

A Study on Cognitive Factors Affecting Decision-Making of Investors during Covid-19

Stutee Mohanty^{1*}, B. C. M. Patnaik¹, Ipseeta Satpathy¹, Suresh-Kumar Sahoo²

¹Department of Finance and HR/OB, School of Management, KIIT-University, Odisha, India

²Department of Finance, Faculty of Management Studies, Sri-Sri University, Odisha, India

Received December 5, 2021; Revised February 3, 2022; Accepted March 15, 2022

Cite This Paper in the following Citation Styles

(a): [1] Stutee Mohanty, B.C.M. Patnaik, Ipseeta Satpathy, Suresh-Kumar Sahoo, "A Study on Cognitive Factors Affecting Decision-Making of Investors during Covid-19," *Universal Journal of Accounting and Finance*, Vol. 10, No. 3, pp. 635-642, 2022. DOI: 10.13189/ujaf.2022.100301.

(b): Stutee Mohanty, B.C.M. Patnaik, Ipseeta Satpathy, Suresh-Kumar Sahoo (2022). *A Study on Cognitive Factors Affecting Decision-Making of Investors during Covid-19*. *Universal Journal of Accounting and Finance*, 10(3), 635-642. DOI: 10.13189/ujaf.2022.100301.

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Abstract Decisions of an individual or investors' financial decisions are affected by behavioral or cognitive factors and not just knowledge. Decision-making is not in every case rational by nature. Investors make irrational decisions many times due to the influence of various cognitive factors. Moreover, the ongoing Covid-19 pandemic has added to the uncertainty around us. Every possible sector of business has been affected by it including financial markets. Aberration in investor behavior during this phase has also been observed and has led to deterrence in investors' financial decisions. The present study intends to focus on analyzing empirically and ascertain the impact of Covid-19 on the behavioral & cognitive aspects of financial investment. Primary data has been used for the purpose and was collected by distributing a structured questionnaire among the participating investors chosen by using the convenience sampling method. The sample size of the study is 200 practicing individual investors. Statistical tools like Descriptive Statistics, Correlation, Reliability, and Multiple Regression Analysis were employed for analyzing the data. In this paper, it is found that herd behavior lacks consistency and significance with anchoring having the highest impact on financial decisions taken by investors. The framing effect also has a very high influence on the financial decision-making process of investors. This research will be useful for the government and the policymakers in the country, brokerage houses, retail investors, financial analysts, and asset management companies. As Covid-19 is a time-

bound phenomenon, financial decisions of investors may change when the situation normalizes.

Keywords Cognitive Factors, Decision-Making, Investor Behavior, Financial Decisions, Covid-19

1. Introduction

Cognitive factors play a crucial role in determining the financial decisions of investors and have been identified by researchers, financial experts, and policymakers in India and around the world. Published reports that are available in this field, both theoretical and empirical, are increasing every passing year. The thinking patterns of individuals, both adaptive and maladaptive, determine their decisions and behavior as per the perception of the situation. Investors are assumed to be very serious and careful about their investments and consequently, wary of risk, return and market value. They collect all the relevant existing information and impartially analyze and choose stocks that are doing well in the market. Traditional theories of economics and finance are based on the assumption of human beings being 'rational'. Even then, people often make errors by not following Modern Portfolio Theory (MPT), namely, expected return, standard deviation, and correlation. Research studies reveal that investors are influenced by psychological and social factors and are not always rational. People behave

irrationally in a very systematic manner [1]. Behavioral finance incorporates the deviations from rational investor behavior into financial markets and its models by developing various theories based on psychological and social factors. In this study, we examine a few cognitive factors, precisely mental accounting, herd behavior, anchoring, and framing effects. Cognitive operations that help individuals and households in organizing, evaluating, and recording financial activities are called mental accounting [2]. Herd behavior primarily focuses on individuals acting together as a group, including decision making, which is practically not possible as an individual. The tendency of a participating investor to evaluate the behavior of other involved investors in the market is known as herding behavior [3]. The anchoring effect is a part of heuristics theory that propagates the idea of an individual's decisions being influenced by an 'anchor' or a reference point. Anchoring is a heuristics concept involving the irrelevant news or information being used by an investor as a point of reference while making any financial or investment decisions [4]. The framing effects are cognitive factors that help people evaluate numerous options available to them based on positive or negative connotations; e.g. as a loss or as a gain. Framing effects being treated as cognitive phenomena allow the decision-makers to opt for solutions that are inconsistent in nature while dealing with a problem that is an identical issue [5]. The Covid-19 pandemic has made the situation around us very murky. So, this study analyses the impact of these cognitive factors on the financial decision of participating investors during the ongoing Covid-19 pandemic.

2. Need and Significance of the Study

Investors are finicky with their financial choices and preferences due to numerous cognitive and social factors. In the scenario of the Covid-19 pandemic, it is increasingly important to conduct a study assessing the impact of cognitive factors affecting the financial decisions of investors. This study will be helpful to individual investors, brokerage firms, retail investors, and asset management companies to understand the psychology of financial decision-making of investors. The present study also intends to examine the behavioral aspects of potential investors that are important for analysts in designing a proper framework of assets for the portfolio of their clients.

3. Literature Review

Behavioral science, cognitive psychology, and finance put together have given birth to this new field of behavioral finance which engages in studying the financial decision-making processes of individuals. This has created a buzz in both industry and academia. So, a lot

of research in recent years has gone into it. Behavioral finance examines the application of psychology to finance, with a focus on individual-level cognitive biases [6]. Emotions and cognitive errors affect individual investors' behavior and financial decisions as explained by behavioral finance theories based on psychology [7]. There have been varied observations on investors' behavior and their financial decisions during the current Covid-19 pandemic. A glimpse of contemporary thoughts on cognitive factors influences investor behavior and decisions, both before and during Covid-19.

3.1. Impact of Cognitive Factors Affecting Investor Behavior and Their Financial Decisions Prior to Covid-19

Financial knowledge is necessary for imbibing proper financial skills in oneself and strengthening the financial decision-making process of investors but cognitive factors can be overpowering in many instances. Investors herd at global stock markets despite having proper financial knowledge and are perceptive to external news [3]. Cognitive factors have a history of influencing investors' behavior and their decisions in the pre-Covid-19 phase. There are specific cognitive factors that have been identified through reports published by prominent researchers influencing the degree of decision-making of financial investors. Cognitive factors including overconfidence, optimism, herd behavior, fear of loss, positive attitude, consultancy, and cognitive bias contribute 61.67% variance to the decision-making of investors [8]. Overconfidence, anchoring, herding, loss aversion, and regret aversion moderately influence investors; on the other hand, market factors highly influence the decision-making of investors [9]. Overconfidence bias and its influence on investors' decision-making in the Tehran stock exchange market are observed to be significant [10]. Overconfidence and illusion of control affect investors' decisions significantly [11]. Psychological biases such as overconfidence, anchoring, regret, and loss aversion affected the decision-making of investors of the Bhubaneswar Stock Exchange [12]. Herding, overconfidence, and regret aversion of investors are also found to affect their financial behavior and decisions [13]. Herding, prospecting, risk aversion, and anchoring impact the financial behavior and decisions of investors in Kenya with herding having the highest influence and risk aversion factor having the least impact [14]. Overconfidence, confirmation, the illusion of control, loss aversion, and excessive optimism have a positive impact on the financial behavior and decisions of investors but mental accounting does not bear any significance [15]. There is strong evidence that suggests that overconfidence, loss aversion, framing, and the status quo bias significantly influence the decision of Nigerian investors [16]. Investors are also found sensitive to framing effects and loss aversion [17]. Overconfidence,

availability bias, herding, market, prospecting, and anchoring have moderate impacts on investors' decision-making [18]. Heuristics are mental shortcuts that lead individuals to make efficient judgments that ultimately solve their problems. Heuristics leads to a proper and sound financial solution [19]. Though it reducing the time needed for decision making in many cases is observed to be responsible for cognitive biases and errors. Complex and uncertain decision-making is made easier by heuristics within a short time frame and results in problem-solving but cognitive errors are common in such conditions [20]. Financial decision-making is simplified by heuristics and as the latter recognizes a definite evaluation criterion despite cognitive biases cropping up frequently [21].

3.2. Impact of Cognitive Factors Affecting Investor Behavior and Their Financial Decisions during Covid-19

Cognitive factors have also played a substantial role in determining investors' behavior and their financial decisions during the Covid-19 pandemic. It is observed that cognitive factors impact the financial decision-making process of investors negatively during the Covid-19 pandemic [22]. All kinds of cognitive factors are found to be relevant during Covid-19 [23]. Specific cognitive factors affecting the behavior and financial decisions of investors have been identified by many researchers. Further, overconfidence bias has any kind of positive effect on the financial decision-making of investors during the Covid-19 pandemic [24]. Overconfidence, representation bias, risk aversion, herding behavior, and availability bias are the most relevant cognitive phenomena in the ongoing Covid-19 pandemic [25]. Overconfidence, representation bias, risk-aversion, herding behavior, and availability bias affect investors' financial decisions both positively and negatively during Covid-19 depending on their individual situation in the market at a given point in time [26]. The presence of overconfidence and optimism bias is responsible for rising markets when there is economic distress in India and Behavioral Finance perspectives are involved in panic selling that caused the biggest market crash ever in the history of Indian capital markets [27]. An investor's gender also influences cognitive biases in the financial decision-making process [28]. It is observed that overtrading and overconfidence play a very significant role in impacting investor behavior in this Covid-19 pandemic [29]. Given the prevalence of herd behavior during the Covid-19 pandemic, the trading strategies of the investors should be developed accordingly [30].

4. Research Gap

It is observed from the available literature that extensive research on the proposed topic has not been

conducted during the ongoing Covid-19 pandemic. As a consequence, the impact of essential cognitive factors such as mental accounting, herd behavior, anchoring, and framing effects on investors' behavior and financial decision-making process has not been adequately studied. Hence, the study is being conducted to address this research gap.

5. Research Objective

To examine the influence of cognitive factors on financial decisions taken by individual investors during the Covid-19 menace.

6. Research Methodology

A sample questionnaire was designed to fulfill the requirements of the study for the collection of data from primary sources. The scope of the study includes a few cities of India namely Bhubaneswar, Kolkata, Mumbai, Ahmedabad, and Delhi. Based upon the review of the literature and identifying the research gap, a well-structured closed-ended questionnaire was designed and circulated among the respondents for tapping the different dimensions of cognitive factors affecting financial decisions of investors during Covid-19 pandemic. Out of 250 questionnaires circulated, 230 filled-up questionnaires were collected, amounting to approximately 92% of the total questionnaires. After due scrutiny of filled-up questionnaires, 30 questionnaires were found incomplete either concerning demographic or any specific question. The final sample size taken for the study was 200. After a proper discussion on the available literature regarding cognitive biases and investors' financial behavior, we considered four independent variables (mental accounting, herd behavior, anchoring, and framing effects) and one dependent variable (financial decision). A Likert scale has been used for this study, ranging between 5 (represents "Strongly Agree") to 1 (represents "Strongly Disagree"). Various statistical tools have been used for data analysis in this study such as Descriptive Statistics, Reliability, Correlation, and Multiple Regression Analysis.

7. Hypotheses

Mental Accounting and Investors' Decisions

Mental accounting is a key factor that influences the real estate investment decisions of an investor than capital market investment decisions [37]. It has a huge impact on the decisions of an investor leading to deviation from basic theories of traditional finance [38]. It affects the household budget of individuals and their investment decisions [39]. Mental accounting has a significant impact

on individual stock returns affecting an investor's decisions [40]. It leads to investors applying various theories and techniques while managing their funds with the specific aim of maximizing returns and minimizing risk. This inclines them to cognitive errors that can adversely impact their decision-making process as emotions play a dominating role in this case [31]. Thus we propose the hypothesis:

H_{a1}: Mental accounting has a noticeable effect on financial decisions taken by investors during Covid-19.

Herd Behavior and investors' decisions:

Herding is extremely common in the Indian capital markets and affects the behavior and financial decisions of Indian investors [41]. It is an indispensable aspect of capital markets that affects investors' financial decisions [42]. It is common among investors which reduces their profitability [43]. Herd behavior is found among Egyptian investors which affects their decision accuracy [44]. It is not found among Indian investors while investing in efficient markets [45]. A negligible number of researchers have found herd behavior to be relevant in the Indian and global financial markets. It significantly influences investors' financial decision-making process if there is a financial market downside [32]. Hence, we propose the hypothesis:

H_{a2}: The presence of herd behavior affects investors' financial decisions during Covid-19.

Anchoring and investors' decisions:

Anchoring highly influences the financial decisions of an investor in the cryptocurrency markets [46]. It is found among Pakistani investors while making high-risk financial decisions [47]. Anchoring does not influence independent investors but it has a significant impact on investment banks and brokerage firms in Kenya [48]. It is

exhibited by Indian investors while taking portfolio investment decisions [49]. Financial decisions are often affected by psychological benchmarks called anchors that subsequently generate cognitive bias related to the investors and their returns on investment. Any change about anchors can have an impact on the process of decision-making of investors [22]. Thus, we propose the hypothesis:

H_{a3}: Anchoring substantially influences investors' financial decisions in the current Covid-19 phase.

Framing effects and investors' decisions:

Framing effects exist when a group of investors together makes a financial decision in China [50]. They are common among fund managers as they plan their investment decisions in the country [51]. Researchers in many instances have concluded that framing effects come into prominence while investors are on the verge of making an important financial decision. Investors display the most persistent framing effects while making financial decisions during adverse market situations [17]. Thus, we propose the hypothesis:

H_{a4}: The impact of framing effects on financial decisions of investors is significant amidst Covid-19.

8. Results, Data Analysis, and Interpretation

An attempt has been made to provide a broad overview of the demographic features of all the participating investors. Multiple regression analysis has been applied to study the impact of independent variables on the dependent variable.

Table 1. Demographic Profile

Demographic Features		Frequency	Percentage
Sex	Male	140	70.00%
	Female	60	30.00%
Age	21-30	80	40.00%
	31-40	103	51.5.0%
	41-50	16	8.00%
	51-60	1	0.50%
Marital Status	Married	140	70.00%
	Single	60	30.00%
Educational Status	Under-graduate	170	85.00%
	Post-graduate	30	15.00%
Job Experience	0-5 years	60	30.00%
	6-10 years	50	25.00%
	11-15 years	40	20.00%
	15-20 years	37	18.50%
	21+ years	13	6.50%
Monthly Income	< 50,000 INR	5	2.50%
	> 50,000 INR	150	75.00%
Investment Control Frequency	Everyday	30	15.00%
	Weekly	40	20.00%
	Monthly	55	27.50%
	Quarterly	60	30.00%
	Unspecified time	15	7.5%

(Source: Compiled and Computed)

It is clearly evident from the table 1 that the majority of the investors belong to males (70.00%) followed by females (30.00%). The majority of the investors fall under the age group of 31-40 years (51.50%) followed by 21-30 years (40%). 85% of the respondents are undergraduates followed by post-graduates. It is found that investors having a work experience of 0-5 years focus their attention more towards investment whereas investors having a work experience of more than 20 years give negligible importance. It has also been identified that the majority of the investors invest every quarter and a negligible number of investors choose to invest as per their convenience.

Table 2. Reliability Test

Variable	Cronbach's Alpha
Financial Decision	.74
Mental Accounting	.78
Herd Behaviour	.56
Anchoring	.91
Framing Effect	.83

(Source: Compiled and Computed)

A reliability test is required for evaluating research quality. It determines whether a method, technique, or test measures the given variable consistently or not. If the reliability coefficient or Cronbach's alpha is between 0.9 and 0.8 then reliability is good, between 0.8 and 0.7, then reliability is acceptable, between 0.7 and 0.6, then reliability is questionable and between 0.6 and 0.5, then reliability is poor. Table 2 shows the Reliability Test for the cognitive factors studied by calculating Cronbach's alpha. The Cronbach's alpha for mental accounting is 0.78, herd behavior is 0.56, anchoring is 0.91, and framing effect is 0.83. So, every variable is steady except for herd behavior whose reliability is poor. Hence, its consistency is questionable and it can vary from study to study depending on the demographics.

It is observed from the table 3 that the financial decision has the highest mean value of 4.23, which indicates that financial decisions are highly affected by cognitive factors among the respondents. Herd behavior

has the lowest mean value of 3.20, which implies the least impact on financial decisions taken by investors. The result of the coefficient of correlation determines that the relationship between dependent and independent variables is positively correlated. The result of the p-value shows <0.05 establishes the significance level of the variables involved. Hence, it identifies that anchoring has the highest level of significance while herd behavior is the least among all independent variables for financial decisions.

Table 3. Descriptive Statistics & Correlation

Variables	Mean	Std. Deviation	Pearson Correlation(r)	p-value
Financial Decision	4.23	.54	1	
Mental Accounting	3.53	.83	.47	.00
Herd Behavior	3.20	.58	.29	.03
Anchoring	3.63	.81	.48	.00
Framing Effects	3.37	.77	.29	.00

(Source: Compiled and Computed)

The regression analysis has been used to study the relationship between independent variables (mental accounting, herd behavior, anchoring, and framing effects) and dependent variables (financial decision). The results show R square = .26 i.e, 26.00%, which indicates the financial decisions are determined by mental accounting, anchoring, framing effects, and herd behavior. The adjusted R square value is 0.24. This represents that even predictors which are not significant in the model (herd behavior) account for determining 24.00% of the financial decisions. Hence, behavioral factors do have a significant influence on the investors' financial decisions during Covid-19.

The equation below refers to a regression model:

$$FD_i = \alpha + \beta_1 MA_i + \beta_2 HB_i + \beta_3 A_i + \beta_4 FE_i$$

It has been observed from the table 4, the p-value is 0.01 (p < 0.05) and the Standardized Coefficients Beta is 0.24, which indicates that mental accounting has a significant effect on the financial decisions of investors. Therefore, H_{a1} is supported.

Table 4. Regression Analysis

Variables	R Sq.	Adjusted R Sq.	f-value	Std. Coefficients Beta	t-Value	p-Value
Fin.Decision					9.46	.00
M.Accounting				.24	2.55	.01
H.Behavior				.06	0.83	.39
Anchoring	0.26	0.24	16.24	.42	3.46	.03
Framing Effects				.33	3.31	.01

(Source: Compiled and Computed)

Herd behavior influences the financial decisions of an investor positively but is insignificant with its p-value being 0.39 ($p > 0.05$). It has a very low effect on them with Standardized Coefficients Beta being 0.06. Therefore, H_{a2} is refuted.

The P-value is 0.03 ($p < 0.05$) and the Standardized Coefficient Beta is 0.42, which indicates that anchoring has a significant effect on the financial decisions of investors. Therefore, H_{a3} is supported.

The P-value is 0.01 ($p < 0.05$) and the Standardized Coefficient Beta is 0.33, which indicates framing effects have a positive influence on investors' financial decisions. Hence, H_{a4} is supported.

9. Conclusion and Suggestions

This study was primarily conducted to analyze the influence of cognitive factors on the financial decision-making process of practicing individual investors during the Covid-19 pandemic. Through the analysis, it is concluded that anchoring has the highest effect on the financial decision-making process of an investor, whereas herd behavior has the least impact on it. Herd behavior is insignificant and its consistency is also questionable. Therefore, an individual would ignore any external news while making financial decisions. It also proves that framing effects have a significant influence on investors' decision-making processes. A few suggestions to prevent cognitive errors in the decision-making process of investors are being presented. It is paramount for an investor to possess a certain level of financial knowledge. This will help in reducing the chances of the investor being manipulated by a third party. External factors that can lead to aberration in investor behavior and financial decisions can also be avoided. Institutions should create awareness to help their employees come up with sound financial decisions. Policymakers need to implement a proper strategy along with these institutions to build a robust foundation for investors. Government should provide authentic information to individual investors regarding investments and financial markets. The investment avenues may be properly aligned to the needs of the individual investors.

10. Implications

This study will be useful for brokerage firms, retail investors, financial analysts, and asset management companies to understand cognitive factors influencing investors' financial decisions. Asset management companies only focus on the sale of various schemes and products. Through this paper, asset management companies can also concentrate on designing a robust portfolio for their clients. The present study will help retail investors, financial analysts, and brokerage firm

managers acquire proper knowledge to make fruitful financial decisions. Further, it also offers a new dimension of studying the behavioral and cognitive aspects of financial decision-making.

11. Limitations and Future Prospects

Covid-19 is a time-bound phenomenon and investor behavior may change when the situation normalizes. Moreover, respondents might also be conscious of their behavior while responding to the questionnaire provided to them. The inclusion of more cities, increased sample size, extensive & intensive study of critical dimensions of cognitive aspects influencing financial decision-making may broaden the scope of further studies.

Funding

The authors have not received any funding for this research.

Acknowledgments

The authors are very grateful to the KIIT Research Foundation for allowing us to conduct this research. They would also like to thank KIMS ethical committee for the ethical clearance of this research work (HirsRef. No.: KIIT/KIMS/IEC/726/2021).

Conflict of Interest

The authors declare no conflict of interest in this study.

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