arguments stated by Ashton & Kennedy (2002) which express an effective method for reducing sequence effects. In this study only some of them are supported so the self-review debiaser presentation pattern cannot reduce the sequence effect.

5. Conclusion

There are differences between participants who receive the evidence sequence of good news followed by bad news compared to participants who receive the evidence sequence of bad news followed by good news with the Step-by-Step presentation pattern in both long and short information series. There is no difference between participants who receive information in the evidence sequence of good news followed by bad news compared to participants who receive information in the evidence sequence of bad news followed by good news with the End-of-Sequence presentation pattern in both long and short series. The self-review debiaser presentation pattern has been proven to reduce the sequence effect on the long information series, whereas in the short information series the Self-review Debiaser presentation pattern has not been proven to reduce the sequence effect. This study indicate that belief revision model developed by Hogarth & Einhorn's (1992) is partially hold in investment decision making. The prediction of Hogarth & Einhorn's (1992) revised belief model which is not supported in this study is first, this study fails to provide support that the Self-review Debiaser presentation pattern will reduce the sequence effect when receiving different presentation patterns (Step by Step compared to End of Sequence) with evidence sequence (++—) and short information series. This can happen because individuals do not cognitively respond to information provided by the company having good performance being bad. Second, no order effects will only occur when the evidence is consistent, but in this study no order effects can occur when the information is mixed.

This research has several limitations that will be presented as follows: First, when looking for the participants, the research experienced a scheduling conflict due to Mid-term test that the targeted participants had to take. Therefore, a substitute participant was chosen from the participant list. Second, on the day of research experiment execution, there were some participants who suddenly could not participate in the research activities so the researchers had to find a replacement participant in a short time. In addition, there were some participants who were late so the research team agreed to wait

for the participants within the determined time limit. Third, on the day of research experiment execution, there were interactions between the participants and there were still a number of participants who opened the next sheet before the experimenters gave instructions to do so. So, in this case, the experimenter had to to reprimand those participants and further tighten supervision with the help of other committee members.

Based on the research results, conclusions, and limitations in this study, it is expected for researchers in the future to: First, look for backup participants so that it is easier to find a replacement when there are participants who suddenly cannot attend or are late. Second, pay attention to the selection of the day on which the experiment is conducted because it involves a lot of participants. Third, pay more attention to participants so that the atmosphere of the experiment is more conducive and calm so they can concentrate well when the assignment takes place. Fourth, further research can use participants who are professional investors, namely investors who have knowledge and experience.

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