

# Belief adjustment model test in investment decision making: Experimentation of short information series

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## ABSTRACT

The aim of this study is to examine the investors' different judgment by using belief adjustment model to consider the presentation pattern, the information order and the information type. This study uses experimental 2×2×2 mixed design that includes Step by Step and End of Sequence presentation patterns, information order of good news followed by bad news (++--), and bad news followed by good news (--++), and accounting and non accounting information types. The hypotheses in this study are tested using Independence Sample T-test and Mann Whitney U. The participants are the undergraduate students (Bachelor Degree) of STIE Perbanas Surabaya majoring in Accounting and Management who had knowledge on investment management and capital market or investment portfolio management and financial statements analysis. The results of this study show that recency effect occurs on Step by Step (SbS) presentation pattern and accounting and non-accounting information types. Recency effect also occurs on End of Sequence (EoS) presentation pattern and accounting information type, whereas there was no order effect on non-accounting information type.

## ABSTRAK

Tujuan penelitian ini adalah untuk menguji penilaian investor yang berbeda dengan menggunakan model penyesuaian kepercayaan untuk mempertimbangkan pola presentasi, urutan informasi dan jenis informasi. Penelitian ini menggunakan experimental 2×2×2 mixed design yang mencakup pola presentasi langkah demi langkah dan akhir urutan, urutan informasi kabar baik diikuti oleh berita buruk (++ -) dan kabar buruk diikuti oleh kabar baik (- ++), dan jenis informasi akuntansi dan non akuntansi. Hipotesis dalam penelitian ini diuji dengan uji independence sample t-test dan Mann Whitney U. Responden adalah mahasiswa S1 (Sarjana) STIE Perbanas Surabaya Jurusan Akuntansi dan Manajemen yang memiliki pengetahuan tentang manajemen investasi dan pasar modal atau manajemen portofolio investasi dan analisis laporan keuangan. Hasil penelitian ini menunjukkan bahwa recency effect terjadi pada pola presentasi step by step (SbS) dan jenis informasi akuntansi dan non akuntansi. Recency effect juga terjadi pada pola presentasi end of sequence (EoS) dan tipe informasi akuntansi, sedangkan tidak ada efek pesanan pada jenis informasi non akuntansi.

## 1. INTRODUCTION

The development of stock and investment in the stock market attract the attention of many people to invest in a company. The fluctuating index and stock allow investors to gain a considerable amount of profit. However, it cannot be neglected that high profits and fluctuations are also accompanied by a high level of risk. The major information required by investors comes from disclosures made by compa-

nies listed on the Indonesia Stock Exchange (IDX).

In analyzing the stock, therefore, an investor needs a lot of information. The investor's knowledge of the information and disclosures made by the company is necessary in making investment decisions. Generally, in the process of investment decision making, the investor considers accounting information factor. The accounting information published by a company may be in the form of fi-

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nancial statement. Some companies also publish not only financial statements but also report to shareholders, shareholder information, corporate governance, management discussion and analysis, and corporate social responsibility (CSR) implementation reports

Accounting information is information derived from financial statements published by a company, while non-accounting information is information not contained in a company's financial statements. For example, Hogarth and Einhorn (1992) developed belief adjustment model to provide an explanation of how information is interpreted and processed. The main advantage of belief adjustment model developed by Hogarth and Einhorn (1992) is that there are three main characteristics of the evidence used in Bayes' Theorem in investment decision making, namely (1) direction (2) strength (3) type. Ashton and Ashton (1988) suggest that the belief adjustment model of Hogarth and Einhorn (1992) considers two important characteristics overlooked by Bayes' Theorem: presentation order and presentation pattern. The presentation pattern used in this research is Step by Step (SbS) and End of Sequence (EoS). The Step by Step (SbS) presentation pattern is the pattern of presentation when the investor makes a gradual stock trading transaction. While the End of Sequence (EoS) presentation pattern is a pattern of presentation when the investor performs a complex stock trading and overall obtained at that time.

This study attempts to see the difference of investor's judgment by using belief adjustment model while considering (information order, presentation pattern, and information type). The research conducted by Luciana Spica and Supriyadi (2013) reveals that there is a difference in investment decision making when an individual gets information order of positive information/good news followed by negative information/bad news when using Step by Step (SbS) presentation pattern. Meanwhile, there is no difference in investment decision making when the individual gets information order of negative information/bad news followed by positive information/good news when using End of Sequence (EoS) presentation pattern. Ghosh and Wu (2012) explain that the measurement of financial and non-financial performance and profit levels have an effect on the recommendation of the investment analyst in a company. These results indicate that the gains of nonfinancial performance appear to be irrelevant when the financial performance is unfavorable. But when the measurement of financial performance is favorable, it will affect

the recommendation of the investment analyst.

Based on the above explanation and the different results of previous studies, the researchers are interested to conduct research entitled "Belief Adjustment Model Test in Investment Decision Making: Experimentation of Short Information Series".

## 2. THEORETICAL FRAMEWORK AND HYPOTHESIS

### Belief Adjustment Model

Belief adjustment model, developed by Hogarth and Einhorn (1992), considers three characteristics: direction, strength, and type. In the research conducted by Ashton and Ashton (1988), it is stated that belief adjustment model considers two important characteristics that are ignored in Bayes' Theorem, namely information order and information pattern. The belief adjustment model predicts that there is no order effect for consistent evidence (overall positive or overall negative), but order effect occurs when individuals gain mixed evidence (some negative and some positive).

The main advantage of the belief adjustment model developed by Hogarth and Einhorn (1992) has three main characteristics of the evidence used in Bayes' Theorem in investment decision making: (1) the direction of evidence, indicating whether the evidence supports (positive evidence) and does not support (negative evidence) the current belief, (2) the strength or level of evidence, indicating whether the evidence supports or does not support the current belief, (3) the type of evidence, which can be categorized as consistent and combined evidence.

Belief adjustment theory considers three task variables, namely: (1) Task complexity. It is the function of task familiarity degradation. (2) The length of the evidence series. It indicates the amount of evidence to be evaluated. The tasks that evaluate 2 up to 12 evidences are short evidence series. Meanwhile, for over 17 evidences are classified as long evidence series. (3) The pattern of information presentation. It indicates how the evidence will be evaluated. Two patterns of information presentation introduced in belief adjustment theory are: Step by Step (SbS) and End of Sequence (EoS).

The Step by Step (SbS) presentation pattern is the pattern of presentation which is conducted when the investor makes a gradual stock trading transaction, while the End of Sequence (EoS) representation pattern is a representation pattern which is conducted when the investor performs a complex stock trading and overall obtained at that time.

**Table 1**  
**Expectation of Sequence 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*		Recency*	Recency	Recency
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 (1992).

### Recency and Primacy Effect

Belief adjustment theory of Hogarth and Einhorn (1992) classifies the possibility of order effects on the combined evidence into two, namely: recency effect and primacy effect. Primacy effect occurs because of the limitations of individuals in processing the information received so that when receiving certain amount of accounting and non-accounting information, the individuals tend to consider more on the first information than the last information received. While the recency effect occurs when the last evidence is considered more than the first evidence, or simply the individual is more likely to consider the last information than the initial information received in the investment decision making.

Table 1 shows a series of mixed information order (++ -- or -- ++) with the sequences of prediction are as follows:

1. If the information series is short, the information is simple, and the information presentation is using End of Sequence pattern, there will be primacy effect.
2. If the information series is long, the information is simple, and the information presentation is using End of Sequence pattern, there will be primacy effect.
3. If the information series is short, the information is simple, and the information presentation is using Step by Step pattern, there will be recency effect.
4. If the information series is long, the information is simple, and the information presentation is using End of Sequence pattern, there will be primacy effect.
5. If the information series is short, the information is simple, and the information presentation is using Step by Step pattern, there will be recency effect.
6. If the information series is long, the information is simple, and the information presentation is using Step by Step pattern, there will be prima-

cy effect.

7. If the information series is short, the information is complex, and the information presentation is using End of Sequence pattern, there will be recency effect.
8. If the information series is long, the information is complex, and the information presentation is using End of Sequence pattern, there will be primacy effect.
9. If the information series is short, the information is complex, and the information presentation is using Step by Step pattern, there will be recency effect.
10. If the information series is long, the information is complex, and the information presentation is using Step by Step pattern, there will be primacy effect.

Table 1 also shows a series of consistent information order (++++ or ----) with the sequences of prediction are as follows:

1. If the information series is short, the information is simple, and the information presentation is using End of Sequence pattern, there will be primacy effect.
2. If the information series is long, the information is simple, and the information presentation is using End of Sequence pattern, there will be primacy effect.
3. If the series of information is short, the information is simple, and the information presentation is using Step by Step pattern, there will be no order effect.
4. If the series of information is long, the information is simple, and the information presentation is using Step by Step pattern, there will be primacy effect.
5. If the series of information is short, the information is complex, and the information presentation is using End of Sequence pattern, there will be no order effect.
6. If the series of information is long, the information is complex, and the information presenta-

tion is using End of Sequence pattern, there will be primacy effect.

7. If the information series is short, the information is complex, and the information presentation is using Step by Step pattern, there will be no order effect.
8. If series of information is long, the information is complex, and the information presentation is using Step by Step pattern, there will be primacy effect.

### No Order Effect

No order effect is predicted to occur on consistent evidence (Ashton and Ashton 1988 and Hogarth and Einhorn 1992). Consistent evidence consists of the same evidence of positive evidence followed by positive evidence (++++) or negative evidence followed by negative evidence (----). No order effect is tested in order to know that consistent evidence has no effect on the belief revision. No order effect occurs if the sequence of the first good news followed by the second good news has the same effect on the belief revision if the sequence of the second good news followed by the first good news, or vice versa. This study is using combined evidence, that is, positive evidence/good news followed by negative evidence/bad news (++--) or negative evidence/bad news followed by positive evidence/good news (--++), so no order effect testing can not be done, because no order effect can be tested for consistent evidence (++++ or ----) only.

### Framework

This study only focuses on the presentation patterns of Step by Step and End of Sequence. This belief adjustment model also has two types of information, namely short information series and long information series. Short information series is a series of accounting and non accounting information consisting of 2 - 12 information. Information presented to investors is in the form of information order of good news followed by bad news (++--) or bad news followed by good news (--++). This indicates that presentation pattern, information order, and information type will affect the final outcome of a decision. In addition, the sequence of information may also affect investors in making investment decisions.

Research conducted by Luciana Spica and Supriyadi (2013) reveals that there is a difference in investment decision making between participants who get information order of positive information/good news followed by negative information/bad news and participants who get informa-

tion order of negative information/bad news followed by positive information/good news on Step by Step (SbS) presentation pattern. Research conducted by Pinsky (2007) states that the belief revision on the stock price decision is more significant on the sequential condition (Step by Step) when a short information series is presented (positive, negative) compared to the simultaneous condition (End of Sequence). The research conducted by Luciana Spica et al. (2013) indicates that there is a reviewer effect in making an investment decision if information is presented in a sequential condition (Step by Step), whereas there is no sequential effect in making an investment decision if the information is presented simultaneously (End of Sequence).

The research conducted by Ashton and Kennedy (2002) shows that there is a reviewer effect in going concern done by the auditor if the information is presented in Step by Step. The result of this research also shows that the pattern of information and experience presentation will have an impact on the final decision result.

There are several factors that influence investment decisions. Research by Liza Alvia and Dedhy Sulistiawan (2009) aimed to see the reviewer's effect of the combined information on sequential presentation patterns. It also tried to know the effect of knowledge, from technical analysis, on investment decision making. The results of the research conducted by Liza Alvia and Dedhy Sulistiawan (2009) show that there is a contemporary or reviewer effect in making investment decisions on stocks when non-accounting information is presented in sequence, each of which contains positive and negative.

Another research by Liza Alvia and Dedhy Sulistiawan (2009) also shows that there is a difference in technical analysis-based decision between the groups that get knowledge about technical analysis and the group that do not get knowledge about technical analysis, but there is no difference in the decision of the group that do not get knowledge. Luciana Spica and Herla Kusumawardhani (2015) show that there is no final judgment difference in the step-by-step presentation pattern based on long information series. Luciana Spica Almilia and Princess Wulanditya (2016) provide evidence that individuals with high levels of trust tend to ignore the available information. Therefore the individuals with high levels of trust are avoided from the order effects.

Based on the results of previous studies, the research hypothesis can be formulated as follows:

H1: There is a difference in investment decision

between participants who get information order of good news followed by bad news (++--) and participants who get information order of bad news followed by good news (--++) on the Step by Step presentation pattern and accounting information type.

H2: There is a difference in investment decision between participants who get information order of good news followed by bad news (++--) and participants who get information order of bad news followed by good news (--++) on the Step by Step presentation pattern and accounting information type.

Pinsker (2011) indicates that there is an order effect that proves that there is an primacy effect that gives information weights at the end of the information, and the mean value of the sequential condition (Step by Step) is insignificant compared to the mean value of the simultaneous condition (End of Sequence).

Research conducted by Baird and Zellin (2000) shows that there is a primacy effect on the group of participants who get positive information at the beginning and will evaluate the past performance better than the negative information received. Ghosh and Wu (2012) say that there is no influence in the recommendations of investment analysts when the measurement of financial and non-financial performance is unprofitable, whereas the profits on non-financial performance seem irrelevant when the financial performance is unprofitable. But when the measurement of financial performance is profitable, the recommendation effect is different in the recommendation of the investment analysts.

The research conducted by Nirvana Putri and Luciana Spica (2015) shows that recency effect still occurs on the presentation pattern of End of Sequence and short information series. The results of the research conducted by Nirvana Putri and Luciana Spica (2015) show that predictions of belief model of Hogarth and Einhorn (1992) is not supported.

Based on the results of previous studies, the research hypothesis can be formulated as follows:

H3: There is a difference in investment decision between participants who get information order of good news followed by bad news (++--) and participants who get information order of bad news followed by good news (--++) on End of Sequence presentation pattern and accounting information type.

H4: There is a difference in investment decision between participants who get information order of

good news followed by bad news (++--) and participants who get information order of bad news followed by good news (--++) on End of Sequence presentation pattern and non-accounting information type.

### **3. RESEARCH METHOD**

#### **Research Design**

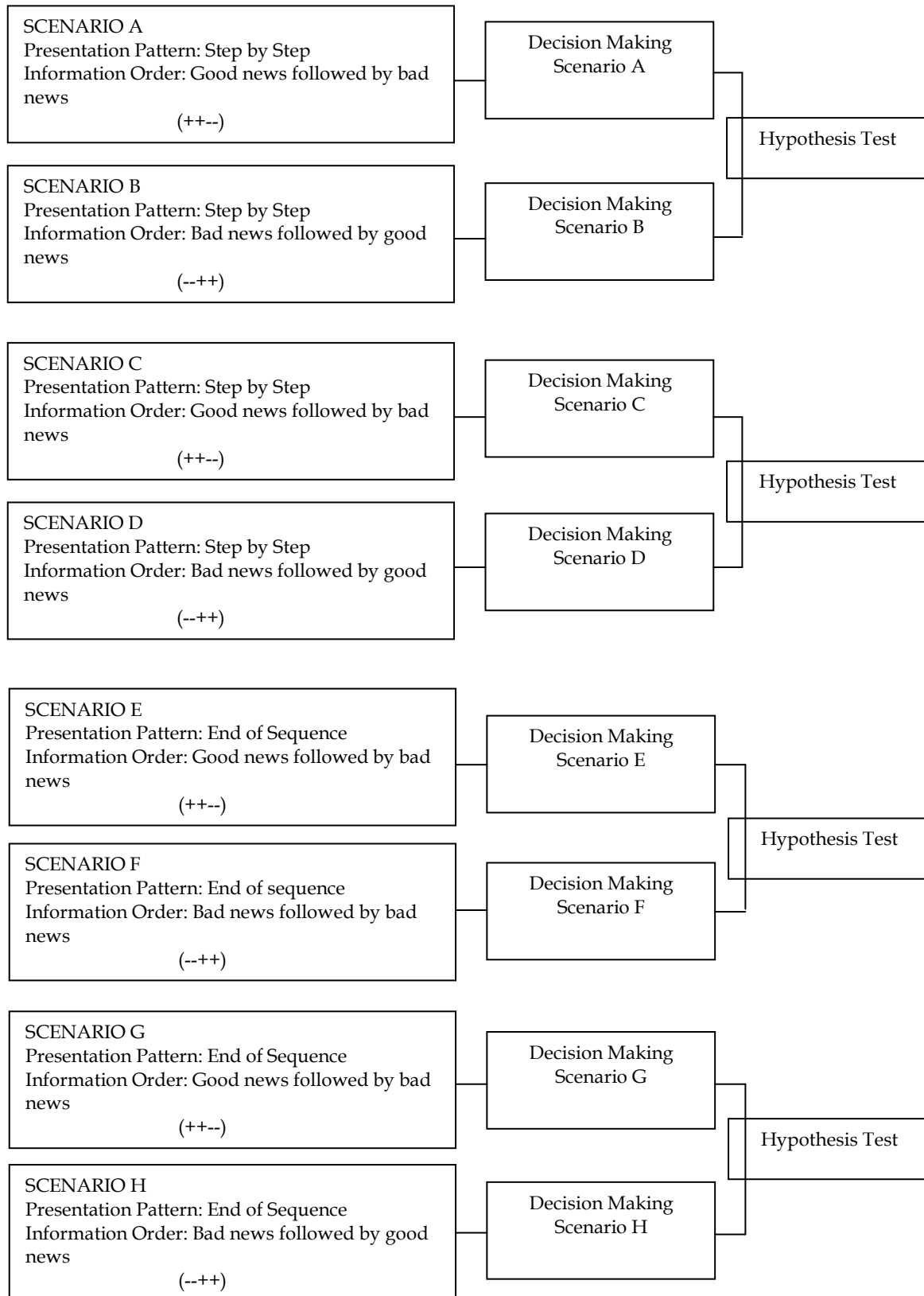
Based on the characteristics of the problem, this research uses experimental research method. Experimental research is a research design to investigate a phenomenon by way of engineering conditions through certain procedures and then observe the results of the engineering and interpret it (Ertambang 2012: 1). This research uses 2×2×2 mix design (between subject and within subject) by separating the condition into two: i.e. the participants who get Step by Step presentation pattern and the participants who get End of Sequence presentation pattern. This experimental research method is chosen because the experimental method has the power to show the causal relationship between the research variables. The experimental design of this research is 2×2×2 using the presentation pattern (SbS and EoS), the information order of positive information/good news followed by negative information/bad news (++--) and negative information/bad news followed by good news (--++), and accounting and non-accounting information type (see Figure 1).

The independent variables in this research are presentation patterns (Step by Step and End of Sequence), the information order of positive information/good news followed by negative information/bad news (++--) and the negative information/bad news followed by the positive information/good news (--++) and accounting and non-accounting information types.

#### **Operational Definition**

The operational definition of each variable in this study can be explained as follows:

- Investment decision is a commitment of fund to one or more assets in the hope of gaining substantial profits in the future. Investment decision usually has a long term so that the decision to be taken should be considered correctly.
- Step by Step (SbS) is an information presentation pattern when investors make transactions based on information presented in stages or step by step. While End of Sequence (EoS) is an information presentation pattern when investors make complex transactions and overall obtained at that time.



**Figure 1**  
**Theoretical Framework**

- The information order is positive information/good news followed by negative information/bad news (++) and negative information/bad news followed by good news (--++).
- Accounting and non-accounting information types. Accounting information type can be re-

ports published by a company that can be in the form of financial statements. While non-accounting information type can be reports to shareholders, shareholder information, corporate governance, discussion and analysis of management, and reports on the implementation of Corporate Social Responsibility (CSR).

### **Research Participants**

The participants in this research are under graduate (Bachelor Degree) students of STIE Perbanas (College of economics and business) Surabaya majoring in Accounting and Management who were taking and/or had taken the course of Financial Statement Analysis and Investment Management and Capital Market (MIPM) or Portfolio Investment Management. The reason for using students as participants in this study is based on the study of Elliot et al. (2007) indicating that advanced students have the same pattern of consideration and decision-making as nonprofessional investors on high-complexity and low-complexity assignments.

### **Experimental Procedures**

This research uses pencil-base experiment, that is, an experiment conducted using questionnaires that will be answered manually by participants or research subjects. The participants will be asked to fill in one of the eight scenarios that have been chosen at random. The scenarios are: Scenario A. This scenario uses Step by Step presentation pattern, information order of good news followed by bad news (++--) and accounting information type. Scenario B. This scenario uses Step by Step presentation pattern, information order of bad news followed by good news (--++) and accounting information type. Scenario C. This scenario uses a Step by Step presentation pattern, information order of good news followed by bad news (++--) and non accounting information type. Scenario D. This scenario uses Step by Step presentation pattern, information order of bad news followed by good news (--++) and non-accounting information type.

Scenario E. This scenario uses End of Sequence presentation pattern, information order of good news followed by bad news (++--) and accounting information type. Scenario F. This scenario uses End of Sequence presentation pattern, information order of bad news followed by good news (--++) and accounting information type. Scenario G. This scenario uses End of Sequence presentation pattern, information order of good news followed by bad news (++--) and non-accounting information type. Scenario H. This scenario uses End of Sequence

presentation pattern, information order of bad news followed by good news (--++) and non-accounting information type.

The duty of the participants is to assess the company shares of PT WMA, as a hypothetical company, but taken from the sample companies that have been listed on the Indonesia Stock Exchange (IDX). Participants were asked to answer questions related to their ability in investment and financial statement analysis. There is no limit to the fiction companies used by the researcher. The researcher was free to select the fiction companies to be used in this experimental study. The fiction companies used can still survive from the beginning the establishment and can survive in the face of new conditions and competitors. In this study, participants were asked to reevaluate the value of investment for accounting and non-accounting information types and the presentation patterns of Step by Step and End of Sequence with initial value of company stock of IDR 16,200.00 and give the scale of each disclosure with multiples of stock price -1000 (very bad news) and +1000 (very good news).

The following is the procedure performed by participants based on a presentation pattern of Step by Step:

- The participants read the background of the company.
- The participants were given information related to the initial stock price of the company (using the share value of IDR 16,200.00).
- The participants were given accounting information related the disclosure of financial statements eight times in scenario A and B. For scenario A, the participants were given four items of good news information and four items of bad news information (for the information order of good news followed by bad news (++--)). In scenario B, the participants were given four items of bad news information and four items of good news information (for the information order of bad news information followed by good news (--++)).
- The participants were given non-financial statement disclosure information as many as eight items in scenario C and D. For scenario C, the participants were given four items of good news information and four items of bad news information (for the information order of good news followed by bad news (++--)). In scenario D, the participants were given four items of bad news information and four items of good news information (for the information order of bad

news followed by good news (--++).

- The participants gave judgment eight times on the value of the company's stocks for any information provided (accounting and non-accounting information).
- Participants were asked to respond to manipulation check questions and questions to measure participants' ability in the analysis of financial statements and capital markets and respondents' demographic items. Manipulation checks were performed to know that the given experiment assignments were known, understood and responded correctly by the participants.
- Debriefing session.

The procedures performed by participants based on the End of Sequence presentation pattern are as follows:

- The participants read the background of the company.
- The participants were given information related to the initial share price of the company (using the share value of IDR 16,200.00)
- The participants were given accounting information related to the disclosure of financial statements one time in scenario E and F. For E scenario, the participants were given four items of good news information and four items of bad news information (for the information order of good news followed by bad news (++--). In scenario F, the participants were given four items of bad news information and four items of good news information (for information order of bad news followed by good news (--++). And the participants were given non-financial statement disclosure information once in the scenario G and H. For scenario G, the participants were given four items of good news information and four items of bad news information (for the information order of good news followed by bad news (+ ±-). In scenario H, the participants were given four items of bad news information and four items of good news information (for the information order of bad news followed by good news (--++).
- The participants gave judgment once on the company's stock value for the information provided (accounting and non-accounting information types).
- Participants were asked to respond to manipulation check questions and questions to measure participants' ability in the analysis of financial statements and capital markets and respondents' demographic items. Manipulation checks were performed to know that the given experi-

ment assignments were known, understood and responded correctly by the participants.

- Debriefing session.

Debriefing is the process of restoring condition before following an experimental assignment and allowing the research subject to provide an honest commentary on experimental execution (Chistensen 1998). The debriefing session in this study was conducted after the participants followed the experimental assignment and the researcher would contact the participants to explain the objective of the experiment, to request feedback from the participants about the experimental assignment and to ask the participants not to discuss various things about the assignment of the experiment. This can be questions: such as whether participants know what research they are currently following, whether participants have heard about experimental research or not, and other questions related to the study.

Some information related to the company was given to participants in this study, namely:

PT WMA, formerly known as PT AKN, is a company in basic industry and chemical industry which was established since March 25, 1953. On July 4, 1991, PT WMA obtained an effective statement from Bapepam-LK to conduct IPO to 40 million people with a nominal value of IDR 1,000.00 per share. These shares were listed on the Indonesia Stock Exchange on July 8, 1991. The initial value of the company's shares in 2015 was IDR 16,200.00 as the reference value.

In addition, this study used eight information taken from the company's financial statements grouped into four information having positive evidence direction and four information that having negative evidence direction as follows:

- The company's net profit increased from the previous period.
- The company's sales value increased compared to the previous period.
- The company's total assets increased from the previous period.
- The company's current assets increased compared to the previous period.
- The company's net profit decreased from the previous period.
- The company's sales value decreased compared to the previous period.
- The company's total assets decreased from the previous period.
- The company's current assets decreased compared to the previous period.

This study also used eight sources of informa-

tion derived from corporate social responsibility and corporate governance reports, grouped into four information having positive evidence directions and four sources of information having negative evidence direction as follows:

- The company provided assistance, including natural disaster relief, health improvement, public facilities and infrastructure development, religious facilities and education assistance in the form of scholarships granted to students.
- The company carried out the Community Development Program as one of the programs aimed at helping improve the living standards and welfare of surrounding communities.
- The company built Waste Heat Recovery Generation (WHRPG), provided additional electricity and improved environmental quality.
- The company transparently indicated the assignment table and the activities of the Board of Commissioners.
- The company faced employee demands related to employee welfare compliance.
- The company faced community demands on waste pollution that disrupts local communities.
- The company faced rejection of local people related to the construction of factories in some areas.
- There was a performance appraisal system of the Board of Commissioners and the Board of Directors but the company had not implemented and carried out the system consistently.

#### **Data Analysis Technique**

Data analysis technique used to test the hypothesis was Normality Test. Normality test was used to determine whether the data obtained was normally distributed or not. Kolmogorov-Smirnov was used know the normality of a data.

After testing the data using Normality Test, the normally distributed data was then tested using Independent Sample test t-test. If the significance value is  $> 0.05$ , then  $H_0$  is accepted which means that there is no difference, otherwise if the significance value is  $< 0.05$ , then  $H_0$  is rejected which means that there is a difference. While the mann-whitney test is used to determine the difference between two samples which are not related or paired to each other, but the data is not normally distributed.

#### **4. DATA ANALYSIS AND DISCUSSION**

##### **Demographic Data and Manipulation Check**

Criteria of the subject in this study are: having knowledge in the field of financial statement analy-

sis and capital market investment management or investment management and portfolio. The reason for choosing the subject criteria is because the subjects have the same knowledge and experience. The subjects in this study are based on the subject criteria: undergraduate students (Bachelor degree)) of STIE Perbanas Surabaya majoring in Accounting and Management. The number of subjects who are willing to become participants is as many as 120 students consisting of 99 Accounting students and 21 Management students. Twenty-five (25) subjects did not complete the experimental instrument because they were not present at the time of the experimental execution.

A total of 95 participants have filled the experimental instruments in the places that have been notified through the invitations circulated at rooms BII402, BII403, BII404 and BII405 of STIE Perbanas Surabaya Campus II at 12.30 until finish. Total subjects that can be analyzed and pass the manipulation check are as many as eighty (80) students. Subjects can be said to pass if they meet the criteria determined by previous researchers.

Criteria for the subjects that can be said pass and can be processed further are as follows

1. Subjects can answer at least two (2) questions correctly regarding manipulation check.
2. Subjects can answer at least two (2) questions correctly regarding the general knowledge of accounting;
3. Subjects fill in and complete the assignment.

#### **Testing the Effect of Information Order, Step by Step Presentation Pattern and Information Type on Investment Decision**

##### **Hypothesis Testing 1**

Table 2 presents the results of normality for participants who get information order of good news followed by bad news (++--) compared to participants who get information order of bad news followed by good news (--++) on the Step by Step presentation pattern and accounting information type. The result of normality test from Kolmogorov-Smirnov test generates the significance value of  $> 0.05$ , which can be concluded that the data is normally distributed.

Table 3 presents the results of hypothesis testing for a Step by Step (SbS) presentation pattern for 15 participants. The average data of the two groups (Table 3) proves that the mean value of final judgment of the group of participants who get the information order ++-- (good news followed by bad news) is 12,977.78 lower than the group of participants who get the information order --++ (bad

**Table 2**  
**Normality Test Results**

Variable	Respondent	Sig.	Description
Stock Price	Students	0.078	Normal

**Table 3**  
**Results of Difference Test of Independent Sample T-Test**

Information Type	Presentation Pattern	Information Order	Number of Participants	Mean	T	Sig.
Accounting	Step by Step	++--	9	12.977,78	-2.888	0.013
		--++	6	16.866,67		

Source: Processed using SPSS 22.

**Table 4**  
**Results of Normality Test**

Variable	Respondent	Sig.	Description
Share Price	Students	0.200	Normal

**Table 5**  
**Results of Different Test of Independent Sample T-Test**

Information Type	Presentation Pattern	Information Order	Number of Participant	Mean	T	Sig.
Non Accounting	Step by Step	++--	11	15,472.73	-2.361	0.028
		--++	11	18,018.18		

Source: Processed using SPSS 22.

news followed by good news), or 16,866.67, for accounting information type.

Based on the difference test Table 3, the results of t-test on the Step by Step (SbS) presentation pattern for the students as participant show that t value is -2,888 with the significance level of 0,013 in scenario A and scenario B. This means that there is significant difference in the mean value of final judgment between the participants who get information order of ++-- and the participants who get information order of --++ because its significance level is 0.013. This study shows that the Step by Step (SbS) presentation pattern raises recency effect on simple information. So, the results support the research hypothesis.

### Hypothesis Testing 2

Table 4 presents the results of normality test for participants who get information order of good news followed by followed by bad news (++--) compared to participants who get information order of bad news followed by good news (--++) on the Step by Step presentation pattern and non accounting information type.

The results of normality test using Kolmogorov-Smirnov test indicate the significance value > 0.05, which means that the data is normally distributed. Table 5 presents the results of the research hypothesis testing for a Step by Step (SbS) presenta-

tion pattern for 22 participants.

The average data of the two groups (Table 5) above proves that the mean value of final judgment for the group of participants who get information order of ++-- (good news followed by bad news) is 15,472.73 lower than the group of participants who get information order of --++ (bad news followed by good news), or 18,018.18 for non accounting information. Based on the different test Table 5, the result of t-test on the Step by Step (SbS) presentation pattern for the students as participant shows that t value is -2,361 with the significance level of 0.028 in scenario C and scenario D.

This means that there is a significant difference in the mean value of final judgment between participants who get information order of ++-- and participants who get information order of --++ because the probability is 0,028. This study shows that Step by Step (SbS) presentation pattern raises recency effect on simple information. So the results support the research hypothesis.

### Testing the Effect of Information Order, End of Sequence Presentation Pattern, and Information Type on Investment Decision

#### Hypothesis Testing 3

Table 6 presents the results of normality test for participants who get information order of good news followed by bad news (++--) compared to

**Table 6**  
**Results of Normality Test**

Variable	Respondents	Sig.	Description
Share Price	Students	0.009	Not Normal

**Table 7**  
**Results of Different Test of Mann-Whitney U Test**

Information Type	Presentation Pattern	Information order	Number of Participants	Mean	Z	Sig.
Accounting	End of Sequence	++--	11	15,836.36	-2,681	0.007
		--++	8	17,325		

Source: Processed using SPSS 22.

**Table 8**  
**Results of Normality Test**

Variable	Respondent	Sig.	Description
Share Price	Students	0.103	Normal

**Table 9**  
**Results of Different Test of Independent Sample T-Test**

Information Type	Presentation Pattern	Information Order	Number of Participants	Mean	T	Sig.
Non accounting	End of Sequence	++--	12	16,200.00	-1.546	0.136
		--++	12	17,450.00		

Source: Processed using SPSS 22.

**Table 10**  
**Hypothesis Test Results**

Presentation Pattern	Hypothesis	Information Type	Effect occurring
Step by Step(SbS)	1	Accounting	Recency Effect
	2	Non Accounting	Recency Effect

participants who get information order of bad news followed by good news (--++) on End of Sequence presentation pattern and accounting information type. Normality testing using Kolmogorov-Smirnov test indicates the significance value of <0.05, which means that the data is not normally distributed. Since the data is not normally distributed, the next step is to use Mann Whitney's different test.

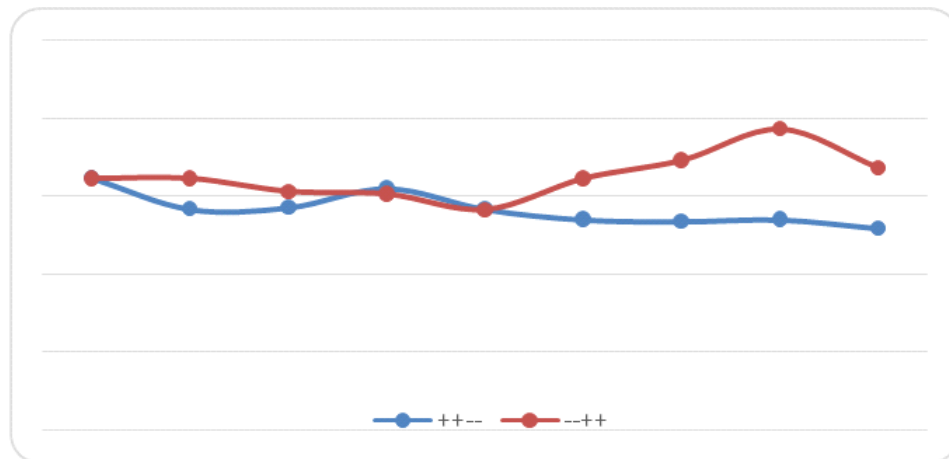
Table 7 presents the results of hypothesis testing for the End of Sequence (EoS) presentation pattern for 19 participants. The average data of the two groups (Table 7) above proves that the mean value of final judgment of the group of participants who get information order of ++-- (good news followed by bad news) is 15,836.36 lower than the group of participants who get information order --++ (bad news followed by good news), or 17,325 for accounting information.

Based on the Mann-Whitney difference test table on the End of Sequence (EoS) presentation pattern for the student as participant, the value of Z is -2.681 with the probability value of 0.007 in the

scenario E and scenario F. This means that there is a significant difference in the mean value of final judgment between the participants who get information order of ++-- and participants who get information order of -- ++ because of the probability value is 0.007. This study shows that the End of Sequence (EoS) presentation pattern raises recency effect on simple information. So, this results support the research hypothesis. From the above test it can be concluded that the participants' end judgment in scenario E and F has an effect on investment decision making.

#### **Hypothesis Testing 4**

Table 8 presents the results of normality test for participants who get information order of good news followed by bad news (++--) compared to participants who get information order of bad news followed by good news (--++) on End of Sequence presentation pattern and non accounting information type. The results of normality test using Kolmogorov-Smirnov test indicate that the significance value is > 0.05, which can be concluded that the



**Figure 2**  
**Fishtail Pattern on the Belief Revision Taken by Investors on the Step by Step Presentation Pattern (Hypothesis 1)**

data is normally distributed.

Table 9 presents the results of research hypothesis testing for the End of Sequence (EoS) presentation pattern for 24 participants. The average data of the two groups (Table 9) proves that the mean value of end judgment of the group of participants who get the information order of ++-- (good news followed by bad news) is 16,200.00 lower than the group of participants who get information order of --++ (bad news followed by good news), or 17,450.00, for non accounting information.

The table of different test of t-test on End of Sequence (EoS) presentation pattern for students as the participant (Table 9) shows that t value is -1.546 with probability value of 0.136 in scenario G and scenario H. This means that there is no significant difference in the mean value of end judgment between the participants who get information order of ++-- and the participants who get information order of --++ because the probability value is 0.136. This study shows that the End of Sequence (EoS) presentation pattern does not cause any effect even on simple information. So, these results do not support the research hypothesis. From the above test, it can be concluded that the participants' end judgment in scenario G and scenario H scenario has no effect on investment decision making.

#### **Discussion of the Effect of Information Order, Step by Step Presentation Pattern, and Information Type on Investment Decision**

Hypothesis (H1) in this study is to test whether there are differences in investment decisions between participants who get information order of good news followed by bad news (++) than participants who get information order of bad news followed by good news (--) on Step by Step pres-

entation pattern and accounting information type. While the hypothesis (H2) in this study is to test whether there are differences in investment decisions between participants who get information order of good news followed by bad news (++) and participants who get information order of bad news followed by good news (--) on Step by Step presentation pattern and non accounting information type. Table 10 explains the test results of hypotheses 1 and 2 of this study.

The result of hypothesis testing (H1) based on the information order and the accounting information type indicate that there is end judgment difference in the information order of ++ or -- and on the Step by Step (SbS) presentation pattern. While the result of hypothesis testing (H2) based on the information order and non accounting information type indicates that there is end judgment difference on the information order of ++ or -- and on the Step by Step (SbS) presentation pattern. The results of this study support the belief adjustment Model of Hogarth and Einhorn (1992) that predicts that the recency effect will occur on the Step by Step (SbS) presentation pattern and simple information.

The result of hypothesis (H1) of this research indicates that the participant will assess the stock lower by 12,977.78, when receiving the information order of ++ compared to when receiving the information order of --, or 16,866.67 on the Step by Step (SbS) presentation pattern and on accounting information type. The result of the hypothesis (H2) of this study indicates that the participants will assess the share lower by 15,472.73 when receiving the information order of ++ compared to when receiving the information order of -- by 18,018.18 on the Step by Step (SbS) presentation pattern and

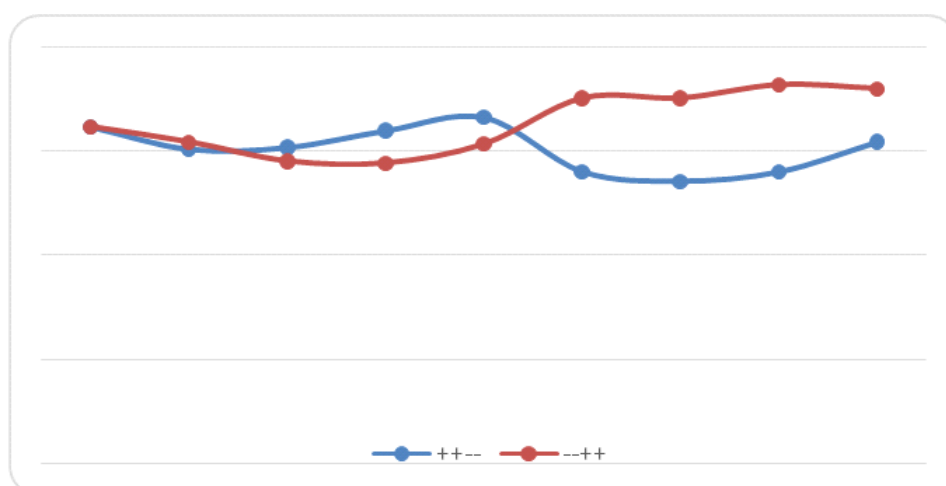


Figure 3  
Fishtail pattern on the belief revision taken by investors on the Step by Step Presentation Pattern (Hypothesis 2)

Table 11  
Hypothesis Test Results

Information Type	Hypothesis	Information Type	Effect Occurring
End of Sequence (EoS)	3	Accounting	Recency Effect
	4	Non Accounting	No Order Effect

on non accounting information. The results of this study are also supported by Figure 2 for hypothesis 1, and Figure 3 for hypothesis 2 showing the fishtail pattern on the Step by Step (SbS) presentation pattern on the participants' belief revision.

Figures 2 and 3 show the fishtail pattern in which the X axis is information presented from one (1) to eight (8), and the Y axis is the mean value of end judgment. The significance value obtained from the results using the Independent sample t-test is in accordance with the basis of decision making in the t-test, so it can be concluded that the hypothesis (H1) and hypothesis (H2) are accepted.

#### Discussion of the Effect of Information Order, End of Sequence Presentation Pattern and Information type on Investment Decision

Hypothesis (H3) examines whether there are differences in investment decisions between participants who get information order of good news followed by bad news (++--) and participants who get information order of bad news followed by good news (--++) on the End of Sequence presentation pattern and accounting information type. While the hypothesis (H4) examines whether there are differences in investment decisions between participants who get information order of good news followed by bad news (++--) and participants who get information order of bad news followed by good news (--++) on the End of Sequence presentation pattern and non accounting information type. Table 11 ex-

plains the test results of hypotheses 2 and 3 of this study.

The result of hypothesis testing (H3) based on the information order and accounting information type indicates that there is end judgment difference when the information order is ++-- or --++ on the End of Sequence (EoS) presentation pattern. Meanwhile, the result of hypothesis testing (H4) based on the information order and non-accounting information type indicates that there is no end judgment difference when the information order is ++-- or --++ on the End of Sequence (EoS) presentation pattern.

The results of the overall research indicate that the Step by Step (SbS) presentation pattern can lead to recency effect when receiving simple and short information on the accounting and non accounting information types. The cause of the recency effect is the information which is presented sequentially (SbS) giving more opportunities to make adjustments. The results of this study are supported by the research conducted by Luciana Spica and Supriyadi (2013) that there are differences in investment decision making between participants receiving the information order of good news followed by bad news compared to participants receiving the information order bad news followed by good news when the presentation pattern is Step by Step (SbS). Research conducted by Pinsker (2007) explains that the recency effect occurs when the information is presented in Step by Step (SbS).

Ashton and Kennedy (2002) show that recency effect occurs in the going concern of the auditor when information is presented in Step by Step (SbS). The results of this study are also supported by research conducted by Luciana Spica et al. (2013) indicating that there is a reviewer effect in making an investment decision if the information is presented sequentially (Step by Step). Previous research by Trotman and Wright (1996) provides evidence suggesting that the recency effect appears to participants with a Step by Step (SbS) response model.

The End of Sequence (EoS) presentation pattern also results in a recency effect when receiving simple and short information on accounting information. The results of this study differ from the theory of Belief Adjustment model of Hogarth and Einhorn (1992) which predicts that primacy effects will occur on the End of Sequence (EoS) presentation pattern and simple information. This results are supported by previous research conducted by Nirwana Putri and Luciana Spica (2015) indicating that a recency effect occurs when information is presented simultaneously (End of Sequence). While there is no difference (no order effect) occurs on the End of Sequence (EoS) presentation pattern when receiving simple and short information on non accounting information. The results of this study differ from the theory of belief adjustment model of Hogarth and Einhorn (1992) which predicts that primacy effect will occur on the End of Sequence (EoS) presentation pattern and simple information. The results of this study are supported by the research conducted by Luciana Spica et al. (2013) indicating that there is no order effect in investment decision making if information is given simultaneously (End of Sequence).

Research conducted by Luciana Spica and Supriyadi (2013) also shows that there is no difference in investment decision making between participants receiving the information order of good news followed by bad news and participants receiving the information order of bad news followed by good news on the End of Sequence (EoS) presentation pattern. Overall, the results of this study indicate that the belief revision model of Hogarth and Einhorn (1992) is partially hold in investment decision making. The prediction of belief revision model of Hogarth and Einhorn (1992) which is not supported in this study is that this study fails to provide support that the End of Sequence (EoS) presentation pattern will generate a primacy effect when receiving simple and short information on accounting and non-accounting information types.

This can happen because the individual cognitively still easy to remember the information received and also because the non-accounting information is qualitative data.

## 5. CONCLUSION, IMPLICATION, SUGGESTION, AND LIMITATIONS

The purpose of this study is 1) to examine whether there are differences in investment decisions between participants who get information order of good news followed by bad news (++--) and participants who get information order of bad news followed by good news (--++) on the Step by Step presentation pattern and accounting information type; 2) to examine whether there are differences of investment decision between participants who get information order of good news followed by bad news (++--) and participants who get information order of bad news followed by good news (--++) on the Step by Step presentation pattern and non accounting information type; 3) to examine whether there are differences in investment decisions between participants who get information order of good news followed by bad news (++--) and participants who get information order of bad news followed by good news (--++) on the End of Sequence presentation pattern and accounting information type; and 4) to examine whether there are differences in investment decisions between participants who get information order of good news followed by bad news (++--) and participants who get information order of bad news followed by good news (--++) on the end of Sequence presentation pattern and non accounting information type.

The conclusion that can be drawn from the results of this study is as follows: First, the findings of this study indicate that there are differences in investment decisions between participants who get information order of good news followed by bad news (++--) and participants who get information order of bad news followed by good news (-++) on the Step by Step presentation pattern and accounting information type.

Second, the findings of this study indicate that there are differences in investment decisions between participants who get information order of good news followed by bad news (++--) and participants who get information order of bad news followed by good news (--++) on the Step by Step presentation pattern and non accounting information type.

Third, the findings of this study indicate that there are differences in investment decisions be-

tween participants who get information order of good news followed by bad news (++--) and participants who get information order of bad news followed by good news (--++) on the End of Sequence presentation pattern and accounting information type.

Fourth, the findings of this study indicate that there is no difference in investment decision between participants who get information order of good news followed by bad news (++ --) and participants who get information order of bad news followed by good news (--++) on the End of Sequence presentation pattern and non accounting information type.

This study also has some limitations which can be described as follows: (1) when looking for participants, the schedule of the experimental activity clashed with the schedule of replacement lecture so that the researcher had to find other participants taken from the participant reserve list; (2) at the time of implementation, there were some participants who suddenly could not follow the research due to unfavorable weather forcing the researcher to find a replacement with other participants. In addition, there were some participants who were late and not allowed to follow the research; (3) there was still interaction between participants although they had been reminded by the experimenter not to make interaction with others. In addition, some participants still opened the file before and after the assignment time although they had been reminded by the experimenter before.

Based on the results of the study, the conclusions and limitations, it is expected that further research to find the reserve participants enabling to find a replacement when one of the participants cannot attend or be late, pay attention to the selection of the right day at the time of the experiment because it involves many participants, pay more attention to participants so that the atmosphere is more conducive and quiet so that they can concentrate when the assignment takes place.

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