

**HEURISTIC AND PROSPECT FACTORS INFLUENCING  
INVESTMENT PERFORMANCE OF INDIVIDUAL INVESTORS**

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## **RECOMMENDATION**

## CERTIFICATION

## **DECLARATION OF AUTHENTICITY**

I, Udaya Adhikari, declare that this GRP is my own original work and that it has fully and specifically acknowledged wherever adapted from other sources. I also understand that if at any time it is shown that I have significantly misrepresented material presented to SOMTU, I will be fully responsible for my entire work. I ensure that this work has not been submitted or presented anywhere else before.

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## ABBREVIATIONS

OC:	Overconfidence
AN:	Anchoring
AV:	Availability
LA:	Loss Aversion
MA:	Mental Accounting
RA:	Regret Aversion
NEPSE:	Nepal Stock Exchange
SPSS:	Statistical Package for the Social Sciences
PLS:	Partial Least Square
SEM:	Structural Equation Modeling

## EXECUTIVE SUMMARY

The traditional theory of finance assumes that investors are rational, and they follow the basic rules of risk and return in making their investment decisions. However, behavioral finance states that investors are in fact irrational, and are largely influenced by behavioral factors that introduce biases in their decisions. Behavioral finance is the phenomena where psychology and economics are combined in explaining the irrational decision-making processes of economic agents. Psychology explores various facets of human behavior and provides explanations for why human behavior deviates from the traditional economic assumptions. This study attempts to examine the behavioral factors within the domain of Heuristic and Prospect factors that influence investment performance of individual investors at NEPSE. Descriptive and causal comparative research design was used to provide insights on the research problem by describing the behavioral factors that influence individual investment performance. The population for this study was the individuals who trade in the NEPSE. Primary data was obtained through closed ended questionnaires that were self-administered with a sample of 430 respondents. SmartPLS has been used for the data analysis and model fit of the study whereas SPSS software has been used for pilot test and descriptive study. The findings of the study reveal that investment decisions are highly influenced by heuristic and prospect factors. Similarly, the results of the study revealed that heuristic factors positively and significantly influence the investment performance of the individual investors. However, the prospect factors negatively influence the investment performance of individual investors but were statistically insignificant. Likewise, there was insignificant moderation effect of investment experience in case of heuristic and prospect factors on investment performance of individual investors.

# CHAPTER I

## INTRODUCTION

### 1.1 Background of the study

The stock market is a place where stocks or shares are bought and sold (Zuravicky, 2005). It is the act of buying and selling the shares on a stock market by individuals and institutions. The buying of equity can be done by placing a buy order through the broker or this can be done through pooled investment vehicles like mutual funds. There are many perceptions to invest the money in stock market, some investors invest for the purpose of becoming the owner of the firm, some for taking dividend and some invest for capital gain (Croushore, 2006). Stock market is also one of the effective channels for raising capital of the company (Zuravicky, 2005). Many invest in stock market instead of making deposits in any other financial institutions. Some people purchase the shares for the purpose of control over the firm. Investors need a major number of shares to set a position in the board of directors and major decision making of the firm in which they invest (Aziz, 2016).

Stock market development variables play a pivotal role in the growth of an economy (Setiawan et al., 2020). This is the reason why government of many countries put more emphasis on the stock market performance because it serves as a factor that triggers growth in most developed economies (Ewah et al., 2009). Stock markets and economic functions may not be distinct, but they represent a close relationship between the disparate sectors in social society between savers and producers as the saving sector needs to employ their savings in more beneficial and ambitious projects (Masoud, 2013). The stock market improves the economic growth by increasing savings and investments, improving the productivity of investments, and raising the profitability of existing capital stock (Singh, 1999). It is difficult to establish a relationship between the magnitude of GDP growth and stock market performance. However, many studies show that they tend to move together over time. Bista (2017), Regmi (2018) and Baral (2019) found significant positive relationship between stock market development and economic growth. Thus, the importance of Nepal Stock Exchange (NEPSE) for the economic growth of Nepal cannot be denied.

Nepal Stock Exchange (NEPSE) has been operating the secondary market under the Securities Act 2006. The objectives of NEPSE are to enlist the publicly issued securities, provide liquidity in overall capital market by encouraging securities trading of listed government and organized companies through brokers, intermediaries and market makers and support overall development of country by increasing securities' transaction and reliable environment in capital market. The formal trading of secondary market in Nepal was started only in 1993 after the establishment of NEPSE. Initially, there were only 2 companies with no issue managers. The trading system was open outcry system. The most significant change in Nepalese secondary market was the establishment of Central Depository System in 2011 which facilitated computerized trading system. Dematerialization of securities aided in full automation of secondary market since 2016. Similarly, NEPSE started online trading of securities from 2018. (SEBON, 2020)

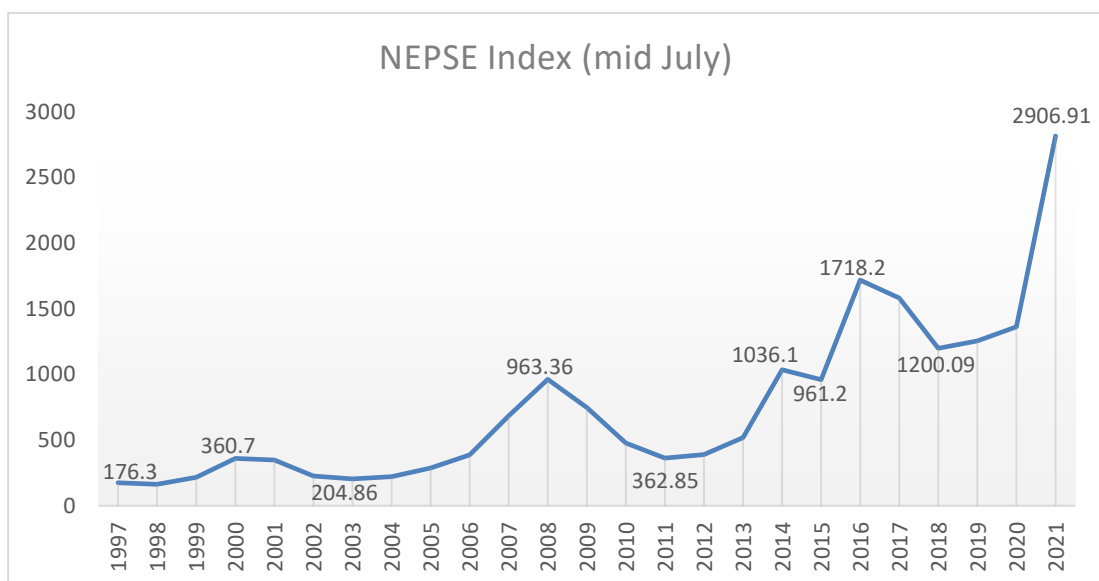


Figure 1. 1 NEPSE Index from 1997 to 2021

(Source: Thapa, 2019 and Nepal Stock Exchange, 2021)

With more than 26 years of operation of NEPSE, there have been significant changes and major turnarounds in the market. The price movement seems to fluctuate unpredictably during these years with varied market conditions. At initial years, the market faced a bear phase from 1997 to 1998 with index of 176.3 and 163.3, respectively. Market moved to 360.7 in 2 years of bull phase till 2000 and again started a 3-years long bear phase dropping the index to 204.86 points in 2003 and

started the bull phase right after. The 5-years long bull phase started in 2004 with 222.04 index points and ended in 2008 with large jump in index point to 963.36. The bear phase of 3 years dropped the index largely to 362.85 points in 2011 with again the 5-years long bull market raising the index to 1718.2 points in 2016. With the start of another bear phase in 2017 with 1582.67 points, it continued for 3 years till 2019 to 1254.56 points. The market started a bull phase in 2020 with 1362.34 points (Thapa, 2019) and the current index point is 2906.91 as on 6<sup>th</sup> June 2021. Since the market has shown significant fluctuations in price and index, it is hard for an investor to make decisions and to anticipate the market movement. As a result, investors become prone to committing specific errors of which some are minor and others fatal (Shefrin, 2002). Investors who are prone to these errors due to biases will take risks that they do not acknowledge, experience outcomes that they do not anticipate, will be prone to unjustified trading, and may end up blaming themselves or others when outcomes are bad (Kahneman & Riepe, 1998). Hence, this paper analyzes the impact of behavioral factors on individual investors' decision making and investment performance within the domain of heuristic and prospect theories.

## **1.2 Statement of the Problem**

Traditional theories like Markowitz portfolio theory (Markowitz, 1952) and the Capital Asset Pricing Model (Sharpe, 1964) are based on the risk-return consideration of the investors. But the level of risk acceptance of the investors depends on their personal characteristics and attitudes to risk (Madininos et.al., 2007). Most traditional financial theories consider investors as rational decision makers. This means that when investors receive information, the investment decision is taken accordingly based on the new information. However, in recent decades, it has been the concept of behavioral finance that exposes the irrationality of investors in general and shows human fallibility in competitive markets (Waruingi, 2011). Furthermore, investors are sometimes irrational, and their decisions might be biased due to the inability to process complex information and the lack of mental abilities (Keswani et al., 2019). Behavioral finance can be helpful in this case because it is based on psychology to explain why people buy or sell stocks and explain feelings and cognitive errors affecting investment decision-making (Waweru et.al., 2008).

However, limited studies have been done on the behavioral aspects of individual investors. Among the limited studies conducted in Nepal, Risal and Khatiwada (2019), Dangol and Manandhar (2020), Baral and Pokhrel (2020) have focused on the behavioral aspects of investor's investment decisions. Many studies have proved the existence of positive effect of heuristics and prospect factors on individual investors' decision making and performance including Luong and Ha (2011), Hamidon and Kehelwalatenna (2020), Keswani et al., (2019), Cao et al., (2021) while other studies have shown no or negative effect including Masomi and Ghayekhloo (2010), Shah et al., (2018), Mahmood et al., (2020). So, the discussion on this topic is still alive.

The stock market trends are determined by the investor's decisions, which then affects the economy (Kengatharan & Kengatharan, 2014). To understand investors decision making that are influenced by behavioral factors, it is necessary to study the psychological and behavioral aspects of investors. So, this paper attempts to examine the influence of heuristic and prospect factors on investment decisions and investment performance of individual investors at NEPSE. The purpose of this research paper can be specified by formulating following research questions:

- At which levels do the heuristic and prospect factors impact the investment decision making of individual investors at NEPSE?
- Do heuristic and prospect factors have any significant impact on the investment performance of individual investors at NEPSE?
- Does the experience in share market moderate the impact of heuristic and prospect factors on investment performance of individual investors?

### **1.3 Research Objectives**

The main objective of this research is to examine the behavioral factors affecting the investment decisions and investment performance of individual investors within the domain of Heuristic and Prospect theories. The specific objectives are:

- i. To measure the impact of heuristic and prospect factors on individual investors decision making.
- ii. To analyze the impact of heuristic and prospect factors on investment performance of individual investors.



- iii. To identify the moderation effect of experience in share market between heuristic and prospect factors and investment performance of individual investors.

#### **1.4 Research Hypothesis**

The following hypotheses are composed to explore the behavioral factors which influence the investor's decision making and their investment performance.

**H<sub>1</sub>:** The heuristic and prospect factors have high impact on investment decision making of individual investors.

H<sub>1</sub>(a): The heuristic factors have high impact on individual investment decision making of individual investors.

H<sub>1</sub>(b): The prospect factors have high impact on investment decision making of individual investors.

Masomi and Ghayekhlo (2010) found that heuristic processes and prospect theory were evident, with heuristics strongly dominating prospect theory in explaining the behavior of institutional investors. Likewise, Lad and Tailor (2018) also showed that behavioral factors including heuristic and prospect factors influence investment decisions of the investors.

**H<sub>2</sub>:** The heuristic and prospect factors have positive impact on investment performance of individual investors.

H<sub>2</sub>(a): The heuristic factors have positive impact on investment performance of individual investors.

H<sub>2</sub>(b): The prospect factors have positive impact on investment performance of individual investors.

Luong and Ha (2011) in their study found that heuristic and prospect factors influence the investment performance of the investors. Further, the study conducted by Keswani et al., (2019) also showed that behavioral factors including heuristic and prospect factors greatly influence investment performance of the investors.

**H<sub>3</sub>:** Experience in share market moderates the impact of heuristic and prospect factors on investment performance of individual investors.

H<sub>3</sub>(a): Experience in share market moderates the impact of heuristic factors on investment performance of individual investors.

H<sub>3</sub>(b): Experience in share market moderates the impact of prospect factors on investment performance of individual investors.

Baker et al., (2018) found that investment experience among other variables is the most important demographic variable that relates to the behavioral biases of individual investors.

### 1.5 Definition of Terms

Table 1. 1

*Definition of Terms*

<b>Theory</b>	<b>Behavior</b>	<b>Definition</b>
<b>Heuristic</b>	Overconfidence	Overconfidence is an individual's own perception of being better and having greater predictive skills while making the investment decisions. Excessive trading and informational disadvantage are two effects of investor overconfidence (Evans, 2006).
	Representativeness	It refers to the degree to which an event resembles its population (Kahneman & Tversky, 1974). For example, share prices often rise when a company reports increased earnings several quarters in a row, because investors tend to infer a high long-term earnings growth rate (Barberis, 2001).
	Anchoring	Anchoring is a cognitive bias where an individual depends too heavily on recent observations (anchor) to make subsequent judgments (Shiller, 2000).
	Availability	Availability bias happens when people make use of easily available information excessively (Luong &

Ha, 2011).

<b>Prospect</b>	Loss Aversion	Loss aversion recognizes that the mental penalty associated with a loss is greater than the mental reward from a similar size gain (Shiller, 2000).
	Mental Accounting	Mental accounting is the tendency to treat each element of the investment portfolio separately, which can lead to inefficiency, and inconsistency in making investment decisions (Shiller, 2000).
	Regret Aversion	Regret is an emotion that occurs after people make mistakes. It is the act of avoiding regret by refusing to sell decreasing shares and willing to sell increasing ones (Luong & Ha, 2011).

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### **1.6 Significance of the Study**

This study is focused on the behavioral aspects that may have effect on investment decision making and investment performance of individual investors at NEPSE. This study not just allows investors to learn about the investment pattern of overall investors but also provides biases and mistakes that are made while investing and suggests ideas about how to re-analyze the investment behavior.

This study would enable individual investors to understand which behavioral factors interrupt their decision making and investment performance. If there are any biases that are affecting the investment performance, they can make better investment decisions by learning and overcoming these biases to gain profit from the market. Moreover, institutional investors and security organizations can also use this study to better understand the investors' behavior or sentiment and make accurate forecasts and provide better recommendations to their clients. The portfolio managers can also use this study to analyze the biases that their clients have, to know the risk-return pattern which can be further used for portfolio management and maximization of clients' profit. Furthermore, this study will assist stock market regulators and policymakers to develop programs through policy formulation and regulation that will rectify any distortions that investors face in the stock market. This will help to reduce the reflection of biases and extreme behavioral patterns in the market which can stabilize the stock market making it easier to regulate.

Hence, this study can be helpful for individuals as well as to overall stock market which implies that it has usage from micro to macro level. This study not only adds justification for/against the theories that are build up but can also be used for practical purpose which reduces the chance of crash on stock market based on investor sentiments regarding the hot stocks in the market while also assisting investors to overcome the biases.

### **1.7 Scope and Limitations of the Study**

Due to time constraints, this study concentrates only on the two dimensions of behavioral factors (heuristic and prospect factors) of individual investors of Nepal Stock Exchange. This study also has some limitations mentioned below.

- i. Although the sample size is relatively high (N=430), a larger sample size would reflect the investor's situations more accurately.
- ii. Since the respondents are chosen from close circles including family members, friends, relatives and their circles, generalization for the whole population of investors may not be fulfilled.

The measurement of investment performance is based on the perceptions of the investors. It is assessed by the subjective awareness of the investors. However, some investors may not know their own expected return or the average return of the stock market.

### **1.8 Structure of the Body**

The present study comprises three main sections with five chapters.

- Preliminary section
- Body of the report
- Supplementary section

The preliminary section consists of title page, certification and declaration of authenticity, acknowledgement, table of contents, list of tables, list of figures, abbreviations, and executive summary. Similarly, the body of the report consists of another five sections: introduction, literature review and theoretical framework,

research methodology, data analysis and results, and discussions, conclusions, and the implications. The final section of the report contains references and appendix.

The first chapter encompasses the introduction of the study that explains the theoretical background of stock market and behavioral finance. It further includes the statements of research problems, purpose of the study, research objectives, significance of the study, scope and limitations of the study, and the structure of this GRP. Similarly, the second chapter comprises literature review and theoretical framework. Literature review consists of review of empirical studies, research articles and thesis or dissertation and depicts the irrational investors and their behavioral biases. It helps to figure out findings of previous research and relate to the current study. A theoretical framework is for identifying the dependent and independent variables based on previous literatures. In the same way, the third chapter is the research methodology that explains the tools and techniques used in the study. This chapter deals with research approach, research strategy, research design, and population and sample. This chapter also describes about the data collection method, design of measurements and questionnaire, data process and analysis, and ethical considerations. The fourth chapter describes analysis and results of the study. It represents analysis of quantitative data using statistical tools that define the various tables, figures intended to answer the objectives and research questions of the research. Finally, the last chapter deals with discussion, conclusion, and implications of the study.

## CHAPTER II

### LITERATURE REVIEW AND THEORITICAL FRAMEWORK

This chapter will review studies done by various scholars and address theories of behavioral finance. Firstly, some backgrounds of behavioral finance are presented with a comparison between traditional finance and behavioral finance. Secondly, the important theories of behavioral finance (heuristics and prospect) are included to have an overall picture of behavior finance and its impacts on investment decisions and investment performance. Finally, the research framework for the study is shown based on the past literatures discussed in the following sections.

#### 2.1 Traditional vs Modern Finance

The beginning of the classical economics was in the middle of the 18th century (Koseoglu, 2019). Mill (1836) presented the notion of “rational economic man”, whose aim is to maximize his utility by considering the constraints he faced. According to maximizing utility aims, the traditional finance theories have four foundation blocks:

- i. Perfectly rational investors
- ii. Efficient markets (Fama, 1970),
- iii. Constructing portfolios depending on the rules of traditional Mean Variance model (Markowitz, 1952),
- iv. Risk-return trade off (Sharpe, 1964).

Thus, traditional finance theories assume that investors think and behave rationally when buying and selling the stocks. Consequently, stock prices accurately reflect the stock’s fundamental values. Andrikopoulos (2005) stated, “Traditional finance theory refers to a greatly simplified model of human behavior where an individual is characterized by perfect self-interest, perfect rationality, and free access to perfect information regarding a specific condition. The key rationale for the development of this assumption lies in the complex nature and unpredictability of human behavior and its inability to be used effectively as a means for accurately predicting and explaining human behavior itself.”

Behavioral finance is based on a notion that investors are subject to behavioral biases which means that their financial decisions can be less than fully rational (Byrne & Brooks, 2008). Stock markets overreact to information (DeBondt & Thaler, 1985). Moreover, Shefrin and Statman (1985) state that stockholders tend to be more willing to sell their winning stocks rather than losing ones even when putting these losers on sale is the best choice. Barberis and Thaler (2003) noted that the basic facts about the aggregate stock market, the cross-section of average returns, and individual trading behavior are not easily understood in traditional finance. Further, Shefrin (2002) pointed out that behavioral finance is important for investors to recognize own as well as others' mistakes, understand those mistakes, and take steps to avoid making them.

## **2.2 Behavioral factors, investment decision making, and investment performance**

According to Waweru et al., (2008), behavioral finance theories are based on cognitive psychology, which suggests that human decision processes are subject to several cognitive illusions. These cognitive illusions can be grouped into two classifications: illusions due to heuristic decision processes and illusions caused by the adoption of mental frames, which are conveniently grouped in the prospect theory (Waweru et al., 2008). These two forms of theories are discussed in this study.

### **2.2.1 Heuristic Theory**

Heuristics are rules of thumb, which people use to make decisions in complex, uncertain environments. These heuristics help in decision making process when time is limited (Waweru et al., 2008) and information is limited (Kahneman & Tversky, 1974). Therefore, sometimes people choose an irrational, easier, simpler, and more effective way of making decisions (Tin & Hii, 2020), due to which they may lead to biases (Ritter, 2003). Some of these biases include overconfidence, anchoring, representativeness, and availability.

#### **Overconfidence**

Overconfidence bias occurs when people overestimate the reliability of their knowledge and skills (DeBondt & Thaler, 1995). According to Daniel and Titman (2000), overconfidence is one of the most documented biases in the behavioural finance literature. Overconfident investors and financial analysts seem to

underestimate the importance of revising the previous assessment of any company and its future performance, even when there is strong evidence that their existing assessment is incorrect (Evans, 2006). As a result, there are two main implications of investor overconfidence. First, investors take bad bets because they fail to realize that they are at an informational disadvantage. Second, they trade more frequently than is recommended, leading to excessive trading volume. Overconfidence increases expected trading volume, triggering an increase in the market depth and a decrease in the expected utility of overconfident traders (Shefrin, 2000).

### **Representativeness**

Representativeness heuristics refers to the rule of thumb, through which individuals assign probability to more representative and similar groups of events (Tversky & Kahneman, 1974). So, investors normally buy hot securities and avoid buying the securities which were performing poorly in recent years (Waweru et al., 2008). This behavior explains why investors are overreacting in the market (DeBondt & Thaler, 1995). Therefore, investors take advantage of the trend analysis of some representative security to make investment decisions and cause the investment performance to increase (Tin & Hii, 2020).

### **Anchoring**

Anchoring is strong tendency to cling to a belief that may or may not be truthful and use it as a reference point for future upcoming decisions (Ricciardi & Simon, 2001). According to Waweru et al., 2008, “People typically overweigh recent experience and extrapolate recent trends contrary to long-run averages and statistical odds. They tend to become more optimistic when the market rises and more pessimistic when the market falls.” Shiller (2000) found that at the peak of the Japanese market, 14% of investors expected a crash, but after it did crash, 32% expected a crash.

### **Availability**

Availability bias is the tendency on which people rely on easily available information in order to make decision (Tversky & Kahneman, 1974). For this reason, investors give more weight on easily available information (Pompain, 2011). However, the reliance on the availability heuristic will lead to systematic biases as Qawi (2010)



explains that the more current and significant an event is, the higher the likelihood of it influencing decision making. Therefore, an individual investor may choose an investment based on advertising rather than on a thorough analysis of the options.

### **2.2.2 Prospect Theory**

Prospect theory focuses on subjective decision-making and is heavily influenced by the investor's value system (Filbeck et al., 2005). Prospect theory provides a framework that explains how behavioral aspects influence risk tolerance in investment decisions. It describes several states of mind which includes loss aversion, regret aversion, and mental accounting (Waweru et al., 2008).

#### **Loss Aversion**

Loss aversion recognizes that the grief from an equal size loss is always heavier than the happiness from similar size of gain. Shiller, (2000) stated that mental penalty associated with a loss is greater than the mental reward from a similar size gain. 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). If individual investors are loss averse, they may be unwilling to realize losses and may even take increasing risks to avoid a losing outcome (Nada, 2013). This provides a viable explanation for 'averaging down' investment tactics, whereby investors increase their exposure to a falling stock, to recoup prior losses, also known as escalation bias (Shefrin, 2000).

#### **Regret Aversion**

Regret aversion shows up when investors have the desire to avoid experiencing the pain of regret resulting from a poor decision. In this, investors feel more responsible and regret for the decision they have made which increases the pain of financial loss (Nada, 2013). 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 (Fogel & Berry, 2006). "Regret has been found by psychologists to be one of the strongest motivations to make a change in something. To avoid the pain of regret, one may alter one's behavior in ways that are sometimes irrational" (Karanja, 2017).

## **Mental Accounting**

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). For instance, “Some investors distribute their financial investments between a safe investment portfolio and a risky portfolio to prevent the negative outcomes that risky investments may have from affecting the entire portfolio. The problem with such a practice is that despite all the work and money that the investor spends to separate the portfolio, his net wealth will be no different than if he had held one larger portfolio. This can lead to inefficient decision-making” (Nada, 2013).

### **2.3 Review of related Studies**

This part includes the results of the studies done by various scholars on behavioral factors and its influence on investment decisions and investment performance.

Chen et al., (2004) studied the investing behavior and trading performance of Chinese investors using the brokerage data from China. The results showed that Chinese investors make trading mistakes (i.e., the stocks they sell outperform the stocks that they buy), they are reluctant to realize their losses (i.e., they suffer from a disposition effect), they tend to be “overconfident” (e.g., they seem to be under-diversified, and they seem to trade often), and they exhibit a representativeness bias (buying recent short-term winners). Further, they also conducted a cross-sectional test on investors behavior by identifying middle-aged investors, active investors, wealthier investors, experienced investors, and those from cosmopolitan cities, to see if they are less inclined toward making cognitive errors. However, investors were found, often unable to overcome behavioral biases and more inclined to making errors.

Maditinos et al., (2007) found that investment practices employed by individual investors are based upon non-financial factors such as instinct/experience, newspapers/media, and noise in the market, which led them to experience significant capital losses. In the study conducted by Waweru et al., (2008), institutional investors were found to have relied on fundamental analysis as the most widely used decision making model at the Nairobi Securities Exchange. However, heuristic processes and

prospect theory were found evident with heuristics strongly dominating prospect theory in explaining the behavior of institutional investors operating at the Nairobi Securities Exchange. Further, market information and the fundamentals of the underlying stock were found to have the highest impact on the investment decision making of institutional investors.

Masomi and Ghayekhloo (2010) examined the effects of behavioral factors in investment decision making of institutional investors at Tehran Stock Exchange. Their study found that majority of the respondents could be explained by the heuristic (over 76%) and prospect (47%) theory. Overconfidence behavior was shown by 69% of the respondents and anchoring also featured prominently, more in the case of purchasing price (80%), but also in relation to the recent experience (78%). However, none of the respondents showed loss aversion behavior.

Luong and Ha (2011) explored the behavioral factors influencing individual investors' decision-making and performance at Ho Chi Minh stock exchange. The study revealed the heuristic factors (overconfidence, anchoring, representativeness, availability, and gambler's fallacy) have moderate impacts on decision making, availability being the highest. Further, the study also found that only herding, prospect and overconfidence have influence on investment performance. Similarly, Ngoc (2014) conducted a study to investigate behavioral factors influencing the decisions of individual investors at the Securities Companies in Ho Chi Minh City, Vietnam. The results showed that both heuristic and prospect factors have high impact on decision making of individual investors.

Kadariya (2012) found that both the tangible and intangible information are essential to succeed in Nepalese capital market. The results identified the five most important factors for investment decisions: dividends, earnings, number of equity, and book to market ratio among the tangible components and political party led government (intangible component) as the most influencing factors for investment decisions. Furthermore, the results also found that the capital structure and average pricing method is one factor that influence the investment decisions, followed by political and media coverage, belief on luck and the financial education, and finally the stock market movement is trend analysis.

Kengatharan and Kengatharan (2014) conducted a study focusing on exploring the behavioral factors influencing individual investors' decisions at the Colombo Stock Exchange. Descriptive statistics showed that the Overconfidence and loss aversion have moderate impact on investment decisions while Anchoring has significantly high impact on investment decisions of the individual investors. Furthermore, the result showed that within heuristic factors overconfidence has negative and anchoring has positive influence while prospect factors showed no positive influence on investment performance. Similarly, the study of Aziz and Khan (2016) also showed positive relation of heuristics on the investment performance while prospect has no effect on the investment performance.

Bakar and Yi (2016) investigated the impact of behavioral factors, namely overconfidence, conservatism, herding and availability biases on investor's decision making in Malaysian Stock Market. Their study found that overconfidence and availability bias have significant positive impact, conservatism has negative significant impact and herding has no significant impact on investor's decision making. Likewise, Alquaraan et al., (2016) explored the influence of the behavioral finance factors on stock investment decisions of individual investors in Saudi Stock Market, emerging markets in the Middle East. Their study found that overconfidence, loss aversion and herding have positive significant impact on investors decision while risk perception has negative impact on investors decision.

Anum and Ameer (2017) in their study found positive correlation of heuristics with investment performance and negative correlation of prospects with investment performance in Pakistan stock market. Further, Mahmood et al., (2016) also found that Heuristics and Herding are positively related to investment performance, but Prospect is negatively related. Likewise, Rajeshwaran (2020) in his study found that heuristic variables are positively related with investment performance while other variables namely prospect variables, market variables and herding variables are negatively related with investment performance.

Ibrahim and Umar (2017) took 160 samples from 225 staffs of active stock brokerage firms in Abuja to investigate the effects of behavioral factors on investment performance of Nigerian capital market. The research indicates the positive significant relationship of heuristics, prospects, herding and rationality factors with

investment performance. Further, Cao et al., (2021) in their study of individual investors from Vietnam stock market (Ho Chi Minh Stock Exchange and Hanoi Stock Exchange) found the similar result. The result showed that heuristics, prospects, market and herding all have positive influence on investment decision making and investment performance of individual investors.

Pahlevi and Oktaviani (2018) investigated determinants of individual investor behavior in stock investment decisions concerning modern investment theory, and results revealed that overconfidence has a significant positive impact on the attitude of investors. Baker et al., (2018) examined how financial literacy and demographic variables (gender, age, income level, education, occupation, marital status and investment experience) relate to behavioral biases. The results showed that financial literacy has a negative association with the disposition effect and herding bias, a positive relation with mental accounting bias, but no significant relation with overconfidence and emotional biases. Age, occupation, and investment experience are the most important demographic variables that relate to the behavioral biases of individual investors in the sample. The results also showed that overconfidence, anchoring, and representativeness biases are associated with more experienced investors. However, Metawa et al., (2018) in their study found that experience does not play a significant role in investment decisions, but as investors gain experience, they tend to overlook the emotional factors.

Gill et al. (2018) investigated the factors affecting investment decision making behavior through the mediating role of information searches. The study results showed positive and significant relationship between economic expectations and investment decision making behavior. But when information search was included as mediator, the relationship became insignificant and negative. Likewise, Hamidon and Kehelwalatenna (2020) examined the moderating influence of stockbroker's recommendation (SBR) and investor's existing knowledge of share market (EK) on heuristic and market factors. The study was based on the samples of 221 respondents collected from Colombo Stock Exchange. The result showed that the prospects have the highest impact on investment performance while the heuristics have the least impact. Further, the study indicates that the moderating impact of both SBR and EK is weak and negative on heuristic and market factors.

Rana (2019) explored the factors associated with investment decisions of individual investors and found that earnings and image factors, corporate governance and positioning factors, goodwill and market share factors, industry competition and size factors, fundamental market factors, and decision-making factors as the common factors affecting stock investment decision of the individual investors in Nepal. Furthermore, the results also showed that among the six factors, fundamental market factors have high relative importance as perceived by the investors. Similarly, Shrestha (2020) found that investors make investment decisions by observing the company related variables which include company's management, recent financial performance of the company, companies with large shares, and growth and size of the company. Risal and Khatiwada (2019) examined the attitudinal factors influencing herding behavior in Nepalese capital market. The results revealed the significant relationship of hasty decision on herd behavior but the relationship of decision accuracy on herd behavior was insignificant. Moreover, the relationship was not significantly moderated by the presence of age or investment experience.

Kumar and Nayak (2019) in their study of behavioral factors affecting investment decisions found that heuristic factors except overconfidence bias showed high degree of impact on investment decision making. Javed and Marghoob (2017) found that 95% of the variation in investors decision making is influenced by the behavioral factors. Their study of investors investment behavior showed that market factor and prospect theory are responsible in explaining the behavior of institutional investors at Pakistan Stock Exchange.

Keswani et al., (2019) in their study at National Stock Exchange of India found that behavioral factors namely heuristics, prospects, market and herding positively influence the investment decisions of individual investors. The study was based on the cross-sectional design that consisted of 361 respondents. The data analysis showed that the investment decisions as mediator positively influence the investment performance of individual investors. Further, Koech (2021) investigated the mediating effect of investment decision between availability heuristics and financial performance of SMEs. The regression results showed that availability heuristics positively and significantly predicts the financial performance of SMEs, and this relationship is partially mediated by Investment decisions.

Dangol and Manandhar (2020) in their study found that all the heuristic biases have significant impact on investment decisions with overconfidence bias having the highest impact followed by anchoring bias. The study also indicated the significant moderation impact of locus of control between anchoring and adjustment bias while no moderation effect was observed between representativeness and availability bias with investment decision. Further, Baral and Pokharel (2020) examined the investor's behavior and their impact on investment performance. The result showed that only market factors have significant impact on investment performance and heuristic, prospect and herding factors have no significant relationship with investment performance.

Ullah (2019) investigated the existence of behavioral biases i.e., disposition effect, herding and overconfidence in investment decision of investors and its subsequent impact on the trade returns of individual investors with moderating role of financial literacy. The results revealed that investors incorporate the disposition effect, herding and overconfidence in their investment decision which have strong impact on the investment returns of investors. Further, financial literacy plays a strong moderating role among disposition effect, herding, overconfidence, and trade returns of the investors.

Tin and Hii (2020) examined the relationship between heuristics behavior and investment performance on Debt Securities in Johor. The findings show that availability and representativeness have significant relationship with the investment performance of debt securities while the anchoring and overconfidence have no significant relationship with the investment performance of debt securities. Shikuku (2012) in his study found that although anchoring has positive relationship, the herd behavior and overconfidence have negative relationship with the investment performance of managers at Unit Trust Companies in Kenya. Similarly, Weerawansa and Morage (2018) revealed that heuristics have a strong negative relation with investment decision making.

Pratheepan and Rathirane (2020), conducted a study to investigate the role of heuristic behavior on the investment performance of individual investors at Colombo Stock Exchange (CSE). The result shows that, overall Heuristic factors have a positive significant influence on investment performance. Likewise, for individual

factors wise analysis, Representativeness and Anchoring variables have significant influence, whereas other factors namely Availability bias, Gambler's fallacy and Overconfidence, do not have a significant influence on investment performance.

Gnawali (2021) examined the factors that affect the individual investor's decision-making behavior in NEPSE. The results showed that for beginner investors psychological factors, social interaction, regulatory policies, and firm's image have significant effect decision making behavior while for experienced investors, only social interaction has significant effect on investors decision making behavior. Further, the regression analysis found that only social interaction and regulatory policies have significant effect on investors decision making behavior for overall investors.

Mahmood et al., (2020) took 268 respondents from individual investors through brokerage firms and examined the impact of behavioral factors on investors' decisions and investment performance by taking financial literacy as moderating variable between behavioral factors and investment decision making. The findings of the study reveal that prospect and herding have positive impact on investment performance whereas heuristic and market variables have negative impact on investment performance. The results also indicate that financial literacy enhanced the relationship between behavioral factors (heuristic, prospect, market) and investment decision making and lessened the relationship with herding variable and investment decision making. However, Quddos et al., (2020) in their study found that investors performance not affected by herding and loss aversion behavior. Further, the presence of financial literacy does not play any role in improving the performance of investors. Shah et al., (2018) in their study found that heuristic biases (overconfidence, representativeness, availability, and anchoring) have a negative impact on investment decisions made by individual investors actively trading on the Pakistan Stock Exchange and on perceived market efficiency.

Dhungana (2018) conducted a study on behavioral factors influencing individual investors' investment decisions and performance. The study found association between age and duration of investment, gender and duration of investment and marital status and duration of investment. The independent sample t test showed that there is no significant impact of gender on study variables. Similarly, the one-way



ANOVA between age and study variables showed that gender does not have significant impact on study variables except investment performance. Likewise, the one-way ANOVA between age and study variables showed that marital status and education do not have significant impact on study variables except herding.

There is a significant relation between the investors' financial decision behavior and their behavioral biases (Chandrasiri et al., 2021). In their study, they examined the impact of psychological biases in financial investment behavior at the Colombo Stock Exchange with evidence from selected Sri Lankan investors. The results show that four behavioral biases, namely, heuristic, herding, prospect, and market variables, significantly impact the investors' financial behavior. Moreover, the herding, prospect, and market variables have a moderate impact whereas the heuristic has a high impact. Similarly, Gamage et al., (2021), investigated the impact of behavioral factors on individual investment decisions of equity investors in the Colombo Stock Exchange (CSE). The results revealed a significant impact of availability heuristic and herding effect, whereas insignificant impact of representativeness and overconfidence on individual investment decisions. The findings further showed that there is no significant impact of demographic factors on individual investment decisions at CSE in the Kurunegala area.

Kunwar (2021) attempted to understand various factors affecting the investor behavior and their association with the investment performance in the Nepalese stock market. The results revealed that behavioral biases like heuristics, prospects, market factor and herding effect are present among individual investors in Nepal. Among the factors, the investment performance of investors is mostly influenced by heuristics and market factors. The heuristic behaviors are found to have the highest and positive influence on the investment performance. Further, the results also showed that following the herd behavior in the market and prospects do not result in the improved investor performance.

## **2.4 Theoretical Framework**

This study sought to examine the impacts of heuristic and prospect factors on investment performance of the individual investors. The investment performance is the dependent variable whose result depends upon the heuristic and prospect factors

(independent variables) and the experience in share market (moderating variable). The theoretical framework of this study is adapted from the study of Luong and Ha (2011). The experience as moderating variable has been taken by considering studies of Metawa et al., (2018) and Baker et al., (2013) among other studies. The researchers on their study have discussed the impact of behavioral factors on the investment decision making and investment performance. Further, they have measured the impact of behavioral factors on investment decisions by synthesizing the respondents' evaluations of influence degrees and examined the impact of behavioral factors on investment performance by using SEM (Structural Equation Modeling). In this research, changes have been made in the theoretical framework in accordance with the research objectives.

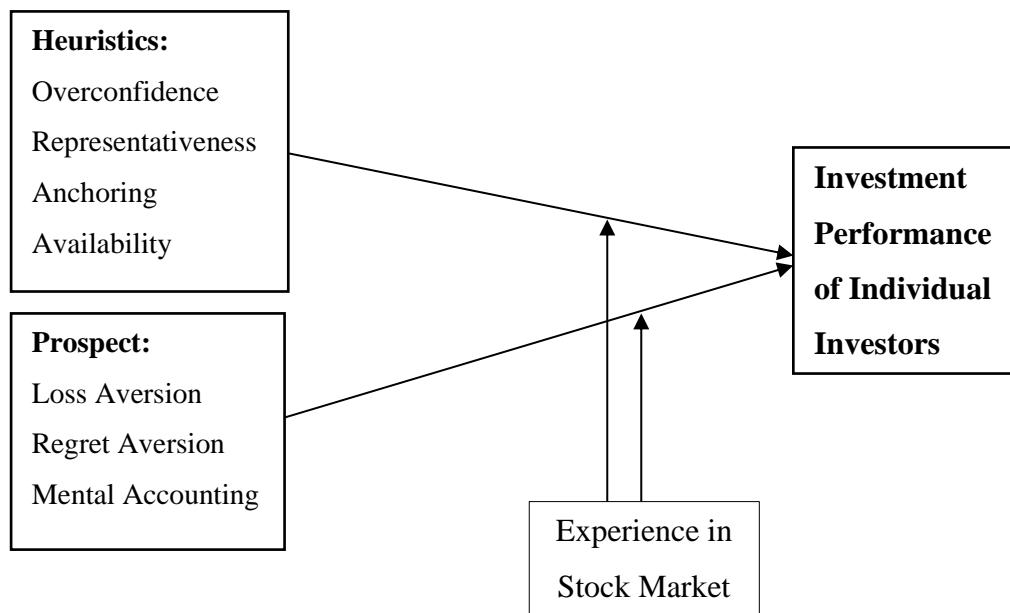


Figure 2. 1 Theoretical Framework (Source: Luong & Ha, 2011)

## **CHAPTER III**

### **RESEARCH METHODS**

This chapter presents the research approach that was used to examine the impact of heuristic and prospect factors on investment performance of individual investors at Nepal Stock Exchange (NEPSE). It sets out the method of selecting the respondents, collecting the data, and analyzing the data. This chapter is structured into research approach, research strategy, research design, and population and sample. The chapter also presents about the data collection method, design of measurements and questionnaire, data process and analysis, pilot study and ethical considerations.

#### **3.1 Research Approach**

In general, theory is built and tested on two different approaches: induction and deduction. When inductive approach is used, no assumptions or hypotheses will apply, and the researcher is free to change the course of analysis after research process has started (Dudovskiy, 2018). An inductive approach moves from specific observations to more general theories (Burney, 2008). In contrast, when deductive approach is used, the researcher explores a proven hypothesis or theory and checks whether it is true under particular circumstances (Snieder & Larner, 2009). Thus, deductive reasoning can be described as a justification from the general to the particular (Pellissier, 2008).

In this study, examining the heuristics and prospect factors influencing the decision making and investment performance of the individual investors that are already out there, is the main objective of the study, instead of building a theory. Therefore, the deductive approach of research was used in this study.

#### **3.2 Research Strategy**

Research strategy can be understood as the orientation for conducting the research practically (Luong & Ha, 2011). A researcher can employ qualitative or quantitative or mixed approach of research strategy.

This study is conducted based on quantitative research strategy. As quantitative research often entails with deductive approach (Collis & Hussey, 2009; Bryman & Bell, 2007), which is consistent with the research approach chosen for this study. Furthermore, the main objective is examining the factors that affect investment decisions and investment performance of investors which may be done effectively by employing quantitative research since quantitative research is designed for identification and description of variables in order to establish the relationship between them (Garner et al., 2009).

### **3.3 Research Design**

Research design provides the framework for data collection and analysis (Bryman & Bell, 2007). To understand the common behaviors of individual investors, survey research design was used for this study. Mugenda and Mugenda (1999) notes that survey research attempts to collect data from members of a population and describe existing phenomena by asking individuals about their opinion, attitudes, behavior or values. Moreover, survey research is used to study the general condition of people and organizations as it investigates the behavior and population of this opinion of people (Blumberg et al., 2003). Kothari (2004) states that descriptive research is concerned with making certain predictions and narrating facts and characteristics regarding individuals, group or situations, and most of the social research comes under this category. For this study, descriptive research design is used with casual comparative method. Descriptive research design explains the behavioral factors that affect the investment decision making and performance along with casual comparative design to test the degree of impact of those variables on investment performance while experience in share market is tested as moderating variable.

### **3.4 Population and Sample**

The study covers all the investors of Nepal Stock Exchange (NEPSE). It consists of all the individual investors who have invested in different investment options at NEPSE. Since the population size is unknown, the sample size is based on sample required to estimate a proportion with an approximate 95% confidence level that generates sample size of 384 (Godden, 2004). According to Godden (2004),

$$n = Z^2 * p * (1-p) / M^2$$

Where,

n = sample size for infinite population

Z = Z value (e.g., 1.96 for 95% confidence level)

p = Population proportion (expressed as decimal) (assumed to be 0.5)

M = Margin of error at 5%

Further, the convenient sampling technique has been used in the study to get responses easily from individual investors through family members, friends, relatives, and their circles. Furthermore, convenient sampling is usually favored by students, since it is inexpensive and easy to use compared to other sample techniques (Ackoff, 1953).

### **3.5 Data Collection Method**

Among various kinds of data collection methods such as structured interviews, semi structured interviews, unstructured interviews, self-completion questionnaire, observation, group discussion, etc., self-completion method is chosen for collecting quantitative data for this study.

Self-completion questionnaire seems to be one of the most common methods of quantitative research (Luong & Ha, 2011). With a self-completion questionnaire, respondents answer questions by completing the questionnaire themselves. This method is chosen for some reasons. The first reason is that as the research questions are defined clearly, questionnaire is the best choice to have standardized data, which is easily to process, and analyze. Especially, as no interviewers present when the questionnaires are completed, the results may not be affected by the interviewers (Bryman & Bell, 2007). Moreover, it is cheaper than other methods and helps to save time (Bryman & Bell, 2007), so hundreds of questionnaires can be sent out in one batch. As the respondents are investors, they may not have much time for interviews,

thus, questionnaires may make them feel more comfortable because they can do it whenever they have free time.

### **3.6 Design of Measurements and Questionnaire**

The questionnaire is divided into three parts: personal information, behavioral factors influencing investment decisions, and investment performance. In the first part, for personal information, nominal and ordinal measurements are used.

This research is based on the theories of behavioral finance mentioned by Luong and Ha (2011), Nada (2013) and many other authors cited in the literature review, to synthesize a set of questions related to behavioral factors influencing investment decisions and investment performance. In these parts, the 5-point Likert scales, which are rating scales widely used for asking respondents' opinions and attitudes, are utilized to ask the individual investors to evaluate the degrees of their agreement with the impacts of behavioral factors on their investment decision as well as with the statements of investment performance. The 5 points in the scale are respectively from 1 to 5: strongly disagree, disagree, neutral, agree, and strongly agree.

### **3.7 Data Process and Analysis**

The collected data are processed and analyzed by using both SPSS and SmartPLS software. The normality test for the study showed that data were not distributed normally since the p-value of both Kolmogorov-Smirnov and Shapiro-Wilk were less than 0.05 (Mishra et al., 2019). According to Ringle et al., (2012), SmartPLS requires no distributional assumptions whereas other SEM assumes a normal distribution of data. Further, Jannoo et al. (2014) found that CB-SEM was not able to calculate paths when non-normality was present, whereas it was possible when using PLS-SEM. Since the data were not distributed normally (Appendix 2), use of SmartPLS was more feasible for this study. The growing use of SmartPLS has demonstrated its robustness and the applicability of the model in the areas that are being studied (Ringle et al., 2015). Hence, structural equation model through SmartPLS has been used in this study.

The statistical techniques, which are used for the data to achieve the research objectives, include Descriptive Statistics using SPSS and assessment of path models

(Measurement Model and Structural Model) using PLS-SEM. Regression analysis has been applied in this study in order to know the degree of impact of behavioral factors on the investment performance (Fornell, 1994, Luong & Ha, 2011, Cao et. al, 2021). As many literatures have supported the use of SEM to test the impact of behavioral factors on investment performance, this study intends to use the verified approach for analyzing the results.

### **3.7.1 Descriptive Statistics**

Descriptive Statistics (mode, median, mean, variance, standard deviation) are used to describe respondents' personal information. Descriptive statistics are also used to describe the influence level of heuristic and prospect factors on the investment decisions of investors and to calculate the investment performance scores. However, only items that remain after the evaluation of factor loadings are put into the consideration of the description. These descriptions help to test the hypothesis H<sub>1</sub> which is mentioned in the Chapter I.

### **3.7.2 Assessment of Path Model**

A path model is a diagram that displays the hypotheses and variable relationships to be estimated in SEM analysis (Bollen, 2002). Constructs (latent variables) are elements in statistical models that represent conceptual variables that researchers define in their theoretical models. Constructs are visualized as circles or ovals in path models, linked via single-headed arrows that represent predictive relationships.

According to Sarstedt et al., (2017), A path model consists of two elements: the structural model and the measurement model. The measurement model assesses the quality criteria of the constructs of the model. The assessment of the quality criteria starts with the evaluation of factor loadings which is followed by establishing the construct reliability and construct validity (Sarstedt et al., 2017). The structural model reflects the paths hypothesized in the research framework. According to Sarstedt et al., (2017), a structural model is assessed based on the collinearity, significance of paths (hypothesis testing), predictive capability of the model ( $R^2$ ), effect size ( $f^2$ ) and predictive relevance of the model ( $Q^2$ ,  $q^2$ ). The table 3.1 shows a general set of criteria for an accepted PLS-SEM.

Table 3. 1

*Criteria for an accepted PLS-SEM*

<b>Indexes</b>	<b>Symbol</b>	<b>General rule for acceptable fit</b>	<b>Source</b>
Factor Loadings		> 0.70	Sarstedt et al., 2017
Multi Collinearity	Outer VIF	< 5	Sarstedt et al., 2017
Composite Reliability		0.60 to 0.70	Hair et al., 2017b
Cronbach's alpha		> 0.60	Hair et al., 2014
Convergent Validity	AVE	$\geq 0.50$	Sarstedt et al., 2017
Discriminant Validity	HTMT	$0.90 \leq$	Henseler et al., 2015
	F&L	Square root of AVE > correlation of all other constructs	Fornell and Larcker (1981)
	Cross-loadings	Loading of each indicator > all of its cross-loadings	Chin (1998b)
Collinearity	Inner VIF	< 5	Sarstedt et al., 2017
Predictive Capability	R <sup>2</sup>	0.75, 0.50, and 0.20 (substantial, moderate, weak) 0.10 (satisfactory for stock returns)	Henseler et al. 2009; Hair et al. 2011 Raithel et al. 2012
Effect size	f <sup>2</sup>	0.02, 0.15, and 0.35 (small, medium, large effects)	Cohen 1988
Predictive Relevance	Q <sup>2</sup>	> 0	Sarstedt et al., 2017
	q <sup>2</sup>	0.02, 0.15, and 0.35 (small, medium, large predictive relevance)	Sarstedt et al., 2017



### 3.8 Pilot Survey

According to Ismail et al. (2018) “Pilot Study is a small-scale research project conducted before the final full-scale study. It helps researchers to test in reality how likely the research process is to work, in order to help them decide how best to conduct the final research study. In piloting a study, a researcher can identify or refine a research question, discover what methods are best for pursuing it, and estimate how much time and what resources will be necessary to complete the larger final version of the study.”

Pilot test was carried out for this study to examine the effectiveness of the statements of the construct. According to Connelly (2008), a pilot study sample should be 10% of the sample size planned for the final study. So, before the final questionnaire was distributed, a pilot test was carried out on 40 respondents to measure the reliability of the questionnaire. Cronbach’s Alpha (Cronbach, 1951) was used to check reliability of the context. The Cronbach’s alpha of all the variables except Overconfidence and Availability were found to be above 0.60. The items from each of the variables were deleted to make them more reliable. The detail of this test is shown in Appendix 1. The table 3.2 shows changes in questions after the pilot study.

*Table 3. 2*  
*Changes in questions after Pilot Study*

Symbol	Question	Change
OC1	I consult others (family, friends) before buying the shares.	Deleted
AV4	If I want to buy shares of certain company, I will rely on information from the financial experts.	Deleted

### 3.9 Ethical Considerations

Ethical issues are critical concerns in research. Ethics refers to doing right and avoiding wrong in research. Ethics and norms are maintained while conducting the survey as well as during the writing of the report.

In this research, respondents are informed with all the relevant information necessary for them to participate willingly in the research. More specifically, the questionnaire has a cover page, which provides sufficient information about this study to the respondents. In addition, questionnaires are sent to respondents by printed form, mail, and messenger. So, respondents decide whether to answer these questionnaires or not themselves. The anonymity issue is also fulfilled as the identities of all the respondents from the survey and their private information, are not revealed in this study. Therefore, it is ensured that there is no question of harm to participants including physical and mental harms.

Another ethical issue, which should be considered here is the accuracy in data gathering, processing, and reporting (Sarantakos, 1998). In this research, data is collected and processed using systematic and scientific methods meeting the requirements suggested by research scholars. Data is used for the research objectives and not for any private purposes. Questions used in survey are also for the purposes of the research. The report reflects the collected data without changing or creating data to meet desirable objectives.

## CHAPTER IV

### ANALYSIS AND RESULTS

The ‘analysis and results’ chapter presents in detail the results from the analysis of the data. In first part, demographic data of the respondents from the survey are analyzed. In the second part, the impacts of heuristic and prospect factors on investment decisions and investment performance scores of individual investors have been examined. In third part, assessment of Measurement and Structural Models of PLS-SEM has been made.

#### 4.1 Demographic Profile of the Respondents

From more than 600 questionnaires delivered to individual investors at Nepal Stock Exchange through mail, social media, and printed forms, 430 respondents are reported, so that the respondent rate is higher than 70%, a high rate for questionnaire survey. The 430-respondent sample with the characteristics of gender, age, education level, income, experience in stock market, course attended on stock market, total amount of investment, and purpose of investment are described below.

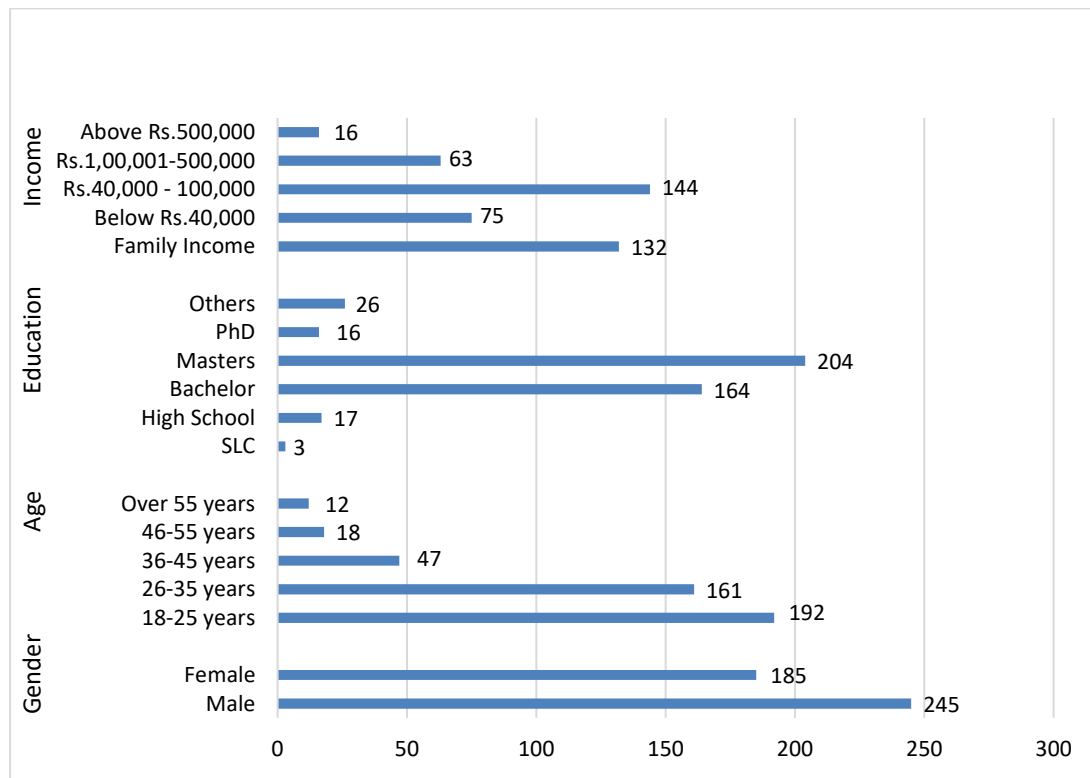


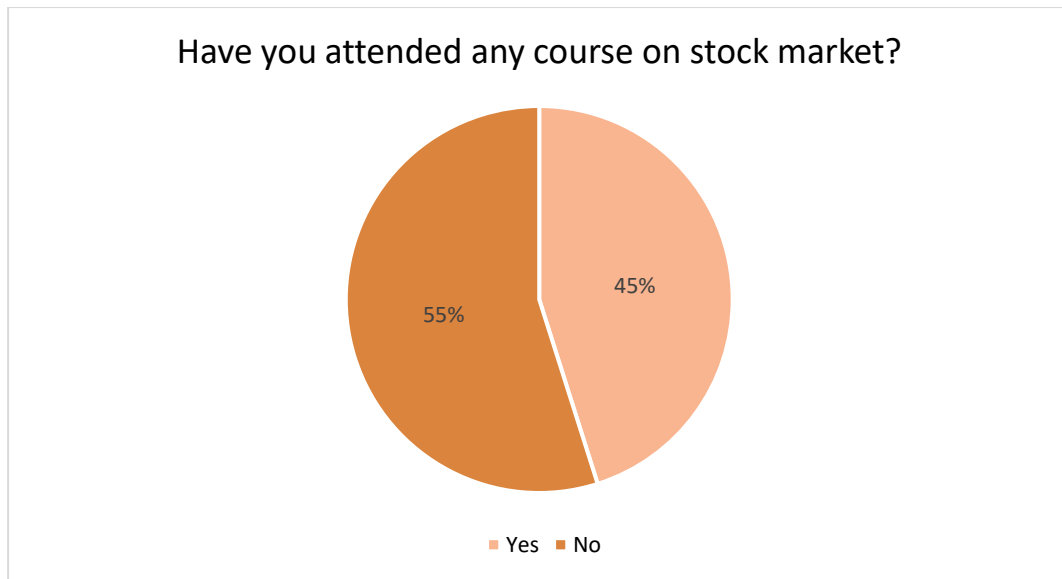
Figure 4. 1 Sample Distributions for Gender, Age, Income, and Education

Figure 4.1 shows that the numbers of male and female investors in the sample are 245 (57%) and 185 (43%) respectively. This shows that there is active participation of female investors at Nepalese Stock Market (NEPSE). This may help minimize the issues related to gender bias in this study.

The stock investors are mainly at the ages of 18 to 25 (192 investors that counts for 44.7% of the total sample) and 26 to 35 (161 investors that counts for 37.4% of the total sample) while 10.9% of the respondents being at the age of 36 to 45, 4.2% of the respondents from 46 to 55 years, and 2.8% of sample having the old ages of over 55 years. This sample reflects the fact that a high proportion of individual investors at NEPSE are younger than 25, and this research may highly reflect the investment behaviors of these investors.

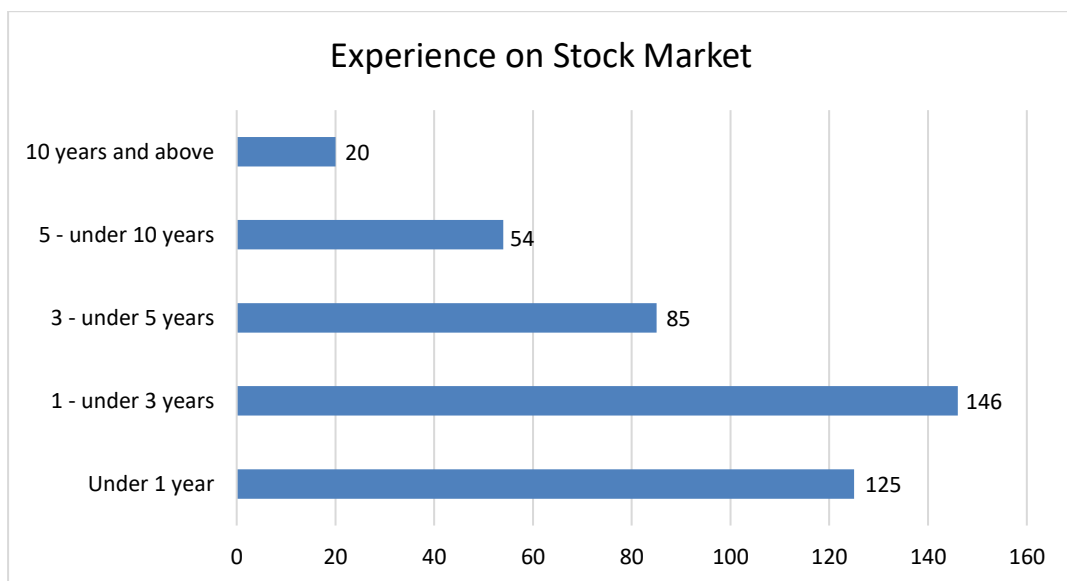
The Figure 4.1 also shows that a large proportion of the sample are investors who have Master degree (47.4% of the respondents) followed by 38.1% of the respondents with Bachelor degree, 6% of the respondents with other degrees, 4% of the respondents with high school degree, 3.7% of the respondents with PhD, and only 0.7% of the respondents with SLC qualification. This shows that majority of the investors at NEPSE are educated and literate thereby enabling them to intelligently respond to the questions.

The majority of the sample are the investors who earn monthly income from Rs.40,000 to Rs.100,000 (33.5% of the respondents) followed by investors depending on family income (30.7% of the respondents), 17.4% of the investors with monthly income below Rs.40,000, 14.7% of the investors with monthly income ranging from Rs.1,00,001 to Rs.500,000, and 3.7% of the investors with monthly income higher than Rs.500,000. Since the majority of the investors are young (18-25), their source of investment being family income justifies the above data.



*Figure 4. 2* Proportion of respondents attending Stock Market course

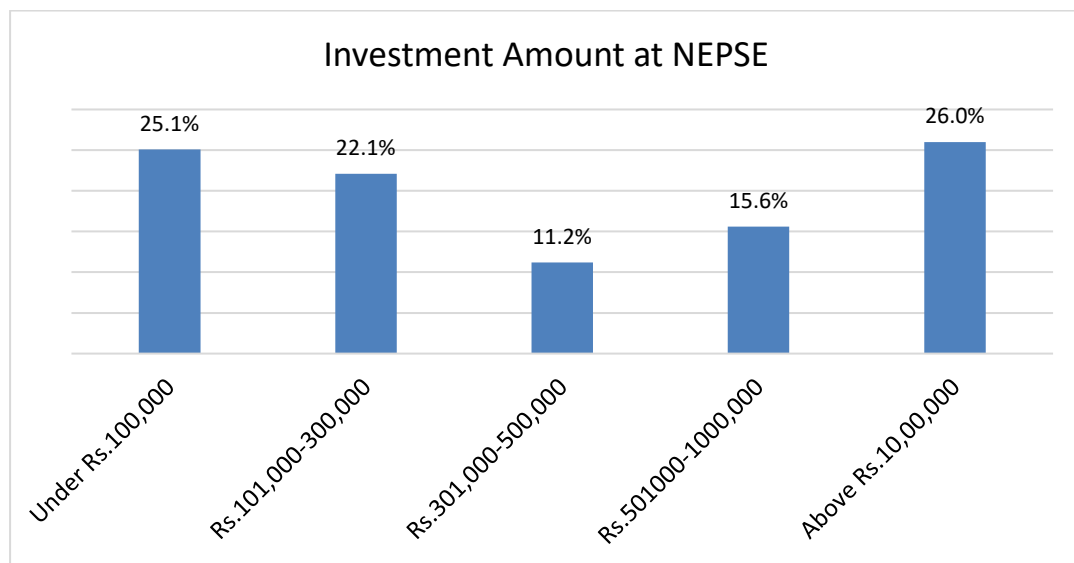
The Figure 4.2 shows that the individual investors in the sample who have already taken the course on stock market account for 55 percent while those who have not yet taken any course on stock market are 45 percent.



*Figure 4. 3* Investment Experience on Stock Market

The Figure 4.3 presents that a large proportion of the sample are investors who have attended the stock market for the duration of less than 1 year (29.1% of the respondents) to duration of 1 to less than 3 years (34% of the respondents), 19.8 % of the respondents having attended for 3 to less than 5 years, 12.6% of the respondents

having attended for 5 to less than 10 years, and 4.7% of the respondents having attended for more than 10 years.



*Figure 4. 4* Percentage of respondents with their ranges of Investments at NEPSE

The Figure 4.4 shows that the respondents cover all the ranges of investment from below 100,000 (NRs.) to above 10,00,000 (NRs.). The higher percentages (26% of the respondents) of individual investors in the surveyed sample invest relatively large amount of money above 10,00,000. The figure also shows 25.1% respondents investing under 100,000, 22.1% investing from 100,000 to 300,000, 15.6% investing from 501,000 to 10,00,000 and 11.2% investing from 301,000 to 500,000.

In total, respondents from the survey are the investors with the higher proportion of ages from 18 to 25 and 26 to 35, generally the newcomers of the stock market. This is easy to acknowledge since most of the investors have recently paid attention to stock market. The lockdown due to COVID-19 pandemic, bull cycle of NEPSE, and increasing trend of issuing IPO could explain such behavior.

#### **4.2 Impact Levels of Heuristic and Prospect Factors on the Individual Investment Decisions and Scores of Investment Performance**

The impact levels of heuristic and prospect variables on the investment decisions are identified by calculating the values of sample mean of each variable. In this part, only variables, which meet the requirements of Factor loadings, are chosen to demonstrate their scores. Because 5-point scales are used to measure the impact levels of these

variables, the mean values of these variables can decide their impact levels on the investment decision making as the following rules (Luong & Ha, 2011):

- Mean values are less than 1 shows that the variables have very low impacts
- Mean values are from 1 to 2 shows that the variables have low impacts
- Mean values are from 2 to 3 shows that the variables have moderate impacts
- Mean values are from 3 to 4 shows that the variables have high impacts
- Mean values are more 4 shows that the variables have very high impacts

#### 4.2.1 Impact levels of Heuristic Variables on the Investment Decision Making

The Heuristic variables consist of four elements: Overconfidence bias, Representativeness bias, Anchoring bias, and Availability bias. The table 4 shows the impacts of these factors on investment decision making of individual investors.

Table 4. 1

*Impact levels of Heuristic Variables on the Investment Decision Making*

<b>Elements</b>	<b>Overall Mean</b>	<b>Variables</b>	<b>Mean</b>	<b>Std. Deviation</b>
<b>Overconfidence</b>	3.369	OC1	3.542	0.973
		OC3	3.481	1.060
		OC4	3.086	1.224
<b>Representativeness</b>	3.693	R1	3.721	0.960
		R2	3.891	0.876
		R3	3.709	0.921
		R4	3.453	1.028
<b>Anchoring</b>	3.623	AN1	3.837	0.805
		AN2	3.744	1.141
		AN3	3.005	1.005
		AN4	3.907	0.955
<b>Availability</b>	3.729	AV1	3.437	1.018
		AV2	3.805	1.091
		AV3	3.947	0.849

Table 4.1 shows that all the variables and their items of heuristic factors have high impacts on the decision making of individual investors with their mean values greater

than 3. Even among the heuristic factors, Availability (with the mean value of 3.729) has the strongest impact on investors when they make their investment decisions. This implies that individual investors at NEPSE tend to rely on information that are easily available to them at the time of making their investment decisions. Such information may include information available from friends, company websites, expert opinions, and the like.

#### 4.2.2 Impacts of Prospect Variables on the Investment Decision Making

The Prospect variables consist of two elements: Loss-aversion bias Mental accounting bias, and Regret aversion bias. The table 5 shows the impacts of these factors on investment decision making of individual investors.

Table 4. 2

*Impact levels of Prospect Variables on the Investment Decision Making*

Elements	Overall Mean	Variables	Mean	Std. Deviation
Loss Aversion	3.597	LA1	3.516	1.067
		LA2	3.537	1.351
		LA3	3.667	0.964
		LA4	3.670	1.017
Mental Accounting	3.478	MA1	3.547	0.996
		MA2	3.612	1.059
		MA3	3.227	1.226
Regret Aversion	3.442	RA1	3.491	1.049
		RA2	3.393	1.046

Table 4.2 shows that all the variables and their items of prospect factors have high impacts on the decision making of individual investors with their mean values greater than 3. Even among the prospect factors, Loss aversion (with the mean value of 3.597) has the strongest impact on investors when they make their investment decisions. This means that the individual investors at the NEPSE are more concerned about their losses than their equivalent profits.



### 4.2.3 Investment Performance Scores

Table 4. 3

*Investment Performance*

Elements	Overall Mean	Variables	Mean	Std. Deviation
Investment	3.665	IP1	3.795	1.021
Performance		IP2	3.381	1.130
		IP3	3.819	1.076

Table 4.3 shows that investment results highly satisfy the investment expectations of individual investors with the mean score of 3.665. They have high return on investments in comparison to their expectations (IP1=3.795). The data in the table 4.3 also demonstrates the fact that majority of the investor's return on their investments are greater than the market rate of return (IP2=3.381). Further, they are highly satisfied with their investment decisions during the last year including buying, selling, choosing stocks and deciding the stock volumes (IP3=3.819).

### 4.3 Model Assessment

The measurement model assesses the quality criteria of the constructs of the model. The assessment of the quality criteria starts with the evaluation of factor loadings which is followed by establishing the construct reliability and construct validity (Sarstedt et al., 2017). This model consists of both lower order constructs and higher order constructs. The application of disjoint two-stage approach has been made to estimate the reflective-reflective model of this study. According to Hair Jr et al., (2019),

In the first stage, the model connecting all the lower-order components (including Endogenous and Exogenous constructs) are created and estimated. The model assessment first focuses on the reflective measurement models of the lower order components (LOC).

In stage two, the latent variable scores of the lower-order components from stage-one are used to create and estimate for the stage-two model. For this purpose, the scores of LOCs of the HOC are located and added as new variables to the dataset. The results

are similar to the ones of the repeated indicators approach but with slight differences of the path co-efficient estimates.

The evaluation of stage two starts with focusing on the reflective measurement model of the higher-order component. For HOC, the loadings of LOC for the HOC are seen, CR and AVE are assessed using the coefficient (loadings) that enables to establish indicator reliabilities and AVE. These results above the critical values of 0.5, Cronbach's alpha, CR, and AVE establish reliability and convergent validity. Based on the HTMT criterion, discriminant validity with other LOCs can be established.

Finally, the assessment of stage two results addresses the structural model. The analysis shall assess the structural model evaluation (collinearity, hypotheses testing,  $R^2$ ,  $F^2$ ,  $Q^2$ , and  $q^2$ ).

#### **4.3.1 Measurement Model**

Quality of the constructs in the study is assessed based on the evaluation of measurement model. The assessment of the quality criteria starts with the evaluation of factor loadings which is followed by establishing the construct reliability and construct validity.

##### ***Factor Loadings***

Factor loading refers to “the extent to which an each of the items in the correlation matrix correlates given the principal component. Factor loadings can range from -1.0 to +1.0, with higher absolute values indicating a higher correlation of the item with the underlying factor” (Pett et al., 2003). All the items except RA3 had the factor loadings closer to or above the recommended value of 0.50 (Hair et al., 2014). Hence, only one item (RA3) was removed. The detail of the factor loadings of the original data is presented in Appendix 3. The factor loadings after removing RA3 are presented in table 4.4.

Table 4. 4

*Factor Loadings*

	AN	AV	EX	IP	LA	MA	OC	R	RA
AN1	0.793								
AN2	0.705								
AN3	0.503								
AN4	0.786								
AV1		0.446							
AV2		0.497							
AV3		0.976							
IP1				0.900					
IP2				0.855					
IP3				0.900					
LA1					0.725				
LA2					0.622				
LA3					0.843				
LA4					0.862				
MA1						0.910			
MA2						0.917			
MA3						0.655			
OC1							0.924		
OC3							0.918		
OC4							0.534		
R1								0.783	
R2								0.837	
R3								0.805	
R4								0.689	
RA1									0.739
RA2									0.929

### *Indicator Multicollinearity (Outer VIF)*

Outer Variance Inflation Factor (VIF) statistic is utilized to assess the multicollinearity in the indicators (Fornell & Bookstein, 1982). According to Sarstedt et al (2017), multicollinearity is not a serious issue if the value for VIF is below 5.

Table 4.5 presents the VIF values for the indicators in the study and reveals that VIF for each of the indicator is below the recommended threshold.

Table 4. 5

#### *Multicollinearity Statistics (VIF) for Indicators*

	VIF
AN1	1.315
AN2	1.453
AN3	1.133
AN4	1.349
AV1	1.926
AV2	2.006
AV3	1.117
IP1	2.449
IP2	1.919
IP3	2.458
LA1	2.325
LA2	2.320
LA3	1.676
LA4	1.855
MA1	1.937
MA2	2.280
MA3	1.524
OC1	2.224
OC3	2.271
OC4	1.193
R1	1.490
R2	1.566
R3	1.879
R4	1.617
RA1	1.235
RA2	1.235

### ***Reliability Analysis***

Reliability is concerned with how consistently or dependably a measurement scale measure what it is supposed to be measuring (Polit & Hungler 1995). The two most commonly used methods for establishing internal consistency reliability include Cronbach Alpha and Composite Reliability (CR). The results for both Cronbach alpha and composite reliability are presented in Table 4.6. The Cronbach's Alpha ranged from 0.608 to 0.862 whereas Composite Reliability statistics ranged from 0.697 to 0.916. Cronbach's Alpha has reliability statistics which are acceptable since they are greater than 0.600 (Hair et al., 2014). Similarly, Composite Reliability has reliability statistics since they are greater than or closer to the recommended value of 0.700 (Hair et al., 2011). Hence, construct reliability is established.

Table 4. 6

#### ***Construct Reliability Analysis (Cronbach Alpha and Composite Reliability)***

	Cronbach's Alpha	Composite Reliability
AN	0.672	0.795
AV	0.687	0.697
IP	0.862	0.916
LA	0.800	0.851
MA	0.805	0.873
OC	0.746	0.847
R	0.795	0.861
RA	0.608	0.825

### ***Construct Validity***

Statistically using PLS-SEM, construct validity is established when there is convergent validity and discriminant validity.

#### ***Convergent Validity***

“Convergent validity is the degree to which multiple attempts to measure the same concept are in agreement. The idea is that two or more measures of the same thing should highly covary if they are valid measures of the concept” (Bagozzi et al., 1991). When the AVE value is greater than or equal to the recommended value of 0.50, items

converge to measure the underlying construct and hence convergent validity is established (Fornell and Larcker, 1981). This level or higher indicates that, on average, the construct explains (more than) 50% of the variance of its items (Sarstedt et al., 2017). Convergent validity results based on the AVE statistics in the current study show that all the constructs except AN and AV have an AVE value greater than 0.50. However, the CR values for all the constructs was equal to or greater than 0.70. Hence the convergent validity is not an issue. Table 4.7 shows the AVE value for each of the constructs.

Table 4. 7

*Construct Convergent Validity (AVE)*

	Average Variance Extracted (AVE)
AN	0.499
AV	0.466
IP	0.784
LA	0.592
MA	0.700
OC	0.661
R	0.609
RA	0.704

### *Discriminant Validity*

“Discriminant validity is the degree to which measures of different concepts are distinct. The notion is that if two or more concepts are unique, then valid measures of each should not correlate too highly” (Bagozzi et al., 1991). The following three are the most practiced criteria for establishing discriminant validity:

#### *i. Cross-Loadings*

According to Chin (1998b), the loading of each indicator is expected to be greater than all of its cross-loadings. In this study, the loading of each indicator is greater than all of its cross-loadings thereby suggesting discriminant validity. Table 4.8 presents the loadings of each item and their cross-loadings.

Table 4. 8

*Discriminant Validity - Cross Loadings*

	AN	AV	IP	LA	MA	OC	R	RA
AN1	0.793	0.324	0.181	0.310	0.280	0.087	0.393	0.282
AN2	0.705	0.374	0.089	0.452	0.359	0.030	0.406	0.452
AN3	0.503	0.039	0.089	0.129	0.256	0.013	0.216	0.187
AN4	0.786	0.406	0.168	0.425	0.308	0.056	0.282	0.366
AV1	0.353	0.446	0.049	0.348	0.345	-0.154	0.198	0.310
AV2	0.446	0.497	0.040	0.401	0.312	-0.142	0.224	0.331
AV3	0.363	0.976	0.324	0.259	0.252	0.181	0.338	0.217
IP1	0.210	0.307	0.900	0.069	0.184	0.358	0.265	0.081
IP2	0.102	0.184	0.855	-0.024	0.220	0.386	0.254	0.023
IP3	0.215	0.312	0.900	0.064	0.208	0.357	0.260	0.071
LA1	0.429	0.293	0.030	0.725	0.432	-0.067	0.333	0.380
LA2	0.410	0.332	0.002	0.622	0.428	-0.068	0.350	0.432
LA3	0.324	0.235	0.038	0.843	0.141	0.095	0.151	0.318
LA4	0.396	0.272	0.037	0.862	0.214	0.030	0.210	0.339
MA1	0.358	0.279	0.228	0.255	0.910	0.177	0.287	0.268
MA2	0.379	0.299	0.216	0.299	0.917	0.194	0.296	0.369
MA3	0.312	0.162	0.060	0.267	0.655	0.051	0.223	0.322
OC1	0.079	0.157	0.411	0.010	0.204	0.924	0.245	0.039
OC3	0.030	0.076	0.381	-0.029	0.161	0.918	0.158	0.068
OC4	0.127	0.055	0.132	0.231	0.060	0.534	-0.041	0.165
R1	0.328	0.205	0.241	0.222	0.232	0.123	0.783	0.209
R2	0.383	0.393	0.294	0.228	0.292	0.215	0.837	0.256
R3	0.413	0.261	0.200	0.229	0.282	0.138	0.805	0.311
R4	0.278	0.211	0.119	0.188	0.162	0.095	0.689	0.163
RA1	0.469	0.229	0.038	0.468	0.298	0.048	0.275	0.739
RA2	0.332	0.242	0.069	0.309	0.317	0.080	0.257	0.929

*ii. Fornell and Larcker Criterion*

According to Fornell and Larcker (1981) criterion, discriminant validity is established when the square root of AVE for a construct is greater than its correlation with all the other constructs. In this study, square root of AVE (in Bold and Italics) for a construct was found greater than its correlation with other constructs, hence providing strong support for establishment of discriminant validity as shown in the table 4.9.

Table 4. 9

*Discriminant Validity - Fornell & Larcker Criterion*

	AN	AV	IP	LA	MA	OC	R	RA
AN	<b><i>0.707</i></b>							
AV	0.427	<b><i>0.683</i></b>						
IP	0.200	0.304	<b><i>0.885</i></b>					
LA	0.468	0.327	0.043	<b><i>0.769</i></b>				
MA	0.410	0.310	0.230	0.312	<b><i>0.837</i></b>			
OC	0.076	0.126	0.414	0.029	0.192	<b><i>0.813</i></b>		
R	0.454	0.358	0.293	0.279	0.321	0.195	<b><i>0.780</i></b>	
RA	0.442	0.276	0.067	0.424	0.360	0.079	0.306	<b><i>0.839</i></b>

*Note: Bold and Italics represent the square-root of AVE*

*iii. Heterotrait-Monotrait Ratio (HTMT)*

The Heterotrait-Monotrait ratio of correlations (HTMT) is a new method for assessing discriminant validity in partial least squares structural equation modeling. HTMT is based on the estimation of the correlation between the constructs. Discriminant validity is established based on the HTMT ratio. However, the threshold for HTMT has been debated in the existing literature; Kline (2011) suggested a threshold of 0.85 or less, while Teo et al (2008) recommend a liberal threshold of 0.90 or less. The HTMT results (Table 4.10) show that HTMT ratio is less than the required threshold of 0.90.



Table 4. 10

*Discriminant Validity – HTMT*

	AN	AV	IP	LA	MA	OC	R	RA
AN								
AV	0.717							
IP	0.242	0.247						
LA	0.676	0.641	0.064					
MA	0.585	0.51	0.239	0.501				
OC	0.137	0.256	0.472	0.172	0.205			
R	0.618	0.419	0.328	0.413	0.388	0.232		
RA	0.764	0.576	0.1	0.71	0.547	0.167	0.444	

**4.3.2 Validating Higher Order Construct**

These higher order constructs are also validated as part of the measurement model assessment. Each of these constructs were assessed for reliability and convergent validity. Furthermore, the higher order constructs were tested for discriminant validity with other lower order constructs in the study as recommended by Sarstedt et al (2019). The results for reliability and validity of the higher order constructs show that both reliability and validity was established. The reliability and convergent validity for all other constructs is acceptable as the value for reliability is  $> 0.60$  and the AVE is greater than or closer to 0.50 respectively (Table 4.11). Further to the assessment of reliability and validity, discriminant validity of the higher order constructs with the lower order constructs is also assessed. The result of Fornell and Larcker criterion (1981) shows that square-root of AVE of the construct is higher than its correlation with all the other considerations (Table 4.12) whereas HTMT for Prospect and Heuristics is slightly greater than 0.90 (Table 4.13). Since the Fornell and Larcker criterion provides strong support there is no issue on discriminant validity.

Table 4. 11

*Reliability and Convergent Validity - Higher Order Construct*

	Cronbach's Alpha	Composite Reliability	Average Variance Extracted (AVE)
Heuristic	0.600	0.759	0.441
Prospect	0.634	0.741	0.508

Table 4. 12

*Fornell and Larcker Criterion - Higher Order Discriminant Validity*

	Heuristic	IP	Prospect
Heuristic	<b>0.6664</b>		
IP	0.484	<b>1</b>	
Prospect	0.495	0.211	<b>0.712</b>

Table 4. 13

*HTMT - Higher Order Discriminant Validity*

	Heuristic	IP	Prospect
Heuristic			
IP	0.58		
Prospect	<b>0.907</b>	0.187	

### 4.3.3 Structural Model

The next step in structural equation modelling is assessment of structural model. The structural model reflects the paths hypothesized in the research framework. According to Sarstedt et al., (2017), a structural model is assessed based on the collinearity, significance of paths (hypothesis testing), predictive capability of the model ( $R^2$ ), effect size ( $f^2$ ) and predictive relevance of the model ( $Q^2$ ,  $q^2$ ).

#### *Indicator Collinearity (Inner VIF)*

Collinearity occurs when independent variables in a regression model are correlated. If the degree of correlation between variables is high enough, it can cause problems when we fit the model and interpret the results. Inner Variance Inflation Factor (VIF) statistic is utilized to assess the collinearity in the indicators. According to Sarstedt et al., (2017), collinearity is not a serious issue if the value for VIF is below 5. Table 4.14 presents the VIF values for the indicators in the study and reveals that VIF for each of the indicator is below the recommended threshold.

Table 4. 14

*Collinearity Statistics (VIF) for Indicators*

	IP
AN	1.734
AV	1.325
LA	1.425
MA	1.343
OC	1.070
R	1.379
RA	1.403

***Significance of paths and Hypothesis testing***

Figure 4.5 shows the PLS-SEM results. The numbers on the path relationship represent the standardized regression coefficients, while the number displayed in the circle of the endogenous latent variable represents the  $R^2$  values. When analyzing the path coefficient estimates of the structural model, we start with the key target construct IP on the right-hand side of the PLS path model (Fig. 4.5). Among the heuristic factors (0.502), the construct OC (0.347) has the strongest effect on IP, followed by AV (0.208), R (0.147), while the effect of AN (0.065) is close to zero. On the other hand, constructs of prospect factors (-0.038) have no significant effect on IP. Bootstrapping results substantiate that the effects of OC, AV, and R on IP are significant, while Prospect factors don't have significant effect at the 5% probability of error level.

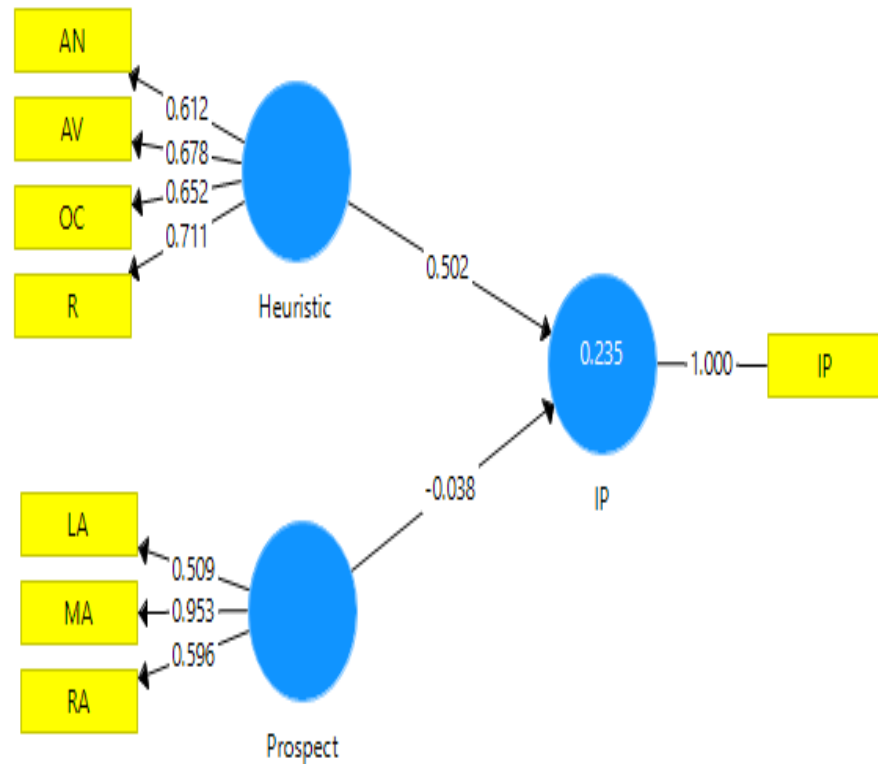


Figure 4. 5 Path coefficients of the model

H<sub>2</sub>(a) evaluates whether heuristic factors have significant impact on the investment performance of individual investors. The results revealed that the heuristic factors have significant impact on IP of individual investors ( $\beta = 0.502$ ,  $t = 8.998$ ,  $p = 0.000$ ). Even among the heuristic factors overconfidence ( $\beta = 0.347$ ,  $p < 0.001$ ), representativeness ( $\beta = 0.208$ ,  $p < 0.001$ ), and availability ( $\beta = 0.147$ ,  $p < 0.001$ ) have significant impact on IP of individual investors as shown in table 4.15. Hence, H<sub>3</sub> was supported.

However, according to Ramayah et al. (2018), which has stated that currently, using t-values and p-values to report the significance and relevance of the structural model relationships is already not sufficient. Thus, the confidence intervals bias result for upper and lower bound when performing bootstrapping test should also be provided. According to Sarstedt et al., (2017), a path coefficient is significant at the 5% probability of error level if zero does not fall into the 95% (bias-corrected and accelerated) confidence interval. While looking into the results on table 4.15, H<sub>2</sub>(a) was significant in bias corrected confidence interval because upper and lower bounds of the confidence interval bias except for anchoring among the Heuristic factors don't have any 0 result.

H<sub>2</sub>(b) evaluates whether prospect factors have any significant impact on the investment performance of individual investors. The results on table 4.15 revealed that none of the prospect factors have significant effect on IP of individual investors ( $\beta = -0.038$ ,  $t = 569$ ,  $p = 0.570$ ). Hence H<sub>2</sub> (b) was not supported.

Table 4. 15

*Path coefficients of the structural model and significance testing results*

	Original	t-			97.50	
	Sample (O)	value	p-value	Decision	2.50%	%
OC -> IP	0.347	7.307	0.000	Supported	0.257	0.441
AV -> IP	0.208	4.074	0.000	Supported	0.112	0.310
R -> IP	0.147	2.652	0.008	Supported	0.038	0.254
AN -> IP	0.065	1.089	0.276	Rejected	0.057	0.179
LA -> IP	-0.100	1.271	0.204	Rejected	0.264	0.042
MA -> IP	0.086	1.565	0.118	Rejected	0.025	0.189
RA -> IP	-0.080	1.364	0.173	Rejected	0.208	0.022
H <sub>2</sub> (a): Heuristic - > IP	0.502	8.973	0.000	Supported	0.398	0.614
H <sub>2</sub> (b): Prospect - > IP	-0.038	0.562	0.574	Rejected	-0.177	0.075

H<sub>3</sub>(a) sought to ascertain the moderating role of investment experience between heuristic factors and investment performance. For this purpose, the investment experience of individual investors was grouped into two categories namely High Experience ( $\geq 5$  years) and Low Experience ( $< 5$  years). The results on table 4.16 revealed that investment experience does not moderate impact of heuristic factors on investment performance ( $t < 1.96$  and  $p > 0.005$ ). Moreover, the confidence interval results (with 0 between upper and lower bounds) also confirmed the insignificant moderation effect of heuristic factors on investment performance.

H<sub>3</sub>(b) sought to ascertain the moderating role of investment experience between prospect factors and investment performance. However, the results on table 4.16 showed that investment experience does not moderate impact of prospect factors on investment performance ( $t < 1.96$  and  $p > 0.005$ ). Further, the confidence interval

results (with 0 between upper and lower bounds) also confirmed the insignificant moderation effect of prospect factors on investment performance.

Table 4. 16

*Parametric Test (PLS-MGA)*

	Path Coefficients-diff (HE - LE)	t-Value ( HE vs LE )	p-Value (HE vs LE)	2.5% (HE)	97.5 % (HE)	2.5% (LE)	97.5% (LE)
Heuristic -> IP	-0.161	0.997	0.320	-0.344	0.542	0.368	0.611
Prospect - > IP	-0.240	1.374	0.170	-0.464	0.285	-0.105	0.157

***Predictive Capability of the Model (R<sup>2</sup>)***

The goodness of model is determined by the strength of each structural path determined by R<sup>2</sup> value for the dependent variable (Briones Penalver et al., 2018). The value for R<sup>2</sup> should be equal to over 0.1 (Falk & Miller, 1992). The result in table 4.17 shows that R<sup>2</sup> (0.235) value is over 0.1. It means that 23.5% of change in Investment Performance can be attributed to heuristic and prospect factors. Hence the predictive capability of the model is established.

Table 4. 17

*Predictive Capability of the Model*

	R Square	R Square Adjusted
IP	0.235	0.231

***Effect Size (f<sup>2</sup>)***

According to Sullivan and Fein (2012), both the effect size and p-value are needed to be reported because although p-value are able to inform the reader whether there exists any effect, but it cannot reveal the size of the effect. Therefore, to measure the effect size, the guideline proposed by Cohen (1988) has been used. According to Cohen (1988), the values of 0.02, 0.15, and 0.35 represent small, medium, and the large effects respectively. According to the table 4.18, Heuristic factors have significant effect (0.249) while prospect factors have no effect (0.001) in producing the R<sup>2</sup> for the investment performance.

Table 4. 18

*Effect Size*

	IP
Heuristic	0.249
Prospect	0.001

*Predictive relevance of the model (Q<sup>2</sup>)*

Q<sup>2</sup> established the predictive relevance of the endogenous constructs. To examine the predictive relevance of the model, the blind-folding procedure was conducted.

According to Hair et al. (2014) and Fornell and Cha (1994), if the Q<sup>2</sup> value is larger than 0, the model has predictive relevance for a certain endogenous construct. While looking into the result of this research, the Q<sup>2</sup> (0.225) in this research is larger than 0 which indicated that the model has sufficient predictive relevance. With this result, it can be concluded that the investment performance is more likely to be influenced by heuristic and prospect variables.

Table 4. 19

*Predictive relevance of the model*

	SSO	SSE	Q <sup>2</sup> (=1-SSE/SSO)
Heuristic	1720	1720	
IP	430	333.366	0.225
Prospect	1290	1290	

## CHAPTER V

### DISCUSSION, CONCLUSION, AND IMPLICATIONS

This chapter discusses the results obtained from data analysis section (chapter IV) and compares these findings with the theories in the literature review chapter, summarizes all the findings of the research, which are about the heuristic and prospect factors having the impacts on the individual investors' investment decisions and performance. This chapter also explains the implications of the research and future research.

#### 5.1 Discussion

The aim of this part is to discuss the results obtained from data analysis and compare these findings with the theories in the literature review chapter.

The results of this study indicate that heuristic factors positively affect the investment decision making of individual investors. Among the heuristic factors, Availability has the strongest impact on investment decisions with the mean value of 3.729. The finding concurs with the finding of Luong and Ha (2011) which revealed the mean (3.95) of availability, highest among the heuristic factors. The reason may be that it is easier and faster to get information from friends and relatives instead of doing the own research before making the investment decision. Similarly, other variables; overconfidence, representativeness and anchoring all had high impact on investment decisions which is similar to the findings of Luong and Ha (2011).

The results also show that prospect factors highly affect the investment decision making of individual investors. Among the prospect factors, loss aversion has the highest impact on investment decisions with the mean value of 3.597. The findings are, to some extent, similar with the findings of Luong and Ha (2011) where loss aversion had moderate impact on investment decision with mean value of 3.71. The reason may be that investors are risk seeking after prior gain and risk averse after prior loss. This is normal reaction because success encourages on investing more, and failure depresses the investor (Luong & Ha, 2011). However, the finding of this study contradicts from the findings of Masomi and Ghayekhloo (2010), where none of the respondents showed loss aversion behavior.



As the findings presented in chapter IV, three of the heuristic factors (overconfidence, representativeness, and availability) have significant positive impact on investment performance. The reason may be that most of the investors of this study are highly educated who have sufficient skills and knowledge to take decisions that yields better returns on their investments. However, prospect factors (loss aversion and regret aversion) showed negative insignificant impact on investment performance. The reason may be that loss averse investors become unwilling to realize losses and may even take increasing risks to avoid a losing outcome. Further, regret averse investors are also unwilling to bear the pain associated with their bad decisions. So, they hold the losing stocks and sell the winning stocks earlier, resulting into poor investment returns. The finding of the impacts of heuristic and prospect factors on investment performance is consistent with the findings of Anum and Ameer (2017), Mahmood et al., (2016), Rajeshwaran (2020) where among other factors, heuristic factors showed positive influence on investment performance and prospect factors showed negative influence on investment performance.

The results indicate that experience in share market do not moderate the impact of heuristic and prospect factors on investment performance. The reason may be explained by the fact that majority of the investors are less experienced investors with investment experience less than 5 years in this study. This finding contradicts to the findings of Baker et al., (2016) which reported that overconfidence, anchoring, and representativeness biases are associated with more experienced investors. The reason may be that as investors gain more experience in share market, they make better investment decisions that are less influenced by behavioral biases.

## **5.2 Conclusion**

As the study has been conducted, the research questions raised on Chapter I has been answered by the results presented in Chapter IV of the study. The study has found that all the heuristic and prospect factors have high impact on investment decision making of the investors. This finding supports the alternative Hypothesis H<sub>1</sub> which proposes that heuristic and prospect factors have high impact on individual investors' decision making.

Only heuristic factors are found to affect investment performance. Among the heuristic factors, overconfidence, representativeness, and availability affect the investment performance positively with highest impact of availability. The effect of anchoring (heuristic factor) was positive but insignificant. In contrast, the prospect factors give negative impact on investment performance and are statistically insignificant.

The moderation effect of investors experience in share market on investment performance was assessed through Multi Group Analysis (MGA). The moderation effect of investment experience was insignificant in case of both heuristic and prospect variables on investment performance. This implies that investors' experience in the market doesn't affect the impact of behavioral factors on his/her investment performance which further explains the importance of understanding and controlling the behavioral biases for every investor.

Hence, it can be concluded that there is significant positive impact of heuristic variables on investment performance whereas there is no significant impact of prospect variables on investment performance of individual investors in Nepalese stock market. The moderation effect of investment experience is insignificant on the impact of behavioral factors on investment performance. Hence, the debate on existence of behavioral impacts on investment performance of the individual investors stays alive in Nepalese context.

### **5.3 Implications**

“The stock market decisions play an important role in determining market trends, which then influence the economy. In order to understand and provide an adequate explanation for investor decisions, it is important to investigate which behavior factors influence investor decisions in the Stock Exchange and how these factors influence their investment performance” Luong and Ha (2011). In this sense, the study examined the impact of heuristic and prospect factors on investment decision making and investment performance of individual investors at NEPSE. Based on this study, the implications of this research have been divided into three parts: practical implications, social implications, and future implications.

### **5.3.1. Practical Implications**

The findings of the present study are useful for financial companies and policymakers to develop programs through policy formulation and regulation that will rectify any distortions that investors face in the stock market. Furthermore, to financial service providers, this study would be beneficial to design an investment profile according to the personality and psychological traits of their clients.

### **5.3.2 Social Implications**

The findings from this study and the literature show that behavioral factors (heuristic or prospect) indeed influence the investment decisions of individual investors thereby by affecting their investment performance. Through this study, the investors can recognize their personality traits and psychological biases and take sound and good investment decisions. This increased level of self-understanding will prevent them from making decisions that could potentially lower their investment performance and aid them further to manage their portfolios well. As Shefrin (2000) mentions, practitioners studying behavioural finance should learn to recognize their own mistakes and those of others, understand those mistakes, and take steps to avoid making them.

### **5.3.3 Future Research Implication**

It is important to conduct more research to confirm the findings of this research by covering a large sample size and diversity of respondents. Another study could be conducted to understand how institutional investors behave at the Nepal Stock Exchange. Moreover, comparative study could be undertaken in Nepal as well as other developed and developing countries in order to explore whether investment experience moderates the impact of behavioral factors on investment performance. Finally, it is useful to conduct behavioural factors of investors at different period of NEPSE cycle (bull cycle and bear cycle).

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## APPENDICES

### Appendix 1: Results of Cronbach's Alpha Test in Pilot Study

	Scale				Overall
	Scale Mean if Item Deleted	Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted	
OC1	9.850	2.592	0.642	-.657 <sup>a</sup>	0.222
OC2	9.275	7.128	-0.449	0.808	
OC3	9.550	3.228	0.424	-.256 <sup>a</sup>	
OC4	10.175	3.174	0.297	-.124 <sup>a</sup>	
R1	11.650	4.849	0.304	0.841	0.736
R2	11.275	4.820	0.633	0.626	
R3	11.425	4.815	0.715	0.596	
R4	11.775	4.435	0.591	0.637	
AN1	10.550	5.485	0.517	0.608	0.687
AN2	10.550	3.741	0.679	0.460	
AN3	11.475	5.846	0.200	0.794	
AN4	10.550	4.767	0.579	0.555	
AV1	10.250	3.321	0.408	0.130	0.397
AV2	10.025	3.563	0.294	0.249	
AV3	10.175	3.020	0.364	0.145	
AV4	10.725	4.922	-0.103	0.638	
LA1	10.725	6.820	0.680	0.760	0.820
LA2	10.550	6.408	0.599	0.798	
LA3	11.100	7.169	0.548	0.815	
LA4	10.825	5.994	0.761	0.715	
MA1	6.750	4.910	0.824	0.749	0.860
MA2	6.500	4.359	0.737	0.803	
MA3	7.000	4.205	0.681	0.869	
RA1	7.075	2.687	0.657	0.468	0.714

RA2	7.475	2.717	0.498	0.681	
RA3	6.650	3.413	0.465	0.702	
IP1	6.850	3.515	0.793	0.665	0.816
IP2	7.425	3.481	0.569	0.846	
IP3	6.875	2.625	0.703	0.729	

*a. The value is negative due to a negative average covariance among items.*

*OC2 and AV4 were deleted for final data collection.*

### **Appendix 2: Results of Normality Test**

	Kolmogorov-Smirnova			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Heuristics	0.053	430	0.005	0.985	430	0.000
Prospect	0.086	430	0.000	0.975	430	0.000
IP	0.163	430	0.000	0.922	430	0.000

### **Appendix 3: Factor loadings of original data**

	AN	AV	IP	LA	MA	OC	R	RA
AN1	0.793							
AN2	0.705							
AN3	0.505							
AN4	0.785							
AV1		0.444						
AV2		0.495						
AV3		0.977						
IP1			0.898					
IP2			0.858					
IP3			0.900					
LA1				0.729				
LA2				0.624				
LA3				0.842				
LA4				0.861				
MA1					0.910			

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MA2	0.918		
MA3	0.656		
OC1		0.924	
OC3		0.918	
OC4		0.534	
R1			0.783
R2			0.836
R3			0.805
R4			0.689
RA1			0.564
RA2			0.832
RA3			0.031

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*RA3 was deleted.*

## Appendix 4: Questionnaire

### I. PERSONAL INFORMATION

1. Gender

Male

Female

2. Age

18-25 years

26-35 years

36-45 years

46- 55 years

Over 55 years

3. Education Level

SLC passed

High School

Bachelor

Master

PhD

Others

4. Please estimate your average monthly income (Rs.)

Family Income

Below Rs.40,000

Rs.40,000 - 100,000

Rs.1,00,001 - 500,000

Above Rs.500,000

5. How long have you been in the stock market?

Under 1 year

1 - under 3 years

3 - under 5 years

5 - under 10 years

10 years and above

6. Have you attended any course of stock market?

Yes

No

7. The total amount of money (Rs.) that you have invested at Nepal Stock Exchange.

Under Rs.100,000

Rs.101,000 to Rs.300,000

Rs.301,000 to Rs.500,000

Rs.501,000 to Rs.10,00,000

Above Rs.10,00,000

8. What is the purpose of your investment?

Regular Income

Capital Growth

Liquidity

Security

## II. BEHAVIORAL FACTORS INFLUENCING YOUR INVESTMENT

**DECISIONS** Please evaluate the degree of your agreement with the impacts of behavioral factors on your investment decision making where: Strongly Disagree =1, Disagree =2, Neutral =3, Agree =4, and Strongly Agree =5.

S.N.	Concept	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
Overconfidence						
9	I have the ability to choose stocks whose performance will be better than market performance.					
10	I feel more confident in my own investment opinions over the opinions of my friends or colleagues.					
11	I trade shares excessively.					
Representativeness						
12	I try to avoid investing in companies with a					

	history of poor earnings.					
13	I rely on past performance to buy shares because I believe that good performance will continue.					
14	Good shares are of firms with past consistent earnings growth.					
15	I buy hot stocks and avoid stocks that performed poorly in the near past.					
Anchoring						
16	I compare the current share prices with their recent year high and low price to justify my share purchase.					
17	I am likely to sell my shares after the price hits recent year high.					
18	I am unlikely to buy shares if it is more expensive than last year.					
19	I use purchase price of share as a reference point for trade.					



Availability						
20	If I heard from a friend about a share that achieved high returns, I would buy it.					
21	If a friend advised me to purchase a share of certain company, then news arrived me about the probability of that share's price rising, I will invest in those shares.					
22	If I want to buy shares of certain company, I will rely on information from the same company.					
Loss Aversion						
23	I am more concerned about a large loss in my stock than missing a substantial gain.					
24	When it comes to investment, no loss of capital (invested money) is more important than returns (profits).					
25	After a prior gain, I am more risk seeking than usual.					

26	After a prior loss, I become more risk averse.					
Mental Accounting						
27	I divide my money to capital account for investment and money account for daily spending.					
28	I tend to treat each element of my investment portfolio separately.					
29	I don't care about the performance of my investment portfolio as a whole but I care about the return of each account separately.					
Regret Aversion						
30	I sell stocks that increased in value very quickly.					
31	I keep stocks that decreased in value for long time.					
32	I feel more sorrow about holding losing stocks too long than about selling winning stocks too soon.					

### III. YOUR INVESTMENT PERFORMANCE

Please give your opinions about the levels of agreement for the following statements:

<b>S.N.</b>	<b>Statements</b>	<b>Strongly Disagree</b>	<b>Disagree</b>	<b>Neutral</b>	<b>Agree</b>	<b>Strongly Agree</b>
33	The return rate of my recent stock investment meets my expectation.					
34	My rate of return is equal to or higher than the average return rate of the market.					
35	I feel satisfied with my investment decisions in the last year (including selling, buying, choosing stocks, and deciding the stock volumes).					