A Study of Investor Behavior in Purchasing Financial Assets

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Abstract
This study investigated whether the process of purchasing financial assets follows a rational decision-making process using Engel-Blackwell-Miniard (EBM) model. The method of investigation was a questionnaire survey of Malaysian individual investors. The sample consisted of 223 responses collected through convenience sampling and online survey. The data was analyzed using factor analysis, reliability analysis, path analysis, and multivariate analysis of variance. The results show that investors' decision-making process of purchasing financial assets is in line with a rational decision-making process in EBM Model. However, the tendency for irrational investment behaviors also exists at the same time. The findings imply that irrational investment behaviors may still occur even though the decision-making process is rational. We also found significant differences in the tendencies for herding, disposition effect and over-confidence based on gender and age.

Key words: EBM Model, behavioral finance, disposition, herding, overconfidence
JEL classification: G02, G11

1. Introduction
The basis of traditional financial theory is rational investors. From the 1980s, behavioral finance posits that investors are irrational in thinking and attitudes. The investment process takes on an irrational rather than a rational approach to buy and sell. Irrationality affects the return on investment and may even interfere with the proper functioning of financial markets. Many economists believe that the financial crisis in 2008 can be mainly attributed to investors' over-optimism and over-investment; investors were not confident about the future world economy, leading to irrational selling, and causing an economic bubble. Traditional finance also mentions that these investors should pay attention to spreading risk, equity ratio and so on, but media reports that the global financial crisis occurred, because banks and investment companies violated traditional finance theory to invest in high-risk assets in the long-term. A well-known large financial company, Lehman Brothers, went bankrupt because it violated the traditional financial theory by overly investing in high-risk assets. Traditional finance and economics are based on people being rational, but irrational phenomenon as described in behavioral finance is beginning to have an increasing presence in financial investment.

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In the view of traditional finance, investors are rational and follow a certain order. For individual investors, the process of purchasing financial assets starts from understanding their needs, being aware of products, assessing whether the products are good or bad, and deciding on whether to purchase or not. This continuous process can be considered as a rational act. In the view of behavioral finance, irrational phenomena very often seem to occur when investors buy and sell financial assets. There are radically different views on the decision-making process between traditional finance and behavioral finance. Therefore, it is important to explore the process of purchasing financial assets and investigate the rational or irrational behavior of investors.

At present, investor behavior is changing. More and more people, whether men or women, young or old purchase financial assets such as stocks, bonds and mutual funds and so on. The purchasing process has become simple; anybody who owns an account with a brokerage firm can purchase financial products quickly and conveniently. Furthermore, information searches have become more convenient with internet development. Investor behavior in relation to purchasing financial assets is similar to that of purchasing ordinary goods. However, the concern is whether investors have rational purchasing behavior?

If investor behavior is consistent with traditional financial theory on investment decisions, the investment attitude should follow the earlier rational thinking process from the beginning to the end of the buying process. Therefore, if investment is a product of a rational thinking process, there should not be irrational attitudes during the decision making process. If investors do not follow a rational attitude when investing, irrational investment behavior may be interpreted as an irrational buying process leading to irrational investment bias. On the other hand, perhaps investors’ decision-making process is rational, but irrational investment behavior still occurs. Why does this situation arise? Is it related to the personal background of investors?

The possibility of divergence in irrational investment behavior using different demographic variables will also be investigated in this study.

This study examines the decision making process of Malaysian investors. Previous scholars used secondary data to determine whether investor behavior tends to be irrational. However, secondary data cannot provide a direct understanding of the psychological motivation for decision-making. We undertook a questionnaire-based investigation to collect primary data in the expectation it would provide a clearer understanding of the purchasing details and attitudes involved in the investor’s decision-making process.

The rest of the paper is organized as follows. Section 2 reviews and discusses the literature related to this study. Section 3 formulates the hypotheses while Section 4 presents the methodology for testing the hypotheses. The results are reported in Section 5. Section 6, discusses the results and concludes the paper.

2. Literature Review
2.1. Engel Blackwell Miniard Model
The Engel Blackwell Miniard model has its beginnings in the decades of work on consumer behavior by Engel, Blackwell, Kollat, and Miniard (2001). These authors were responsible for the evolution of the model from 1968 to 2001 which was presented in the eight editions of their books on consumer behavior. As succinctly described by Aronson, Wilson, and Aker (2003), the EBM model has several advantages. The model considers the variables widely and comprehensively so that the decision-making process can be explained clearly. The EBM model integrates many relevant related variables. It provides the relationships
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We assume that the process of purchasing financial assets is rational, and refer to the decision-making process of EBM model as the fundamental theory. In the EBM model, the consumer buying process consists of five parts: information input, information processing, decision-making process, variables of decision-making process and environmental influences. The decision-making process is the core part of the EBM model, and is also the focus of discussion in this study.

The decision-making process of the EBM Model is divided into five steps: (1) Need recognition: consumers recognize their real needs; (2) Information search: seek information from the external environment or knowledge stored in memory for potential solutions; (3) Pre-Purchase alternative evaluation: evaluate or judge competing alternatives in terms of salient beliefs about relevant consequences; (4) Purchase: buy the chosen alternative; and (5) Post-Purchase alternative evaluation: re-evaluate product in terms of actual performance. In this study, we investigated whether the process of purchasing financial assets is in line with the decision-making process in the EBM model. The procedure of the EBM model is shown in Figure 1.

2.2. Prospect Theory
Kahneman and Tversky (1979) proposed the prospect theory which describes decision-making between alternatives under uncertain outcomes and involves known probabilities. The theory mentions that people do not analyze events comprehensively and completely, instead they have a cognitive bias. People often rely on rule of thumb, intuition as a basis for investment decisions rather than rational and objective analysis. Under the prospect theory, the three key behavioral finance aspects of disposition effect, herding behavior and over-confidence have been developed.

2.2.1. Disposition Effect
According to Shefrin and Statman (1985), disposition effect is the tendency of investors to sell financial assets whose price has increased, while keeping assets that have fallen in value. Investors are more willing to recognize profits, but less willing to recognize losses. There are many empirical studies on the existence of disposition effect. Bremer and Kato (1996) found that profit shares had a high turnover rate while the turnover rate for the loser stocks was low in the Japanese stock market from 1975 to 1990. It confirmed that the disposition effect exists in Japan. Odean (1998) analyzed 10,000 accounts at a large
discount brokerage house from 1987 to 1993 and verified the existence of disposition
effect. For the sample period of 1996 to 2003, Luo and Lu (2007) found that institutional
investors practise disposition effect in trading the B-share market in China. Leal, Manuel,
Rocha, and João (2008) documented that the disposition effect during the bull market was
higher than during the bear market period in the Portuguese market. They also found that
the more sophisticated the investors, the lower the disposition effect.

Goetzmann and Peles (1997) examined the disposition effect by observing inflow and
outflow of funds, and found that the inflow speed from good performance funds is faster
found that the main reasons for the disposition effect are investors' values and different
levels of attention to gains and losses, regardless of the purpose of investment. Dhar and
Zhu (2006) showed that the older, higher professional groups and high-income groups
have weaker disposition effect. Furthermore, according to Odean (1998), the disposition
effect influences market price, but its economic significance is probably greatest for
individual investors. Benartzi and Thaler (1995) examined investors who had disposition
effect and found that the returns was 3.4% higher than for investors who did not sell and
waited for a rebound in the loss of stock in the coming year.

2.2.2 Herding Behavior
A psychological experimental study by Sherif (1996) indicated that the judgment of people
would be affected by others which is called herding behavior. Herding behavior is not
rational thinking in making decisions, but a blind following of decisions by others so as to
make the same choice, which is considered irrational behavior. A study by Scharfstein and
Stein (1990), based on observation of fund managers, showed that fund managers would
consider or follow other managers when making their investment decisions, because if
the investment failed, then not only he or she would fail but others would too. Devenow
and Welch (1996) proposed that fund managers herd to protect their reputation and also
do not want to lag behind other colleagues on performance, thus they would adopt similar
investment strategies. These studies pointed out that fund managers do exhibit a herding
behavior. Grinblatt and Titman (1994) found that the more active fund categories, the
greater the occurrence of herding behavior; they also found that allocation of funds would
stock market and found that foreign institutional investors' herding behavior significantly
affected stock price. Studying on demographic variables of investors, Aronson et al. (2003)
found no difference in the herding behavior of males and females. Conrad (2009) proposed
that in order to avoid speculative bubbles, investors should not have herding behavior.

2.2.3. Over-confidence
When an individual believes the accuracy of his or her information is more credible than
the actual information, over-confidence occurs. Griffin and Tversky (1992) argued that
investment experts would be more overconfident than new investors because they had
professional forecasting methods. Odean (1998) and Grinblatt and Keloharju (2009) found
that investors trade frequently because of over-confidence. Gervais and Odean (2001) found
that if investors clearly understood their abilities, which came from accumulated experience
over a period of time, and were more aware of their strength, over-confidence would be
reduced. Chuang and Lee (2006) found that if investors are over-confident, they will over-
react to private information and under-react to public information. Statman, Thorley, and
Vorkink (2006) examined the trading volume of the market and individual stocks, and found
that there was a significant positive relationship between the overall turnover rate and market returns during the previous period.

Some scholars have analyzed the causes of over-confidence based on demographic variables. Barber and Odean (2001) investigated 35,000 investors' data and found a significant difference in over-confidence between genders. Men's turnover rate was higher than women, and because of this they invested frequently in and out of the market, resulting in the returns of men being lower than women. Bhandari and Deaves (2006) found male investors, highly educated investors and high-income investors to be more confident than female investors, poorly educated investors and low-income investors.

3. Research Objectives and Hypotheses
This study first assumes that investors are rational. Although financial assets have their own peculiarity that differs from ordinary goods, a rational investor would still follow a rational logic in the decision-making process. Engel et al. (2001) proposed a rational model where consumers buys goods, but will follow the rational decision-making process according to need recognition, information search and pre-purchase evaluation in order to make a purchase decision. The first research goal is to investigate whether investors' financial assets purchasing behaviors follow the rational decision-making process of EBM model. We state the first hypothesis as follows.

Hypothesis 1: The process of purchasing financial assets follows the rational decision-making process of the EBM Model.

In order to understand the relationship between the phenomena of irrational investment behavior and different demographic variables, Barber and Odean (2001) found that men show a higher tendency than women towards over-confidence. On the other hand, Dhar and Zhu (2006) pointed out that younger investors and those with higher professional occupation and lower salaries have less tendency for the disposition effect. Studies have also pointed out that there are significant differences between irrational investment behavior and different demographic variables, in terms of gender, age, occupation and annual income. However, the variable of race has not been fully tested. We examined whether there are significant differences of disposition effect, herding behavior and overconfidence tendencies among different demographic variables of gender, age, race, occupation and annual income. We state the hypotheses as follows:

Hypothesis 2: There are significant differences in irrational investment behavior in tendencies of disposition, herding and overconfidence based on demographic variables.

Hypothesis 2a: There are significant differences of all three irrational investment behavior tendencies based on gender.

Hypothesis 2b: There are significant differences of all three irrational investment behavior tendencies based on age.

Hypothesis 2c: There are significant differences of all three irrational investment behavior tendencies based on race.

Hypothesis 2d: There are significant differences of all three irrational investment behavior tendencies based on occupation.

Hypothesis 2e: There are significant differences of all three irrational investment behavior tendencies based on annual incomes.
### Table 2
Factor Loadings and Cronbach’s Alpha Values for the Study Variables

<table>
<thead>
<tr>
<th>Variables</th>
<th>Questions</th>
<th>Factor Loading (λ)</th>
<th>Cronbach Alpha (α)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Need recognition</td>
<td>B1. Willing to buy financial assets, because investment makes me feel happy and accomplished.</td>
<td>.836</td>
<td>.666</td>
</tr>
<tr>
<td></td>
<td>B2. Willing to buy financial assets, because I want to increase my wealth, and investment in financial assets is a good way to increase my wealth.</td>
<td>.793</td>
<td></td>
</tr>
<tr>
<td></td>
<td>B3. Willing to buy financial assets, because it not only hedges against inflation, but also maintains the value of property.</td>
<td>.563</td>
<td></td>
</tr>
<tr>
<td>Information search</td>
<td>C1. In order to understand the financial assets, I often exchange information among family members and friends.</td>
<td>.763</td>
<td>.761</td>
</tr>
<tr>
<td></td>
<td>C2. Before investing, I collect and understand newspapers, magazines and public information on financial analysis.</td>
<td>.745</td>
<td></td>
</tr>
<tr>
<td></td>
<td>C3. Base on past investment experience I can understand the financial assets more quickly.</td>
<td>.741</td>
<td></td>
</tr>
<tr>
<td></td>
<td>C4. Before investing, I will consider recommendations from experts, such as fund manager.</td>
<td>.648</td>
<td></td>
</tr>
<tr>
<td>Alternative evaluation</td>
<td>D1. When I choose a financial asset, I will consider companies with good operating status and future growth.</td>
<td>.778</td>
<td>.612</td>
</tr>
<tr>
<td></td>
<td>D2. When I choose a financial asset, I will consider the risk and return.</td>
<td>.776</td>
<td></td>
</tr>
<tr>
<td></td>
<td>D3. When I choose a financial asset, I will consider the price and relevant costs.</td>
<td>.607</td>
<td></td>
</tr>
<tr>
<td>Disposition Effect</td>
<td>E1. For investment in financial assets, I do not set up a stop-loss point.</td>
<td>.674</td>
<td>.770</td>
</tr>
<tr>
<td></td>
<td>E2. Even if I set up stop-loss point in my mind, I do not strictly enforce.</td>
<td>.825</td>
<td></td>
</tr>
<tr>
<td></td>
<td>E3. My experience is that when I face loss, I do not make decision to sell, however I wait and hope the price will rise again.</td>
<td>.697</td>
<td></td>
</tr>
<tr>
<td></td>
<td>E4. If there is a serious loss in financial assets, I will choose not to sell.</td>
<td>.752</td>
<td></td>
</tr>
<tr>
<td>Herding</td>
<td>E5. I will purchase financial assets that are recommended by newspapers, magazines, friends and relatives.</td>
<td>Deleted</td>
<td>.637</td>
</tr>
<tr>
<td></td>
<td>E6. If a financial asset continues to rise for a while, I will consider buying.</td>
<td>.560</td>
<td></td>
</tr>
<tr>
<td></td>
<td>E7. I will purchase the same financial assets purchased by my friends.</td>
<td>Deleted</td>
<td></td>
</tr>
<tr>
<td></td>
<td>E8. When I know that many investors are buying a particular financial asset, I will follow them.</td>
<td>.734</td>
<td></td>
</tr>
<tr>
<td></td>
<td>E9. I prefer to be interested in financial assets that most people are interested in.</td>
<td>.660</td>
<td></td>
</tr>
<tr>
<td></td>
<td>E10. I would not choose to purchase financial assets that most people are pessimistic about.</td>
<td>.713</td>
<td></td>
</tr>
</tbody>
</table>
which indicates that no question should be dropped. However, based on Rotated Component Matrix of irrational investment behavior, the questions E5, E7, and E13 were found not to fulfill the normal rule – main loading of above 0.5 and a cross loading of less than 0.35. Consequently, E5, E7, and E13 questions should be dropped in anticipation of greater validity. Reliability analysis values for internal consistency using Cronbach's alpha coefficient commonly lies between 0 and 1. In this study, all Cronbach’s values were over 0.5; the values of Cronbach’s alpha would become smaller if items were deleted. Therefore, no questions needed to be deleted.

5.2. Path Analysis

Further, we conducted a path analysis to test whether the process of investment followed a rational decision-making process in EBM model by using structural equation modeling (SEM). Figure 2 illustrates the path structural model. The ellipse represents latent variables, which includes variables of need recognition, information search and alternative evaluation in the decision-making process of EBM. The variables derived from the questionnaire are observed variables, which are represented as a square. The questions used to predict the variable of need recognition were hedge against inflation, gain profit, and self-actualization. Four questions were used to measure the variable of information search, which included personal sources, commercial sources, public sources, and experiential sources. Finally, for measuring alternative evaluation, three questions were used; these related to background, reward and risk, and the cost of investment.

The value of ellipses are squared multiple correlations (R²). The interpretation of R² is that the relative amount of variance of a dependent variable is explained by the explanatory variables. In this study, the value of R² are 0.46 and 0.3, which indicates that need recognition can explain 46% of the variance in information search, and information search can explain 30% of the variance in alternative evaluation. The values beside the arrows are standardized path coefficients which are similar to regression coefficients in a regression model. If its value is positive, it means positive correlation between independent variables and dependent variables; in other words, the value of a dependent variable increases with an increasing value in the independent variable. Based on path coefficients, when individual investors have more regard for hedge against inflation, gain profit, and self-actualization, the degree of need recognition will rise. Under the information search aspect, when individual investors strengthen search information based on personal, commerce, public, and experience, there will be an increase in the level of information search. For
Fit Values
Chi Square = 61.834
df = 33
GFI = .947
AGFI = .912
NNFI = .923
CFI = .944
RMSEA = .063
CMIN = 1.874
IFI=.945
p-value = .002

Figure 2. Path structure diagram of decision making process

alternative evaluation, when individual investors strengthen considerations of relevant background, reward and risk, and the cost of investment, the degree of alternative evaluation will rise.

The path of the structure model was tested for fit-to-standard. The significance and model fit index suggested ideal values according to Wuensch (2008) should be as follows: CMIN/DF (χ²/df) need to be less than 3; comparative fit index (CFI) should exceed 0.9; root mean squared error (RMSEA) should not exceed 0.08; goodness-of-fit index (GFI) should be over 0.9; adjusted goodness-of-fit index (AGFI) should exceed 0.8, non-normed fit-index (NNFI) should exceed 0.9; standardized root mean residual (SRMR) should not exceed 0.08; and incremental fit index (IFI) should be over 0.9. In this study, all indices were consistent with the ideal value of model fit index except for the p-value. Although in the leaner structural model, the p-value was significant, all of the other indices did fit well, therefore the model can be considered as adequate. The process of investor purchasing financial assets is in line with rational decision-making process of the EBM model. Thus, hypothesis H1 of this study is supported.

5.3. Irrational Investment Behavior Tendency Analysis
We converted a set of variables (questions) within the same category into one factor score by using regression factor score, and then constructed the degree of tendency of each factor score to a range of 0 to 100 by using logistic function. Finally, one sample Kolmogorov-Smirnov was used to test the degree of tendency of the disposition effect, herding behavior and over-confidence to understand their distributions and to determine overall irrational investment behavior situation.

The results of tendency of irrational investment behavior are summarized in Table 3. If the distribution is normal, the p-value must be greater than 0.05. Based on the results, p-values of disposition, herding behavior, and over-confidence were found to be greater than 0.05. This indicates that the distribution of disposition, herding and over-confidence are normal. At the same time, the means of tendency of disposition effect, herding and over-confidence were 50.12, 50.09 and 49.91. All three irrational investment behaviors were located in the vicinity of mean and were normally distributed. Therefore the degree of all of the three irrational investment behaviors was considered moderate.

The empirical results indicate that the process of purchasing financial assets follows the rational decision-making path of the EBM model. The findings also show that investors of the sample have irrational investment behavior at moderate level of intensity. Although the decision-making process of investment in financial assets is rational, irrational investment behavior still exists. Thus, although the process of decision-making is based on rational and logical thinking to choice, irrational investment behavior is still present.

| Table 3 | The results of One-Sample Kolmogorov-Smirnov Test |
|-----------------|-----------------|-----------------|-----------------|
|                | Disposition     | Herding         | Over-confidence |
| Mean            | 50.12           | 50.09           | 49.91           |
| S.D             | 21.12           | 19.79           | 21.06           |
| K-S Z           | 0.943           | 0.557           | 1.010           |
| Asymp. sig.     | 0.336           | 0.915           | 0.299           |
| Distribution    | Normal          | Normal          | Normal          |
| Tendency        | Moderate        | Moderate        | Moderate        |

As the process of investor decision-making is rational, but irrational investment behavior still occurs, it is conceivable that other factors affect individual investors' investment attitude, approach and process. This study subsequently used MANOVA to discuss whether irrational investment behaviors of disposition, herding and over-confidence are related to demographic variables of gender, age, race, occupation and annual income to understand the reason for irrational investment behavior.

5.4. MANOVA for Irrational Investment Behavior Tendency Analysis
5.4.1. Sample Classification
In order to have a more effective analysis of data, groups with common or relevant features should be classified into the same category. In the age section, the investors who were under 35 years old were classified into one group representing less social experiences; investors of 36-55 years old were categorized into the moderate social experiences group while investors who are over 55 years old were considered as the group with more social experiences. In the race section, as only 2 respondents were non-Malaysian, the 2 respondents were merged into the Indian group, the penultimate-less sample group. In the occupation section, most of the respondents were from manufacturing which will constitute one group; the finance and business sector fell into the same category because both were more familiar with financial investment. As other occupations had a slightly more dispersed distribution, they were integrated into the other category. In the personal annual income section, investors whose earnings were equal or less than RM50,000 per year formed the first category; those with an annual income of RM50,000 to RM90,000 fell into the second category, representing middle class; and those with an annual income of more than RM90,000 fell into the third category and represented the higher socio-economic status group.

5.4.2. Assumptions of MANOVA
Before MANOVA analysis, data must fit two assumptions, one of which is a normal distribution. The second assumption is homogeneity of variance which means a sample from each group has similar dispersion. A homogeneity test was done to test the existence of homogeneity of irrational investment behavior of disposition effect, over-confidence and herding behavior within the demographic variables of gender, age, race, occupation and annual income. When the p-value significance is over 0.05, it indicates homogeneity of each group. The results of homogeneity test are shown in Table 4. The results indicate that the three tendencies of irrational investment behaviors are normally distributed. The results of the test of homogeneity on each group based on five demographic variables of gender, age, race, occupation and personal annual income show disposition effect, herding behavior and over-confidence, consistent with the homogeneity assumption.

Table 4
The Results of p-value of Homogeneity Test

<table>
<thead>
<tr>
<th>Variables</th>
<th>Disposition</th>
<th>Herding</th>
<th>Over-confidence</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td>0.240</td>
<td>0.306</td>
<td>0.825</td>
</tr>
<tr>
<td>Age</td>
<td>0.116</td>
<td>0.282</td>
<td>0.579</td>
</tr>
<tr>
<td>Race</td>
<td>0.658</td>
<td>0.253</td>
<td>0.332</td>
</tr>
<tr>
<td>Occupation</td>
<td>0.327</td>
<td>0.167</td>
<td>0.730</td>
</tr>
<tr>
<td>Annual Income</td>
<td>0.104</td>
<td>0.114</td>
<td>0.297</td>
</tr>
</tbody>
</table>

5.4.3. Divergences of Irrational Investment Behavior Analysis

Multivariate analysis of variance (MANOVA) was used to test for significant divergences of disposition, herding and over-confidence within the demographic variables of gender, age, race, occupation and personal income using the four methods of Pillai’s Trace, Wilk’s Lambda, Hotelling’s Trace, and Roy’s Largest Root. If the overall test achieved significance level (P < 0.05), it will indicate that at least one irrational investment behavior is significantly different from the other groups. Then, the single factor significance level needs to be checked. The results of this analysis are shown in Table 5. We used the four methods to examine the significance level of the tendency of disposition, herding and over-confidence. The p-values of Pillai’s Trace, Wilk’s Lambda, Hotelling’s Trace and Roy’s Largest Root were less than 0.05, indicating that at least one of the irrational investment behaviors is significantly different based on gender, age, race, occupation and annual income.

The results of the single factor analysis of variance are shown in Table 6. The significance level of disposition, herding and over-confidence were less than 0.05 based on gender and age. Therefore, there were significant divergences on all three irrational investment behaviors based on gender. Hypotheses H2a and H2b of this study are supported. On the other hand, the significance level of disposition, herding and over-confidence are not all less than 0.05 based on race, occupation and annual income. Therefore, hypotheses H2c, H2d and H2e are not supported.

6. Discussion and Conclusion

The empirical results show that hypothesis H1 is supported. This indicates that when investors purchase financial assets, they will base their decisions on a rational decision-

Table 5
Multivariate Tests

<table>
<thead>
<tr>
<th>Effect</th>
<th>Pillai’s Trace</th>
<th>Wilk’s Lambda</th>
<th>Hotelling’s Trace</th>
<th>Roy’s Largest Root</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td>0.000</td>
<td>0.000</td>
<td>0.000</td>
<td>0.000</td>
</tr>
<tr>
<td>Age</td>
<td>0.000</td>
<td>0.000</td>
<td>0.000</td>
<td>0.001</td>
</tr>
<tr>
<td>Race</td>
<td>0.000</td>
<td>0.000</td>
<td>0.000</td>
<td>0.000</td>
</tr>
<tr>
<td>Occupation</td>
<td>0.001</td>
<td>0.001</td>
<td>0.001</td>
<td>0.000</td>
</tr>
<tr>
<td>Income</td>
<td>0.000</td>
<td>0.000</td>
<td>0.000</td>
<td>0.000</td>
</tr>
</tbody>
</table>
Table 6
Tests of Between-Subjects Effects

<table>
<thead>
<tr>
<th>Source</th>
<th>Dependent variable</th>
<th>Sig.</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td>Disposition</td>
<td>0.000</td>
<td>H2a supported</td>
</tr>
<tr>
<td></td>
<td>Herding</td>
<td>0.000</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Over-confidence</td>
<td>0.000</td>
<td></td>
</tr>
<tr>
<td>Age</td>
<td>Disposition</td>
<td>0.015</td>
<td>H2b supported</td>
</tr>
<tr>
<td></td>
<td>Herding</td>
<td>0.023</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Over-confidence</td>
<td>0.005</td>
<td></td>
</tr>
<tr>
<td>Race</td>
<td>Disposition</td>
<td>0.566</td>
<td>H2c not supported</td>
</tr>
<tr>
<td></td>
<td>Herding</td>
<td>0.023</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Over-confidence</td>
<td>0.000</td>
<td></td>
</tr>
<tr>
<td>Occupation</td>
<td>Disposition</td>
<td>0.190</td>
<td>H2d not supported</td>
</tr>
<tr>
<td></td>
<td>Herding</td>
<td>0.088</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Over-confidence</td>
<td>0.001</td>
<td></td>
</tr>
<tr>
<td>Income</td>
<td>Disposition</td>
<td>0.000</td>
<td>H2e not supported</td>
</tr>
<tr>
<td></td>
<td>Herding</td>
<td>0.237</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Over-confidence</td>
<td>0.070</td>
<td></td>
</tr>
</tbody>
</table>

making model. The rational decision-making process cannot be affected by the peculiarity of financial assets. But investors adhere to the purchase order of need recognition, information search and alternative evaluation to make investment decisions.

We found that although investors adhere to a rational decision-making process to make investment decisions, they still have irrational investment behaviors of disposition, herding and over-confidence. This indicates that investors recognize their own needs with rational thinking, then find information about financial assets, and finally use rational analysis for purchasing the financial assets based on future growth, cost and risk, which is consistent with the EBM Model (Engel, 2001). However, within this rational decision-making process, there exists some irrational investment behaviors of disposition, herding and over-confidence. This finding is similar to that of Markic (2009), who described that people are rational in thinking but the actual decision-making is still emotional or irrational.

Hypotheses H2a and H2b are supported by empirical tests. There are significant differences in all three tendencies of irrational investment behaviors based on gender and age. It means that irrational investment tendencies are mainly related to psychological aspects with possible factors associated with individual investors' mental, characters, traits, attitudes and/or other psychological factors. This study however found no significant relationship among external factors such as race, occupation and personal annual income. Therefore, the external factors cannot fully explain the causes of irrational tendency.

Since this study adopted convenience sampling, that is, non-probability sampling, it might not generate a good estimate of the values of the population. Moreover, samples from different groups differed in numbers which may cause bias in the test for tendency of irrational investment behavior. Though the questionnaire was original, the pilot test was not verified by professional fund managers or scholars. The questionnaire was designed to understand the tendency of irrational investment behaviors. Previous studies have shown that the existence of irrational investment would lead to a decline in investment returns,
but the real returns to investment by our sample is not known. Investors may have a tendency for irrational investment behaviors, but if investment returns are not reduced, such irrational investment behaviors do not cause a problem for investors. Future studies should seek to investigate the returns to investment and analyze the relationship between irrational investment tendency and investment returns.

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References


