



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

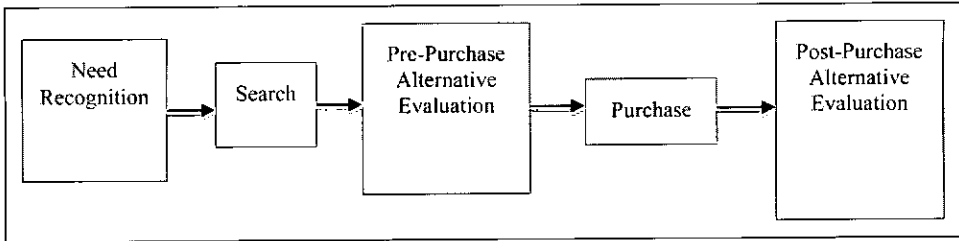


Figure 1. The procedure of the EBM Model

among variables, contributing to academic research and discussion. The model integrates many scholars' views, and has been refined through constant revision. The EBM model can be described as a very comprehensive consumer behavior model.

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 than the outflow speed from poor performance funds. Lee, Park, Lee, and Wyrjr (2008) 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 be based on past experience. Iihara, Kato, and Tokunaga (2003) researched on the Japanese 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 buy 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

Variables	Questions	Factor Loading (λ)	Cronbach Alpha (α)
Need recognition	B1. Willing to buy financial assets, because investment makes me feel happy and accomplished.	.836	.666
	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.	.793	
	B3. Willing to buy financial assets, because it not only hedges against inflation, but also maintains the value of property.	.563	
Information search	C1. In order to understand the financial assets, I often exchange information among family members and friends.	.763	.761
	C2. Before investing, I collect and understand newspapers, magazines and public information on financial analysis.	.745	
	C3. Base on past investment experience I can understand the financial assets more quickly.	.741	
	C4. Before investing, I will consider recommendations from experts, such as fund manager.	.648	
Alternative evaluation	D1. When I choose a financial asset, I will consider companies with good operating status and future growth.	.778	.612
	D2. When I choose a financial asset, I will consider the risk and return.	.776	
	D3. When I choose a financial asset, I will consider the price and relevant costs.	.607	
Disposition Effect	E1. For investment in financial assets, I do not set up a stop-loss point.	.674	.770
	E2. Even if I set up stop-loss point in my mind, I do not strictly enforce.	.825	
	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.	.697	
	E4. If there is a serious loss in financial assets, I will choose not to sell.	.752	
Herding	E5. I will purchase financial assets that are recommended by newspapers, magazines, friends and relatives.	Deleted	.637
	E6. If a financial asset continues to rise for a while, I will consider buying.	.560	
	E7. I will purchase the same financial assets purchased by my friends.	Deleted	
	E8. When I know that many investors are buying a particular financial asset, I will follow them.	.734	
	E9. I prefer to be interested in financial assets that most people are interested in.	.660	
	E10. I would not choose to purchase financial assets that most people are pessimistic about.	.713	

Over-confidence	E11. I have relatively adequate financial information, so I know I can make the right investment decisions.	.578	.616
	E12. For the purchased financial assets, I know their future trends.	.552	
	E13. If company earnings fulfill my expectation, I will purchase more of this stock.	Deleted	
	E14. I think that my views are often consistent with investment analysts.	.607	
	E15. I am always eager to sell certain securities, but surprisingly, I find that it continues to rise after my trade.	.639	
	E16. My successful investment strategies play an important role in generating my investment return.	.691	

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 (R^2). The interpretation of R^2 is that the relative amount of variance of a dependent variable is explained by the explanatory variables. In this study, the value of R^2 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

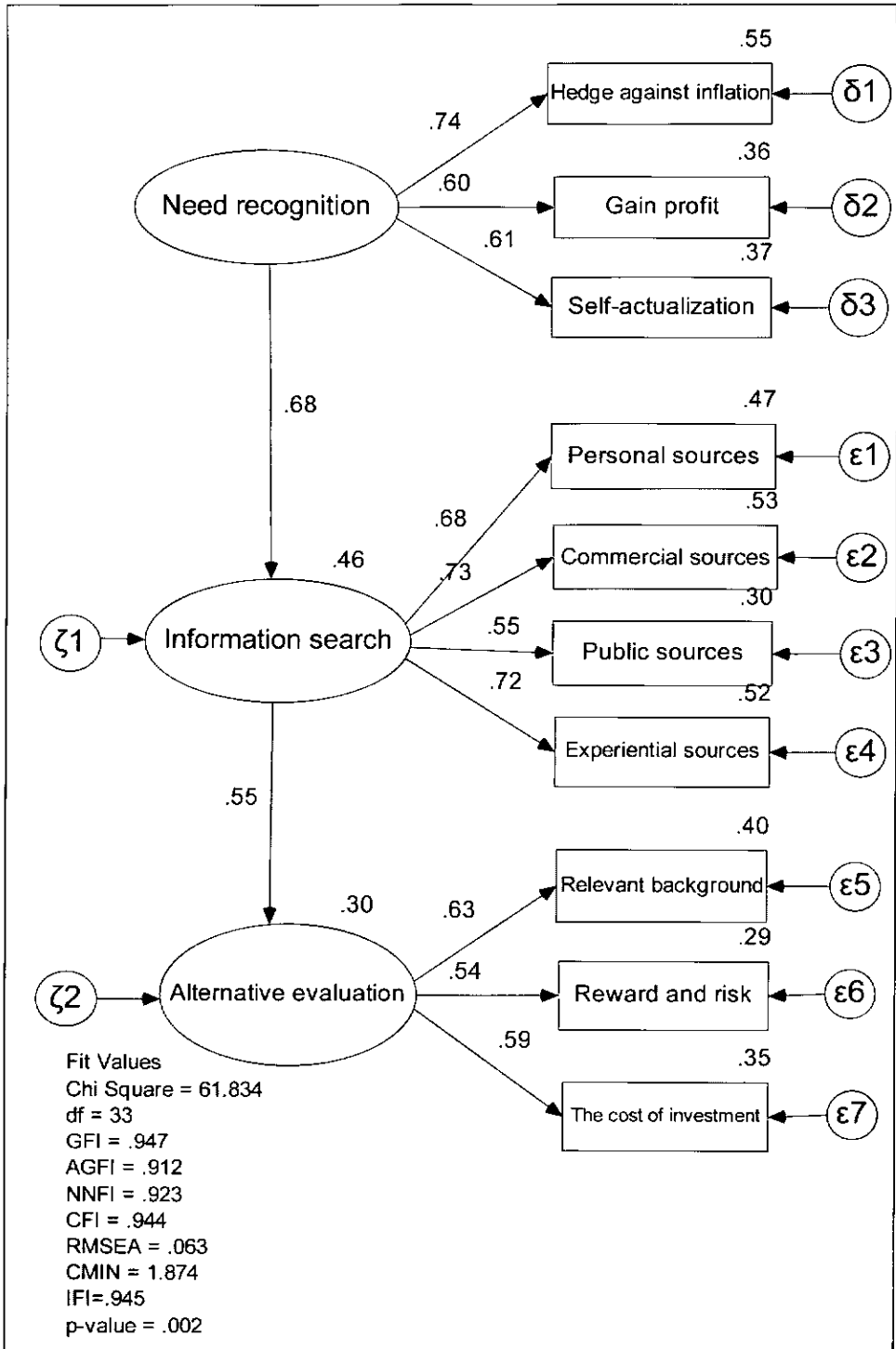


Figure 2. Path structure diagram of decision making process

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 (χ^2/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	0.259
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

Variables	Disposition	Herding	Over-confidence
Gender	0.240	0.306	0.825
Age	0.116	0.282	0.579
Race	0.658	0.253	0.332
Occupation	0.327	0.167	0.730
Annual Income	0.104	0.114	0.297

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

Effect	Sig.	
Gender	Pillai's Trace	0.000
	Wilks' Lambda	0.000
	Hotelling's Trace	0.000
	Roy's Largest Root	0.000
Age	Pillai's Trace	0.000
	Wilks' Lambda	0.000
	Hotelling's Trace	0.000
	Roy's Largest Root	0.001
Race	Pillai's Trace	0.000
	Wilks' Lambda	0.000
	Hotelling's Trace	0.000
	Roy's Largest Root	0.000
Occupation	Pillai's Trace	0.001
	Wilks' Lambda	0.001
	Hotelling's Trace	0.001
	Roy's Largest Root	0.000
Income	Pillai's Trace	0.000
	Wilks' Lambda	0.000
	Hotelling's Trace	0.000
	Roy's Largest Root	0.000

Table 6
Tests of Between-Subjects Effects

Source	Dependent variable	Sig.	Results
Gender	Disposition	0.000	H2a supported
	Herding	0.000	
	Over-confidence	0.000	
Age	Disposition	0.015	H2b supported
	Herding	0.023	
	Over-confidence	0.005	
Race	Disposition	0.566	H2c not supported
	Herding	0.023	
	Over-confidence	0.000	
Occupation	Disposition	0.190	H2d not supported
	Herding	0.088	
	Over-confidence	0.001	
Income	Disposition	0.000	H2e not supported
	Herding	0.237	
	Over-confidence	0.070	

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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