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The Formation of Rational and Irrational Behaviors in Risky Investment Decision Making: Laboratory Experiment of Coping Theory Implication in Investors' Adaptation Model

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This study analyzes the stock investor's rational and irrational behavior formation through Investor's Adaptation model. Hypotheses testings were conducted by manipulating four market conditions using between-subject experimental design. The results supported the hypotheses proposed in this study. When given treatment one (opportunity-high control), investors tended to adapt the profit maximizing strategy (rational). Meanwhile, when given treatment two (opportunity-low control), three (threat-high control) and four (threat-low control), they tended to adapt the profit satisfying strategy (rational-emotional), bad news handling strategy (emotional-rational), and self-preserving strategy (irrational) respectively. The application of rational strategies are intended to obtain personal benefits and profit, while adapting irrational strategy is intended to recover emotional stability and reduce some other tensions. Another finding showed that for the investors, the relatively irrational decision formation was "harder" than that of rational.

Keywords: *Rational and irrational behaviors, coping, primary and secondary appraisal, Investor's Adaptation model, adaptation strategies*

Introduction

Decision making theory has being developed significantly over recent decades. The rationality assumption (expected utility theory), which has been the mainstream in explaining individual decisions, reaped criticisms. Several empirical studies showed that an individual does not only use the ratio in making the decision, but also involves the emotion and behavior (Kahneman and Tversky, 1979; Shefrin and Statman, 1985; and Ritter, 2003). This condition raised two perspectives (rational and irrational) in analyzing the phenomenon of capital market. Rational perspective assumes an individual emphasizes more on the cognitive and ratio in the decision making, while the irrational perspective believes an individual often experiences psychological biases when making decisions. Sar (2004) implicitly says that both perspectives need to be bridged in order to reduce unnecessary debates. It thus needs a conceptual framework that ideally gives a comprehensive explanation of "why" and "how" individuals applying rational and irrational behaviors.

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This study adopts Lazarus and Folkman's (1984) Coping theory to analyze the investors' rational and irrational behaviors forming process when they face market events that require them to immediately adapt to these events. Researches on investors' adaptations are still rare (Lee et al., 2009) and until recently, there is no research that comprehensively describes the investors' adaptation strategies to market events, which are integrated with rational and irrational behaviors. Investors' understanding towards the emerging event and its response (adaptation strategies) is similar to the coping concept. Therefore, the authors argue that investors' adaptation process to market events can also be understood through Lazarus and Folkman's (1984) Coping theory.

This paper is organized into five sections. The first section begins with an introduction, which in turn followed by review of literature, discussion of relevant theories and prior empirical findings. The research method will be discussed later, followed by discussion of research results. The last section presents a number of conclusions and limitations of the research and suggestions for future researches.

Literature Review

According to Lazarus and Folkman (1984), coping process is divided into two parts, namely appraisal and coping efforts. The appraisal (primary and secondary) aims to evaluate event's consequences (positive/negative and opportunities/threats) and coping options (individuals' level of control), in which individuals will assess the nature and relevance or importance of a particular event for them. Primary appraisal is performed at the beginning of the event. This appraisal produces two kinds of perception. *First*, assess the event as an opportunity or good news, and *second*, assess the event as a threat or bad news. Opportunity will result in positive consequences, while threat will result in negative consequences.

The process of evaluating options is called secondary appraisal. The results of the secondary appraisal will result in a perception of the individuals' level of control (high and low) to the event and its available resources (internal and external). High level of control suggests that individuals judge themselves able to cope with occurring event, while a low level of control suggests otherwise.

After doing the appraisal, then the next individual's response is to do different actions to cope with the event. Lazarus and Folkman (1984) and Folkman (1992) call such actions as coping efforts. Cognitive efforts and behavioral efforts will result in coping efforts, which can be divided into problem-focused coping and emotion-focused coping. The problem-focused coping generally handles on specific aspects of the occurring event by changing the environment or the event itself. Meanwhile, the emotion-focused coping is done by changing individual perceptions of an event, but does not change the event itself.

In general, Lazarus and Folkman (1984), Folkman (1992), and Folkman and Moskowitz (2000) assert that the problem-focused coping is selected when an individual perceive him/herself can cope with such event (having a high degree of control). Meanwhile, the act of emotion-focused coping is selected when an individual thinks him/her not able to control the situation (having a limited degree of control or low). Thus, problem-focused coping will lead an individual to the formation of rational behavior, while the emotion-focused coping will direct to the formation of irrational behavior.

Investor's Adaptation model

Coping theory explains the sequential coping process, starting from the primary appraisal, secondary appraisal, and development of adaptation strategies in the form of cognitive and behavior efforts and emotion. Based on the foregoing explanation, the researchers reconceptualize Lazarus and Folkman's (1984) Coping theory and correlate it to the investors' rational and irrational behaviors formation in risky investment decision making. The results of this conceptualization can be seen in Figure1.

Investors face various daily things in the capital market, which could be rumor, information, and certain events that prompt them to make

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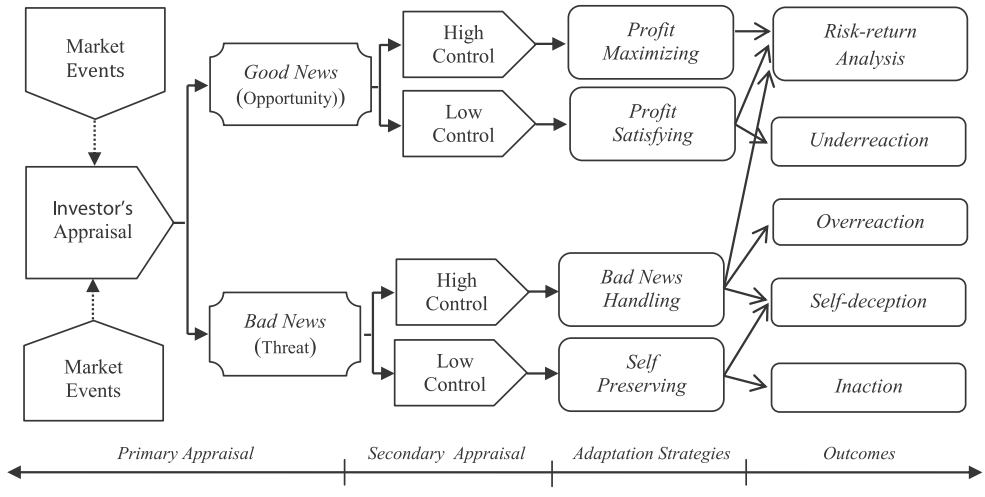

Figure 1. Investor's Adaptation model

decisions in responding to such matters. Figure 1 shows that investors do the primary appraisal process first as they face an event. After that, investors will make secondary appraisal (Lazarus and Folkman, 1984). Run with Coping theory, primary and secondary appraisal outcomes will be used as a basis for investors in developing adaptation strategies (profit-maximizing, profit-satisfying, bad news handling, and self-preserving). Investors' adaptation strategies can be analyzed through the behaviors they exhibit, such as the risk-return analysis, underreact/overreact behavior, emotional stability restoration through self-deception, and inaction.

Profit maximizing strategy based on Coping theory (Lazarus and Folkman, 1984; Folkman and Lazarus, 1985; Hartono, 2008; Beaudry and Pinsonneault, 2005; and Folkman and Moskowitz, 2000) will be adapted when: (1) on primary appraisal investors judge an event as an opportunity, (2) on secondary appraisal investors assess themselves have a high level of control, (3) investors adapt problem-focused coping, and (4) investors focus to gain the optimal profit and maximizing the personal benefits.

Individuals who face such conditions will attempt to adapt themselves to deal with the event (Majchrzak and Cotton, 1988). Due to investors' adaptation efforts on profit maximizing toward market event, then they will make a deeper analysis in making risky investment decision. They will pay more attention to any company's fundamental factors. Risk-return analysis mentioned in this context includes several stages, including: (1) investors observe the market and update any information relevant to the current market condition, (2) investors analyze the prospects of the company, industrial sector, and economy condition, (3) investors make a profit-loss prediction, (4) investors simulate alternative investment decisions, and (5) investors take the most profitable investment decision. All investors' efforts in risk-return analysis is intended to achieve the most optimal profit by relying on their cognitive ability, which will represent the profit-maximizing strategy.

The review shows that in "normal" conditions (when ratio aspect dominates), investors tend to use their ratio in investment decisions, which results in all aspects related to investment will be studied carefully (such as financial report, economy condition, corporate action, stock's historical prices, company prospect, and other publications). They will also work to improve their personal abilities to cope and get the benefit from the event as well (Lazarus and Folkman, 1984; Beaudry and Pinsonneault, 2005). Based on the explanation and the previous findings, then the first hypothesis proposed in this study is stated as follow:

H_1: Investors develop profit-maximizing strategy when they perceive themselves as having a high level of control on the market event and considered it as an opportunity.

Profit-satisfying strategy based on the Coping theory (Lazarus and Folkman, 1984; Folkman, 1992; Beaudry and Pinsonneault, 2005; and Hartono, 2008) will be adapted by investors when they: (1) assess an event as an opportunity in the primary appraisal, (2) assess themselves as having low level of control on secondary appraisal, (3) direct adaptation strategy to gain individual efficiency and effectiveness, and (4) use limited emotion-focused and problem-focused coping. Zuboff (1988) states that when an individual is not able to adapt to an event that is considered capable of providing opportunities due to his/her limitations, he/she tends to do limited adaptation which later will result in limited benefits as well. Feeling unable to control the opportunities, investors tend to be more conservative in adapting to market event. Risk-return analysis is intended only for gaining specific profit to their limited resources, making them seemed performing an underreact behavior. Tversky and Kahneman (1974) state that underreaction is caused by a heuristic cognitive in a form of anchoring-adjustment. Thus, the individual would not think deliberately by using mathematical modeling and other normative laws, making them to think more pragmatically.

Under limited information condition, investors in the stock market generally predict the stock price using the previous price data. Investors' tendency to use the previous stock price as the anchor value will strengthen the stock prices on alternate days. This condition will put them into trouble when they encounter a new event with opposite indication, which has very different anchor compared to their own prediction. In this situation, they tend to be more conservative on different events with opposite anchor values, making them tend to give underreact response to the market event (Habbe, 2007). Based on the previous explanation and empirical findings, the second hypothesis proposed in this study is as follow:

H_2: Investors develop profit-satisfying strategy when they perceive themselves as having a low level of control on the market event and considered it as an opportunity.

Bad news handling strategy based on the Coping theory (Lazarus and Folkman, 1984; Folkman and Lazarus, 1985; and Hartono, 2008) will be adapted by investors when they: (1) judge an event as a threat on the primary appraisal, (2) assess themselves as having a high degree of control on secondary appraisal, (3) more frequent use emotion-focused coping than problem-focused coping, and (4) aim the adaptation strategy at minimizing the negative consequences and recover emotional stability. Investors are fully aware that such event can give a loss (threat) for them, but because they feel confident as having a high degree of control, they then will try to adapt themselves to improve their abilities. Folkman (1992) and Folkman and Lazarus (1985) say that when an event is considered as a threat, then the individual will use the emotion-focused coping efforts. On bad news handling strategy, investors will try to analyze risk-return to minimize the negative consequences. However, because they perceive themselves as having a high level of control against such threat, in addition to the limited risk-return analysis, they may also overreact and commit self-deception.

Tversky and Kahneman (1974) explain that the heuristic representativeness can be the antecedent of overreact behavior. According to them, an individual tends to assess the value or predict the probability using representation approach. On the primary appraisal an event is considered as a threat but predicted to give an advantage as well because investors perceive themselves as having a high degree of control. This fact then may cause investors to behave overreact. In addition to overreact behavior, investors who develop bad news handling strategy also show self-deception. Investors unconsciously perceive themselves as having a high level of knowledge, so they feel be able to influence and control the event's outcome which is actually uncontrollable (Nofsinger, 2002). The implications of the self-deception are the emergence of overconfident behavior and the illusion of control. Explanations and previous empirical results strengthen the authors' argument to propose the third hypothesis:

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Table 1. Experimental design

Primary Appraisal	Secondary Appraisal	
	High Level of Control	Low Level of Control
Opportunity	Treatment I	Treatment II
Threat	Treatment III	Treatment IV

H_3: Investors develop bad news handling strategy when they perceive themselves as having a high level of control on the market event and considered it as a threat.

Self-preserving strategy based on the Coping theory (Lazarus and Folkman, 1984; Folkman and Moskowitz, 2000) will be adapted by investors when they: (1) judge an event as a threat in the primary appraisal, (2) assess themselves as having low level of control in the secondary appraisal, (3) use emotion-focused coping, and (4) use the adaptation to recover emotional stability. Individuals who develop such strategies can only recover their emotional stability and gain less profits and benefits (even not at all) (Beaudry and Pinsonneault, 2005).

In capital market context, investors who adopt this strategy tend to rely more on their emotion to cope with a market event. This condition occurred in the Black Thursday (September 11, 1986) and the Black Monday (October 19, 1987), in which investors use more on their emotion in making decision when feeling unable to control markets events that will give them a financial loss (Asri, 2003; Wendy, 2008; 2010). In this condition, psychological factors like anxiety, greed, and panic hold a large proportion. In accordance with the Coping theory, investors who develop this strategy tend to "deceive" themselves. In certain circumstance, investors may perform denial and inaction by changing their beliefs and attitudes toward market event. Explanation from Coping theory and previous empirical findings support the authors' argument to propose the last hypothesis in this study.

H_4: Investors develop self-preserving strategy when they perceive themselves as having a low level of control on the market event and considered it as a threat.

Research Method

Research design

This experiment manipulates four market conditions using 2x2 between-subject experimental design (primary appraisal: threat and opportunity; and secondary appraisal: high and low levels of control). The independent variables in this study are capital market events, meanwhile, the dependent variable is risky investment decision. Manipulation towards independent variables is done by using a number of cases. Each case contains primary appraisal (opportunity or threat) and secondary appraisal (high or low levels of control). Table 1 presents the four manipulated matrices.

The population in this research includes all stock investors who are the members of securities companies in West Kalimantan. Subjects of the experiment are 32 participants for each treatment group. The amount is considered sufficient in accordance with the Myers and Hansen (2001)'s recommendation that the subjects of the experiment consists of at least 15 to 20 people for each treatment group. In determining the subjects of the experiment, this study controls the nonexperimental variables, such as gender, education level, experience, and age of participants (Jaggia and Thosar, 2000; Watson and McNaughton, 2007).

The selection of the participants in this study was based on four criteria that are: (1) stock investors on one or more securities companies in West Kalimantan, (2) experienced at least one year in the stock trading, (3) of at least high school graduates or equal, and (4) of at least 25 year old. Those who were willing to participate in this experiment were further classified into four randomized groups so that each of them had an equal opportunity to be selected into a particular treatment group (Christensen, 1988).

Research instruments

The research instruments used in this experiment were built with the involvement of experts such as practitioners (investors and stock brokers) and academia (methodology and finance professors). The involvement of experts aimed at strengthening the qualitative validity (content and face). The first phase of the research instrument development was conducted through intensive discussions with the academia to determine the most relevant instrument, which ultimately refers to the use of short cases. The development of these cases was conducted through focus group discussion (FGD) involving the practitioners. FGD and intensive discussion were then analyzed using coding techniques (open, axial, and selective) to process, analyze and interpret the qualitative data. The results were then used to formulate the early stage research instruments, which were tested in a pilot test.

Experimental techniques

This experiment used four types of manipulation (each manipulation consists of five cases), each of which is used to test the research hypotheses. The participants were provided with additional tools such as specific forms in order to simplify and speed up their analysis. The cases were presented in the form of a slideshow using the LCD-projector with a preset duration. After watching the slide show, participants wrote their decisions on the form provided. Each case consists of three information, that is general information (company's profile, investors' endowment, company's prospect, and stock's historical prices), performance indicators (financial ratios, corporate actions, dividend payout ratio, EBIT, and EAT), and market review (market-update, recommendation of analyst, and the review of national and global economy condition).

The participants simply filled in the interval between zero percent to one hundred percent on the appraisals (primary and secondary). After that, in the decision making, they were given a set of four risky investment decisions, each of which represented an adaptation strategy. The participants would be asked to choose one according to their decisions they will likely make in a real situation. In addition to the four decisions, in the bottom of the form, they were also given an open-answer space to write down own decision (which may differ from the set of four provided decisions), or add another analysis to refine the set of decision chosen. Estimated time taken for each case was approximately 5-6 minutes or half an hour in total for a treatment group. This condition had been deliberately designed to avoid the boredom and fatigue effects when participants take a lengthy experiment.

The manipulation check was intended to eliminate participants' responses which were irrelevant to the context and objective of the experiment. Manipulation check done by analyzing the participants' responses on primary and secondary appraisals. If any of the answers given to these two appraisals is less than or equal to 50%, then the answer would be skipped and not be analyzed. The manipulation check also aimed at anticipating the participants' dispositional aspect which tends to lead them on a specific behavior that is formed due to personality factors.

Statistical testing in this study used categorical data analysis with chi-square test, both for a categorical variable (chi-square goodness of fit) and two categorical variables (chi-square for independence). Chi-square goodness of fit was used to analyze whether or not the observed nonmetric data frequency of a variable were in accordance with the expected frequencies, while the chi-square for independence was intended to see whether or not the two categorical variables were independent (Hair et al., 2010; Uyanto, 2006).

Result and Discussion

Pilot test

The pilot test involved four groups of 40 university students (one of which in each group already had stock trading experience). Each group was given a different session and discussed only one type of manipulation. This

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Table 2. Chi-square test result

Description	Value	df	Asymp. sig. (2-sided)
Pearson Chi-Square	2.541E2	9.000	0.000
Likelihood Ratio	260.826	9.000	0.000
Linear-by-Linear Association	158.447	1.000	0.000
N of Valid Cases	640.000		

Table 3. Observation frequency among coping strategies and treatments

Coping strategy	Treatment 1 *Observed* N	Treatment 2 *Observed* N	Treatment 3 *Observed* N	Treatment 4 *Observed* N	Total
Profit Maximizing	**103**	54	45	12	**214**
Profit Satisfying	43	**83**	41	48	**215**
Bad News Handling	9	3	**62**	41	**115**
Self Preserving	5	20	12	**59**	**96**
Total	**160**	**160**	**160**	**160**	**640**

Table 4. Chi-square among coping strategies

Description	Coping strategies			
	H1	H2	H3	H4
Chi-square	154.100	95.350	32.350	30.250
df	3.000	3.000	3.000	3.000
Asymp. sig.	0.000	0.000	0.000	0.000

combination was expected to contribute better pilot test results. In general, there were no substantive improvements from the pilot test. Several participants noted the constructive input of which a request to erase the identity of the participants (the phone number and email address), cutting the duration of the experiment to five to six minutes per case, remove the stochastic appearance oscillator on technical chart, and industrial sectors vary between cases in a single treatment. From these inputs, the idea to vary the industrial sector in any kind of treatment could not be accommodated in the final stage of research instruments' improvement. This was because it was in the contrary to the research methodology principles, which might create confounding effect due to industrial sector differences. After improving the research instruments, then the authors performed the actual experiment.

Experiment results

The early stage of data analysis started with the manipulation check to ensure that participants were unconsciously manipulated by the treatments given. The analysis showed that all observations passed the manipulation checks. Total records as much as 640 observations (five cases x 32 participants x four treatments) are then examined further.

The first test was done to see the independency of treatments and coping strategies developed by the participants. This test was very important because if both were independent, it means coping strategies developed by participants were not influenced by the type of treatment given, and vice versa. To test this, the authors conducted chi-square test for independence. The results can be seen in Table 2.

Based on the table, it appears that the chi-square test resulted in probability value of 0.000. Because the probability value indicated significance at the level of one percent, it can be interpreted that the coping strategies and types of treatment were the two non independent categorical variables, in which coping strategies taken by the participants affected by type of treatment given. The results of this analysis generally indicated a theoretical support to the Investors' Adaptation model proposed in this study. Testing thus could be performed for each research hypothesis. The test results of each hypothesis are shown in Table 3, 4, and 5.

Table 3 presents information on the adaptation strategies adopted by each group of participants when given treatment 1, 2, 3 and 4. The observations in this table indicated the

Table 5. Chi-square among treatments

Description	Treatment			
	H1	H2	H3	H4
Chi-square	79.346	21.707	80.304	72.750
df	3.000	3.000	3.000	3.000
Asymp. sig.	0.000	0.000	0.000	0.000

dominance of profit-maximizing strategy when given treatment 1 (103 observations or 64.4%). Similar domination also happened with other coping strategies: when given treatment 2, 3 and 4, investors tended to adapt the profit satisfying strategy (83 observations or 51.9%), bad news handling strategy (62 observations or 38.8%), and self-preserving strategy (59 observations or 36.9%). To see the degree of significance, the authors carried out a statistical testing, as presented in Table 4. The test result in Table 4 supported the fourth hypothesis proposed, with one percent significance level.

Observations in Table 3 also show that profit maximizing strategy tended to be adapted by investor when they were subjected to treatment one (103 observations or 48.1%). Similar tendency happened to other strategies: profit satisfying, bad news handling, and self-preserving when investors given treatment 2 (83 observations or 38.6%), 3 (62 observations or 53.9%), and 4 (59 observations or 61.5%). These results then underwent further test, as seen in Table 5. The result of statistical test in Table 5 also supported the four hypotheses, which was significant at the level of one percent. The result of statistical analysis was then combined with the codification of the participants' open-answers to interpret the experimental results comprehensively.

Based on the statistical test result performed (Table 4 and 5) as well as the analysis of participants' open-answers, the authors gained empirical support for the four research hypotheses proposed. The analysis showed that when given treatment 1 (opportunity–high control), participants tended to adapt the profit maximizing strategy. Participants adopted problem-focused coping to deal with capital market event. In this situation, they would do the risk-return analysis comprehensively, carefully learn and consider all aspects related to investment (fundamental, economy condition, corporate actions, stock prices history, company's future prospect, and other various publications), and try to improve their personal skills. The purpose of profit maximizing strategy adaptation was more on optimizing the personal benefits and gaining profit from the event. Thus, this strategy would lead investors to the rational behavior formation.

The analysis on treatment 2 (opportunity-low control) showed that participants tended to adapt the profit satisfying strategy. Participants developed problem-focused coping and limited emotion adaptation, in which their responses included not only the ratio aspect, but also the emotional aspect. One notable behavior in this treatment was the underreaction behavior. This behavior made participants more passive and conservative in the transaction processes because they judged themselves unable to utilize the information available to make a profit. Investors would gain limited benefits in this situation. Profit satisfying strategy adaptation was intended to obtain the benefits of individual efficiency and effectiveness in dealing with capital market event. This adaptation strategy unconsciously directed investors to the limited rational-emotional behavior formation.

The subsequent analysis tested treatment 3 (threat-high control). The analysis showed that when given treatment 3, participants tended to adapt the bad news handling strategy. Participants were more likely to use emotion-focused coping and limited problems in order to minimize the negative consequences and recover their emotional stability. In this treatment, the emotional aspect relatively dominated on the investment decision making.

The participants applied bad news handling strategy adaptation in several ways, including positive comparison, minimizing threats, and positive reappraisal. Some other revealed behaviors in addition to risk-return analysis in this treatment were overconfident behavior, self-deception, illusion of control, conservatism, and

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representative. The analysis shows that under the "threat-high control" condition, investors began to experience cognitive biases leading them into the limited emotional-rational behavior formation.

In the last treatment of the research, the authors manipulated the "threat-low control" market condition. When given this treatment, the participants tended to adapt the self-preserving strategy using emotion-focused coping by degrading the cognitive and changing the self perception toward current event. The purpose of adapting this strategy was more on recovering emotional stability and reducing other tensions of the other so that individuals generally gained limited profit (or not at all). Empirical study in this treatment discovers some notable participants' behaviors, including self-deception, inaction (responding in a way not to act), positive comparison, passive acceptance, and disposition effect in a form of holding a bad stock for a long uncertain period. Thus, the emotion-focused coping by adapting the self preserving strategy tended to lead investors to the irrational behavior formation.

The empirical findings resulted from this research gives an overview of ratio and emotion factors influence in the risky investment decision-making. In a certain circumstance, the ratio aspect was more dominant in the investment decision, while in another condition, the emotions was aspect dominating. This research revealed that the rationality assumption which was mostly used in explaining the theory of decision making is not always true. Under certain conditions, economic subjects can also provide an emotional response. The results of this research may give an idea that it is difficult to develop a mathematical equation and econometrics model for the real behaviors, for its non-deterministic nature.

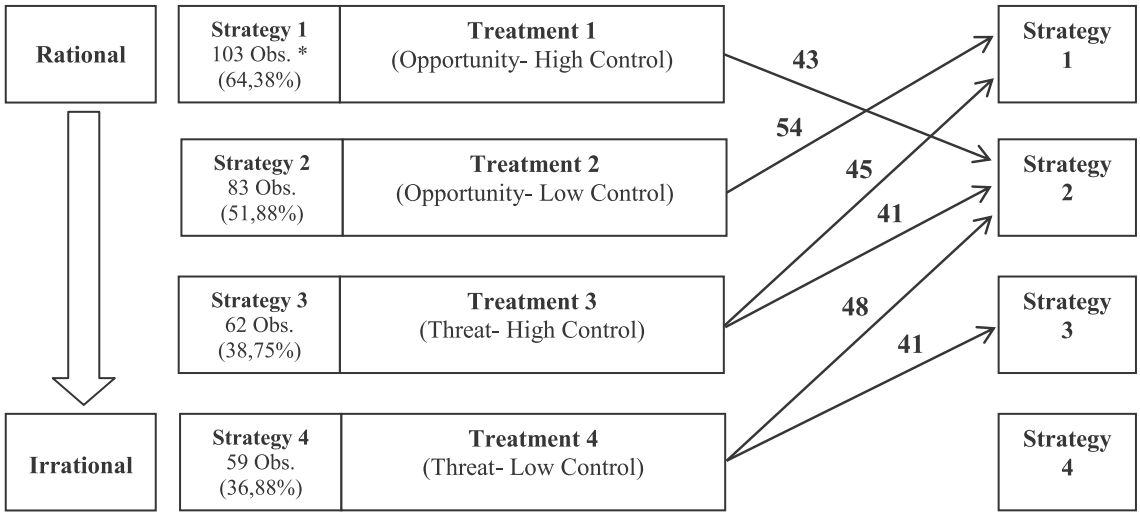
Economic subjects will give a different response when facing different market situations. The analysis also indicates that the combination of primary and secondary appraisal that produce four types of capital market events can be used to explain the "black-box" of investors' behavior formation through their responses in the form of risky investment decisions.

Based on this empirical finding, then the basic question of "which perspective is the most appropriate one in explaining the phenomenon of capital markets" is simply not debatable. The analysis shows that different capital market event will stimulate investors to adopt different adaptation strategies as well. Investors might give rational responses (profit-maximizing strategy), emotional (self-preserving strategy), or a combination of the two (profit-satisfying and bad news handling strategies). Due to this response combination, then none of both perspectives is dominating, which means studies based on a rational perspective will better explain the phenomenon of capital market when there is a condition which stimulates investors in giving rational response. So, the use of mathematical modeling, statistics, and econometrics will be more powerful in identifying and explaining capital market phenomenon.

The opposite condition occurs in a market situation that stimulates the investors to give an emotional response. In this situation, the behavioral perspective approach is best used to explain the capital market phenomenon. The qualitative modeling approach modeling is less powerful to use in this situation due to the investors' emotional responses.

This particular argument may lead to certain conditions and insignificant rational and irrational perspectives results, even though they referred to a strong theoretical foundation and used proper research methods. This is presumably due to the lack of "conformity" between the analysis perspectives used and the market condition studied. This explanation also recommends future financial researches perspective not to contra pose which perspective is the right one, for each has its own advantages and limitations. A consideration to adopt each other's perspective is likely to generate new empirical findings which are more applicable and better explain the complexity of capital market.

The discussion above only describes the research argument which is in parallel with the statistical test results and participants' open responses. There was also another finding showed an intriguing phenomenon. According to the research hypothesis, participants responded to



Obs. *: Observations

Figure 2. The relation between treatments and other adaptation strategies

treatment 1 by adapting the profit maximizing strategy, as well as treatment 2, 3, and 4 with profit satisfying strategy, bad news handling, and self-preserving. The observation results presented in Table 3 show an ideal condition as expected in the hypothesis. However, it was identified that the number of observations in each treatment and its adaptation strategy has diminishing value.

The number of profit maximizing strategy observations subjected to treatment 1 was 103 observations (64.38%). Later when given treatment two, it seems that the profit satisfying strategy adapted by investors dropped to 83 observations (51.88%). The same condition also occurred treatment 3, in which investors' bad news handling strategy diminished to 62 observations (38.75%). While treatment 4, investors' self-preserving strategy dropped to the lowest number, 59 observations (36.88%). Gradually, there appeared successive downward trend in the number of observations (absolute and relative) from the profit-maximizing strategy (rational) to the self-preserving strategy (irrational).

This phenomenon indicated that the market condition led investors to the rational behavior formation was more easily accepted by them, while one that led them to the irrational behavior formation was less easily accepted. Market conditions that lead to rational behavior generally in accordance with investors' expectations toward their investment assurance, while one that led them to the irrational behavior formation was generally in contrary to their expectations and predictions, where a "contradiction" happened (between the prediction and the real investment outcome). This contradiction might require investors to less easily adapt the irrational compared to the rational coping strategies. Nevertheless, this assumption still needs further in-depth empirical confirmation.

Further discussion is about the possible emergence of investor tendency behavior to adapt other coping strategies expected by research hypothesis. To look into this, the authors attempts to map and relate the observations results in Table 3, which are between types of treatment and its adaptation strategy and other second rank adaptation strategies. The result of the mapping is further related to the rational and irrational behavior formation, which details can be seen in the Figure 2.

Based on Figure 2, it shows that the participants adapted other hypothesized strategies. Although such condition was not covered in the statistical test, it may need extra attention. Participants were supposed to adapt the profit maximizing strategy when manipulated with treatment one (opportunity-high control) indicated a

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possibility of adapting the second coping strategy (profit satisfying). This appeared from the number of observations obtained, 43 observations (26.88%). Investors have a tendency to behave underreact even within the market conditions that should ideally be profitable. This may due to the unpredictable of capital market events which gave investors their own experiences. Some of them might have experienced losses in the past when facing capital market events similar to the current event, so they were still affected by the past loss experience. This would make them more cautious in making current investment decision.

Opposite condition happened to treatment 2 (opportunity-low control), which should have encouraged the participants to adapt the profit satisfying strategy. In this condition, there are 54 observations (33.75%) which would adapt the profit maximizing strategy. Just like the previous explanation, these investors were likely to have beneficial past experience similar to the current event. This might encourage them to adapt the past strategy implementation.

When associated with rational and irrational behavior, these results were also consistent with the notion that investors are "harder" to adapt the irrational strategy. This appeared from the number of observations, that when they were subjected to treatment 1 (rational), 43 observations (26.88%) shifted to the second adaptation strategy (limited rational-emotional). Different condition occurred when the participants were subjected to treatment 2, in which the number of observations shifted to the first adaptation strategy (rational) increased to 54 observations, or approximately 33.75%.

Further discussion analyzes treatment three (threat-high control), which should have encouraged the participants to adapt the bad news handling strategy (limited emotional-rational). In this condition, there are two alternative strategies that could potentially be adapted by participants apart from bad news handling strategies: profit maximizing strategy (45 observations or 28.1%) and profit satisfying strategy (41 observations or 25.6%). Although under the market conditions that ideally stimulating them to adapt emotional-rational strategy, most participants tended apply the rational (strategy 1) and the rational-emotional (strategy 2) behaviors. Investors might have different expectations of an investment outcome so that when facing market situations with different expectations to theirs, there was a quest for "self-justification" to only access information that supported their prediction (the self-deceiving behavior) that encouraged them to adapt another strategy. Still similar to the previous explanation, in this condition the shift to rational coping strategies (strategy 1) still outnumbered the shift to the emotional coping strategies (strategy 2).

Last analysis discusses the self preserving strategy (irrational) that investors should have adapted when given treatment 4 (threat-low control). Although (compared to the other three coping strategies) the self-preserving strategy adapted dominated in the treatment 4 (59 observations or 36.88 %), but in this situation participants had a tendency to adapt other strategies. According to the previous Figure 2, there were two strategies that could potentially be adapted when investors are in this situation: the profit satisfying strategy (rational-emotional) and bad news handling strategy (emotional-rational). Irrational market condition had been in the contrary to the investors' expectations on an investment's outcome, where they should be able to make a profit (according to the initial prediction), but in fact it has potential losses.

This condition is certainly in the contrary to what investors had expected, so there was a tendency to "not believe" this fact and continued to believe their initial predictions before. This fact could potentially cause investors to adapt other strategies beyond strategy 4: strategy 2 (48 observations or 30%) and strategy 3 (41 observations or 25.6%). These results are also consistent with the previous discussion in which the shift to the rational strategy (strategy 2) outnumbered the irrational strategy (strategy 3). In addition, the possibility of a shift among adaptation strategies of the four treatments showed no behavior shift led to self-preserving strategy (irrational). These results strengthen the assumption on previous discussion that the irrational decision formulation were likely to be "harder" than the decisions rational one.

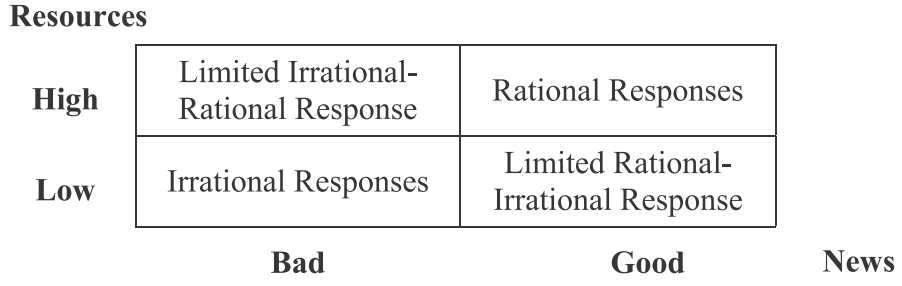

Figure 3. Prediction of Investors' Adaptation model toward their own responses

Conclusion

Based on the results of statistical testing and analysis of participants' open responses, the authors obtained empirical supports for the four research hypotheses proposed. When given treatment 1, participants tended to adapt the profit maximizing strategy by conducting a comprehensive analysis of risk return. This strategy would lead investors to the rational behavior formation. In treatment 2, participants generally used the problem-focused solving and emotion-focused coping in adapting the profit satisfying strategy. Participants tended to behave underreaction and become more passive and conservative in the transaction.

Problem-focused and emotion-focused adaptations were also employed when the participants were subjected to treatment 3, where the situation was more dominated by emotional aspect. Meanwhile, the adaptation of fourth strategy (self preserving) done by developing emotion-focused adaptation that aimed to reduce the tensions and create emotional stability. This strategy would lead investors to the irrational behavior formation.

Another analysis showed that investors were generally "harder" to respond irrational than rational behavior. The results showed some specific reasons. *First*, investors generally had early prediction on an investment's performance, so any new information that contradicted to the initial prediction was likely to be ignored. *Second*, market condition that led to the rational behavior was generally in line with investors' expectations, while the irrational condition tends to conflict with their expectations. This would stimulate them to "not recognize" the market condition. *Third*, the investors' past experience would always undergo re-appraisal and served as new internal resources to deal with similar future market events. When linked to the results of this research, it is understandable why the rationality assumption dominated the financial researches. This might occur because individuals are relatively "easier" to formulate rational decision than the irrational one, thus enables more capital market phenomena studied by a rational perspective.

Based on the above explanation, assuming the ceteris-paribus, thus the Investors' Adaptation model developed in this study will be able to predict the investors' response possibilities when they face capital market events. The predictions are as summarized in Figure 3.

This research contains several implications. From the conceptual point of view, this research successfully developed a new approach in analyzing the investors' rational and irrational behavior formation process through an integrated empirical model that combines theories of finance and psychology, which is referred as Investors' Adaptation model. Empirical findings in this study suggest that rational and irrational responses given by investors can be influenced by the appraisals (primary and secondary) toward current capital market event.

Investors' Adaptation model can be used to explain the rational and irrational behavior formation that occurs when investors take the risky investment decision. For events that lead them to profit maximizing strategy adaptation (rational responses), the rational perspective-based researches would best solve the phenomenon, while for events that direct investors to adapt self-preserving strategy (emotional response), behavioral perspective will best provide an empirical explanation. In addition, a

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counter opinion on which approach is the most appropriate one in analyzing the capital market phenomena may also be explained by Investors' Adaptation model.

Behavioral finance-researches on Indonesian capital market background are still rare. The review in this study may hopefully be used as a basis for developing the limited behavioral finance-researches, including the research methodology used. Behavioral researches based on the Coping theory generally used survey and case study methods. This study succeeded in explaining the experimental method which adopted Coping theory integrated with theory of finance to develop new research instruments. Meanwhile, the use of experimental subjects in the form of stock investors could increase the external validity of experiments, which also broke the paradigm that experimental design generally only focuses on the internal validity.

From the managerial point of view, this research contributes policy recommendations to the practitioners (investors, brokers, investment managers, and other capital market participants) in understanding the psychology of investing. By understanding it, they are expected to formulate the best investment strategy and develop the most appropriate approach in dealing with the complexity of capital market.

Behavior is a unique and complex "thing" in which the Investors' Adaptation model may still have limitations in explaining the complexities on the investment behavior formation. Another limitation of this model is that it can only be used to analyze individual investment behavior which has not been able to explain the institutional investment behavior. Investors' Adaptation model only tested the behavior formation for certain event and has not tested the behavior formation after the reappraisal process.

The study also contains several other limitations, such as experimental techniques, the use of virtual endowment, and the methods of data analysis. To improve some of these limitations, the future researches need to consider several things such as: (1) experimental techniques improvement by developing experimental software, (2) develop better data analysis methods, including the use of metrics data and the ability to reveal the switch degree among investors' rational-irrational behaviors, and (3) consider the use of actual endowment to increase the participants' perceptions toward investment risks.

By doing some improvements, the future researches hopefully will be better able to uncover the complex phenomena of capital market, especially those related to the psychology of investing in a more extensive and comprehensive way. In addition, the continuous replications may also improve Investors' Adaptation model developed in this study, including the research instruments used.

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