



IMPACT OF INVESTOR'S BEHAVIOR ON INVESTMENT DECISION MAKING: A SURVEY ON COLOMBO STOCK EXCHANGE, SRI LANKA

Saseela Balagobei

Department of Financial Management, University of Jaffna, Sri Lanka.

E-mail: saseelab@univ@jfn.ac.lk

Abstract

Traditional finance has always presumed that investors are rational in their decision making process in the stock market about risk return trade-offs and maximizing utility. However, behavioral finance studies revealed that human beings do not behave as rationally as economists suppose as their decisions at times are affected by various factors. The objective of this study is exploring the investor's behaviour influencing investment decision making at Colombo Stock Exchange. As there are limited studies about behavioral finance in Sri Lanka, this study is expected to contribute significantly to the development of this field in Sri Lanka. To achieve the objective, the questionnaires are distributed to a sample size of 100 individual investors who are involved in the Colombo stock Exchange. The collected data are analysed by using statistical techniques including factor Analysis. The result shows that there are four behavioral factors affecting the investment decisions of individual investors at Colombo Stock Exchange which are Herding, Heuristics, Prospect and Market. Most of the variables from all factors have moderate impacts whereas anchoring variable from heuristic factor has high influence and choice of stock variable from herding factor has low influence on investment decision making.

Keywords: Behavioral finance, Investor's behaviour, Investment decision making.

1. Introduction

Behavioral finance attempts to investigate the psychological and sociological issues that influence investment decision making process of individual and institutions. It also considers how various psychological traits affect how individuals or groups act as investors, analysts, and portfolio manager.

Investment decisions are crucial for the performance of the economy from two perspectives. From the macro perspective in regular business cycle they account for the majority of volatility in the Gross Domestic Product Dynamics but also their magnitude serves as a significant leading indicator of the economic performance (Zarnowitz 1992). From micro perspective, they are crucial for the growth of individual companies, increasing their efficiency by reducing unit costs. Much of economics and financial theories presume that individuals act rationally and consider all available information in the investment decision making process. Bernstein (1996) notes that there is evidence to show repeated patterns of irrationality, inconsistency and incompetence in the way human beings arrive at decisions and choices when faced with uncertainty.

Behavioral finance seeks to understand and predict systematic financial market implications of psychological decision processes (Olsen, 1998). Behavioral finance considers how various psychological traits affect how individuals or groups act as investors, analysts, and portfolio managers (Brown & Reilly, 2004). Heuristics can be defined as the use of experience and practical efforts to answer questions or to improve performance. Raines and Leathers (2011) argue that when faced with uncertainty, people rely on heuristics or rules of thumb to subjectively assess risks of alternatives, which reduces the complex tasks of assessing probabilities and predicting values to simpler judgmental operations.



There are some researchers conducted on investor's behaviour influencing investment decision making (Luong & Thi Thu Ha, 2011; Shikuku, 2012). Those studies are concerned with Western countries. Therefore, this study is an endeavour to investigate the impact of investor's behaviour on investment decision making on investors of Colombo stock exchange in Sri Lanka.

Due to the positive correlation between stock market and economy, the rise of stock market will positively affect the development of the economy and vice versa. Thus, the decisions of investors on stock market play an important role in defining the market trend, which then influences the investment performance. To understand and give some suitable explanation for the investment performance, it is important to explore the investors' behaviour influencing the investment decisions making.

It will be useful for investors to understand common behaviors, from which justify their reactions for better returns. Security organizations may also use this information for better understanding about investors to forecast more accurately and give better recommendations. Thus, stock price will reflect its true value and Colombo stock market becomes the yardstick of the economy's wealth and helps enterprises to raise capital for production and expansion. Based on the problem the research question is as follows, "To what extent investor's behavior influence on the individual investment decisions making in Jaffna district?" The main objective of the study is to investigate the impact of investor's behaviour on investment decision making of individual investors in Colombo Stock Exchange.

2. Literature Review

Even though finance has been studied for thousands of years, behavioral finance that considers human behavior in the financial world is a fairly new field. Behavioral finance theories which are based on psychology, try to understand how emotions and cognitive errors influence behavior of individual investors. According to Ritter (2003), behavioral finance is based on psychology which suggests that human decision processes are subject to several cognitive illusions. These illusions are divided into two groups: illusions caused by heuristic decision process and illusions rooted from the adoption of mental frames grouped in the prospect theory (Waweru, Munyoki and Uliana, 2008). These two categories as well as the herding and market factors are also presented as the following.

Heuristic theory

Heuristics are defined as the rules of thumb, which makes decision making easier, especially in complex and uncertain environments (Ritter, 2003) by reducing the complexity of assessing probabilities and predicting values to simpler judgments (Kahneman & Tversky, 1974). In general, these heuristics are quite useful, particularly when time is limited (Waweru et al., 2008), but sometimes they lead to biases (Kahneman & Tversky, 1974; Ritter, 2003). Kahneman and Tversky seem to be ones of the first writers studying the factors belonging to heuristics when introducing three factors namely representativeness, availability bias, and anchoring (Kahneman & Tversky). Waweru et al. (2008) also list two factors named Gambler's fallacy and Overconfidence into heuristic theory.

Representativeness refers to the degree of similarity that an event has with its parent population (DeBondt & Thaler, 1995) or the degree to which an event resembles its population (Kahneman & Tversky, 1974).



Representativeness may result in some biases such as people put too much weight on recent experience and ignore the average long-term rate (Ritter, 2003). A typical example for this bias is that investors often infer a company's high long-term growth rate after some quarters of increasing (Waweru et al., 2008).

Representativeness also leads to the so-called "sample size neglect" which occurs when people try to infer from too few samples (Barberis & Thaler, 2003). In stock market, when investors seek to buy "hot" stocks instead of poorly performed ones, this means that representativeness is applied. This behavior is an explanation for investor overreaction (DeBondt and Thaler, 1995).

The belief that a small sample can resemble the parent population from which it is drawn is known as the "law of small numbers" (Rabin, 2002; Statman, 1999) which may lead to a Gamblers' fallacy (Barberis & Thaler, 2003). More specifically, in stock market, Gamblers' fallacy arises when people predict inaccurately the reverse points which are considered as the end of good (or poor) market returns (Waweru et al.). In addition, when people subject to status quo bias, they tend to select suboptimal alternative simply because it was chosen previously (Kempf and Ruenzi, 2006).

Anchoring is a phenomena used in the situation when people use some initial values to make estimation, which are biased toward the initial ones as different starting points yield different estimates (Kahneman & Tversky, 1974). In financial market, anchoring arises when a value scale is fixed by recent observations. Investors always refer to the initial purchase price when selling or analyzing. Thus, today prices are often determined by those of the past.

Anchoring makes investors to define a range for a share price or company's income based on the historical trends, resulting in under-reaction to unexpected changes. Anchoring has some connection with representativeness as it also reflects that people often focus on recent experience and tend to be more optimistic when the market rises and more pessimistic when the market falls (Waweru et al., 2008).

When people overestimate the reliability of their knowledge and skills, it is the manifestation of overconfidence (DeBondt & Thaler, 1995, Hvide, 2002). Many studies show that excessive trading is one effect of investors. There is evidence showing that financial analysts revise their assessment of a company slowly, even in case there is a strong indication proving that assessment is no longer correct. Investors and analysts are often overconfident in areas that they have knowledge (Evans, 2006).

Overconfidence is believed to improve persistence and determination, mental facility, and risk tolerance. In other words, overconfidence can help to promote professional performance. It is also noted that overconfidence can enhance other's perception of one's abilities, which may help to achieve faster promotion and greater investment duration (Oberlechner & Osler, 2004).

Availability bias happens when people make use of easily available information excessively. In stock trading area, this bias manifest itself through the preference of investing in local companies which investors are familiar with or easily obtain information, despite the fundamental principles so-called diversification of portfolio management for optimization (Waweru et al., 2003).

In this study, five components of heuristics: Overconfidence, Gambler's fallacy, Availability bias, Anchoring, and Reprintativeness are used to measure their impact levels on the investment decision making of individual investors in Colombo Stock Exchange.



Prospect theory

Expected Utility Theory (EUT) and prospect theory are considered as two approaches to decision-making from different perspectives. Prospect theory focuses on subjective decision-making influenced by the investors' value system, whereas EUT concentrates on investors' rational expectations (Filbeck, Hatfield & Horvath, 2005). EUT is the normative model of rational choice and descriptive model of economic behavior, which dominates the analysis of decision making under risk. Nonetheless, this theory is criticized for failing to explain why people are attracted to both insurance and gambling. People tend to under-weigh probable outcomes compared with certain ones and people response differently to the similar situations depending on the context of losses or gains in which they are presented (Kahneman & Tversky, 1979). Prospect theory describes some states of mind affecting an individual's decision-making processes including Regret aversion, Loss aversion and mental accounting (Waweru et al., 2003).

Regret is an emotion occurs after people make mistakes. Investors avoid regret by refusing to sell decreasing shares and willing to sell increasing ones. Moreover, investors tend to be more regretful about holding losing stocks too long than selling winning ones too soon (Forgel & Berry, 2006; Lehenkari & Perttunen, 2004).

Loss aversion refers to the difference level of mental penalty people have from a similar size loss or gain (Barberis & Huang, 2001). There is evidence showing that people are more distressed at the prospect of losses than they are pleased by equivalent gains (Barberis & Thaler, 2003). Moreover, a loss coming after prior gain is proved less painful than usual while a loss arriving after a loss seems to be more painful than usual (Barberis & Huang, 2001). In addition, Lehenkari and Perttunen (2004) find that both positive and negative returns in the past can boost the negative relationship between the selling trend and capital losses of investors, suggesting that investors are loss averse. Risk aversion can be understood as a common behavior of investor, nevertheless it may result in bad decision affecting investor's wealth (Odean, 1998).

Mental accounting is a term referring to "the process by which people think about and evaluate their financial transactions" (Barberis & Huang, 2001). Mental accounting allows investors to organize their portfolio into separate accounts (Barberis & Thaler, 2003; Ritter, 2003). From own empirical study, Rockenbach (2004) suggests that connection between different investment possibilities is often not made as it is useful for arbitrage free pricing.

In this study, three elements of prospect dimension: Loss aversion, Regret aversion, and mental accounting are used to measure their impact levels on the investment decision making of individual investors in Colombo Stock Exchange.

Market factors

DeBondt and Thaler (1995) state that financial markets can be affected by investors' behaviors in the way of behavioral finance. If the perspectives of behavioral finance are correct, it is believed that the investors may have over- or under-reaction to price changes or news; extrapolation of past trends into the future; a lack of attention to fundamentals underlying a stock; the focus on popular stocks and seasonal price cycles. These market factors, in turns, influence the decision making of investors in the stock market. Waweru et al. (2008) identifies the factors of market that have impact on investors' decision making: Price changes, market information, past trends of stocks, customer preference, over-reaction to price changes, and fundamentals of underlying stocks.

Normally, changes in market information, fundamentals of the underlying stock and stock price can cause over/under-reaction to the price change. These changes are empirically proved to have the high influence on



decision-making behavior of investors. Researchers convince that over-reaction (DeBondt & Thaler, 1985) or under-reaction (Lai, 2001) to news may result in different trading strategies by investors and hence influence their investment decisions. Waweru et al. (2008) conclude that market information has very high impact on making decision of investors and this makes the investors, in some way, tend to focus on popular stocks and other attention-grabbing events that are relied on the stock market information. Moreover, Barber and Odean (2000) emphasize that investors are impacted by events in the stock market which grab their attention, even when they do not know if these events can result good future investment performance. Odean (1998) explores that many investors trade too much due to their overconfidence. These investors totally rely on the information quality of the market or stocks that they have when making decisions of investment.

Waweru et al. (2008) indicate that price change of stocks has impact on their investment behavior at some level. Odean (1999) states that investors prefer buying to selling stocks that experience higher price changes during the past two years. Change in stock price in this context can be considered as an attention-grabbing occurrence in the market by investors. Additionally, Caparrelli et al. (2004) propose that investors are impacted by herding effect and tend to move in the same flow with the others when price changes happen. Besides, investors may revise incorrectly estimates of stock returns to deal with the price changes so that this affects their investment decision-making (Waweru et al., 2008).

Many investors tend to focus on popular stocks or hot stocks in the market (Waweru et al., 2008). Odean (1999) proposes that investors usually choose the stocks that attract their attention. Besides, the stock selection also depends on the investors' preferences. Momentum investors may prefer stocks that have good recent performance while rational investors tend to sell the past losers and this may help them to postpone taxes. In contrast, behavioral investors prefer selling their past winners to postpone the regret related to a loss that they can meet for their stock trading decisions (Waweru et al., 2008). Besides, past trends of stocks are also explored to impact the decision making behavior of the investors at a certain level by Waweru et al. (2008). In this concept, investors usually analyze the past trends of stocks by technical analysis methods before deciding an investment.

In general, market factors are not included in behavioral factors because they are external factors influencing investors' behaviors. However, the market factors influence the behavioral investors (as mentioned above) and rational investors in different ways, so that it is not adequate if market factors are not listed when considering the behavioral factors impacting the investment decisions. Together with the research of Waweru et al. (2008), this research treats the market factors fairly as behavioral factors influencing the decisions of investors in the stock market.

Herding effect

Herding effect in financial market is identified as tendency of investors' behaviors to follow the others' actions. Practitioners usually consider carefully the existence of herding, due to the fact that investors rely on collective information more than private information can result the price deviation of the securities from fundamental value; therefore, many good chances for investment at the present can be impacted. Academic researchers also pay their attention to herding; because its impacts on stock price changes can influence the attributes of risk and return models and this has impacts on the viewpoints of asset pricing theories (Tan, Chiang, Mason & Nelling, 2008).

In the perspective of behavior, herding can cause some emotional biases, including conformity, congruity and cognitive conflict, the home bias and gossip. Investors may prefer herding if they believe that herding can help



them to extract useful and reliable information. Whereas, the performances of financial professionals, for example, fund managers, or financial analysts, are usually evaluated by subjectively periodic assessment on a relative base and the comparison to their peers. In this case, herding can contribute to the evaluation of professional performance because low-ability ones may mimic the behavior of their high-ability peers in order to develop their professional reputation (Kallinterakis, Munir & Markovic, 2010).

In the security market, herding investors base their investment decisions on the masses' decisions of buying or selling stocks. In contrast, informed and rational investors usually ignore following the flow of masses, and this makes the market efficient. Herding, in the opposite, causes a state of inefficient market, which is usually recognized by speculative bubbles. In general, herding investors act the same ways as prehistoric men who had a little knowledge and information of the surrounding environment and gathered in groups to support each other and get safety (Caparrelli et al., 2004).

There are several elements that impact the herding behavior of an investor, for example: overconfidence, volume of investment, and so on. The more confident the investors are, the more they rely on their private information for the investment decisions. In this case, investors seem to be less interested in herding behaviors. When the investors put a large amount of capital into their investment, they tend to follow the others' actions to reduce the risks, at least in the way they feel. Besides, the preference of herding also depends on types of investors, for example, individual investors have tendency to follow the crowds in making investment decision more than institutional investors (Goodfellow, Bohl & Gebka, 2009).

Waweru et al. (2008) propose that herding can drive stock trading and create the momentum for stock trading. However, the impact of herding can break down when it reaches a certain level because the cost to follow the herd may increase to get the increasing abnormal returns. Waweru et al. (2008) identify stock investment decisions that an investor can be impacted by the others: buying, selling, choice of stock, length of time to hold stock, and volume of stock to trade. Waweru et al. conclude that buying and selling decisions of an investor are significantly impacted by others' decisions, and herding behavior helps investors to have a sense of regret aversion for their decisions.

For other decisions: choice of stock, length of time to hold stock, and volume of stock to trade, investors seem to be less impacted by herding behavior. However, these conclusions are given to the case of institutional investors; thus, the result can be different in the case of individual investors because, as mentioned above, individuals tend to herd in their investment more than institutional investors. Therefore, this research explores the influences of herding on individual investment decision making in Colombo Stock Exchange to assess the impact level of this factor on their decisions.

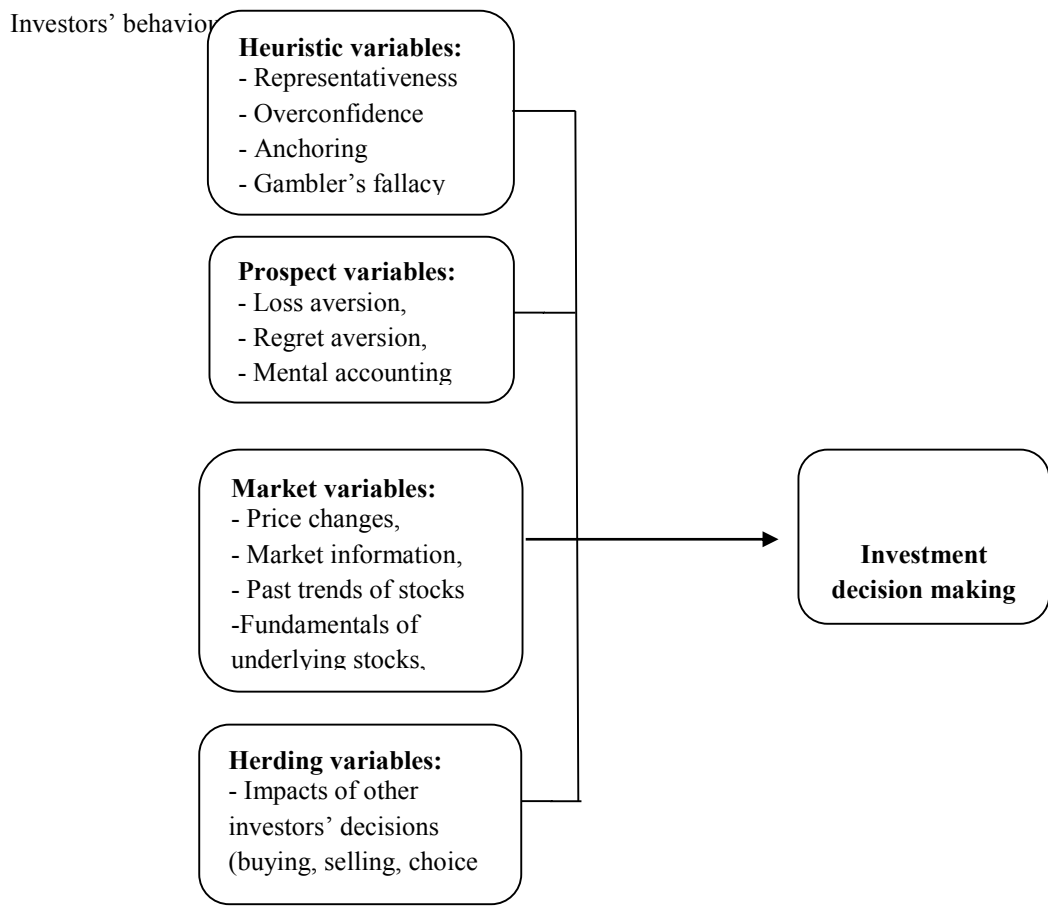
3. Materials and Methods

In general, theory is built and tested based on two different approaches: induction and deduction. When deductive approach is employed, researchers start with the existing theory and logical relationships among concepts, and then continue to find empirical evidences. In this study, exploring the behavioral factors influencing the decision making of investors, deduction approach seems to be the most appropriate choice.

Population of the study was individual investors of CSE. Cross-sectional design is employed in this study. Study fits the nature of this study to describe a common trend of investors' behaviors rather than one specific case, and the data in this study has not been collected in stages but carried out in a single time period. The cross-sectional



design allows collecting quantitative data and data synthesized from the questionnaires sent to individual investors of CSE. The data collected from questionnaires provide the basic understandings about the investor’s behavior affecting investment decisions making. Questionnaires are sent to respondents using random sampling method. The questionnaire is divided into two parts: personal information and investor’s behavior affecting investment decisions making. The 5-point Likert scales, which are rating scales widely used for asking respondents’ opinions and attitudes (Fisher, 2010, p.214), are utilized to ask the individual investors to evaluate the degrees of their agreement with the impacts of investor’s behavior on their investment decision making. The 5 points in the scale are respectively from 1 to 5: strongly disagree, disagree, neutral, agree, and strongly agree. Based on the literature survey and problem statements of the study, the following conceptualization is developed to show the relationship between investor’s behaviour and investment decision making. In this study, investors’ behaviour (independent variable) is measured by heuristic variable, prospect variable, market variable and herding variable whereas investment decision-making is employed as dependent variable.



Source: Developed by researcher

Figure 1: Conceptual framework

Operationalisation describes how to measure the variables and concepts used in the particular study.

Table 1. Measurements for Key concepts and variables



Concepts	Variables	Indicators
Investor's behaviour	Heuristic	<ul style="list-style-type: none"> ▪ Representativeness ▪ Overconfidence ▪ Anchoring ▪ Gambler's fallacy ▪ Availability bias
		<ul style="list-style-type: none"> ▪ Loss Aversion ▪ Regret aversion ▪ Mental accounting
	Market	<ul style="list-style-type: none"> ▪ Price changes ▪ Market information ▪ Past trends of stocks ▪ Fundamentals of underlying stocks ▪ Customer preference ▪ Over-reaction to price changes
		<ul style="list-style-type: none"> ▪ Following the others' trading actions (buying and selling, choice of stock, volume of stock, and speed of herding)
Investment decision making	Decision Making Behavior	<ul style="list-style-type: none"> ▪ Satisfaction of investment decisions ▪ High degree of safety ▪ Risk level

4. Results and Discussion

The collected data are processed and analyzed by SPSS. At first, the data are cleaned by removing the questionnaire with poor quality such as including too many missing values or bias ratings. Then, statistical techniques, which are used for the data to achieve the research objectives, include Factor Analysis, and Multiple Regression Analysis. To establish reliability and validity of the questionnaire, questionnaire was pre-tested with a 30 sample of investors and finalized before it was utilized for the survey. The Cronbach's alpha was used to measure of reliability random errors. The reliability coefficient of all indicators was 0.876 which indicated the high reliability.

The 23 questions of the questionnaire are designed to explore the levels of behavioral variables' influence on the individual investment decisions at the CSE. The exploratory factor analysis (EFA) is used for the behavioral variables and investment decision to identify the factors which these variables belong to. The requirements of factor analysis are satisfied to reduce the variables. After some rounds of removing the unsuitable variables, the analysis results that the remaining variables are grouped into five factors (four factors of behavioral variables and one factor of investment decision). Here Bartlett's test of Sphericity and the Kaiser-Meyer-Olkin measure of sampling adequacy (George & Mallery, 2003) are used. A measure of sampling adequacy of 0.654 with a value of Bartlett's test of Sphericity (1435.274) with a high significant level ($P < 0.000$), indicates the suitability of factor analysis and the results is presented in table 3

Table 2. KMOband Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.	0.654
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Bartlett's Test of Sphericity	Approx. Chi-Square	1435.274
	df	271
	Sig.	0.000

Source: Survey Data

Factor loadings of the items on a factor are greater than 0.5 (with the sample size is 100) ensure that EFA has a practical significance to the analyzed data (Hair et al., 1998, p.111). Eigen value greater than one suggests that the five factors explain a sizable variation contained in the data. Since these five factors have Eigen values greater than one, which together explains a variance of 52.791%; therefore, the factors confirmed the factorial validity. The table 4 and 5 represents these results.

Table 3. Factor analysis for behavioral variables and investment decision making

Factors	Variable	Factor Loadings				
		Factor 1	Factor 2	Factor 3	Factor 4	Factor 5
Heading	Other investors' decisions of choosing stock types have impact on your investment decisions	0.743				
	Other investors' decisions of the stock volume have impact on your investment decisions	0.714				
	Other investors' decisions of buying and selling stocks have impact on your investment decisions	0.835				
Heuristics	You usually react quickly to the changes of other investors' decisions and follow their reactions to the stock market	0.756				
	You believe that your skills and knowledge of stock market can help you to outperform the market.		0.711			
Investment decision making	You rely on your previous experiences in the market for your next investment		0.737			
	You forecast the changes in stock prices in the future based on the recent stock prices		0.754			
	The return rate of your recent stock investment meets your expectation			0.867		
Prospect	Your rate of return is equal to or higher than the average return rate of the market.			0.832		
	You feel satisfied with your investment decisions in the last year (including selling, buying, choosing stocks, and deciding the stock volumes).			0.765		
Market	After a prior gain, you are more risk seeking than usual.				0.876	



After a prior loss, you become more risk averse	0.754
You avoid selling shares that have decreased in value and readily sell shares that have increased in value.	0.843
You have the over-reaction to price changes of stocks	0.765
You analyze the companies' customer preference before you invest in their stocks	0.688

Cronbach's Alpha	0.786	0.754	0.832	0.811	0.672
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Extraction Method: Principal Component Analysis. Rotation Method: Varimax with Kaiser Normalization.

Table 4. Total variance explained for factors

	Herding (Factor 1)	Heuristic (Factor 2)	Investment decision making (Factor 3)	Prospect (Factor 4)	Market (Factor 5)
Eigen Value	4.108	3.582	2.832	2.107	1.625
Proportion of Variance explained (%)	15.214	13.267	10.488	7.805	6.018
Cumulative Variance explained (%)	15.214	28.481	38.969	46.774	52.791

Source: Survey Data

As shown in the Table 4 the variables of herding, heuristics, investment decision making, prospect, and market are grouped into related factor. Some of the variables' factor loadings have been removed from the analysis as their factor loadings are less than 0.5. The result illustrates that the behavioral variables that influence the investment decisions of individuals at the CSE are grouped in four factors as the reviewed theories: Herding, Heuristics, Prospect, and Market.

As such, there are four behavioral factors that influence the investment decisions of individual investors at the CSE. In the herding factor, all four original variables from the questionnaire are kept after the factor analysis. Only three of eight original items of heuristics are kept by factor analysis, two of six original items of market and three of six original items of prospect are accepted by factor analysis. All three original variables investment decision making are accepted by factor analysis and all belong to one dimension.

The internal consistency of the items used to measure each factor was calculated using Cronbach's alpha, which is the procedure of choice for investigating the internal consistency of items using Likert-type scale (Walsh & Betz, 1995). Cronbach's alpha for each factor: factor 1(Herding), factor 2 (Heuristics), factor 3(Investment performance), factor 4(Prospect) and factor 5 (Market) were 0.786, 0.754, 0.832, 0.811 and 0.672 respectively. Since the marginally acceptable reliability should be above 0.60 (Gliner & Morgan, 2000), this study's all



measures are above 0.60 which demonstrates reliability. Therefore the results of reliability analysis confirmed that consistency is at an acceptable level for each factor.

5. Conclusion

The study is concluded by giving all the answers for the research questions raised in the introduction. The following part gives the conclusions for the study by presenting the main points to answer the research questions. There are four behavioral factors that impact the investment decisions of individual investors at the CSE: Herding, Heuristics, Prospect and Market. The herding factor includes four behavioral variables: choice of trading stocks, volume of trading stocks, buying and selling, and speed of herding). Heuristics factor consists of two behavioral variables: over confidence and anchoring. The prospect factor possesses two variables: loss aversion, and regret aversion. The market factor consists of two variables: market information, and customer preferences.

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