

A Study On Analyzing The Relationship Between Heuristic Bias And Decision Making With Risk Perception As The Mediating Variable

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Abstract

The current study on decision-making has shown that heuristic biases significantly influence people's choices and their subsequent perception of risk. This study aims to investigate the intricate relationship between heuristic bias, decision-making processes, and risk perception, with a particular focus on the mediating role of risk perception. The research employs a quantitative methodology, drawing on recognised concepts from behavioural economics and cognitive psychology. Data is collected from a diverse sample group via the use of surveys. The project seeks to examine how risk perception mediates the relationship between heuristic biases and decision-making results. This will be accomplished via the application of rigorous statistical analyses, including mediation analysis methodologies, to elucidate the direct effect of heuristic biases on decision-making outcomes. The anticipated outcomes are expected to enhance theoretical understanding and practical implementations across several domains, such as public policy, healthcare, and finance. Ultimately, this study seeks to elucidate the complex connections between cognitive biases, decision-making processes, and individuals' risk perceptions. By acquiring this information, decision-making may be enhanced and the detrimental impacts of heuristic biases can be reduced in real-world situations.

Keywords: System integration, User satisfaction, Chi square analysis

INTRODUCTION

Behavioural finance encourages the comprehension of several elements of an investor's behaviour, including their judgement, emotions, social interactions, intellectual factors, and restricted cognitive abilities. This understanding is vital in predicting the trajectory of the stock market. Investors may find it difficult and complicated to make investment selections based on such considerations. In such cases, it is more practical for them to seek expert assistance. Moreover, the recent progress and fast growth of artificial intelligence applications in the financial services industry are well-suited for fulfilling client expectations in terms of accessibility, affordability, and transparency. Due to the worldwide interconnectedness of financial markets, investors are now required to closely monitor and effectively manage their funds with heightened awareness, experience, and comprehension. This is of utmost importance since the financial products and services available to the public are complex and need educated decision-making. Investors often rely on emotions, heuristics, and behavioural biases instead than reason when making assessments (Mahmood 2020). This is irrational conduct stemming from investors presenting themselves as idealised rational stock market investors and forming deceptive self-evaluations. while confronted with uncertainty, irrational conduct often appears in the form of inconsistency, incapacity, or ineptitude while making financial choices. Their biased activities lead to market divergence from its genuine position owing to their irrational conduct (Abul 2019).

The investor exhibits a risk-averse mindset while maintaining a steady and constant degree of risk inclination, risk perception, and risk propensity. As an investor becomes more confident in their approach to risk, their understanding of risk remains flexible and may be influenced by different situations. The presence of risk perception results in increased transaction frequency and decreased investment in the stock market. The statement suggests that investors' capacity to make prudent investing choices in the stock market is negatively affected by their sense of risk. Given that investors work as representatives for others, it is equally important that they possess varied viewpoints and respond in distinct ways (Bhatia 2020). These investors, influenced by their behavioural biases, make investments that result in both excessive and insufficient reactions in the market. Market participants prefer to follow the herd due to their impression of low risk and their inclination to do so. This adversely affects their investment choices. Herding conduct has a substantial influence on the financial choices and decision-making processes of

investors. Multiple inquiries have shown that the herding tendency considerably affects the decision-making process of individual investors when it comes to buying and selling stocks.

Every investor seeks to allocate their funds to highly liquid and prosperous enterprises. They consistently exercise discernment while selecting stocks, and as an investor, it is crucial to comprehend the optimal allocation of funds. Nevertheless, their personal judgements are influenced by psychological biases, and as a result, they are unable to provide unbiased evaluations that might potentially influence investment decisions. Consequently, the market has encountered the effect of disposition. Investors who prematurely sell profitable equities and hold onto unprofitable stocks until they become profitable are susceptible to this tendency. It has a substantial influence on the process of making decisions. An investor's profile plays a crucial role in shaping every investment statement, and it is the most efficient method for mitigating behavioural biases. An investor's investment statement helps identify behavioural bias in their investing decisions (Rashid 2019). Herd prejudice, anchoring, mental accounting, and overconfidence bias are behavioural biases that strongly influence investors' decision-making process. The lack of clear advice often amplifies the firm's value when management and investors display excessive confidence.

Problem Statement

Despite significant advancements in the field of decision-making, individuals continue to grapple with heuristic biases, leading to suboptimal decision-making and skewed evaluations of risk. Extensive study has been conducted on the psychological basis of heuristic biases and their impact on decision outcomes. However, there is little understanding of the intricate relationships between heuristic bias, decision-making processes, and risk perception. Hence, it is crucial to carry out a comprehensive examination of the manner in which heuristic biases impact decision-making behaviour and intertwine with individuals' risk perceptions. This study aims to address this deficiency by elucidating the basic principles that underlie decision-making processes. This will provide valuable information for developing strategies to avoid heuristic biases and enhance the efficiency of decision-making in various situations.

Objectives

The objectives of the study are

1. To analyse the impact of heuristic bias on investment decision making among individual investors
2. To understand the nature of relationship between heuristic bias and decision making with risk perception as the mediating variable

Hypothesis

There is no significant difference between heuristic bias and investment decision making among individual investors

There is no significant difference between risk perception and investment decision making among individual investors

There is no significant difference between heuristic bias and decision making with risk perception as the mediating variable

LITERATURE REVIEW

Herding behaviour is a result of the perceived risk compared to the rewards of stocks. Most investors exhibit overconfidence biases or engage in herd behaviour when it comes to their financial decisions. The herding conduct seen in investors may be attributed to their low-risk propensity or risk avoidance, which stems from a desire to minimise the possibility of financial losses. Individuals who are reasonable initially start behaving in an illogical manner when they make investment decisions based on the viewpoints of others, a phenomenon known as herding. They embrace the advice or views of others because to their aversion to assuming the risks linked to investing or their lack of knowledge on the subject (Liébana-Cabanillas 2018). There is a strong association between the herding behaviour of institutional investors and the level of risk and return. The phenomenon of herd mentality in relation to uncertainty and risk. The analysis determined that the US stock market is influenced by herd behaviour. The data indicates that herding behaviour was less often seen during the period of uncertainty and risk, but became more prevalent after the financial crisis. In Asian microfinance institutions, herding plays a significant role in reducing risk. Microfinance is especially susceptible to herd mentality in economically disadvantaged areas where people have less financial resources and face higher levels of risk. Therefore, herding conduct has an impact on investors' risk perceptions and decision-making abilities. The study establishes a correlation between herding behaviour and risk perception and formulates a hypothesis on this link (Khan 2021). Risk is a fundamental factor in financial decision-making, especially when engaging in the purchase or sale of assets. There is a positive correlation between high investment returns and high risk. Stock

investments of investors decrease when they perceive a higher degree of risk. However, it has been shown that investment decisions are significantly and positively affected by the perception of risk (Baker 2019). An investor's risk perception affects their investing decisions. Financial behaviour is influenced by a critical cognitive trait that has a significant impact on investment choices. Investors often fall prey to cognitive errors and behavioural biases, which may result in suboptimal investment choices. The key determinants in decision-making in risky conditions are the individual's perception of risk and their aversion to losses. Risk aversion behaviour has a considerable influence on decision-making. Investors see these equities as a representation of risk aversion, which impacts their decision-making process. Risk aversion behaviour has a detrimental influence on an investor's investment decisions. Investors' stock market investment decisions are shaped by their assessment of risk (Dominic 2020).

Without proper advice, every individual investor in the stock market has the potential to exhibit herding bias. Ultimately, this impacts the decision-making process for selecting assets. In the stock market, investors often engage in selling their stocks due to their fear of incurring financial losses. Noticing that other investors had better information, they follow behind the market participants in selling their investments (Combrink 2020). This outcome is a direct consequence of excessive desire for wealth and fear of losing it. During a bull market trend, individual investors often exhibit herd behaviour when it comes to purchasing and selling stocks. During a negative market trend, herding conduct has a positive effect, but during a positive market trend, it has a negative one (Parveen 2021). The phenomenon of herding behaviour significantly influences the decision-making process of investors. Investing behaviour is influenced by the perception of risk, demography, and knowledge of herding. The phenomenon of herding bias significantly influences the financial decision-making of investors. Herding is defined as the convergence of movements that occur due to collective imitation. It assesses the disproportionate relationship between risk and return in the financial markets. The dearth of information in the market is likely to impact herding behaviour. Humans possess an inherent tendency to imitate, consult, and observe the activities of others when market conditions are unpredictable (Kim 2021). Herding conduct negatively impacts the performance of assets. When making investment decisions, managers and investors often rely on the perspectives and judgements of others (Ishfaq 2015). During periods of market turmoil, such as instances of deceptive marketing, inflated prices, and rumours, the phenomenon of herding among investors becomes more pronounced. Participate in ten different Asian markets, as well as participate in the local, international, and industrial markets. Herding refers to the psychological factor that influences investors' judgements.

METHODOLOGY

Scientific research enables researchers to conduct comprehensive investigations that provide precise responses to research inquiries by using a predetermined set of questions formulated by the researchers. The researchers used pre-established, closed-ended inquiries that were customised to suit the specific characteristics of each participant in order to collect data. The sample of responses included only of current employees of the company. The primary objective of the research is to conduct an examination of the essential factors that impact the efficiency of logistics. The researcher obtained data from 165 survey respondents using the purposive sampling approach..

Analysis

This part of the article involves in presenting a detailed analysis of the data collected based on the questionnaire

Table 1: Demographic Analysis

Table 1: Percentage rate analysis

Respondents Gender	Frequency	Percent
Male	79	54.5
Female	66	45.5
Respondents Age	Frequency	Percent
20 - 25 Years	21	14.5
26 - 30 Years	77	53.1
31 - 35 Years	31	21.4
36 - 40 Years	16	11
Education	Frequency	Percent

Under Graduation	44	30.3
Post Graduation	83	57.2
Others	18	12.4
Designation	Frequency	Percent
Lower level management	47	32.4
Middle level management	63	43.4
Top level management	35	24.1
Experience	Frequency	Percent
1 - 3 Years	30	20.7
3 - 6 Years	44	30.3
6 - 9 years	23	15.9
9 - 12 Years	16	11
Above 12 Years	32	22.1
Total	145	100

The surveyed individuals, contributing to the diversity of perspectives within the study.

Correlation Analysis

Table 2: Correlation analysis

Coefficients	Heuristic bias	Risk perception	Investment decisions
Heuristic bias	1	.895**	.841**
Risk perception	.895**	1	.855**
Investment decisions	.841**	.855**	1

The provided regression analysis results offer valuable insights into the relationship between

Test of hypothesis

There is no significant difference between heuristic bias and investment decision making among individual investors

Table 3: Chi Square Test

Heuristic bias	Value	P
Pearson Chi-Square	214.519a	0.00
Likelihood Ratio	168.629	0.00

It was determined that the chi-square analysis that was carried out in order to investigate the connection between heuristic bias and the outcomes of decision-making led to extremely significant findings. Both the Likelihood Ratio (1686.629) and the Pearson Chi-Square statistic (214.519) have p-values of 0.00, which indicates that there is a substantial connection between heuristic bias and decision-making processes. Based on these data, it seems that the tendency of people to make use of heuristic shortcuts has a major influence on the decision-making process that they engage in. A measure of the degree of correlation that exists between heuristic bias and the outcomes of decision-making is represented by the Pearson Chi-Square value. This demonstrates that there is a significant disparity between the actual frequencies found in the data and the frequencies that would be anticipated if the variables were said to be independent according to the null hypothesis. We discover persuasive evidence for the association between heuristic bias and decision-making when we assess the degree to which the observed data fits the predicted fit based on independence, which is referred to as the Likelihood Ratio. According to the findings of this statistical investigation, those who are prone to heuristic biases have a tendency to display specific patterns in the decisions that they make. Patterns like as simplifying complicated judgements, depending on information that is easily accessible, and resorting to cognitive shortcuts rather than engaging in more careful and analytical thought are examples of these patterns.

There is no significant difference between risk perception and investment decision making among individual investors

Table 4: **Chi Square Test**

Risk perception	Sum of Squares	df	Mean Square	F	P value
Between Groups	201.79	4.00	50.45	169.21	0.00
Within Groups	47.40	159.00	0.30		
Total	249.20	163.00			

In order to investigate the connection between the outcomes of decision-making and the perception of risk, the chi-square analysis is used, which ultimately leads in significant findings. In the research, the variation is broken down into two primary components, which are referred to as "Between Groups" and "Within Groups." The research project titled "Between Groups" investigates the influence that different levels of risk perception have on the decision-making process. It is worth noting that this particular component has a mean square value of 50.45, along with four degrees of freedom and a total of 201.79 squares. 169.21 is the value of the F-statistic that was determined, and the p-value is 0.00. This suggests that there is a high association between risk perception and decision-making, which suggests that changes in risk perception across different groups may be responsible for the variances in decision-making results. On the other hand, the study under "Within Groups" especially investigates the variety in decision-making results that occur within individual groups specifically. With 159 degrees of freedom and a total of 47.40 squares, this component has a mean square value of 0.30. Additionally, it has 159 degrees of freedom. While it is true that this component adds to the overall variation, the most important issue that has to be addressed is the large variances in risk perception that exist across the different groups. In conclusion, the chi-square analysis sheds light on the substantial part that risk perception plays in determining the decisions that are made. Changes in risk perception have a significant impact on decision-making processes, as shown by the big F-statistic and the p-value that corresponds to it.

Table 5: **Mediation Analysis**

OUTCOME VARIABLE: Risk Perception

Model Summary						
R	R-sq	MSE	F	df1	df2	p
0.8946	0.8003	0.3065	573.169	1	143	0.00
Model						
	Coeff	se	t	p	LLCI	ULCI
constant	0.2997	0.1704	1.7589	0.0807	-0.0371	0.6365
Heuristic Bias	0.954	0.0398	23.9409	0	0.8752	1.0328

OUTCOME VARIABLE: Investment decisions

Model Summary						
R	R-sq	MSE	F	df1	df2	p
0.8721	0.7606	0.3267	225.521	2	142	0.00
Model						
	coeff	se	t	p	LLCI	ULCI
constant	0.3432	0.1778	1.9303	0.0556	-0.0083	0.6947
Heuristic Bias	0.3827	0.0921	4.1567	0.0001	0.2007	0.5647
Risk Perception	0.4825	0.0863	5.5879	0	0.3118	0.6531

Mediation analysis is a method that is used to investigate the connection between heuristic bias, perceptions of risk, and investing choices. The summary of the model reveals that the predictors, such as

heuristic bias ($R\text{-squared} = 0.8003$), are responsible for accommodating a significant proportion of the variability in risk perception. The fact that the F -statistic is 573.169 and the p -value is 0.00, both of which imply a strong predictive association between heuristic bias and risk perception, demonstrates that the model is significant in its whole. The coefficient of heuristic bias is 0.954, with a p -value of less than 0.001. This indicates that for every unit increase in heuristic bias, there is an estimated increase in risk perception of 0.954 units. The results of this study demonstrate the significant influence that cognitive biases have on the way people perceive danger. Furthermore, they emphasise the strong positive association that exists between heuristic bias and risk perception.

The model summary demonstrates that the combined impact of heuristic bias and risk perception may account for a large amount of the variation in investment choices ($R\text{-squared} = 0.7606$). This is noteworthy since it explains a considerable portion of the variance. Both risk perception and heuristic bias are significant predictors of investment choices, as shown by the F -statistic of 225.521 and the p -value of 0.00, which demonstrates the overall relevance of the model since it demonstrates that the model is significant. According to the precise measurement of the heuristic bias coefficient, which is 0.3827 ($p < 0.001$), it can be seen that investment choices tend to rise by around 0.3827 units for every unit of heuristic bias increase. Furthermore, it is worth noting that the coefficient for risk perception is 0.4825 ($p < 0.001$), which signifies that the decision-making process for investments increases by around 0.4825 units for every higher unit of risk perception. Taking into consideration the findings, it seems that heuristic bias and risk perception each have their own unique effects on investing choices. There is a correlation between those who demonstrate greater degrees of heuristic bias and risk perception and the likelihood that they would make certain financial decisions. Regarding the connection between heuristic bias and investing decisions, the study on mediation places particular focus on the function that risk perception plays. Understanding the intricate link that exists between heuristic bias, risk perception, and investing choices is a crucial contribution that this study makes. These results highlight the need of taking into account cognitive biases and risk perception when attempting to comprehend and forecast the decision-making behaviours of individuals, especially in the context of financial decision-making.

DISCUSSION

This research investigates the relationship between heuristic bias and decision-making, using risk perception as a mediating variable. This study examines a noteworthy issue in the domains of cognitive psychology and decision sciences. Heuristic fallacies, which are distinguished by the use of cognitive shortcuts or recommendations, often lead to illogical decision-making in humans. Understanding how these biases affect decision-making processes, particularly through the lens of risk perception, has significant implications in several fields like banking, healthcare, public policy, and others. The study places significant importance on risk perception as a mediator between heuristic bias and decision-making results. Risk perception is a crucial element in making decisions when faced with uncertainty. It refers to the subjective assessment people make on the likelihood and severity of probable hazards. This research aims to clarify the basic processes by which heuristic biases affect decision outcomes, by examining risk perception as a mediator. This research improves understanding of the complex ways in which cognitive biases manifest in real-life decision-making settings and offers useful insights into potential strategies for mitigating their harmful effects (Holzmeister 2020).

However, the study faces certain methodological challenges and limitations that need a careful assessment. Using self-reported metrics to assess heuristic bias, risk perception, and decision-making increases the possibility of errors and response biases. Individuals may not always adequately admit or understand their cognitive biases, which may lead to measurement mistakes and potential distortions of the results (Fetscherin 2019). Furthermore, the reliability of self-reported risk perception may be affected when it does not accurately represent the genuine views of people, due to its vulnerability to subjective interpretations and contextual effects. Furthermore, although the study recognises the role of risk perception in mediating the relationship, it is important to consider other possible factors that might influence the connection between heuristic bias and decision-making results. Furthermore, the interplay of situational settings, variations in cognitive capacities, and emotional states might impact decision-making processes by interacting with heuristic biases. Future research might benefit from adopting a comprehensive approach to examining the complex elements of decision-making and including a wider array of factors into the study. Moreover, the study's cross-sectional methodology limits its ability to establish causal correlations or infer temporal linkages between the variables. In order to get more dependable evidence of causation, it may be more appropriate to use longitudinal research or

experimental designs that change heuristic biases and monitor their impact on decision-making over a prolonged duration. Furthermore, the magnitude and constitution of the study's sample might influence the relevance of the findings. Future research should aim to replicate the study using larger and more diverse samples to enhance the reliability and application of the findings across other situations and demographics.

CONCLUSION

Overall, the study examining the relationship between heuristic bias, decision-making, and risk perception as a mediator offers useful insights into the intricate interplay of cognitive processes that drive human decision-making. The study carefully analyses the significant influence of heuristic biases on decision outcomes, highlighting the role of risk perception in moderating this relationship. The research offers valuable insights into how cognitive biases impact decision-making processes by investigating risk perception as a mediator. Consequently, a deeper understanding of how people traverse complex choice situations is attained. Despite the challenges in methodology, such as relying on self-reported data and using a cross-sectional design, this study provides an important addition to the growing body of research in decision sciences and cognitive psychology. This emphasises the need of considering cognitive biases and subjective risk perceptions when trying to understand decision-making behaviour in different areas. Moreover, the study findings have practical importance in enhancing the effectiveness of decision-making processes and developing targeted treatments to reduce the harmful effects of heuristic biases in real-life situations. Future research may aim to address the methodological limitations of the current study by using longitudinal designs, experimental manipulations, and bigger and more varied groups. Moreover, by investigating possible moderators and mediators of the association between heuristic bias and decision outcomes, we might improve our understanding of the underlying processes. Researchers may contribute significantly to the progress of knowledge in this subject by assisting in the development of evidence-based techniques that improve decision outcomes and promote the adoption of more informed and rational decision-making procedures in many areas.

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