한국항해항만학회지 제46권 제2호
J. Navig. Port Res. Vol. 46, No. 2 : 121-133, April 2022 (ISSN:1598-5725(Print)/ISSN:2093-8470(Online))
DOI : http://dx.doi.org/10.5394/KINPR.2022.46.2.121

Analysis of the Maturity Selection on Ship Finance: A Behavioral Finance Perspective

† *Wu-Seok Kim*

† *Alumnus, Graduate School of National Korea Maritime and Ocean University, Korea*

Abstract : *The purpose of this study was to analyze decision-making regarding ship finance term selection from the behavioral finance perspective and to confirm if the causes and backgrounds of decision-making related to the term selection of ship finance are explicitly explained by behavioral finance theories. Additionally, through a case study, this study infers if decisions are irrational. Narrative and questionnaire responses on the selection of the ship finance period were obtained and analyzed from the behavioral finance perspective. Some shipping companies incur additional losses by choosing inappropriate ship-financing terms. This study applied behavioral finance theories, such as the certainty effect, availability heuristic, and loss aversion, to clearly explain the causes and background of such decision-making. Based on the results, it was found that behavioral finance theories impact ship financing decisions and errors related to behavioral finance can result in irrational decisions. Ship finance managers must be vigilant in preventing behavioral finance errors that can affect the decision-making term of ship finance.*

Key words : *behavioral finance, shipping finance, availability heuristic, certainty effect, loss aversion*

1. Introduction

Since the 2000s, behavioral economists have been awarded several Nobel Prizes. The major distinction between behavioral economics and traditional economics is that the former can explain the process of decision-making. While traditional economics acknowledges human beings as rational entities and focuses on analyzing the market or system, behavioral economics analyzes humans' decision-making by applying aspects, such as psychological theories. Behavioral economics and finance are suitable for explaining various decision-making situations because they are difficult to explain in terms of traditional economics (Baddeley, 2017; Wilkinson and Klaes, 2012; Camerer et al., 2004).

Traditional economics suggests that humans are rational beings that act for their own benefit without being swayed by emotions. Because humans are considered rational decision-makers, traditional economics blames the market and the government's functioning or the failure of the system for various economic problems or inefficiencies. It argues that additional analysis and attention should be drawn to the functional and institutional aspects, and that it is on the market or country to correct such problems (Baddeley, 2017; Wilkinson and Klaes, 2012; Camerer et al., 2004).

However, behavioral economists consistently claim that humans are not rational beings. In contrast to blaming the failure of the market or system, they contend with the cause of economic inefficiency within the irrationality of the economic units—the irrationality of the people (Baddeley, 2017; Chen et al., 2017; Barberis and Thaler, 2002). Thus, it can be assumed that shipping companies suffer from business difficulties or go bankrupt because of irrational decisions made by their CEOs or managers.

It has been confirmed that shipping companies tend not to give up the delivery of ships that are economically non-viable because of errors in behavioral finance, a sub-discipline of behavioral economics. They tend to pay additional costs and receive delivery of ships that are much more expensive than the market price after the downturn in the shipping market (Kim and Lee, 2020). Moreover, shipping companies tend to incur additional losses due to rising interest rates. Moreover, they choose floating rather than fixed interest rates in financial markets with historically low rates of interest (Kim, 2021). This confirms that behavioral finance theories directly influence ship delivery decisions and interest rate selection in shipping finance. In addition, decisions affected by behavioral finance errors result in additional losses.

Several shipping companies continued to suffer losses and filed for court receivership or went bankrupt after the 2008 global financial meltdown because they arranged their medium- to long-term ship financing with very high

† Corresponding author, wuseokkim@naver.com +82-51-794-3981
Note) This paper is a part of the author Wu-Seok Kim's doctoral thesis, submitted at Korea Maritime and Ocean University in 2021

interest rates. Bank K in Korea has arranged L shipping funds since 2009 to support ship financing for several domestic shipping companies. However, the rate of return on L shipping funds is higher than 13% per annum (Han, 2010; Jeon, 2010; Jeon et al., 2017; 2019).

Managers in charge of ship financing in several shipping companies that had borrowed loans from the L shipping funds conducted negotiations with one of the Korean Public Ship Financiers ("KPSF") on finance procurement for other ships in their possession in 2015. They regretted making the ship financing decision from L shipping funds with a 5 - 6 years maturity rather than a short-term maturity. The shipping companies used funds supported at high interest rates because of difficulty in securing ship financing after the Lehman crisis. However, abnormal financial markets quickly normalized. From 2012 onwards, shipping companies secured financing at a stable interest rate. However, shipping companies cannot terminate their existing financial contract and continue to pay high financing costs until the maturity date because of the additional costs incurred due to loan prepayment and refinancing. This decision seems far from rational, pursuing the maximum benefits claimed in traditional economics.

This study performs a case study to analyze how human psychological factors influence decision-making when deciding on the maturity of a loan. It analyzes why some managers in charge of ship finance in shipping companies make decisions that differ from the recommendations of ship finance institutions regarding ship maturity selection, and whether these decisions are rational or irrational. Additionally, this study investigates whether behavioral finance theories can explain these decisions.

2. Literature review

Since the 1980s, psychology-based behavioral economics has been recognized in academia. Behavioral economics clearly explains the economic phenomena that traditional economic theories cannot explain (Baddeley, 2017; Wilkinson and Klaes, 2012; Camerer et al., 2004).

For example, when it is necessary to secure funds by selling stocks, individual investors do not select stocks to sell by analyzing the company's financial position and operating prospects. Instead, there is a tendency to hold stocks that fall below the purchase price and sell stocks that rise above the purchase price (Odean, 1998). Such an action is difficult to regard as rational, and traditional economic theory is limited in explaining such decision-making.

Hence, economists and finance scholars have recognized the difficulty in explaining financial market phenomena using traditional theories, and the need for behavioral finance (Barberis and Thaler, 2002). Behavioral finance is a sub-discipline of behavioral economics that investigates human behavior related to finance (Forbes, 2009), based on human psychology, sociology, and anthropology. (Shiller, 1998). Ritter(2003) argues that behavioral finance studies inefficiencies in financial markets and how people think and act in finance-related matters.

Traditional finance regards humans as rational decision makers, whereas behavioral finance assumes that humans do not always make rational decisions. (Chen et al., 2017).

2.1 Loss Aversion and Certainty Effect

The analysis of decision-making under risky conditions and uncertainty has traditionally been explained using expected utility theory. According to this theory, humans make the best choice considering expectations, asset integration, and risk aversion in the face of uncertainty, because people are rational (Von Neumann and Morgenstern, 1947). Friedman and Savage(1948) assert that humans endeavor to maximize utility and profit even when there is risk involved. However, decisions made by humans under uncertain conditions have not been adequately explained by traditional theories. Hence, Kahneman and Tversky(1979) introduced prospect theory, a behavioral theory of decision-making under conditions of uncertainty. They claimed that people tend to avoid risk when there are gains and take risks when faced with losses.

Kahneman and Tversky(1979) experimentally analyzed people's risk preferences. In Experiment 1 of their study, 82% of people chose to get Israeli shekel ("ILS") 2400 with 100% probability, and only 18% of participants selected the chance to get more than ILS 2400 with 99% probability. In the third experiment, 80% of the participants chose to obtain an ILS 3000 at 100% probability, and only 20% chose to obtain an ILS 4000 at 80% probability. In Experiment five, 78% of the participants chose to travel to the UK for a week with a 100% probability, and 22% chose to travel to Europe for three weeks with a 50% probability. The authors argued that people are more focused on certainty than on high probability. This phenomenon is known as the certainty effect.

They also claimed that humans tend to avoid risks.

Shiller(1998) stated that people are willing to purchase insurance because they prefer to avoid risk. These results are inconsistent with the maximum expected value found in expected utility theory. However, they are consistent with the risk-aversion assumption of the theory. Through experiments, Kahneman and Tversky(1979) demonstrated that expected utility theory does not adequately explain human decision-making under conditions of uncertainty. In Experiment 3.2, 92% of the participants chose to lose ILS 4000 with an 80% probability, and only 8% chose a sure loss of ILS 3000. In Experiment 7.2, 92% of the participants chose a risk of 45% to lose ILS 6000, and only 8% chose to lose ILS 3000 with a 90% probability. In Experiment 8, 73% of the participants chose the chance of acquiring ILS 6000 at a probability of 0.1%, whereas 27% chose the chance of acquiring ILS 3000 at a probability of 0.2%. However, in Experiment 8.2, 70% of the participants chose to lose ILS 3000 at a 0.2% probability, and 30% chose to lose ILS 6000 at a 0.1% probability. These experimental results cannot be explained using expected utility theory. The authors asserted that losses and gains are the reference points associated with human decision-making under conditions of uncertainty and risk; humans respond more sensitively to losses than to gains.

Tversky and Kahneman also demonstrated human loss-aversion tendencies in an article published in 1981. In Experiment 3.1, 84% of the participants opted for a sure gain of $240, and only 16% chose to receive $1000 with a 25% chance. However, in Experiment 3.2, only 13% of the participants opted for a sure loss of $750, whereas 87% of the participants chose to lose $1000 with a 75% probability. In Experiment 4, 100% of the participants selected a 25% chance of receiving $250 or a 75% chance of losing $750 over a 25% chance of getting $240 or 75% chance of losing $760, respectively. In Experiment 5, 78% of the participants opted for a definitive $30 acquisition, while 22% chose to earn $45 at an 80% probability. In Experiment 6, 74% of the participants selected a definite $30 acquisition, whereas 26% chose an 80% chance of receiving a $45. Most of the choices resulting from these decision-making processes are driven by loss aversion and certainty.

Kahneman and Tversky(1984) argued that most people prefer gain and loss aversion over gains or losses related to gambling, even though the latter mathematically had higher expectations. Undoubtedly, decision makers prefer to adopt loss-avoidance strategies (Tversky and Kahneman, 1979, 1984, 1981, 1986).

Tversky and Kahneman(1991) stated that the reason for choosing loss aversion in decision-making processes can be found in the imbalance between happiness and pain. Decision-makers place more emphasis on the negative than the positive when experiencing the results of the experiments, because pain is fatal and more serious to people than pleasure. They also asserted that experience creates reference points for decision-making and directly impacts it.

Dimmock and Kouwenberg(2010) claim that several households do not like to invest in stock markets despite the high return on investment. In particular, households with higher loss aversion do not prefer to invest in stocks; instead, they gravitate toward mutual funds.

According to Baghestani(2016), when gasoline prices dropped in the U.S., consumers saw the economic outlook as positive. Nonetheless, there was no change in consumer expenditure during that time. By contrast, when gasoline prices rose, consumers saw the economic outlook as negative, and, as a result, consumer spending decreased. The authors state that people tend to focus more on negative phenomena.

Xie et al. (2018) analyzed the relationship between GDP per capita and loss aversion. They claimed that loss aversion increases in richer countries with more mature financial markets.

Meng and Weng(2018) contend that loss aversion directly affects disposition effect. If investors' assets reach their expected values, they tend to dispose them off because of their loss aversion tendencies.

Baghestani(2019) argues that if the current economic situation is evaluated as bad, consumers' proclivity to purchase a car deteriorates. However, when it improves, consumers' attitudes towards purchasing a car remain unchanged. He believes that people are more concerned about negative situations.

It is estimated that loss aversion has a direct impact on shipping and ship finance-related decisions. During the boom period of shipping, some shipowners were able to generate more profits through spot business or short-term charter contracts, but there were frequent cases where charter rates were fixed through long-term charter contracts due to concerns about falling freight rates. In this study, we analyzed how loss aversion affects ship finance decision-making.

2.2 Availability Heuristic

Humans are more likely to use similar examples to make decisions and weigh recent information based on all related information in the decision-making processes. This phenomenon is known as availability heuristic. The availability heuristic directly affects the decision-making process (Tversky and Kahneman, 1973). Further, Tversky and Kahneman(1974) contended that people's decision-making under conditions of uncertainty is affected by cognitive biases and heuristics learned from experience.

Detmer et al. (1978) insisted that estimates of mortality rates differ significantly between surgeons who work in fields with high and low mortality. This was because the estimates were based on surgeon experience.

Doctors are more likely to judge a patient's condition as more serious or judge the symptoms as less serious because of their treatment experience. Suppose a physician has experience in treating a similar patient, the physician could improperly use antibiotics based on experience (Poses and Anthony, 1991).

When past events reoccur, humans are more likely to rely on past features and experiences when forecasting future conditions because of their dependence on given information (Agans and Shaffer, 1994).

Stapel et al. (1995) contended that people use past examples that are readily available for decision-making. However, if these past examples are irrelevant, people may use other information to select more appropriate strategies.

Buckingham and Adams(2000) asserted that the availability heuristic strongly influences nurses' clinical decisions concerning patients.

Hertwig et al. (2004) asserted that humans rely heavily on experience when making risky choices. In particular, people tend to make risky choices based on the experiences gained from recent events.

Owing to constraints such as limited time, information, and cognitive capacity, it is not easy to evaluate and find the optimal solution for all issues in the real world. Thus, humans make decisions based on their learning and experience. Players must make quick decisions in the sports domain because speed is vital and limited information is available during the game. Thus, players must make instantaneous decisions based on their experience and judgment (Bennis and Pachur, 2006).

Sunstein(2006) insists that countries that have experienced climate change are more concerned about it than countries that have not experienced it severely. Under conditions of uncertainty in financial markets, availability heuristics directly impact investor behavior in stock markets (Kliger and Kudryavtsev 2010).

Sjoberg and Engelberg(2010) contended that availability heuristics tend to easily recall memory. For example, they claimed that people who watch disaster movies can easily recall nuclear power and fire dangers.

Haden et al. (2012) claimed that farmers are concerned about the serious events that they have experienced in relation to climate change and tend to take personal measures. They also assert that, as they have learned from experience, California farmers have been seriously concerned about water scarcity and have tried the hardest to address the water shortage. Mase et al. (2015) insisted that availability heuristics have a direct effect on agricultural advisors recognizing the risks of climate change.

Chen et al. (2017) assert that the Taiwanese stock market displays a "January effect" because of the availability heuristic. Taiwanese companies pay bonuses before the Chinese New Year and workers are more likely to purchase shares to increase their wealth. Thus, Taiwan's stock market tended to increase in January. In the case of insufficient information, availability heuristics can strongly impact the prices of the shares of low-capitalization companies and increase stock price volatility after a given event (Kudryavtsev, 2018).

It is inferred that the availability heuristic has had a significant impact on decision-making related to shipping and ship finance. From 2004 to the first half of 2008, freight rates and ship prices of bulk carriers continued to rise. As a result, it is estimated that some domestic shipping companies purchased multiple secondhand ships at high prices and chartered several ships at high charter rates because they judged that high freight rates and ship prices would be maintained. It is also expected that the availability heuristic may influence decision making. In this study, we analyzed how the availability heuristic affects ship finance decision-making.

3. Empirical Framework and Hypothesis

This study analyzes ship finance decision-making using behavioral finance theories. As the decision-makers and management of ship finance and the managers of shipping companies are human beings, their points of view should be considered. Therefore, the qualitative research was a suitable method for this study.

In addition, narrative inquiry or case studies are

appropriate qualitative research methods if the subject and object of the study are related to humans or human behavior (Creswell, 2013). Assuming the research question is related to "how" or "why," the case study method is one of the most appropriate research methods that can be applied (Hedrick et al., 1993).

A case study is a qualitative research method that considers, analyzes, and reviews the subject of study extensively, and is methodology suitable for describing, searching, or explaining phenomena occurring in real life. In addition, case studies are one of the most suitable research methods to improve the understanding of complex situations, behaviors, and cultural factors (Stake, 1995; Yin, 2014), and are universally used in social and life sciences (Yin, 2009). In business administration, case studies are mainly used to analyze external influences and their impacts on a company, to understand the company's strategies, decision-making, and interests, or to ascertain and develop optimal business cases (Klonoski, 2013; Bell et al., 2019).

Therefore, this study uses a qualitative case study method, narrative, and questionnaire responses to analyze and explain why the person responsible for shipping companies' ship financing makes decisions that diverge from managers' advice in financial institutions and the consequences. In addition, this study examines whether ship finance decisions are explained by behavioral finance theories and infers whether decision-making is rational or irrational.

3.1 Narrative response

In the case of A Shipping Company, two respondents provided narrative responses. The participants in charge of shipping finance negotiations with the KPSF were the directors and managers of the shipping company. The questions were as follows:

"While negotiating the shipping finance project with the KPSF in 2009, the KPSF proposed a three-year loan because of the high-interest rates after the collapse of Lehman Brothers. However, A Shipping Company has adopted a five-year loan. Please explain the background behind the decision to choose a five-year loan instead of a three-year loan, considering the high interest rates at the time."

3.2 Questionnaire surveys

Table 1 Loss aversion, certainty effect, availability heuristic - Q1 & Q2

Your company is trying to procure refinancing of a ship with a maturity of ship finance in the financial market. Currently, short-term/mid-term/long-term refinancing rates are very high compared to normal financial market conditions. In this case, please select your opinion on choosing a refinancing period for ships due to maturity. However, a high prepayment fee is required for early repayment.		
	Conditions	**Answer choice**
Q 1.	Selection of financing period (short/medium/long-term)	- Short term (1~3 years) - Medium term (4-6 years) - Long term (over 7 years)
Q 2.	Selection of financing period (short/medium/long-term), additional information provided - Refinancing was blocked due to financial market instability for the past 3 years - The company repaid the existing loan by disposing of ships that reached maturity in ship finance at a low price in the market or repaid ship finance with the company's operating cash. - The current liquidity of the company is no longer available.	- Short term (1~3 years) - Medium term (4-6 years) - Long term (over 7 years)

The contents of the above [Table 1] are actual questionnaire questions and multiple-choice answers of the survey conducted for this study. The questionnaire questions and multiple-choice answers were prepared based on previous studies. These questions and answers were modified from questionnaires and statements used by behavioral finance scholars, and converted into questionnaires and multiple-choice answers applicable to analyzing ship finance decisions. Questions and answers were also prepared based on negotiations of ship finance projects executed by the KPSF for shipping companies in the past.

Table 2 Participants in survey responses

	Classification	**Respondents**	**Ratio**
Organizations	Shipping Companies	14	25.0%
	Financial Institutions	21	37.5%
	Shipbroking Companies	6	10.7%
	Other Shipping Related Organizations	8	14.3%
	Other Organizations	7	12.5%
Work Experience	less than 5 years	3	5.4%
	less than 10 years	6	10.7%
	less than 15 years	21	37.5%
	less than 20 years	14	25.0%
	less than 30 years	8	14.3%
	more than 30 years	4	7.1%
Age	over 30s	15	26.8%
	over 40s	31	55.4%
	over 50s	6	10.7%
	over 60s	4	7.1%

The survey was conducted over the course of three weeks in February 2020. After completing the questionnaire

on Google Forms, a text message was sent to the ship finance and shipping industry workers to ask them to participate in the survey. A total of 56 people participated in the survey. Most of the survey participants were industry practitioners and experts who had directly or indirectly experienced and performed ship finance-related work over a long period as employees in the shipping and ship finance industry. The details of the survey participants are shown in the above [Table 2].

4. Analysis of the maturity selection on ship finance

4.1 Shipping loan maturity selection - analysis of narrative responses

Since the collapse of Lehman Brothers in 2008, most new shipping financing supported by financial institutions has halted, and A Shipping Company has not been an exception. It experienced tremendous hardships due to the shipping market's decline and the liquidity crisis. Therefore, the company participated in the KPSF ship-financing program with 17 debt-free vessels in their possession to secure liquidity (Maritime Press, 2009). During this process, the company accepted a five-year maturity USD fund with an interest rate of 8.5%. Since the interest rate for issuing a five-year USD bond for POSCO, which has one of the highest credit ratings in Korea, was 8.95% (Kim, 2009), an interest rate of 8.5% was acceptable for A Shipping Company in 2009 (Kim, 2009; Bu, 2009).

However, the interest rate of A Shipping Company's financing was below the level of L+100bps before the Lehman Brothers crisis (Infomax 2020; Marinemoney 2020). Therefore, the 8.5% interest rate was still very high compared to previous interest rates. Executive managers and the board of directors expected the financial turmoil to be temporary. They also expected that the interest rate in shipping finance would decrease back to the previous rates. Despite this, during the negotiation process, the shipping company requested a five-year maturity financing agreement instead of short-term financing of two or three years, because they were not certain of the possibility of re-financing with a lower interest rate in two to three years.

According to the narrative responses, respondents A1 and A2 stated that the company experienced several difficulties in securing ship financing during the Lehman Brothers crisis. Therefore, during the decision-making process in arranging shipping finance with the KPSF, the company adopted a five-year term loan instead of a short-term loan because it prioritized stability. Such decision-making demonstrates humans' availability heuristics, certainty effects, and loss-averse tendencies, as asserted by Tversky and Kahneman (1973, 1979). Hertwig et al. (2004) claimed that people tend to make choices based on the experiences gained from recent events. Kliger and Kudryavtsev(2010) insist that people use past experiences in their decision-making processes. Baghestani(2019) argues that people are more concerned about negative situations. Meong and Weng(2018) contend that loss aversion directly impacts decision-making. Dimmock and Kouwenberg(2010) claim that decision makers prefer to adopt loss-avoidance strategies. It can be concluded that the decision-making process in this case corresponds exactly to behavioral finance theory. However, A Shipping's decision to prioritize certainty and avoid losses did not lead to the best business and financial management outcomes. Several cases of financial decisions based on certainty and loss aversion have been evaluated as mistakes.

According to information provided by Yonhap Infomax and Financial News, Samsung Electronics secured USD 460 million through the Yankee bond in 1997, with an interest rate of 7.7%. The bond was issued under the condition of 30-year maturity, and the coupon is still paid off at a high interest rate because it is not possible to receive an early redemption (Choi, 2016). This was an excellent investment choice for creditors, as it secured high profitability and stability. However, Samsung Electronics is desperate for early redemption, because it has abundant liquidity and the highest credit rating worldwide. Samsung Electronics' decision to secure certainty in an unstable financial market was irrational.

Based on the information provided by the Infomax database, the coupon rate on the 5-year public corporate bonds rapidly soared to the high 6% level after the Lehman crisis, and then gradually declined to less than 3% in 2012.

Using data collected from the Infomax database, the below [Fig. 1] shows the interest rates for non-guaranteed 5-Year corporate bonds with a BBB rating, which is the credit rating of A Shipping Company in 2009. The bond market showed full recovery from Lehman Brothers' after effects by the second half of 2012.

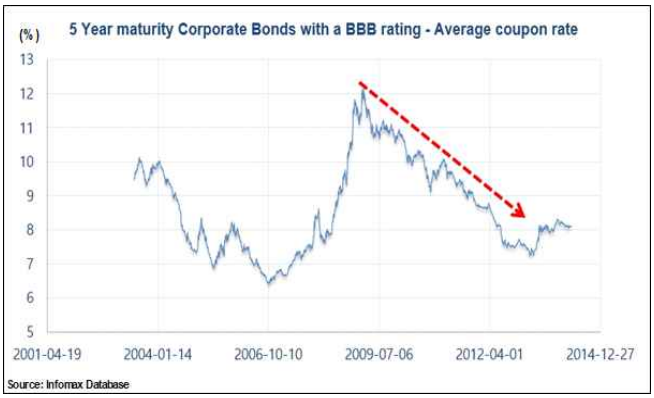

Fig. 1 5-Year maturity Corporate Bonds with a BBB rating - Average coupon rate

Shipping finance has characteristics similar to those of mortgage finance, with vessels as mortgages. It is similar to corporate finance because it is supported by the creditability of a company (Harwood, 1995). Hence, it is inappropriate to compare the interest rates of ship finance to non-guaranteed bonds issued solely based on a company's credit rating. The data provided above are meant only to analyze interest rate trends.

Table 3 K shipping fund - coupon rate

Execution Date	Jul-2009		Dec-2009	Apr-2010			Jul-2010	Dec-2011			
Companies	H2	H1	H2	H3	H1	H2	D1	D2	D3	S1	H2
Interest rate	8.00%	8.50%	8.25%	6.20%	7.25%	7.00%	7.25%	5.00%	4.75%	5.25%	4.75%

Source: DART(http://dart.fss.or.kr/), www.kamcosimc.com

The above [Table 3] shows the dollar interest rates provided to Korean shipping companies by the KPSF. As shown in the table, interest rates started to drop in 2009. The KRW and USD funding rates for the KPSF have decreased rapidly since 2010.

According to data provided by the Infomax and Marinemoney databases, the interest rate for shipping finance of A Shipping Company was below L+100bps before the Lehman Brothers crisis. After the collapse, it became extremely difficult for the company to procure shipping finances with high interest rates of approximately L+700bps.

When examining the interest rate trends for domestic and overseas shipping provided by financial institutions working with the KPSF shipping fund, it was nearly impossible to secure ship financing after the collapse of the Lehman Brothers in 2009. In 2010, maximum support was still inactive, but from 2011 onward, active support for ship finance emerged (Kwak, 2011).

The DVB and Nord LB banks in Germany and other global ship financing banks in Europe and Singapore expressed their intention to participate in the shipping finance support program of the KPSF fund, and they were able to provide interest rates of up to L+250-300bps in 2011 (Kwak, 2011; 2012). In 2012, participation potential and interest rates were maintained at levels similar to those in 2011. Later in 2013, interest rates increased slightly and were maintained at a normal rate up to the present day.

A Shipping Company has been requesting early repayments on their loans to the KPSF since the second half of 2012 (Kim, 2014; Kwak, 2014; Seong, 2016; Shipping Daily, 2014) because they could have used these vessels in the market to procure more funds at a lower interest rate. However, considering the swap-breaking cost, an early redemption would result in more losses than profits for the company. The fund created in 2009 used the cross-currency interest rate swap ("CCIRS") and the issuance of a KRW bond, because the KPSF fund was a dollar support program with a fixed five-year principal and interest. This is because it uses the CCIRS guaranteed by the KPSF to ameliorate the financial situation of the shipping company.

When looking at the below [table 4] about results of analyzing the narrative responses, the company's decision to procure five-year maturity ship finance, as explained by behavioral finance, to prioritize loss aversion and secure stability, did not yield the most optimal outcome in terms of business and financial management.

Table 4 Case analysis of ship finance period of repayment selection - narrative response analysis

Data	Behavioral finance theory	Results of analysis and basis of judgment
Narrative response	Loss aversion	"There is no certainty that the financial market will normalize after 3 years"
	Availability heuristic	"Experience in situations where financing is impossible due to the Lehmann crisis"
	Certainty effect	"Ship financing with a 5-year maturity is safer than a 3-year maturity for securing refinancing"

After analyzing the ship financing case of A Shipping Company, it was found that the background and causes of the ship financing decision made by the company can be explained by behavioral finance theories.

The finance decision-maker of A Shipping Company predicted that the financial market would normalize within two - three years. The interest rate fell within two to three years at the time of negotiations in 2009. However, instead of choosing a short-term loan with a relatively low interest rate, the company proceeded with a 5-year ship loan with a high interest rate. Despite high interest rates, A Shipping,

which experienced financial market collapse after the Lehman crisis and the impossibility of procuring ship finance, chose 5-year maturity rather than short-term finance to avoid losses due to the impossibility of refinancing. However, since 2010, the financial market has normalized, and the USD and KRW interest rates on loans fell rapidly. Ultimately, the company has continuously requested prepayment from the KPSF since 2012 (Kim, 2016; Kwak, 2014; Seong, 2016; Shipping Daily, 2014).

Suppose A Shipping Company proceeded with short-term financing for two to three years, as recommended by ship financing institutions, considering the abnormally elevated interest rate level after the Lehman crisis. In this case, the company could have saved interest expenses of at least 3% per annum since 2011. The five-year ship financing that A Shipping executed in 2009 was hardly rational and not the best decision given the circumstances. These decision-making backgrounds and processes are explained by behavioral finance theories, such as the availability heuristic, loss aversion, and certainty effect, as mentioned by behavioral finance scholars.

4.2 Shipping loan maturity selection – analysis of questionnaire responses

In ship financing, if the interest rate of loans is abnormally high, unlike in a normal financial markets, it is generally recommended that short-term financing be executed and the loan refined after the interest rate stabilizes. It is also recommended that interest expenditures and financial costs be normalized to reduce them. As shown in [Fig. 1], when the interest rate is abnormally high owing to an external shock, it stabilizes rapidly. This decision-making is consistent with the rational human, efficiency maximization, and profit maximization asserted in traditional economics.

Similar to the analysis of narrative responses, behavioral finance theories clearly explained the analysis of questionnaire responses. In the case of abnormal financial market conditions and the assumption that the funding rate is abnormally high, 58.9% of all the survey respondents chose to execute short-term financing. However, when the information that financing was almost impossible during the past three years was provided, the number of respondents who chose short-term financing decreased to 39.3% in Questionnaire 2. The below [Table 5] shows the results of the survey.

Table 5 Case analysis of the selection of ship finance repayment period: Survey response analysis.

Data	Results of survey response analysis	Behavioral Finance Theory	The basis of judgment
Q 1	- 58.9% of all respondents chose the short-term ship financing - 76.2% of employees in financial institutions chose the short-term ship financing - 50.0% of employees in shipping companies chose the short-term ship financing	Loss aversion Availability heuristic Certainty effect	As information about the past situation in which financing was not possible was provided, the selection ratio for short-term financing decreased.
Q 2	- 39.3% of all respondents chose the short-term ship financing - 47.6% of employees in financial institutions chose the short-term ship financing - 42.9% of employees in shipping companies chose the short-term ship financing		

Suppose that the interest rate is abnormally high because the financial market is abnormal. In this case, it is necessary to reduce the interest expenses for ship finance by executing refinancing when the financial market normalizes after the procurement of short-term financing instead of mid-to-long-term financing. However, owing to the psychological tendency of human beings to avoid loss and seek certainty, decision-makers cannot maximize benefit when making decisions about the repayment period of ship finance.

In addition, difficult situations related to past shipping financing experience have a significant impact on current decision-making. Managers are more likely to procure mid-or long-term finance than short-term finance when interest rates are abnormally high due to unstable financial markets. This is because of the effects of loss aversion, certainty effect, and availability heuristics mentioned in behavioral finance theory. It has been confirmed that the psychological factors mentioned by behavioral finance scholars have a direct influence on ship finance decision-making.

The distinctive thing is that no respondents from the ship financial institutions chose long-term financing in Questionnaire 1, and 76.2% of respondents chose short-term financing in the case of ship financial institution workers. In Questionnaire 2, 47.6% of respondents from ship financial institutions chose short-term financing, which is higher than the 39.3% of respondents who chose short-term financing among all respondents. It can be inferred that financial industry workers are more sensitive to interest rate level and loan term setting.

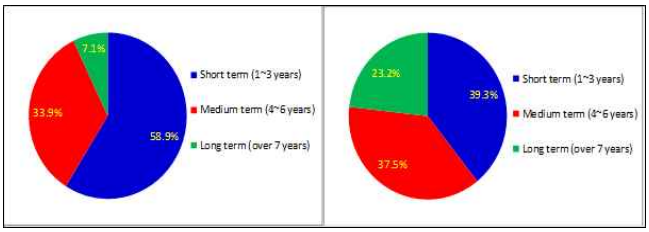

Fig. 2 Questionnaire responses 1 vs. 2

Under the assumption of abnormal financial market conditions, a questionnaire survey on the choice of refinancing maturity for ships was conducted. The above [Fig. 2] shows the results. In Questionnaire 1, 58.9% of all survey respondents chose to execute short-term refinancing under financial market conditions with abnormally high interest rates, 33.9% chose medium-term refinancing, and 7.1% chose long-term refinancing. It can be seen that the results of these survey responses are not very different from the interpretation of traditional economics. In Questionnaire 2, additional information to Questionnaire 1 was provided. When financial market information, which was very difficult to obtain in the past, was provided, the choice of refinancing period of all survey respondents changed. Those who chose short-term financing decreased to 39.3%, those who chose medium-term financing increased to 37.5%, and those who chose long-term financing increased to 23.2%.

Table 6 Statistical tests of differences between questionnaire responses 1 and 2

Q 1 vs. Q 2	Short term financing	Medium- to long term financing
Q 1	33	23
Q 2	22	34
5% (Significance level)	two proportion Z-test	
Z-score	2.0791	Reject the null hypothesis(H_0)
p-value	0.0189	Reject the null hypothesis(H_0)
5% (Significance level)	Fisher's exact test	
p-value	0.0290	Reject the null hypothesis(H_0)

According to the above survey test results on the choice differences between the test respondents of Questionnaires 1 and 2, the difference between the two proportions indicated a Z-score of 2.0791 and p-value of 0.0189. At a 5% significance level, the test results demonstrated a Z-score larger than $Z_{0.05}$=1.645, rejecting H_0, as well as a p-value of 0.0189, which is smaller than α=0.05, eliminating the null hypothesis of H_0.

Additionally, according to Fisher's exact test, the results indicated a p-value of 0.0290, smaller than α=0.05, thus rejecting the null hypothesis of H_0. Therefore, with the results of both the two-proportion Z-test at the 5% significance level and Fisher's exact test, it can be concluded that there are choice differences among the survey respondents concerning questionnaires 1 and 2 in the survey.

As past financial market information was provided, survey respondents changed their choice of maturity in ship finance. In other words, the number of survey respondents who changed their decision-making from short-term financing to medium-to-long-term financing increased.

Fig. 3 Question 1 - Ship Financial Institutions vs. Shipping Companies

In contrast, an interesting result was found by comparing the results of the survey responses to Questionnaire 1 regarding the selection of financing periods among employees of each institution. As shown in [Fig. 3], most employees of shipping financial institutions responded that they would execute short-term refinancing when interest rates were abnormally high. However, the responses of the shipping company workers differed. In addition, none of the employees of ship-financial institutions chose to procure long-term ship financing in response to Questionnaire 1.

Table 7 Question 1 - Statistical test of the difference between two institutions (short-term vs. mid-to-long-term)

Q 1	Short term financing	Medium- to long term financing
Financial institutions	16	5
Shipping companies	7	7
5% (Significance level)	two proportion Z-test	
Z-score	1.5991	Accept the null hypothesis(H_0)
p-value	0.0559	Accept the null hypothesis(H_0)
5% (Significance level)	Fisher's exact test	
p-value	0.1086	Accept the null hypothesis(H_0)

According to the above [Table 7] which are statistical test results on the choice differences in the selection of short-term ship financing in Questionnaire 1 between workers from financial institutions and shipping companies, the difference in the proportions indicated a Z-score of

1.5991 and a p-value of 0.0559. In the case of a 5% significance level, the test results indicated a Z-score smaller than $Z_{0.05}$=1.645, thus accepting H_0; as well as a p-value of 0.0559, which is larger than α=0.05, thus accepting the null hypothesis of H_0. Therefore, it can be determined that there is no choice difference between workers in the two groups at the 5% significance level. Nevertheless, the test at the 10% significance level confirms the differences in decision-making between the workers of the two groups.

Table 8 Question 1 - Statistical test of the difference between the two institutions (short-term/mid-term vs. long-term)

Q 1	Short- to medium term financing	Long term financing
Financial institutions	21	0
Shipping companies	10	4
5% (Significance level)	two proportion Z-test	
Z-score	2.6027	Reject the null hypothesis(H_0)
p-value	0.0047	Reject the null hypothesis(H_0)
5% (Significance level)	Fisher's exact test	
p-value	0.0191	Reject the null hypothesis(H_0)

According to the above [Table 8] which are statistical test results on the choice differences between short- and medium-term financing and long-term financing in Questionnaire 1 of the survey between workers from financial institutions and shipping companies, the difference between the two proportions indicated a Z-score of 2.6027 and a p-value of 0.0047. In the case of a 5% significance level, the test results indicated a Z-score larger than $Z_{0.05}$ =1.645, thus rejecting H_0; as well as a p-value of 0.0047, which is smaller than α=0.05, thus eliminating the null hypothesis of H_0. Therefore, it can be determined that there are choice differences between the workers in the two groups at the 5% significance level. In addition, according to Fisher's exact test, the p-value was 0.0191, which was smaller than α=0.05. Therefore, the null hypothesis was rejected.

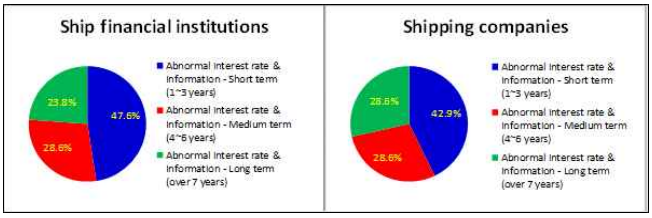

Fig. 4 Questionnaire No. 2 - Ship financial institutions vs. shipping companies (abnormal procurement rate and historical information provided)

As shown in the above [Fig. 4], the responses to Questionnaire 2 for financial institutions and shipping companies were also different from those of Questionnaire 1. After information about past problems with financial procurement was provided, the choice of short-term financing by ship financial institution workers decreased significantly, from 76.2% to 47.6%. The choice of short-term procurement financing among shipping company employees also decreased from 50% to 42.9%.

Behavioral finance scholars argue that humans use the availability heuristic, certainty effect, and loss aversion in decision-making. As stressed by Kliger and Kudryavtsev (2010), people tend to use their past experiences in decision-making. Hertwig et al. (2004) argued that people make decisions based on the experiences gained in recent events. In particular, they contend that people tend to make decisions based on their recent experience in uncertain situations. Meng and Weng (2018) argue that loss aversion directly influences decision-making. Dimmock and Kouwenberg(2010) also stress that decision makers adopt loss-aversion strategies. In addition, Baghestani(2019) argues that people care more about bad situations.

It is judged that the survey respondents' decision-making fits these theories of behavioral finance. When the financing rate is high in an abnormal financial market situation, it is reasonable to execute short-term financing with a relatively lower interest rate, rather than medium- to long-term financing, and then proceed with refinancing when the interest rate normalizes. Thus, 58.9% of all respondents chose short-term financing in Questionnaire 1. However, only 39.3% of the survey respondents chose short-term financing in Questionnaire 2 because information on past and recent financial markets was provided. Among the survey respondents, 60.7% chose medium-and long-term financing to secure stable funding without the risk that financing would not be possible within a short period. The survey results confirmed that decision-making changes according to the given information and past experiences. These results demonstrate all the theories of loss aversion, certainty effect, and availability heuristic asserted by behavioral finance scholars.

5. Conclusion

In situations where the interest rate is abnormally high because the financial market is abnormal, it is necessary to procure short-term ship financing first, and refinancing

should be implemented later—when the financial market normalizes—to reduce interest expenses on ship finance. However, because of the human psychological tendency to avoid loss and seek certainty, decision makers tend not to pursue the maximum benefit when deciding on the maturity of ship financing. In addition, difficult situations that decision-makers have experienced in the past directly impact decision-making.

According to the results of the analysis of narrative and questionnaire responses on the selection of ship financing maturity, it is confirmed that behavioral finance theories, such as availability heuristics, loss aversion, and certainty effect, influence decision-making regarding the selection. Despite the advice of the person in charge of shipping finance in financial institutions, shipping finance managers tend to choose medium- to long-term financing over short-term financing when the financial market is unstable and interest rates are abnormally high. The past experience of difficulties in procuring ship finance affects the decision-making of ship finance managers in shipping companies.

Tversky and Kahneman(1991) stated that decision-makers care more about negative content than positive content because people are more sensitive to pain than joy. In addition, they argue that references made by past experiences directly influence decision-making. It is confirmed that the psychological factors mentioned by behavioral finance scholars have a direct influence on ship finance decision-making and that decision-making affected by behavioral finance errors can result in additional losses. When the financial market stabilizes and interest rates decrease, shipping companies regret securing medium- to long-term financing.

As behavioral finance scholars have argued, humans instinctively think and make judgements; therefore, decision-making cannot avoid cognitive bias. The same applies to the CEOs and leaders. In addition, it was confirmed that errors in behavioral finance directly affect ship finance decisions such as interest rate selection, maturity determination, and ship delivery.

In the Fourth Industrial Revolution era, collective intelligence and collective emotions should be adopted and utilized to reduce losses due to decision-making affected by behavioral finance errors. If shipping companies do not prepare new systems and leadership that utilize and adopt collective intelligence and emotions, they would face a situation where growth is impossible and survival is difficult. New leadership and management skills are required to induce cooperation through horizontal decision-making and to lead the organization through creative thinking. In other words, shipping companies need a horizontal decision-making structure that reflects the knowledge and ideas of corporate members and external experts.

References

[1] Agans, R. P. and Shaffer, L. S.(1994), “The Hindsight Bias: The Role of the Availability Heuristic and Perceived Risk.”, Basic and Applied Social Psychology, Vol. 15, No. 4, pp. 439-449.

[2] Baddeley, M.(2017), Behavioural Economics: A Very Short Introduction, 1st ed. Oxford University Press.

[3] Baghestani, H.(2016), “Do gasoline prices asymmetrically affect US consumers”, Energy Economics, Vol. 55, pp. 247-252.

[4] Baghestani, H.(2019), “An analysis of vehicle-buying attitudes of US consumers”, Research in Transportation Economics, Vol. 75, pp. 62-68.

[5] Barberis, N. and Thaler, R.(2002), A Survey of Behavioural Finance, National Bureau of Economic Research.

[6] Bell, E., Bryman, A. and Harley, B.(2019), Business Research Methods, 5th ed. New York: Oxford University Press.

[7] Bennis, W. M. and Pachur, T.(2006), “Fast and Frugal Heuristics in Sports.”, Psychology of Sport and Exercise, Vol. 7, pp. 611-629.

[8] Buckingham, C. D. and Adams, A.(2000), “Classifying Clinical Decision Making: Interpreting Nursing Intuition, Heuristics and Medical Diagnosis.”, Journal of Advanced Nursing, Vol. 32, No. 4, pp. 990-998.

[9] Bu, D. J.(2009, July 17), “캠코 첫 선박펀드 원가분석했더니...”, Shipping Daily, http://www.shippingdaily.co.kr/news_view.php?num=60620

[10] Camerer, C. F., Loewenstein, G. and Rabin, M.(2004), Advances in Behavioral Economics, New Jersey: Princeton University Press.

[11] Chen, C. S., Cheng, J. C., Lin, F. C. and Peng, C.(2017), “The Role of House Money Effect and Availability Heuristic in Investor Behaviour.”, Management Decision, Vol. 55, No. 8, pp. 1598-1612.

[12] Choi, M. Y.(2016, March 11), “삼성전자 7.7% 고금리대출 700억원 못 갚는 사연”, News1, http://news1.kr/articles/?2599673

[13] Creswell, J. W.(2013), Qualitative Inquiry and Research Design: Choosing Among Five Approaches, 3rd Edition. SAGE Publications Inc.

[14] DART(2020), DART database website, http://dart.fss.or.kr

[15] Detmer, D. E., Fryback, D. G. and Gassner, K.(1978), "Heuristics and Biases in Medical Decision-making.", Journal of Medical Education, Vol. 53.

[16] Dimmock, S. G. and Kouwenberg, R.(2010), "Loss-aversion and household portfolio choice", Journal of Empirical Finance, Vol. 17, pp. 441-459.

[17] Forbes, W.(2009), Behavioural Finance, West Sussex: John Wiley & Sons Ltd.

[18] Friedman, M. and Savage, L. J.(1948), "The utility analysis of choices involving risk", Journal of Political Economy, Vol. 56, No. 4, pp. 279-304.

[19] Haden, V. R., Niles, M. T., Lubell, M., Perlman, J. and Jackson, L. E.(2012), "Global and Local Concerns: What Attitudes and Beliefs Motivate Farmers to Mitigate and Adapt to Climate Change?", PLoS ONE, Vol. 7, No. 12, e52882.

[20] Han, H Y.(2010, Sep 24), "산은-선박펀드, 10월중 2억불 지원 예정", 머니투데이, https://news.mt.co.kr/mtview.php?no=2010092418006043037&outlink=1&ref=https%3A%2F%2Fsearch.daum.net

[21] Harwood, S.(1995), Shipping Finance. 2nd ed. Euromoney Institutional Investor.

[22] Hedrick, T. E., Bickman, L. and Rog, D. J.(1993), Applied Research Design, SAGE Publications Inc.

[23] Hertwig, R., Barron, G., Weber, E. U. and Erev, I.(2004), "Decisions from Experience and the Effect of Rare Events in Risky Choice.", Psychological Science, Vol. 15, No. 8, pp. 534-539.

[24] Infomax(2020). Infomax Database Terminal, Korea Asset Management Corporation.

[25] Jeon, B. Y.(2010, June 22), "해운업 회복, 선박펀드 기지개 켜나", 머니투데이, https://news.mt.co.kr/mtview.php?no=2010062211362631239

[26] Jeon, H. J., Yun, H. S. and Choi, Y. J.(2017), "A Study on the Limitations and Development Direction of Shipping Finance in Korea", Korea Maritime Institute 2017-01.

[27] Jeon, H. J., Yun, H. S. and Choi, Y. J.(2019), "A Comparative Study of Domestic and Overseas Shipping Financing to Build the Capacity of Shipping Financing in Korea", Korea Maritime Institute 2019-15.

[28] Kahneman, D. and Tversky, A.(1979), "Prospect theory: An analysis of decision under risk", Econometrica, Vol. 47.

[29] Kim, Y. M(2009, Apr 09), "외평채 30억달러 발행 위기설 탈피 계기", fnnews, http://www.fnnews.com/news/200904091618008453?t=y

[30] Kim, Y. G.(2014, Oct 30), "해운업계 경기도 안좋은데.. 캠코선박운용 청산에 '발목'", fnnews, http://www.fnnews.com/news/201312261717428416?t=y

[31] Kim, S. R(2016, Mar 28), "[취재 後] 해운산업 지원한다는 선박펀드의 이면", Dailylog, http://www.dailylog.co.kr/news/articleView.html?idxno=11432

[32] Kim, W. S.(2021), "Fixed Versus Floating Interest Rates in Shipping Finance: A Behavioral Finance Perspective", Journal of Navigation and Port Research, Vol. 45, No. 5, pp. 259-275.

[33] Kim, W. S. and Lee, K. H.(2020), "The Effect of Sunk Cost and Anchoring Effect on Shipping Finance", Journal of Navigation and Port Research, Vol. 44, No. 4, pp. 326-337.

[34] Kliger, D. and Kudryavtsev, A.(2010), "The Availability Heuristic and Investors' Reaction to Company-Specific events.", The Journal of Behavioral Finance, Vol. 11, No. 1, pp. 50-65.

[35] Klonoski, R.(2013), "The Case for Case Studies: Deriving Theory from Evidence.", Journal of Business Case Studies, Vol. 9, No. 3, pp. 261-266.

[36] Kudryavtsev, A.(2018), "The Availability Heuristic and Reversals Following Large Stock Price Changes.", Journal of Behavioral Finance, Vol. 19, No. 2, pp. 159-176.

[37] Kwak, Y. S.(2011, Nov 04), "선박금융 "위기는 곧 기회"", Maritime Press, http://www.maritimepress.co.kr/news/articleView.html?idxno=84385.

[38] Kwak, Y. S.(2012, June 01), "캠코, DVB와 선박금융업무 협력", Maritime Press, http://www.maritimepress.co.kr/news/articleView.html?idxno=87668

[39] Kwak, Y. S.(2014, Feb 05), "2014. 한진해운, 4천teu 컨테이너선 해체", Maritime Press, http://www.maritimepress.co.kr/news/articleView.html?idxno=96968.

[40] Marine money(2020), "Deal Database.", Accessed September 20, 2020. https://www.marinemoney.com/deals.

[41] Maritime Press(2009, Aug 06), "한진해운 감량경영·유동성확보 총력", http://www.maritimepress.co.kr/news/articleView.html?idxno=72940.

[42] Mase, A. S., Cho, H. and Prokopy, L. S.(2015), "Enhancing the Social Amplification of Risk Framework (SARF) by Exploring Trust, the Availability Heuristic, and Agricultural Advisors' Belief in Climate Change.", Journal of Environmental Psychology, Vol. 41, pp. 166-176.

[43] Meng, J. and Weng, X.(2018), "Can prospect theory explain the disposition effect? A new perspective on reference points", Management Science, Vol. 64, No. 7, pp. 3331-3351.

[44] Odean, T.(1998), "Are Investors Reluctant to Realize Their Losses?", The Journal of Finance, Vol. 53, No. 5, pp. 1775-1798.

[45] Poses, R. M. and Anthony, M.(1991), "Availability, Wishful Thinking and Physicians' Diagnostic Judgments for Patients with Suspected Bacteremia.", Medical

Decision Making, Vol. 11, No. 3, pp. 159-168.
[46] Ritter, J. R.(2003), "Behavioral Finance", Pacific-Basin Finance Journal, Vol. 11, pp. 429-437.
[47] Seong, M. J.(2016, Mar 11), "[글로벌 제로섬게임]④김영무 선주協 부회장 "추가자금 없이 해운 살릴 수 있다"", Edaily, https://www.edaily.co.kr/news/realtime/realtime_NewsRead.asp?newsid=01249686612582336.
[48] Shiller, R. J.(1998), Human Behavior and the Efficiency of the Financial System, National Bureau of Economic Research.
[49] Shipping Daily(2014, Feb 06), "한진해운, 캠코선박 해체매각중", http://www.shippingdaily.co.kr/news_view.php?num=96402.
[50] Sjoberg, L., and Engelberg, E.(2010), "Risk Perception and Movies: A Study of Availability as a Factor in Risk Perception.", Risk Analysis, Vol. 30, No. 1, pp. 95-106.
[51] Stake, R.(1995), The Art of Case Study Research. Los Angeles, California: Sage.
[52] Stapel, D. A., Reicher, S. D. and Spears, R.(1995), "Contextual Determinants of Strategic Choice: Some Moderators of the Availability Bias.", European Journal of Social Psychology, Vol. 25, pp. 141-158.
[53] Sunstein, C. R.(2006), "The Availability Heuristic, Intuitive Cost-Benefit Analysis, and Climate Change.", Climatic Change, Vol. 77, pp. 195-210.
[54] Tversky, A. and Kahneman, D.(1973), "Availability: A Heuristic for Judging Frequency and Probability.", Cognitive Psychology, Vol. 5, pp. 207-232.
[55] Tversky, A. and Kahneman, D.(1974), "Judgement Under Uncertainty: Heuristics and Biases.", Science, Vol. 185, No. 4, pp. 1124-1131.
[56] Tversky, A. and Kahneman, D.(1981), "The framing of decisions and the psychology of choice", Science, Vol. 211, No. 4, pp. 453-458.
[57] Tversky, A. and Kahneman, D.(1984), "Choices, values, and frames", American Psychologist, Vol. 39, No. 4, pp. 341-350.
[58] Tversky, A. and Kahneman, D.(1986), "Rational choice and the framing of decisions", The Journal of Business, Vol. 59, No. 4.
[59] Tversky, A. and Kahneman, D.(1991), "Loss Aversion in Riskless Choice: A Reference-Dependent Model", The Quarterly Journal of Economics, Vol. 106, No. 4, pp. 1039-1061.
[60] Von Neumann, J. and Morgenstern, O.(1947), Theory of Games and Economic Behavior, New Jersey: Princeton University Press.
[61] Wilkinson, N. and Klaes, M.(2012), An Introduction to Behavioral Economics, London: Palgrave Macmillan.
[62] Xie, Y., Hwang, S. and Pantelous, A. A.(2018), "Loss aversion around the world: Empirical evidence from pension funds", Journal of Banking and Finance, Vol. 88, pp. 52-62.
[63] Yin, R. K.(2009), Case Study Research: Design and Methods, 4th ed. Thousand Oaks, CA: Sage.
[64] Yin, R. K.(2014), Case Study Research: Designs and Methods, Los Angeles, California: Sage.

Received 10 February 2022
Revised 14 March 2022
Accepted 19 April 2022