The Degree of Financial Literacy as a Deterministic Factor in Investment Decisions: Evidence from Colombo Stock Exchange (CSE) of Sri Lanka

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Abstract

Local retail investors at the CSE are not gaining the optimum benefits out of the market whereas, the foreign investors are gaining high profits through trading stocks. In addition, the financial literacy level of Sri Lankans is low compared to other countries. The main target of the researcher is to determine "The Impact of Behavioral Finance on Investment Decision-Making in the Stock Market and the Moderating Role of Financial Literacy: with special reference to local individual investors at the CSE of Sri Lanka". The findings of the study revealed that a significant relationship exists between behavioral finance and investment decision-making. It was also established that financial literacy moderates the relationship between the independent variables and the dependent variable. The qualitative findings resulted in a final thematic analysis which gave rise to additional independent variables and moderating variables which were suggested for future research by the author.

Keywords: *Stock Market; Financial literacy; Behavioral finance; Gambler's Fallacy; Herd Behaviour; Sri Lanka*

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Introduction

Behavioral finance is an emerging area in research where one can ascertain the factors affecting the investment decision-making. Behavioral finance succeeds in explaining the irrational and biased behavior of investors whereas traditional finance theories fail to do so. This research intends to identify the extent of the relationship between behavioral finance factors and investment decision-making and whether financial literacy has a moderating impact on behavioral finance and investment decision-making

Research Problem

When investment decision-making is concerned, the emotional inclinations of investors, their thought patterns, perceptions and psychological biases tend to affect their rationality (Jagongo and Mutswenje, 2014). Behavioral finance causes investors to be biased and as a result it affects their investment decision-making.

According to the studies done by Lusardi and Mitchell (2011), Atkinson and Messy (2012), Brown and Graf (2013), Thaler (2013) and World Bank (2014), much of the world's population still suffer from financial illiteracy and therefore a remedy to such a problem is of immense need.

Sri Lankan stock market has experienced the irrational decision making of investors. Decisions which wouldn't be explained by traditional theory which assumes investors to always be rational and markets to always be efficient. Arunajith (2014), the writer of the article "Behavioral Finance: Force Behind Capital Market Behavior" for Sunday Times, stated that prior to 2005, Sri Lankan stock Market was known as the best performing markets in the region, whereas a closer look at the listed companies reveals "lackluster performance". He further stated that behavioral finance explains why the Colombo stock price Index dropped immediately after the 2005 presidential elections.

CSE has attracted foreign investments in the recent past. According to a statement made by the CEO of CSE, Mr. Rajeeva Bandaranaike (2017), "The foreign activity we have witnessed indicates that international investors have been quick to identify an opportunity in Sri Lankan stocks".

Lack of financial literacy in Sri Lanka, as identified by the Standard and Poor's 2014 Global Financial Literacy survey (further discussed under the justification of the problem), is low and therefore the Colombo Stock Exchange (CSE) is actively engaged in conducting educational forums and guiding local investors to identify opportunities and engage in rational decision-making.

Financial literacy has scope for improvement among the Sri Lankans. According to the Standard and Poor's 2014 global financial literacy survey, Sri Lanka has the highest gap between print literacy and financial literacy in the region (DailyFT, 2017). The survey further identified that South Asia records the lowest percentage of financial literacy.

This indicates that financial literacy among the citizens of a country could affect its economic growth. "One of the fundamentals of finance is the positive relationship between Risk and Return. There are opportunities where people could maximize the return by investing in assorted saving products of credible and reputed financial institutions" – Manosh Kulasena (DailyFT, 2017).

Previous researches conducted in Sri Lanka by Dunusinghe and Ranasinghe (2015), Ponnamperuma (2013), Securities and Exchange Commission and University of Peradeniya (2012) and Perera (2016) depict that investors at CSE have a significant tendency of being led to irrational decision-making due to the effect of behavioral finance, i.e. emotions and biases. The findings also suggest that investors lack financial literacy.

In order to further support the existence of the problem, a preliminary survey was conducted on 20 respondents through convenience sampling, using a questionnaire (refer annexure). It was identified that every respondent was biased by at least one factor out of heuristics, prospect theory, herding or market factors which are behavioral finance factors. The following table 1 shows the results of the preliminary survey.

Table 1: Findings of the Preliminary Survey (Source: Developed by author)

Behavioral finance factors	Percentage of respondents affected by each behavioral finance factor
Heuristics – Representativeness	60%
Heuristics – Overconfidence	65%
Heuristics – Anchoring	70%
Heuristics – Gamblers' Fallacy	55%
Prospect theory	55%
Market Factors	60%
Herding behavior	40%

Furthermore, the preliminary survey also identified the following with regard to the levels of financial literacy of the respondents; 55% of the respondents possess financial knowledge, whereas only 35% of the respondents apply such knowledge in the process of investment decision-making. This research aims at identifying if financial literacy has a moderating impact on reducing the effect of the impact of behavioral finance on investment decision-making as suggested by the literature review in the next chapter.

Therefore, this research aims to ascertain the influence of behavioral finance on investment decision-making of local investors at the CSE and to what extent such influences could be reduced by the moderating impact of financial literacy.

Research Objectives

- To identify the possible behavioral finance factors influencing the investment decisions of local individual investors at the CSE

- To assess the degree of impact of behavioral finance factors on the investment decisions of local individual investors at the CSE

- To identify if there is a moderating impact of financial literacy on the relationship between behavioral finance and investment decision making of local individual investors at the CSE

- To assess the degree of moderating impact of financial literacy on the relationship between behavioral finance and investment decision making of local individual investors at the CSE

Literature Review

Investment Decision Making

Decision making refers to a process of choosing the best alternatives and the decision-making process is considered as the most complex and challenging activity of investors (Chaudhary, 2013).

Investment decision-making is done after analyzing information according to Kast and Lapied (2006). They stated that in the decision-making process, the information arrivals make decisions change.

Investment decision-making is considered extremely important according to the statements discussed above and therefore investors ideally desire to remain rational in their decision-making. However, many difficulties arise in decision-making, thus causing rationality to be only a theory but not realistic in practice as highlighted by many researchers.

Certain difficulties are caused in the investment decision making due to the factors such as lack of financial information, shortsightedness and insufficient self-regulation (Winchester, Huston and Fink, 2011). In addition to that, information changes from time to time, thus making the decision-making process more complicated (Formlet, 2001). Hirshleifer (2011) identified that when investors are having multiple information, they tend to focus on the information which seems more important to them and therefore individuals leave most of the information unattended and unprocessed, thus failing to remain accurate.

Behavioral Finance

Behavioral finance is focused on the psychological factors which give way to investment practices (Graham et al., 2002). Behavioral finance argues that people are not always rational as vividly assumed in the traditional classic finance theories. This concept shows the influence of psychological and emotional biases which affect investors in making decisions (Sewell, 2005). Thus, it interrupts the rational decision making of investors.

In contrast to the traditional theories which completely rely on the assumption that investors are rational, behavioral finance, according to Farlin (2006), shows that the roots of behavioral models are not considered as rational because different investor perceptions and preferences causes them to behave and make decisions irrationally.

Fromlet (2001) states that "behavioral finance closely combines individual behavior and market phenomena and uses knowledge taken from both the psychological fiend ad financial theory". Furthermore, according to A. Talangi (2004), behavioral finance is the process involving the psychological decision making in identifying and predicting the financial markets.

Theories and Models of Behavioral Finance

Heuristics is based in the rule of thumb which is said to be facilitating and easing the decision making in uncertain environments (Ritter, 2003). However, Ritter further states that in some cases heuristics may also lead to different biases in versatile situations which in that perspective, may lead to less than optimal and less accurate decision making.

Kahneman and Tversky, in 1974, introduced three factors under heuristics which are representativeness, availability bias and anchoring heuristics. Similarly, Kengatharan & Kengatharan (2014) also mentions the same biases under heuristics. In addition to that, two other factors, namely, Gambler's fallacy and overconfidence are also included in heuristics (Waweru et al., 2008).

- Representativeness

Representativeness is "the degree by which the situations and instances resemble with the population" (DeBondt & Thaler, 1995).

Representativeness heuristics depicts the nature of individuals correlating between probabilities and similarities which causes basic information to be ignored (Lagnado and Sloman, 2004). In this bias, according to Luu (2014), sample size is ignored since people only refer to a few samples. Individuals make evaluations based on the similarity of a case with another case when being biased under representativeness (Goldstein, 2003).

- Availability bias

According to Murgea (2010), availability is a judgmental heuristic. This bias occurs when people excessively use and rely on easily available information. In terms of dealing in the stock market, availability bias can be observed where investors tend to have a preference in buying stocks of local companies which they are familiar with and can easily obtain information; this also goes against the basic principle of diversification of portfolio management for optimization (Waweru et al., 2008).

Availability bias also occurs when people use general rules or mental shortcuts i.e. easily recalled events, in predicting the profitability of certain results. The process of evaluating the events which are at the end of the month is easier than having to recall the events which are at the beginning of the month, as a result, recent events affect perception (Sadi et al., 2011).

- Anchoring

Anchoring can be observed in the circumstances where people use some initial values to make estimations, which are biased towards the initial ones because different starting points yield different estimates (Kahneman & Tversky, 1974). It's the tendency to rely too heavily on or "anchor" on one piece of information when making decisions.

Anchoring is also defined as the tendency of investors to refer their decisions to an irrelevant reference point regarding their investments (Pompian, 2006).

- Gambler's fallacy

Gambler's fallacy is the behavioral bias that occurs when individuals believe that the sample resembles its parent population from which it is drawn out (Statman, 1999). 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. Investors try to predict reversal in stock prices when they are suffering from this bias, because they think that the trend will be reversed (Waweru et al., 2008).

- Overconfidence

Overconfidence is unreasonable belief of an individual in his own mind, thoughts and decision making. This is birthed from the fact that individuals think of themselves as more intelligent than what they actually are or think that they have better knowledge (Siddiqui and Singh, 2009). It is further defined as the measure of the difference between real knowledge of people and the knowledge which they think they have (Dobelli, 2014). According to Kyle and Wang (1997), an overconfident individual has high subjective probability and therefore they trade more than the rational investors and expect higher returns over their investments and expect a positive performance and return for their investment.

Prospect Theory

This theory is developed by Tversky and Kahneman (1979). They presented a paper regarding the critiques of Expected Utility Theory. Prospect theory focuses on subjective decision-making which is influenced by the investors' value system, whereas Expected Utility theory focuses on investors' rational expectations (Filbeck et al., 2005).

Prospect theory is defined as major states of mind which significantly affect individual decision-making process (Waweru et al., 2008). He further identifies such key states of mind to be regret aversion, loss aversion and mental accounting.

- Regret aversion

Regret aversion arises when an investor has a desire to avoid the pain of regret caused by a poor investment decision. Forgel and Berry (2006) further states that in investing, the fear of regret can make investors either risk averse or motivate them to take high levels of risk, therefore this theory deals with the emotional reaction experienced by investors after realizing that they have made mistakes in their analysis and evaluation and thus their decision, i.e. when faced with the prospect of selling a stock, investors become emotionally affected by the price at which they purchased the stock. According Pompian (2006), at such a situation, people avoid selling stocks in order to avoid regret of having made a bad investment and in order to avoid the embarrassment of reporting a loss.

Regret aversion in stock trading results in investors keeping stocks which are lost for a long period of time even if there is no expectation (Eaton and Douglas, 2000). Investors also tend to avoid the possibility of feeling regret by following the conventional wisdom and buying only the stocks which are bought by everyone else while rationalizing their decision with "everyone else is doing it" (Jagongo and Mutswenje, 2014).

- Loss aversion

Loss aversion is simply explained as the tendency of individuals in avoiding losses when compared to reacting to gains, i.e. when a problem is framed in a negative manner, the loss aversion is more intense. In such a situation there will be less negotiation when the exposure of loss is stronger because individuals are not aware of that loss (Chira, Adams and Thornton, 2008).

According to Barberis and Thaler (2003) and Luu (2014), it is proven that people are more distressed at prospect losses than they are pleased by equivalent gains. The same was stated by Kahneman and Tversky (1979).

- Mental accounting

Mental accounting refers to "the process by which people think about and evaluate their financial transaction" (Barberis and Huang, 2001). Mental account facilitates the investors to manage their investment portfolios in difference accounts (Ritter, 2003).

According to Thaler (1999), there are three components on mental accounting. The first captures how outcomes are perceived and experienced and therefore how decisions are made after subsequent evaluation. Second is the assignment of activities to specific accounts, labelling the sources and uses of funds. Third component is the frequency with which the accounts are evaluated and "choice bracketing". He further states that mental accounting influences the choices made by investors.

Herding Theory

Herding effect is the tendency of individuals to follow the actions of others in the stock market. Investors may prefer herding if they believe that herding can help them to attain useful and reliable information. Accordingly herding can contribute to the evaluation of professional performance because low ability individuals may imitate the behavior of peers with high ability in order to develop their professional reputation (Kallinterakis et al., 2010). In herding theory, investors tend to behave in a similar manner as the prior man who was unaware of the market and the surrounding environmental factors (Caparrelli, Arcangelis and Cassuto, 2004).

Waweru et al. (2008) states that herding can drive the stock trading and create momentum for stock trading.

Market Factors

Factors of market which have an impact on the investment decision making investors are (i) Price changes, (ii) Market information, (iii) Past trends of stocks, (iv) Customer preference, (v) Overreaction to price changes and (vi) Fundamentals of underlying stocks (Waweru et al., 2008).

Investors are impacted by events in the stock market that grab their attention even when they are not aware if these events can result in good future investment performance or not (Barber and Odean, 2000).

Model of Behavioral Finance Factors by Waweru et al.

Waweru et al. (2008), simplified all behavioral factors into four main groups. Accordingly, behavioral finance factors which influence the investment decision making are categorized into four main groups as shown below in Table 02.

Financial Literacy

Table 2: Summary of Behavioral Finace Factors – Waweru et al., 2008

Group	Factors belonging to each group
Heuristic Theory	Representativeness Overconfidence Anchoring Gambler's fallacy Availability bias
Prospect Theory	Loss aversion Regret aversion Mental accounting
Market factors	Price changes Market information Past trends of stocks Fundamentals of underlying stocks Customer preference Overreaction to price changes
Herding effect theory	Buying and selling decisions of other investors Volume of stock traded by other investors Choice of stock traded by other investors Speed of herding

The classification shown above in Table 2, which was introduced by Waweru et al. (2008), is used by the author for the purpose of this research.

"Financial literacy is regarded as a combination of awareness, knowledge, skill, attitude, and behavior needed to make sound financial decisions and ultimately achieve individual financial well-being" (OECD, 2013). Financial literacy has two dimensions: (i) understanding – represents the personal financial knowledge or financial education, and (ii) its use – the application of such knowledge in personal financial management (Huston, 2010).

According to Robb, Babiarz and Woodyard (2012), financial literacy involves the ability to understand financial information and make effective decisions by using such information, while financial education means simply recalling a set of facts.

Lack of financial literacy may result in certain biases during decision-making. According to Jappeli and Padula (2013), majority lack the basic knowledge of economics and finance like

behavioral finance, risk diversification, inflation and interest compounding and therefore as a result, there are more chances to indulge in investment biases.

According to Cohen (2005), some investors rely on earnings per share for their investment while excluding the important measures like a firm's revenue and cash flows.

Moderating Role of Financial Literacy on the relationship between Behavioral Finance Factors and Investment Decision Making

Financial literacy helps the individuals in making investment decisions and helps them to make unbiased decisions (Rooij et al., 2011). Financial literacy positively affects the investment decisions which are made by investors in the stock market (Lusard and Mitchell, 2007). Therefore, it's evident that the financial literacy effects the relationship of cognitive biases and investment decision.

According to Mitchell and Curto (2010), the financial literate individuals can make better investment decisions and maximize their returns. Investors having lack of understanding about financial matters make poor investment decisions and also make poor allocation of resources (Banks & Oldfield, 2007). Financial literacy plays a moderating role in reducing the effect of psychological and behavioral biases on investment decision-making.

Empirical Findings

this research aims at identifying the degree impact of behavioral finance and which factors affect investment decision-making. Such impact is observed in many empirical research findings as summarized below in Table 3.

Table 3: Empirical Research Findings on Behavioral Finance and Investment Decision-
making

Researcher	Findings
Barber and Odean (1999)	Investors are biased by overconfidence Investors are biased by the urge to avoid regret
Camerer (1997), Bailey (2012) , Breuer, Riesener and Salzmann (2014) Zoghlami and Matoussi (2009) Al-Horani and Haddad (2011) Hooy and Ahmad (2012) Abdulaziz (2013) Alquraan, Alqisie and Shorafa (2016) Chaudhary (2013) Chaffai and Medhioub (2014)	Investors are affected by psychological/ behavioral factors
Ton (2011), Barberis and Huang (2001)	Investors are highly influenced by loss aversion
Chen et al. (2004)	Representativeness bias is high among experienced investors
Shiller (2000) Shabgou and Mousavi (2016) Welch (2000), Ritter (2003) Waweru et al. (2008) Dohmen et al. (2011).	Market factors has the highest correlation with investment decision-making
Anum and Ameer (2017)	Highest impact caused by herding theory

(Source: Developed by the Author)

This research also focuses on the moderating role played by financial literacy and therefore aims to identify the extent to which financial literacy could reduce the impact

of behavioral finance on investors and thus cause them to be more rational. This research also explores the variation of financial literacy according to demographic factors. Such impact is observed in many empirical research findings as summarized below in Table 4.

Table 4: Empirical Research Findings on Financial Literac (Source: Developed by
   author)

Researchers	Findings
Banks and Oldfield (2007)	Poor financial literacy results in poor allocation of resources, lower return and poor risk minimization
Ballantine and Stray (1998) Lusardi and Mitchell (2007) Lusardi, Mitchell and Curto (2010) Jappeli and Padula (2013)	Financial literacy causes people to take rational decisions and make maximum returns from their investments.
Doukas and Petmezas (2007)	The effect of cognitive biases on investment decisions can be reduced by knowing more about financial markets, principles and trends.

The literature review provides a solid foundation for the research of the impact of behavioral finance on investment decision making and the moderating role of financial literacy in the context of Sri Lanka.

Methodology

Research Design and Approach

This research is largely into positivism and deduction approach which encourages quantitative findings. However, the researcher also followed up the quantitative findings with qualitative findings as well. A survey was conducted in this research based on a large sample and extensive usage of statistics which compliments with the deductive approach. Quantitative approach was used to analyze the data collected. Data was collected using a structured questionnaire to test the hypothesis and according to the results, conclusions were drawn to solve the research questions.

However, due to the complexity in interpreting biased behavior of investors, there was a need for answering the research questions from different perspectives and in order to aid the interpretation of the quantitative findings, the researcher has opted for a mixed method.

According to Creswell and Clark (2011), the Explanatory Sequential Method is where the researcher first collects quantitative data and then collects qualitative data in order to explain the relationships found in quantitative data. Accordingly, an *Explanatory Sequential Method* is used in this research. Therefore, in addition to the main survey, a qualitative approach was also used to analyze the face-to-face interviews conducted with CSE experts and experienced employees of stock broker firms in order to give an in-depth understanding of the content in a different perspective.

The population of this research is estimated to be approximately 25,000 local individual investors. The researcher has selected a sample size of 378 respondents to conduct her study using the table introduced by Krejcie & Morgan in 1970. However, due to time constraints only 372 responses were collected by the researcher for this study.

The non-probability sampling was used in this research. The Colombo Stock Exchange (CSE) does not reveal any details with regard to the current investors. Therefore, there is no access to a sample frame or contact details of investors, due to which, it was unable to carry out probability sampling. Therefore, the researcher has chosen to use convenience sampling in collecting responses.

The researcher visited the CSE during trading hours (9.30am to 2.30pm) during two weeks and distributed the questionnaires to the investors present at the CSE. Since the researcher requires the respondents to have stock trading experience of at least one year, the respondents were asked if they have been trading for at least one year and the questionnaire was given only to those who satisfy the criteria.

The main source of information used for this research is primary data which are collected by the researcher specifically for this study. This research based on the Explanatory Sequential Method, focusses mainly on a quantitative method of data gathering while engaging in qualitative data gathering afterwards in order to support the results of the quantitative analysis and to obtain a deeper understanding of the content.

The quantitative data was gathered through questionnaires. The qualitative data was gathered through a few semi-structured face-to-face interviews conducted with experts at the CSE and stock broker firms in order to discuss pre-identified concepts.

Descriptive statistics measurements were applied to describe and establish patterns and trends to make it easy to understand and interpret the implications of the study. Inferential statistical measurements were used for testing validity, reliability, hypothesis testing, moderation effect, etc. the correlation and regression coefficient were used in testing the hypothesis developed.

Conceptual Framework

According to the literature review that was carried out, the researcher identified that behavioral finance factors has an impact on investment decision making and also that

financial literacy plays a moderating role on the above stated relationship. Literature suggests that behavioral finance factors are antecedents of investment decision making.

However, this concept including the moderating variable has not been tested empirically in the Sri Lankan context. Therefore, the researcher developed the following conceptual framework.
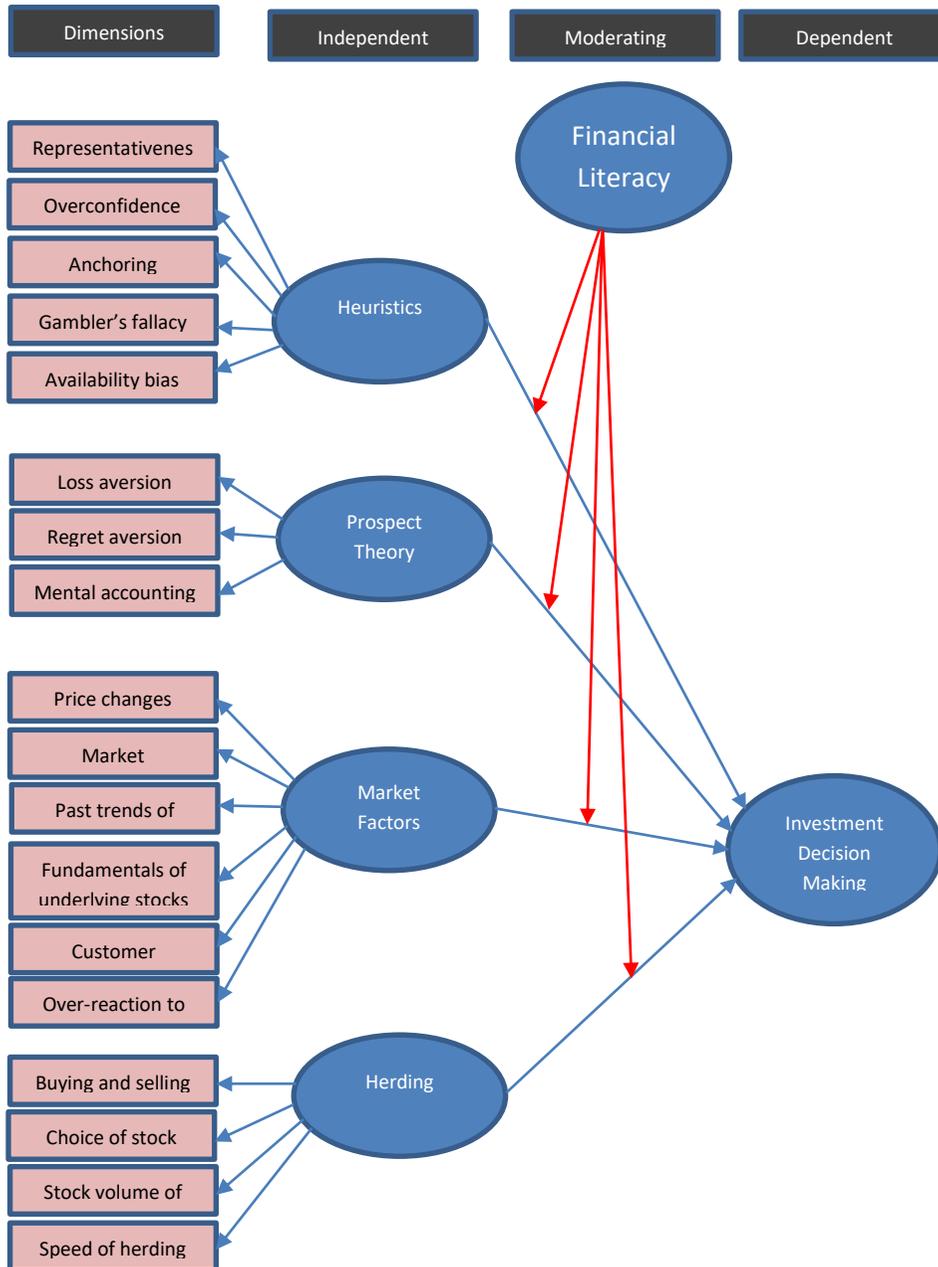
Development of Hypotheses

$H1_0$: There is no significant relationship between heuristics and investment decision-making of local individual investors at the CSE

$H1_1$: There is a significant relationship between heuristics and investment decision-making of local individual investors at the CSE

$H2_0$: There is no significant relationship between prospect theory and investment decision-making of local individual investors at the CSE

$H2_1$: There is a significant relationship between prospect theory and investment decision-making of local individual investors at the CSE

$H3_0$: There is no significant relationship between market factors and investment decision making of local individual investors at the CSE

$H3_1$: There is a significant relationship between market factors and investment decision-making of local individual investors at the CSE

$H4_0$: There is no significant relationship between herding theory and investment decision-making of local individual investors at the CSE

$H4_1$: There is a significant relationship between herding theory and investment decision-making of local individual investors at the CSE

$H5_0$: Financial literacy does not cause a significant impact on the relationship between the behavioral finance factors and investment decision-making of local individual investors at the CSE

$H5_1$: Financial literacy causes a significant impact on the relationship between the behavioral finance factors and investment decision-making of local individual investors at the CSE

Operationalization of Variables

Table 5: Operationalization of Variables (Source – Developed by Author)

Independent Variable	Dimension	Source	Measurement
Heuristics	*Representativeness* *Overconfidence* *Anchoring* *Gambler's fallacy* *Availability bias*	Waweru et al. (2008) Kahneman and Tversky (1974) Kengatharan & Kengatharan (2014)	Likert scale 1-Strongly Disagree 2-Disagree 3-Neutral 4-Agree 5-Strongly Agree
Prospect theory	*Loss aversion* *Regret aversion* *Mental accounting*	Waweru et al. (2008)	Likert scale 1-Strongly Disagree 2-Disagree 3-Neutral 4-Agree 5-Strongly Agree
Market factors	*Price changes* *Market information* *Past trends of stocks* *Fundamentals of underlying stocks* *Customer preference* *Over-reaction to price changes*	Waweru et al. (2008)	Likert scale 1-Strongly Disagree 2-Disagree 3-Neutral 4-Agree 5-Strongly Agree

Herding theory	*Buying and selling decisions of others* *Others' choice of stock types* *Others' choice of stock volume* *Speed of herding*	Waweru et al. (2008)	Likert scale 1-Strongly Disagree 2-Disagree 3-Neutral 4-Agree 5-Strongly Agree
Moderating Variable	**Dimension**	**Source**	**Measurement**
Financial Literacy	*Understanding* *Application in decision-making*	Robb, Babiarz and Woodyard (2012) Huston (2010)	Likert scale 1-Strongly Disagree 2-Disagree 3-Neutral 4-Agree 5-Strongly Agree
Dependent Variable	**Dimension**	**Source**	**Measurement**
Investment Decision Making	*Choosing best alternatives* *Analyzing information*	Chaudhary (2013) Kast and Lapied (2006)	Likert scale 1-Strongly Disagree 2-Disagree 3-Neutral 4-Agree 5-Strongly Agree

Validity and Reliability Testing – Main Survey

Table 6: KMO and Bartletts tests

Variables	No. of Indicators	KMO test	Bartlett's tests of sphericity	Composite reliability	Average variance extractor
Heuristics	5	0.713	$X^2 = 983.458$ Significance level, 0.000	0.828	0.655
Prospect Theory	3	0.630	$X^2 = 595.588$ Significance level, 0.000	0.756	0.598
Market Factors	6	0.815	$X^2 = 1359.877$ Significance level, 0.000	0.927	0.516
Herding Theory	4	0.678	$X^2 = 781.341$ Significance level, 0.000	0.846	0.684

Correlations

Table 7: Discriminant Validity test output

		HEU _MEAN	PROTHE _MEAN	MARFAC _MEAN	HERTHE _MEAN
HEU _MEAN	Pearson Correlation	0.655			
	Sig. (2-tailed)				
	N				
PROTHE _MEAN	Pearson Correlation	.561[**]	0.598		
	Sig. (2-tailed)				
	N				
MARFAC _MEAN	Pearson Correlation	.386[**]	.175[**]	0.516	
	Sig. (2-tailed)				
	N				
HERTHE _MEAN	Pearson Correlation	.544[**]	.444[**]	.325[**]	0.684
	Sig. (2-tailed)				
	N				

**. Correlation is significant at the 0.01 level (2-tailed).

Table 8: Cronbach's Alpha of Independent Variables

Variables	No. of Questions	Cronbach's alpha
Heuristics	8	0.781
Prospect Theory	6	0.751
Market Factors	6	0.891
Herding Theory	4	0.858

Reliability and Validity of Qualitative Findings

The reliability and validity of the follow-up qualitative research done was measured by the trustworthiness of the interviewees. Experts with substantial years of experience in dealing with the stock market were interviewed. Moreover, a different perspective was chosen in order to avoid any biased responses. The investor behavior was discussed with experts at the stock exchange and stock broker firms.

Ethical conduct was strictly followed in interviewing the respondents. Ethical conduct was maintained at a high level ensuring that no harm or inconvenience in any manner was caused to the participants. It was required to conduct semi-structured interviews in order to follow up with the quantitative findings. The experts at the CSE and stock broker firms preferred to remain anonymous without mentioning their names. Furthermore, The date, time and location for interviews were decided upon purely based on the convenience of the participants.

Findings and Discussion

The correlation values indicated that each behavioral finance factor has a significant relationship with investment decision-making. In other words, all independent variables have a relationship with the dependent variable, investment decision-making. Table 9 below shows the correlation values of each independent variable (behavioral finance factors) and investment decision-making.

Table 9: Pearson Correlation results

	Investment Decision-making	**Correlation**
Heuristics	-0.895	Strong negative
Prospect theory	-0.716	Strong negative
Market factors	-0.413	Weak negative
Herding	-0.894	Strong negative

These findings were further verified by the follow-up interviews conducted with experts at the CSE and stock broker firms. They all agreed on the strong negative impact of herding behavior. They also agreed on heuristics and prospect theory affecting investment decision-making. However, they did not mention market factors in their discussions.

The mean value for Market factors is 3.85 which shows, that majority of the sample has selected "neutral" and "Mildly Agree" as their responses for the indicators reflected in the related dimensions. The standard deviation of the sample is 0.688. The median of the distribution is 4.00 and the mode is 4.00, which clearly implies that most frequently

marked numbers is 4 which represent "Mildly Agree". The distribution ranges from 2.00 to 5.00. Hence the range of the distribution is 3.00. The lowest value of 2.00 denotes that a few respondents have selected "Mildly Disagree" and the maximum value of 5.00 denotes that several respondents have selected "Agree" for the indicators under this variable. The distribution is skewed left. Furthermore, the mean is lesser than the mode, indicating that majority of the respondents agree with the statements regarding the Market factors.

To assess the moderating impact of financial literacy on the relationship between behavioral finance and investment decision-making, regression analysis and ANOVA were used. When financial literacy was introduced as a moderating factor, the R value increased by 0.63. Moreover, ANOVA value of 13.453 was significant at 5% significance level. This resulted in the acceptance of the alternative hypothesis and the rejection of the null hypotheses. It was concluded that financial literacy reduces the negative impact of behavioral finance on investment decision-making.

The qualitative findings further amplified the moderating role of financial literacy on the relationship between behavioral finance and investment decision-making. All interviewees agreed on the moderating impact of financial literacy.

It was discovered that the local individual investors at the CSE are usually affected by behavioral finance factors. The mean values obtained for each independent variable (behavioral finance factor) were; (i) Heuristics mean = 3.55, (ii) Prospect theory mean = 3.40, (iii) Market factors mean = 3.85 and (iv) Herding mean = 3.55. This shows that all respondents have preferred between 3-Neutral and 4-Agree of the Likert scale under each independent variable. These outcomes were further supported by the histograms under each of the four independent variables concerning behavioral finance, which are skewed to the left shoeing that most of the responses suggested that the investors are biased by behavioral finance factors.

The level of investment decision-making recorded to be at a satisfactory level as shown by the mean value of 3.33 which is between 3-Neutral and 4-Agree as per the Likert scale which was used. This was also presented using a histogram which was skewed to the left. This shows that the investment decision-making of local individual investors the CSE is at a moderate level.

The level of financial literacy recorded to have a mean value of 3.25 which is between 3-Neutral and 4-Agree, more towards 3-Neutral. The financial literacy level of Sri Lankan investors seems to be at a moderate level.

This study revealed that there is a negative relationship between behavioral finance and investment decision-making. A strong negative significant relationship was found to be existing between heuristics, prospect theory, herding and investment decision-making. A weak negative relationship was identified between market factors and investment decision-making. All null hypotheses were rejected and alternative hypotheses were

accepted. This was evident from the negative r values which were obtained from the Pearson correlation results for each behavioral finance factor and investment decision-making. This indicates that as investors are more influenced by behavioral finance factors, it adversely affects the investment decision-making of investors. Therefore, this study proves that there is a significant relationship between behavioral finance and investment decision-making.

The table 10 below shows the previous empirical research findings discussed under literature review along with the relevant findings of the research conducted.

Table 10: Discussion on behavioral finance and investment decision-making

Researcher	Empirical Findings	Researcher's Findings
Barber and Odean (1999)	Investors are biased by overconfidence Investors are biased by the urge to avoid regret	The study conduct by the researcher agrees with Barber and Odean (1999). The research conducted identified that investors and biased by overconfidence and regret aversion. These were supported by quantitative and qualitative findings both. Overconfidence was identified as a dimension of heuristics and regret aversion was identified as a dimension of prospect theory.
Camerer (1997) Bailey (2012) Breuer, Riesener and Salzmann (2014) Zoghlami and Matoussi (2009) Al-Horani and Haddad (2011) Hooy and Ahmad (2012) Abdulaziz	Investors are affected by psychological/ behavioral factors	The findings of this research also portray that investors are affected by psychological/ behavioral factors. The local individual investors at the CSE portray moderate to high levels of behavioral/ psychological biases in their responses. It was also discovered that heuristics, prospect theory and herding show high levels of adverse impact on investment decision-making with a strong negative correlation. Such behavioral reactions are also a part of the human nature. However, the

(2013) Alquraan, Alqisie and Shorafa (2016) Chaudhary (2013) Chaffai and Medhioub (2014)		adverse effect of such biases on investment decision-making is what needs to be reduced or mitigated. This research provides recommendations for such actions in the next chapter.
Kausar and Taffler (2005)	Findings support DHS model	Markets under overreaction or underreaction were not tested by the researcher. DHS model was not tested by the researcher. This is justified under the "critical analysis of literature review" in chapter 02.
Ton (2011) Barberis and Huang (2001)	Investors are highly influenced by loss aversion	The quantitative and qualitative findings both suggest that investors are influenced by loss aversion. Loss aversion is a dimension of prospect theory. Prospect theory and investment decision-making showed a strong negative relationship according to the correlation test, which was supported by qualitative findings as well.
Chen et al. (2004)	Representativeness bias is high among experienced investors	The extent of representatives among investors was not tested by the researcher since it was not an objective of this study. However, it was discovered that heuristics (which includes representativeness) has a strong negative relationship with investment decision-making. The impact of representatives was also identified in the findings of the qualitative analysis.

Shiller (2000) Shabgou and Mousavi (2016) Welch (2000) Ritter (2003) Waweru et al. (2008) Dohmen et al. (2011).	Market factors has the highest correlation with investment decision-making	The research conducted resulted in a weak negative relationship between market factors and investment decision-making which contradicts with this empirical finding. The interviewees also did not mention market factors in their discussions. However, the qualitative analysis introduced 'market literacy' as an effective way to reduce the impact of behavioral finance on investment decision-making. Therefore, reaction due to market factors may result in positive investment decisions.
Anum and Ameer (2017)	Highest impact caused by herding theory	The findings of this researcher completely support Anum and Ameer (2017). A very high correlation is observed between herding and investment decision-making with a Pearson correlation value of -0.894 which indicates a strong negative relationship. In addition to that all interviewees agreed that herding caused investors to make irrational decisions and also highlighted herding as the main factor why local investors are at a disadvantage when compared with foreign investors. In Sri Lanka, this could be due to the lack of guidance and support available for investors. Due to the lack of advanced statistical tools, the investors tend to benefit from the market by following others which however, does not result in rational decisions as proved through the findings.

| Dunusinghe and Ranasinghe (2015) | Results of the factor analysis confirm that the individual investors in the CSE are influenced by four behavioral biases: Herding, Heuristics, Prospect and Market in which each dimension includes certain behavioral variables

The study reveals irrational behavior of CSE investors | The research findings support the findings of Dunisinghe and Ranasinghe (2015). After three years, in 2018, still investors at the CSE are affected by four behavioral factors which were tested in this research: Heuristics, Prospect theory, market factors and herding. The researcher also discovered the irrational investment decision-making of investors mainly through the qualitative research where experts expressed their views and strongly agreed that local investors at the CSE are irrational in their decision-making.

However, in addition to that the researcher discovered that the reasons behind such irrational behavior was the influence of behavioral finance factors. |

Research findings in foreign countries along with the research findings of other studies conducted in Sri Lanka with reference to the impact of behavioral finance and investment decision-making were related to the findings of the study conducted by the researcher in Table 27 above.

The hypothesis testing conducted to understand the moderating role of financial literacy revealed that there is a strong moderation effect present as evidenced by the regression analysis and ANOVA conducted by the researcher. Investment Decision Making = 5.353 + (0.920*Financial literacy factors) + (0.180* Heuristics factors) + (0.310* Prospect Theory factors) + (0.620* Market Factors factors) + (0.010* Herding Theory factors). ANOVA value of 13.453 which is significant at 5% significant level, suggests that the independent variables alone are doing a good job at representing the dependent variable. But when the moderating variable is introduced the ANOVA Value increased up to 228.859, which tells that with the moderating variables impact the framework is so much better in representing the independent variable. Therefore, this model can be successfully used to predict the Investment Decision Making.

In addition to that, qualitative findings also agreed that financial literacy reduces the negative impact of behavioral finance on investment decision-making. Thus, it is proven that financial literacy has a moderating impact on the relationship between behavioral finance and investment decision-making. Evidence of similar nature were also presented in various empirical research findings which are shown in the table below.

Table 11: Discussion on Financial literacy

Researchers	Empirical Findings	Researcher's Findings
Banks and Oldfield (2007)	Poor financial literacy results in poor allocation of resources, lower return and poor risk minimization	The researcher's findings support the same. Qualitative research findings state that poor financial literacy results in poor allocation of resources, lower return and poor risk minimization.
Ballantine and Stray (1998) Lusardi and Mitchell (2007) Lusardi, Mitchell and Curto (2010) Jappeli and Padula (2013)	Financial literacy causes people to take rational decisions and make maximum returns from their investments.	The quantitative findings identified that financial literacy can reduce the impact of behavioral biases on investment decision-making, thus resulting in rational decisions. The qualitative findings also agreed that financial literacy helps investors to be rational in their decisions and reduces the influence of behavioral finance factors.
Doukas and Petmezas (2007)	The effect of cognitive biases on investment decisions can be reduced by knowing more about financial markets, principles and trends.	Cognitive biases are also psychological or behavioral biases which were tested in this research. The quantitative and qualitative findings both agree that biases on investment decisions can be reduced by knowing about the financial markets. Qualitative findings also related this to market literacy.

Ponnamperuma (2013)	Individual investors who invest in the Sri Lankan share market do not consider annual reports as an important factor in stock selection. Majority of market participants could not be considered as mature investors and they may not possess an adequate knowledge about the capital market.	The quantitative findings show that the local individual investors at the CSE have a moderate level of financial literacy. However, the qualitative findings strongly agree that the financial literacy level of Sri Lankan investors are extremely low. Experts also mentioned in their interviews that investors lack knowledge about the market and financial fundamentals both which agrees with the research findings of Ponnamperuma (2013).
Securities and Exchange Commision and University of Peradeniya (2012)	Majority of the sample were not aware of their return in comparison with inflation Most of the respondents focus on the security of their investment when choosing stocks and give less importance to the returns of the investment	The qualitative findings of this research reveal that the financial literacy levels if Sri Lankan investors are extremely low. In addition to that the qualitative research findings highlights the behavior of Sri Lankan investors in avoiding risk and preferring safer options such as fixed deposits, treasury bills, treasury bonds or investing in an asset. Therefore, it could be observed that Sri Lankans are mainly risk-averse in their nature and they prefer safety over high returns which causes them to lose the optimum benefits of trading in the stock market.

Empirical research findings in foreign countries with reference to the moderating impact of financial literacy on the relationship between behavioral finance and investment decision-making were related to the findings of the study conducted by the researcher in Table 28 above. Empirical research findings of studies conducted in Sri Lanka only tests

the levels of financial literacy but not its moderating role. Therefore, the current study will be the first empirical study that will consider the moderating impact of financial literacy on the relationship of behavioral finance and investment decision-making in the Sri Lankan stock market.

Through the analysis of the quantitative findings it was established that investment decision-making was influenced by behavioral finance factors and that financial literacy played a moderating role on the relationship between behavioral finance and investment decision-making. The dimensions in the original framework were tested under each independent variable. Moreover, financial literacy also showed a significant moderating impact.

However, the qualitative findings gave birth to new behavioral finance factors as independent variables (speculation and blind trust in stock brokers). The qualitative findings also introduced "market literacy" and "statistical tools" as moderating variables. These improvements are graphically presented under the final thematic analysis in Chapter 04.

Since this research followed an *Explanatory Sequential Method*, the qualitative research was a follow-up to the quantitative findings and consisted of only 5 respondents. Therefore, the conceptual framework will not be modified according to the qualitative findings. However, it could be subject to further research.

Hence, the original conceptual framework did not require any modifications

Summary and Conclusion

From the main survey it was identified that all behavioral finance factors, i.e. heuristics, prospect theory, market factors and herding, had a significant negative impact on investment decision-making. Out of the four independent variables, three (heuristics, prospect theory and herding) had a strong negative relationship with investment decision-making and market factors had a weak negative relationship with investment decision-making. This proved the first four hypotheses which tested the relationship between behavioral finance and investment decision-making.

It was also identified that financial literacy moderates the relationship between behavioral finance and investment decision-making. It was proved by the regression analysis and ANOVA tests conducted, where the R^2 value showed a 0.63 increase after introducing financial literacy as the moderating variable. This proved that financial literacy had a moderating impact on the relationship between behavioral finance and investment decision-making. The analysis of the qualitative findings supported the quantitative findings. However, market factors were not identified as a behavioral finance factor during the qualitative research. The impact of heuristics, prospect theory and herding were further emphasized. In addition to that, the analysis of the interview responses paved the way for the discovery of behavioral factors such as speculation and

blind trust in stock brokers. The respondents' opinions were based on their years of experience. Moreover, as they agreed on the moderating role of financial literacy, they also expressed the moderating role of market literacy and statistical tools. A thematic analysis was done by the researcher which identified all the variables and dimensions proved by the qualitative findings. However, the conceptual framework was not revised based on the qualitative research findings, since the research was mainly based on quantitative findings and only 5 respondents were interviewed for the qualitative research.

Finally, through this study, the researcher has proved that behavioral finance factors impact the investment decision-making of local individual investors at the Colombo Stock Exchange of Sri Lanka and that financial literacy moderates the relationship between behavioral finance and investment decision-making.

Areas for Future Research

This research is restricted to the Western province of Sri Lanka. Therefore, a similar research could be conducted taking into consideration the investors of CSE in all nine provinces of Sri Lanka, thus, attaining a broader view with a larger sample representing the entire country. Many issues which faced up during the interview discussions were mainly in rural areas. Therefore, a wholistic view to this issue could be obtained by an island-wide research. This research is focused on the individual investors at the CSE. A similar research could be conducted on the corporate investors at the CSE as well. New independent variables (speculation and blind trust in stock brokers) and new moderating variables (market literacy and statistical tools) were identified during the follow up interviews which are presented in detail under the thematic analysis conducted by the researcher. Further research could be conducted to provide solid evidence and justification.

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