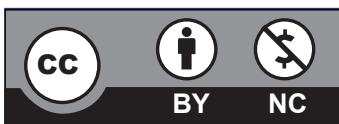# Demographic Factors and Behavioral Biases of Individual Investors in Nepalese Capital Market

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A B S T R A C T

This study aimed to analyze the relationship between demographic factors (age, gender, income, and occupation) and behavioral biases (overconfidence bias, disposition effect, and herding bias) while making share trading decisions in the Nepalese capital market. The research was conducted by distributing questionnaires to active investors with trading accounts in the Nepal Stock Exchange (NEPSE). The data was gathered from primary sources and used for statistical analysis through ANOVA and Chi-square.

The results of the analysis showed that there is a difference in overconfidence bias among different levels of income, age, and occupation, while a difference in herding bias among occupation and gender, whereas no difference is seen in the disposition effect among the demographic variables. This finding is consistent with other studies conducted on the behavioral biases of individual investors in the stock market.

Understanding the factors that influence investment decisions is crucial for investors, financial advisors, and policymakers. This study provides insights into the relationship between demographic factors and behavioral biases while making share trading decisions in the Nepalese capital market. The findings of this study can be used to develop effective investment strategies and improve investment decision-making.

Keywords: behavioral finance, demographics, overconfidence bias, disposition effect, herding bias

Introduction

Overconfidence is a cognitive bias in which people have unwarranted faith in their intuitive reasoning, judgments, and cognitive abilities (Pompian, 2006). The disposition effect is a phenomenon in which investors exhibit a tendency to realize gains while being reluctant to realize losses (Shefrin & Statman, 1985). Lin (2011) describes herding bias as the conduct of investors who decide to follow the majority's choice. Age, occupation, and investment experience are the most important demographic variables associated with individual investors' discriminatory behavior (Beatrice, Murhadi, & Herlamberg, 2021). Additionally, gender and income have significant differences concerning rational decision-making (Beatrice et al., 2021).

The following changes have been made to improve the formatting of the text:

1. The text has been divided into paragraphs to improve readability.
2. The references have been added in square brackets at the end of the relevant sentences.

Gender has been divided into three categories: Male, Female, and Others. Respondents between the ages of 18 and 60 are working-age investors, and those over the age of 60 are retirement-age investors (Pompian, 2006). Investors invest their funds in a more volatile portfolio composed of more volatile stocks when they have a higher level of income (Barber & Odean, 2001). Occupation is the profession in which people are involved to get paid (Maccrimmon & Wehrung, 1985).

There are millions of transactions and trades happening around the world where people are buying and selling securities in the capital markets. One of the leading stock exchanges, the New York Stock Exchange (NYSE) in the USA, has a market capitalization of 28.3 trillion Dollars in which most of the participants are literate (Department, 2022). However, humans are susceptible to incurring different biases while making decisions and therefore will make irrational decisions

Baker, Kumar, Goyal, and Gaur (2019) found out that investors do not always act rationally.

Demographics and financial literacy have a major impact on behavioral biases of investors in India. Additionally, research conducted by J. Elizabeth (2020) found out that overconfidence bias is influenced by gender and income, disposition effect is affected by age, and herding bias is influenced by occupation in Indonesia

Understanding the factors that influence investment decisions is crucial for investors, financial advisors, and policymakers. This study provides insights into the relationship between demographic factors and behavioral biases while making share trading decisions in the Nepalese capital market. The findings of this study can be used to develop effective investment strategies and improve investment decision-making.

Problem Statement

The analysis of behavioral biases among individual investors is crucial as it impacts their investment decisions at a significant level. To measure the bias level of individual investors, factors with an average of more than 3 are considered to indicate biasness in their investment decisions [Sharma, 2020]. Financial literacy has been found to have a negative relationship with behavioral biases, meaning that as the level of financial literacy increases, the likelihood of investors facing behavioral biases reduces [Sharma, 2020]. However, there are conflicting findings regarding the association between gender and behavioral factors [Sharma, 2020].

Many studies have explored the relationship between demographic factors and behavioral biases of individual investors. However, some of the findings drawn from these studies contradict each other. For example, Graham et al. (2005) and Lin (2011) found no influence between income and overconfidence bias, while Sharma (2020) concluded that investors with middle to lower-income tend to be more confident compared to investors with middle to upper income. Similarly, Sharma (2020) found that investors with non-finance related occupations had more herding bias,

which contradicts the findings of Kumar & Goyal (2016) that found no influence between occupation and herding bias.

Moreover, most of the research in this area has been conducted in developed and emerging economies, but there has been limited attention given to the relationship between demographic factors and behavioral biases of individual investors in the context of Nepal. This research gap presents an opportunity to explore the unique dynamics of the Nepalese capital market and understand how demographic factors influence behavioral biases among individual investors in Nepal.

By addressing this research gap, the study aims to contribute to the existing literature on the relationship between demographic factors and behavioral biases of individual investors. The findings of this study can provide valuable insights for investors, financial advisors, and policymakers in Nepal, helping them develop strategies to mitigate biases and improve investment decision-making in the Nepalese capital market.

The context of Nepal has not received much attention in terms of the relationship between demographic factors and behavioral biases of individual investors. Most of the research has been conducted in developed and emerging economies [Sharma, 2020]. Therefore, it is essential to investigate the impact of demographic factors on behavioral biases of individual investors in the Nepalese capital market. This study aims to fill this gap by examining the relationship between demographic factors (gender, age, education level, and income) and behavioral biases (overconfidence bias, disposition effect, and herding bias) among individual investors in the Nepalese capital market. The findings of this study can help develop effective investment strategies and improve investment decision-making in Nepal.

Objective

To analyze the relationship between demographic factors (income, occupation, age, gender) and behavioral bias (Overconfidence bias, Herding bias, Disposition effect) of individual investors in the Nepalese capital market.

Literature Review

Behavioral biases have a significant impact on investors, leading them to invest in less risky avenues. The link between investment decisions and demographic factors such as gender, age, education level, and income has been established [Sharma, 2020]. However, there are conflicting findings regarding the association between gender and behavioral factors [Sharma, 2020]. Specifically, studies have found that gender and income influence overconfidence bias, age is influenced by the disposition effect, and occupation is influenced by herding bias [J. Elizabeth, 2020]. Male investors are more prone to overconfidence and herding bias, while female investors tend to have a higher herding tendency [Lin, 2011]. However, there is no major evidence regarding the influence of occupation and level of annual income on investment decisions.

Kunwar (2021) examined the correlation of behavioral factors with investment performance and found that heuristic behaviors are positively related to investment performance, while following herd behavior in the market and prospects does not result in improved investor performance.

Sharma (2020) studied the investment patterns of individual investors in India and the behavioral biases present in investment decision-making. The paper also examined the effect of demographic profiles on investment decision-making. The study found that investors are influenced by behavioral bias to a large extent, which is why they avoid taking risks and invest in less risky avenues in India. The study also found that there is a significant association between investment decision and demographic profile of the respondent's i.e., gender, age, education qualification, and income class.

Ateşa, Coşkunb, Şahinc, and Demircand (2016) studied the relationship between the financial literacy level of investors and the level of behavioral biases that may result in irrational behavior in financial decision-making. The results revealed that around half of the investors have a low financial literacy

level, their main source of financial information is advice from parents or friends, and they have a high level of behavioral biases.

Baker et al. (2019) introduced prospect theory suggesting that financial literacy and demographic variables (gender, age, income level, education, occupation, marital status, and investment experience) relate to behavioral biases. The study found that financial literacy has a negative association with the disposition effect and herding bias and has a positive relation with mental accounting bias, but no significant relation with overconfidence and emotional biases.

Chandra, Sanningammanavara, and Nandini (2017) studied the determinants of investment behavior and found that individual heterogeneity and financial factors such as gender, age, educational status, income, and investment levels determine their trading behavior besides the features such as marital status and occupation. The study found that retail investor's self-perceived confidence as a function of both expected and unexpected changes in the market and personal factors largely determines trading behavior of retail investors.

Kumar and Goyal (2016) examined the relationship between rational decision-making and behavioral biases among individual investors in India, as well as to examine the influence of demographic variables on the rational decision-making process. The study found that gender and income have a significant difference with respect to the rational decision-making process. Likewise, male investors are more prone to overconfidence and herding bias.

Lin (2011) studied how behavioral biases impact rational decision-making and compared the relative differences of three behavioral biases, i.e., disposition effect, herding bias, and overconfidence bias, by various demographic variables. The study found that gender largely explains the difference in behavioral biases. Female investors have more herding bias than male counterparts. Also, there is no significant evidence in the investor's category of occupation and level of annual income.

The literature review highlights the importance of understanding the impact of behavioral biases and demographic factors on investment decision-making. The findings of these studies can help develop effective investment strategies and improve investment decision-making. However, there are conflicting findings regarding the association between gender and behavioral factors, which needs further investigation.

Variable Prepositions

Overconfidence Bias

Overconfidence is a cognitive bias in which people have unwarranted faith in their intuitive reasoning, judgments and cognitive abilities (Pompian, 2006). Overconfident people become too confident about their skills and knowledge while underestimate the various risk associated with the investment. Generally, overconfident investors overreact to the private information signals while ignoring the publicly available information (Daniel, Hirshleifer, & Subrahmanyam, 2002). This study defines the main causes of overconfidence that come with self-efficacy i.e. personal optimism, previous experience, data and knowledge limitation, environmental pressure and availability heuristic. This study views overconfidence bias as a person's tendency to exaggerate their skills and abilities in a specific field.

Disposition Effect

Disposition effect is a phenomenon in which investors' exhibit a tendency to realize the gains while reluctant to realize losses (Shefrin & Statman, 1985). Firstly, Shefrin & Statman (1985) developed a framework based on different elements (i.e. mental accounting, regret aversion, self-control and tax consideration) and formally analyzed the disposition effect. Most of the empirical studies referred the (Kahneman & Tversky, 1979) prospect theory to explain thedisposition effect. Prospect theory states that people become more risk averse after experiencing gains while risk seekers after suffering from the losses. This study views disposition effect as the tendency to sell assets that have appreciated in value while holding those that have declined in value.

Herding Bias

Lin (2011) describes herding bias as the conduct of investors who decide to follow the majority's choice. This type of behavior typically arises when investors lack sufficient understanding and prefer to follow the majority's decisions. This study views herding behavior as the behavior of somebody who tends to emulate other people's decisions resulting from the investor's personal and demographic aspects.

Hypothesis

H1: On an average, Overconfidence Bias is different across different age, gender, income and occupation groups

H2: On an average, Herding Bias is different across different age, gender, income and occupation groups

H3: On an average, Disposition Effect is different across different age, gender, income and occupation groups

H4: Overconfidence Bias depends on age, gender, income, occupation.

H5: Herding Bias depends on age, gender, income, occupation.
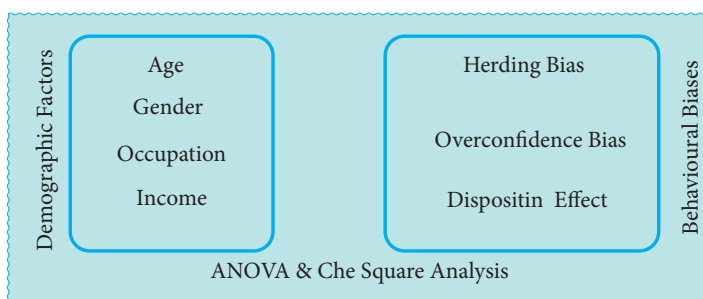
Fig 1: Conceptual Framework

Methodology

Research Design

The analysis of this study is based entirely upon quantitative data. The study looked into various demographic factors (age, gender, income, occupation) and biases (overconfidence bias, disposition effect, and herding bias) which are measured using different sets of questionnaires. Our source of information is primary source, through questionnaires.

Variable

In the study Overconfidence Bias, Herding Bias and Disposition Effect are taken as dependent variables while Gender, Age, Income and Occupation are taken as independent variables.

Unit of analysis

The study concentrates on the relationship between demographic factors and investor's behavioral biases while making share trading decisions. So, the unit of analysis for this study will be Individual Respondents.

Population

This study relates to behavioral biases exhibited by the active investors in NEPSE. The population for this study are the total active clients with trading accounts. According to (ShareSansar, 2020) total number of active clients is 264,633.

Sample Design

This study focuses on the analysis of total active clients in Kathmandu Valley. Since its time efficient, a convenient sampling approach is used to pick the samples. In addition, data is gathered from primary sources, and questionnaires related to the study's major variables are used. A total of 105 respondents was used as a sample for the study.

Measures

This study has four independent variables and three dependent variables which are used to analyze the effects of demographic factors on the investor's behavioral biases. Adapting from previous study, the chosen variables are determined to be legitimate and reliable for capturing the variables under consideration.

Administration of Questionnaires

A set of questionnaires developed for the primary research will firstly be tested by conducting a pilot test and if it doesn't fit the criteria, it will be modified accordingly. The questionnaire contains a total of 19 questions representing four independent variables and three dependent variables. The Likert scale is used in the questionnaire. The data was collected through personal visits as well as online methods.

Validity and Reliability

The internal validity of the questionnaires is determined by Cronbach's alpha test. The external validity on the other hand, is assured by properly sorting and screening the data collected and eliminating the unanswered or less authentic responses. Furthermore, the collected data is analyzed by using SPSS.

Data Processing

Responses were manually screened for missing data or incomplete responses and the relativity was examined using the IBM SPSS Statistics 25 software.

Data analysis

For the purpose of data analysis, the tools being used are categorized below:

- *Descriptive analysis:* This gives the description of the data collected through various variables of our study using tools like mean, median, and mode.

- *ANOVA:* This provides results that help determine, whether there exists a relationship between demographic factors and the behavioral biases.

- *Chi-Square Analysis:* This provides results that help determine, whether behavioral biases are dependent on the demographic factors.

Mishra, A.K., & Aithal, P. S., (2021 a&b), Mishra.A.K., (2019), Mishra, A.K., & Aithal, P. S. (2021) and Sah,S., Mishra,A.K.,(2020) have been adopting similar research methods in case of Nepal. The similar approach of methods applied in research gives validity for the methodology.

Result Analysis

Table 1: Description of Demographic Variables

		Frequency	Percent	Cumulative%
Gender	Male	60	57.1	57.1
	Female	45	42.9	100
	Total	105	100	
Income	0-50000	38	36.2	36.2
	50000-100000	17	16.2	52.4
	100000-200000	24	22.9	75.2
	200000 or more	26	24.8	100
	Total	105	100	
Occupation	Finance related	48	45.7	45.7
	Non finance related	30	28.6	74.3
	Student	27	25.7	100
	Total	105	100	
Age	18-24	34	32.4	32.4
	25-30	21	20	52.4
	31-36	18	17.1	69.5
	37-42	11	10.5	80
	43-49	8	7.6	87.6
	50-55	7	6.7	94.3
	55 above	6	5.7	100
	Total	105	100	

Source: SPSS

Table 1 exhibits the demographics profile of respondents. It shows the majority respondents in terms of gender are male i.e. 57.1% and female occupies 42.9% of the total responses. Next, it shows that the majority of the respondents belong to the income level of 0-50,000 per month

(36.2%) followed by 2,00,000 or more per month (24.8%), followed by NRS 1,00,000- 2,00,000 per month (22.9%) and NRS 50,000-1,00,000 per month (16.2%). It also exhibits that the majority of respondents belong to finance related occupation (45.7%) followed by Non- Finance related occupation (28.6%) and Students (25.7%). Finally the table exhibits that the majority of the respondents belong to the age group of 18-24 years (32.4%), followed by 25-30 years (20%), and followed by 31-36 (17.1%) and followed by 37-42 years (10.5%) and followed by 43-49 (7.6%) and followed by 50-55 (6.7%) and 55 and above (5.7%).

Reliability Statistics

Table 2: Probability Statistics

Cronbach's Alpha	N of Item
847	5

Source: SPSS

Table 2 depicts the reliability study using Cronbach Alpha test which has a value of 0.847 which is good. It shows that the items used to measure the dependent variables i.e, Overconfidence bias are reliable.

Table 3: Reliability Statistics

Cronbach's Alpha	N of Item
852	5

Source: SPSS

Table 3 depicts the reliability study using Cronbach Alpha test which has a value of 0.852 which is good. It shows that the items used to measure the dependent variables i.e Herding Bias are reliable.

Table 4: Reliability Statistics

Cronbach's Alpha	N of Item
.697	4

Source: SPSS

Table 4 depicts the reliability study using Cronbach Alpha test which has a value of 0.697 which is good. It shows that the items used to measure the dependent variables i.e. Disposition effect are reliable.

Table 5: ANOVA Test Overconfidence Bias

		Sum of Squares	Df	Mean Square	F	Sig
Income	Between Groups within Groups Total	8.068	3	2.689		
		73.505	101	0.728	3.6950.014	
		81.573	104			
Occupation	Between Groups Within Groups total	15.732	2	7.866	12.86	0
		65.842	102	0.646		
		81.573	104			
Age	Between Groups within Groups Total	16.772	6	2.795	4.227	0.001
		64.801	98	0.661		
		81.573	104			
Gender	Between Groups Within Groups Total	0.126	1	0.126	0.159	0.691
		81.447	103	0.791		
		81.573	104			

Source: SPSS

The research findings suggest that on average, overconfidence bias is different across different income, occupation, and age groups, as indicated by the P values for these demographic variables being less than 0.05. However, the P value for gender is more than 0.05, indicating that on average,

overconfidence bias is the same across different gender groups. The ANOVA test was used to assess potential differences in a scale-level dependent variable by a nominal-level variable having 2 or more categories. The null hypothesis was partially accepted, meaning that there is evidence to suggest that demographic factors can influence overconfidence bias, but not gender.

Table 6: ANOVA Test Herding Bias

		Sum of Squares	DF	Mean Square	F	Sig
Income	Between Groups Within Groups Total	1.292	3	0.431	0.508	0.678
		85.598	101	0.848		
		86.89	104			
Occupation	Between Groups Within Groups Total	6.451	2	3.226	4.09	0.02
		80.439	102	0.789		
		80.439	102	0.789		
Age	Between Groups Within Groups Total	7.723	6	1.287	1.593	0.157
		79.167	98	0.808		
		86.89	104			
Gender	Between Groups Within Groups Total	0.083	1	0.083	0.098	0.755
		86.807	103	0.843		
		86.807	103	0.843		

Source: SPSS

Table 6 depicts the results obtained by performing ANOVA test between herding bias and demographic variables. The P value for occupation is less than 0.05, which signifies that on an average, herding bias is different across different occupation groups (Davar, S. C., & Gill, A. S. (2007). However, the P value for income, age, and gender is more than 0.05, indicating that on an average, herding bias is the same across different income, age, and gender groups(Adhikari, D., & Poudyal, A. K. ,2018: Bhattarai, K., & Adhikari, D. ,2023). Therefore, the null hypothesis is partially accepted, meaning that there is evidence to suggest that demographic factors can influence herding bias, but not income, age, and gender (Adhikari, D., & Poudyal, A. K. ,2018: Bhattarai, K., & Adhikari, D. ,2023) . ANOVA is a statistical technique used to assess potential differences in a scale-level dependent variable by a nominal-level variable having 2 or more categories (Statistics Solutions. (2013).

Table 7: ANOVA Test Disposition Effect

		Sum of Squares	DF	Mean Square	F	Sig
Income	Between Groups Within Groups Total	0.928	3	0.309	0.453	0.716
		68.959	101	0.683		
		69.887	104			
Occupation	Between Groups Within Groups Total	2.149	2	1.075	1.618	0.203
		67.737	102	0.664		
		69.887	104			
Age	Between Groups Within Groups Total	2.519	6	0.42	0.611	0.721
		67.368	98	0.687		
		69.887	104			

Source: SPSS

Table 8: ANOVA Test Herding Bias

		Sum of Squares	DF	Mean Square	F	Sig
Income	Between Groups	0.656	1	0.656	0.976	0.326
	Within Groups Total	69.231	103	0.672		
		69.887	104			

Source: SPSS

Table 8 depicts the results obtained by performing ANOVA test between Disposition effect and demographic variables. The P value for income, occupation, age and gender is more than 0.05 which signifies that on an average disposition effect is same across different income, occupation, age and gender groups. Therefore, we accept the null hypothesis.

Table 9: Square Test Overconfidence Bias

	Chi Square Tests	Value	Df	Asympthotic Significance e (2-sided)
Income	Person Chi-Square	67.601a	57	0.159
	N of Valid Cases	105		
Occupation	Person Chi-Square	48.958a	38	0.11
	N of Valid Cases	105		
Age	Person Chi-Square	126.864a	114	0.193
	N of Valid Cases	105		
Gender	Person Chi-Square	18.407a	19	0.495
	N of Valid Cases	105		

Source: SPSS

Table 9 depicts the results obtained by performing Chi-Square test between Overconfidence Bias and demographic variables. The P values for income, occupation, age and gender is more than 0.05, we accept the null hypothesis. Therefore, overconfidence bias does not depend on income, occupation, age and gender.

Table 10: Chi-Squre Test Herding Bias

	Chi Square Tests	Value	Df	Asympthotic Significance e (2-sided)
Income	Person Chi-Square	54.591a	60	0.673
	N of Valid Cases	105		
Occupation	Person Chi-Square	40.030a	40	0.469
	N of Valid Cases	105		
Age	Person Chi-Square	127.919a	120	0.294
	N of Valid Cases	105		
Gender	Person Chi-Square	32.991a	20	0.034
	N of Valid Cases	105		

Source: SPSS

Table 10 depicts the results obtained by performing Chi-Square test between Herding Bias and demographic variables. The P values for income, occupation, age is more than 0.05 which signifies that herding bias does not depend on income, occupation and age. However, the P value for gender is less than 0.05 which signifies that herding bias depends on gender. The Null hypothesis therefore is partially accepted.

Table 11: Chi-Square Test Disposition Effect

	Chi Square Tests	Value	Df	Asympthotic Significance e (2-sided)
Income	Person Chi-Square	49.663a	45	0.293
	N of Valid Cases	105		
Occupation	Person Chi-Square	25.752a	30	0.688
	N of Valid Cases	105		
Age	Person Chi-Square	75.010a	90	0.872
	N of Valid Cases	105		
Gender	Person Chi-Square	19.205a	15	0.205
	N of Valid Cases	105		

Source: SPSS

Table 11 depicts the results obtained by performing Chi-Square test between Disposition Effect and demographic variables. The P values for income, occupation, age and gender is more than 0.05, we accept the null hypothesis. Therefore, disposition effect does not depend on income, occupation, age and gender.

Conclusion

Based on the findings of the study, the following conclusions can be drawn:

1. Overconfidence Bias: On average, overconfidence bias is different across different groups of income, occupation, and age. Overconfidence bias does not depend on demographic factors.

    There is a relationship between income and overconfidence bias, which supports the study conducted by J. Elizabeth (2020).

    There is a relationship between occupation and overconfidence bias, which supports the results of Chandra et al. (2017).

2. Herding Bias:On average, herding bias is different across different groups of occupation.

    Herding bias is the same across different groups of income, age, and gender.

Herding bias depends on gender, but not on income, occupation, and age.

There is a relationship between occupation and herding bias, which supports the study conducted by J. Elizabeth (2020).

3. Disposition Effect:On average, the disposition effect is the same across different groups of income, occupation, age, and gender. The disposition effect does not depend on demographic factors.

Overall, the study suggests that there is a relationship between demographic factors and behavioral biases of individual investors in the Nepalese capital market. However, the specific relationships vary depending on the type of bias and demographic factor examined. The study supports some previous research findings, while contradicting others. Further research is needed to fully understand the relationship between demographic factors and behavioral biases in the Nepalese capital market.

Authors Note

We are International BBA Program students at Kathmandu College of Management (KCM) Gwarko-16, Lalitpur Nepal. This article is based on

our academic research report that we submitted to the institution to meet the requirement in marketing research for the sixth semester. We'd like to express our gratitude to Mr. Ritesh Thakur for reviewing and mentoring us through the development of this report.

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