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Mitigating Role of Covid-19 in Relationship between Behavioural Factors of Investors

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ABSTRACT

The efficient market hypothesis (EMH) forms the basis of classical financial theories, assuming the rationality of investors. However, this hypothesis often proves inadequate in financial markets due to investors' tendency toward irrational behaviour. Behavioural finance investigates how individual investors analyse and interpret information when making investment decisions. This study explores the relationship between behavioural factors and investment decision-making, considering the moderating effect of COVID-19. Using convenient sampling and structured questionnaires, the researcher collects data from 364 investors actively trading on the Pakistan Stock Exchange. Structural Equation Modelling (SEM) with Smart PLS 4 software is employed as the research method to assess the influence of independent variables on the dependent variable, moderated by COVID-19. This research aims to encourage investors to carefully consider their decisions before investing and understand how psychological factors may impact their investment choices. The findings indicate a positive association between behavioural factors and investment decision-making, alongside a negative impact of COVID-19. This study is beneficial for both individual and institutional investors as it underscores the importance of behavioural factors (herding, loss aversion, and risk perception) in investment decision-making within the context of Pakistani investors.

1. Introduction

Investing capital in various financial instruments such as stocks, bonds, or insurance requires thorough deliberation and analysis. While investors typically aim for maximum returns and minimizing risksthe process involves more than mere theoretical considerations. Investors must carefully assess both internal and external determinants before committing to an investment. External factors encompass elements such as the company's current and historical performance, growth prospects, financial forecasts, and expert recommendations. However, internal factors can sometimes constrain or distort the decision-making processes of investors. Psychological biases and inclinations frequently disrupt rational thinking among investors (Robin & Angelina, 2020). Behavioural finance explores how individual investors process and assess information when making risky investment decisions. It encompasses the mental faculties involved in attention, memory, reasoning, problem-solving, decision-making, and comprehension. In psychology, cognition pertains to the processes of the mind, thinking, and intelligence. In essence, cognition refers to higher mental functions such as thinking, feeling, logical reasoning, analytical skills, problem-solving, and decision-making. Decision-making can be described as the process of selecting a particular option from a range of alternatives. While the fundamentals of an organization remain unchanged, the stock market fluctuates daily. Decision-making involves a cognitive process that leads to choosing one statement among several alternative possibilities. It culminates in a final decision or selection (Ishfaq, Maqbool, Akram, Tariq, & Khurshid, 2017). The efficient market hypothesis (EMH) serves as the foundation for classical financial theories, assuming the rationality of all investors. However, this hypothesis often fails in financial markets due to the tendency of investors toward irrational behavior (Wen, Yang, & Jiang, 2022). Financial markets are frequently guided by diverse patterns of investor behavior particularly during periods of stress as evidenced by several studies. Emotional responses to stressful events can result in irrational decision-making by both investors and managers. The recent onset of the coronavirus pandemic has spurred numerous scientific inquiries into the disruption of financial markets. COVID-19 has not only adversely affected public health but also financial markets and the broader economy, introducing an unprecedented level of uncertainty. The Stability Report highlights the significant repercussions of the pandemic on financial systems, warning that further escalation of the crisis could jeopardize global financial stability. Several studies have provided evidence of the detrimental effects of the COVID-19 outbreak on financial markets, attributable to investor fear and anxiety. (Bogdan, Suštar, & Draženović, 2022). A multitude of psychological and technical factors contribute to shaping investment decisions. Individual investors' decisions tend to fluctuate in response to market volatility. Various theories have been proposed to understand individual investor behavior, highlighting the importance of studying investors' psychological behavior and decision-making processes under diverse circumstances. Financial specialists possess the ability to thoroughly evaluate aspects such as income validation, financial reports, market trends, risks, and returns of an investment, providing validation to investing companies. Conversely, individual investors lack the same level of expertise and validation, making them susceptible to psychological influences, particularly in high-stress situations such as those presented by COVID-19, SARS, or Swine flu outbreaks. Given that financial specialists rely on both advertised estimations and intuition, it can be inferred that general investors are significantly influenced by psychological factors, particularly during times of heightened uncertainty. Therefore, the psychological elements at play in investment decisions need thorough examination, especially under circumstances like those brought about by the aforementioned health crises (Kiruba & Vasantha, 2021). A comprehensive

understanding of psychology of investor is essential to address these inquiries. In the 1980s, the challenge was met by shifting traditional finance towards a new paradigm known as behavioural finance. Behavioural finance explores the cognitive, emotional, and psychological biases that shape investor decision-making. These behavioural factors contribute to inconsistencies with the efficient market hypothesis. The Pakistani stock market is regarded as dynamic, with investor behaviour exhibiting continuous variability. This highlights the necessity for research aimed at identifying the diverse behavioural factors influencing investor behaviour towards investment. The current unprecedented COVID-19 pandemic has created an exceptionally uncertain market environment. Investor intentions may diverge during this period due to the unprecedented nature of the pandemic's impact on financial markets (Khurshid, Ahmed, & Irrum, 2021). The Prospect theory made a significant contribution to behavioral finance. This theory elucidates how investors make decisions when faced with probabilistic alternatives involving risk and known probable outcomes. Moreover, the impact of these behavioural biases varies between developed and dynamic markets (Kahneman & Tversky, 1979). Each investor is subject to unique behavioral biases due to their individual personalities. These biases often lead investors to make irrational investment decisions, which can have significant consequences on their performance. Investors frequently exhibit irrational behavior following successful investment breakthroughs. Since the 1990s, theories of behavioral finance have evolved continuously, with theorists presenting ample compelling evidence that the anomalies present in the market and investors' irrational behavior cannot be adequately explained by the efficient market hypothesis alone. Several behavioral finance theorist and researchers have highlighted in their studies that the irrational behavior exhibited by humans in financial markets remains unaffected by training, even among fund managers. Within the context of behavioral finance, previous researchers have examined numerous factors that can influence the performance of individual investors, including financial knowledge, limited information, perceptual errors, fundamental heuristics, bounded rationality, intuitive reasoning, behavioral biases, cognitive and emotional weaknesses, income level, previous investment experience, investors' qualifications, and demographic characteristics. Among these factors, perceptual errors or behavioral biases are considered particularly significant, exerting a profound influence on the performance of individual investors (Shafqat & Mohti, 2022). The substantial decrease in stock prices observed during the COVID-19 pandemic highlighted the significant role played by psychological factors in shaping stock investment decisions. several studies have explored the psychological determinants impacting stock investment decisions. Psychological aspects steer stock investors towards biased decision-making, characterized by irrational behavior. Investors tend to exhibit greater pessimism than optimism in their stock transactions, leading to volatile fluctuations in stock prices. The factors such as risk perception, loss aversion, and herding behaviour constitute integral components of investor psychology that influence investment decisions (Silalahi, Hafizh, Nasution, & Sugianto, 2020). The COVID-19 pandemic poses a significant threat to economic stability due to restrictions that diminish economic activity. Investment decisions inherently entail uncertainty and risk concerning the future. However, investors may also incorporate psychological factors into their decision-making process. It has been noted that individuals occasionally make irrational decisions and misjudge situations based on various factors (Dita, Heryana, & Basuki, 2023). The economic impact of COVID-19 significantly changes how individuals perceive and behave in terms of investment. Consequently, investment decision-making undergoes changes as people adapt to this new economic landscape. This influence is particularly significant in uncertain environments, where investment decisions are made. It is crucial to examine how the negative shock of COVID-19 affects households, which are integral to the micro-level economic system. Understanding responses of

individuals within households to the pandemic, in terms of both perceptions and behaviors, requires further research to gain insight into how they navigate financial investment decisions during this challenging circumstance (Iqbal & Li, 2022). Individuals may anticipate or undergo reductions in income or wealth, triggering emotional responses and fostering more cautious behaviors. Lockdowns limit consumption opportunities, prompting involuntary increases in savings, while heightened uncertainty prompts individuals to boost precautionary savings (Meunier & Ohadi, 2021). Combination of rational and behavioral factors influence the investment decisions, with the covid-19 it worsens the effect of psychological biases on investment decisions and outcomes (Shafqat & Mohti, 2022).

1.1 Problem Statement

The decisions made by investors in the stock market specially in times of uncertainty significantly influence market trends, subsequently impacting the economy. To adequately comprehend and explain decisions of investor, it is essential to investigate the behavioral factors influencing decision-making at the Pakistan Stock Exchange and examine how the COVID-19 pandemic affects this relationship. Investors and financial experts need to know the uncertainty and volatile landscape of investment decisions during the pandemic. These diverse challenges and uncertainties in global investment brought by covid-19 has changed the decision-making processes of investors (Khurshid et al., 2021; Sadiq, 2015). Although the factors influencing investor decision-making have been well studied in traditional financial scenarios, it is essential to examine how these factors function in the context of the pandemic and its profound consequences. Investor decisions sometimes include the interaction of emotions and feelings which are influenced by economic conditions, perception of risk, negative behavior, and below-average investment performance (Iqbal & Li, 2022; Kaya, 2021).

2. Literature review

The unification of behavioral science, cognitive psychology, and finance has given rise to the emerging field of behavioral finance, which researches into examining the financial decision-making processes of individuals. This development has gained significant attention from both industry and academia (Mohanty, Patnaik, Satpathy, & Sahoo, 2022). Identifying that humans aren't always rational, financial decisions can often be influenced by behavioral biases. Consequently, the study of behavioral finance plays a crucial role in the realm of finance, where cognitive psychology seeks to understand human behavior, including that of investors. Several behavioral biases exert influence on individual investors (Wijaya & Zunairoh, 2021).

2.1 Influence of Behavioral Factors on investment decision-making

Traditional finance, as explained by the efficient market hypothesis, falls short in capturing behavior of investor during the investment decision-making. These theories struggle to separate the patterns of investor conduct in investment scenarios. Consequently, this creates opportunities for researchers to scrutinize the myriad factors influencing investor behaviors across diverse circumstances (Khurshid et al., 2021).

2.2 Herding Behavior

Herding bias demonstrates as inclination of investor to mimic the actions of the majority in the market rather than exercising independent judgment. This bias fosters irrational behavior, as investors give up dependence on their own experiences to emulate the patterns of prominent investors (Aslam,

Ferreira, Ali, & Kauser, 2021). When investment decisions depend on collective information rather than personal insights, the intrinsic value of shares may diminish. Consequently, herding behavior produces various consequences, including heightened stock price volatility, declining prices, calendar effects, disparities in stock returns, and an imbalance between prices and fundamental stock variables, thus challenging the efficient market hypothesis (Sadewo & Cahyaningdyah, 2022). There are several reasons which contribute to why herding bias affects investors' decision-making processes. Firstly, humans possess an innate tendency to conform to the herd, driven by the notion that majority consensus signifies correctness. Secondly, societal pressures compel individuals to conform to prevailing trends. Lastly, a lack of self-assurance prompts investors to succumb to herding bias, driven by the belief that collective decisions are less likely to be wrong (Robin & Angelina, 2020). Herding can be implicit, with investors emulating the actions or performance of their peers based on private or publicly available information about others' actions (Chang, McAleer, & Wang, 2020).

Mahmood, Ayyub, Imran, Naeem, and Abbas (2020) explored the influence of four behavioral variables namely heuristic, prospect, herding, and market variables within the context of the Pakistan Stock Exchange. These behavioral factors collectively exert the most significant impact on the investment decisions made by individual investors. Notably, herding is identified as having a positive impact on investment performance, with this variable demonstrating the highest positive influence among all behavioral variables on performance.

Bouri, Demirer, Gupta, and Nel (2021) explored how the recent novel coronavirus pandemic has influenced investor herding behavior in global stock markets. They demonstrate a significant correlation between herd formation in global stock markets and the financial market uncertainty brought about by COVID-19. The herding effect resulting from COVID-19-induced uncertainty is particularly pronounced in emerging stock markets and the European PIIGS stock markets, which encompass some of Europe's hardest-hit economies during the pandemic. This observation suggests that the prevalence of herding behavior varies depending on the economic development status of the studied economy. Their findings establish a direct connection between the recent novel coronavirus pandemic and investor behavior in financial markets, underscoring the role of catastrophic risks such as COVID-19 as potential drivers of behavioral patterns in financial markets.

Fang, Chung, Lee, and Yang (2021) investigated the multiple impacts of COVID-19 on the global landscape. Their findings indicate that the COVID-19 pandemic amplifies herding behavior across all Eastern European stock markets. First, they revealed that the COVID-19 crisis accentuates the impact of global market returns on herding behavior in most Eastern European countries. Second, they discovered that COVID-19 strengthens the spillover effect of regional herding on herding behavior in specific stock markets across almost all Eastern European countries. Finally, the asymmetric effects remain consistent across all the tests conducted in most Eastern European countries. Taking these into account, they reaffirm that COVID-19 heightens herding behavior, strengthens the influence of global market returns on herding behavior, and reinforces the spillover effect of regional herding on herding behavior in these countries.

2.3 Loss Aversion

Loss aversion bias characterizes a psychological inclination among investors, wherein losses are perceived as more impactful than gains, even when their magnitude is relatively equal. It entails a propensity to prioritize avoiding losses over pursuing profits, constituting a biased behavior that

conflicts with investor expectations of increased risk and diminished returns. Loss aversion bias underscores individuals' heightened sensitivity to losses compared to gains (Dita et al., 2023). Loss aversion bias closely resembles prospect theory, wherein individuals tend to experience twice as much distress from losses as they derive pleasure from gains. Loss aversion explains hesitancy of investors to invest or spend money. It amalgamates heightened sensitivity to losses relative to gains with a penchant for evaluation. Additionally, individuals might excessively focus on losses and gains due to an underestimation of their capacity to adapt to such fluctuations. Loss aversion behavior has been observed to significantly influence decision-making in the Saudi Arabian capital market (Rahawarin, 2023). Shafqat and Mohti (2022) examined the impact of loss aversion bias on the trading performance of individual investors, with a focus on the moderating effect of financial literacy. The results of the research offer strong evidence that the trading performance of individual investors is significantly affected by loss aversion behavioral bias. Loss-averse individual investors tend to adopt a pessimistic approach in their trading activities, driven by the emotional bias of loss aversion. Moreover, the negative correlation between loss aversion bias and trading performance highlights the manifestation of pessimism among individual investors. Sapkota (2023) explored loss aversion as a rule of thumb, highlighting a definite preference for avoiding losses over pursuing gains due to the heightened fear of loss compared to the allure of gain. The study found that loss aversion bias significantly influences equity investment decisions among individual investors in the Chitwan district. Hala, Abdullah, Andayani, Ilyas, and Akob (2020) demonstrated that individuals with heightened loss aversion tend to exhibit greater reluctance in making investment decisions and lean towards risk aversion. Such individuals are inclined to hold onto stocks longer in anticipation of recovering losses. Despite respondents in the study being experienced in asset auctioning, the results revealed a tendency to swiftly purchase assets offered at lower prices and vice versa.

Yuniningsih, Widodo, and Wajdi (2017) demonstrated the significant impact of loss aversion on decisions of investors regarding risk-taking in investments. The degree of sensitivity towards the fear of potential losses heavily influences the willingness to take risks. The level of risk tolerance ultimately determines whether an investor will adopt a risk-seeking or risk-averse stance. This suggests that decisions of investors regarding investments are often influenced by loss aversion.

2.4 Risk Perception

Risk perception serves as a communication channel that prepares investors to perceive risks based on their comprehension and psychological factors. The thought process and decision-making of individual investors about investments are influenced by the different levels of risk perceptions. It is demonstrated in multiple studies that the decision-making of investor is influenced by their risk attitude and perception of investment risk, both of which are essential factors in the investment decisions (L. Riaz & Hunjra, 2015). Risk perception is an important element in human behavior, especially when making decisions in uncertain situations. Individuals tend to assess and evaluate uncertainty in different ways, which often deviate from the norms of financial theory because of psychological factors and unpredictable behavior (Sukamulja, Meilita, & Senoputri, 2019).

Kaya (2021) emphasized the favorable influence of the pandemic on consumer purchase decisions, specifically in relation to risk perception and conformist inclinations. The negative effects of covid-19 pandemic resulted in higher risk perception, thus influencing the behavior of investors and risk tolerance. His findings revealed an increased investment behavior and risk appetite of investors, which

have been driven by the anticipation of economic and financial market improvement due to the reduction in the pandemic.

Natsir, Arifin, and Bangun (2021) examined the concept of Perceived Risk, which refers to an individual's perception of potential risks associated with decision-making. The findings of this study suggest that perceived risk significantly impacts investment intentions. Investors typically hold varying perceptions of risk, ranging from acceptance to neutrality and avoidance. To enhance individuals' willingness to invest, it is essential to mitigate the perception of the capital market as a risky environment. This can be achieved by providing education on the capital market, instilling confidence in its safety as an investment avenue. Additionally, educating individuals about stock products can help alter their perceived risk. When individuals perceive the capital market as a secure investment platform, their intention to invest is likely to increase.

Saputro and Lestari (2019), investigated the influence of risk perception on investment decision-making is substantial. Individuals who regard investment products as safer are more likely to be inclined to invest, whereas those with lower risk perceptions may exhibit reluctance in making investment decisions owing to their sense of potential risk. The significance of risk perception lies in its ability to offer valuable insights on risks and the adjusted rate of return on investments.

Almansour, Elkrghli, and Almansour (2023) examined a significant association between risk perception and investment decision-making. Their finding shows that investors who possess an increased awareness of risk are more likely to have a higher degree of caution when making investment decisions. This association has significant importance for Saudi investors who are engaged in activities inside the confines of the domestic stock market, which is subject to the effect of geopolitical occurrences, market instability, regulatory adjustments, and macroeconomic circumstances specific to Saudi Arabia.

2.5 Moderating Role of Covid-19

Kaya (2021) conducted a study aimed at uncovering the causal impact of the COVID-19 pandemic on risk appetite, a pivotal aspect of stock exchange investors' investment decisions and risk perception in Turkey. The study suggests that the pandemic's effect on decisions of investors is influenced by the expectation of a decrease in cases, leading to anticipated improvements in the economy and financial markets. This positive outlook has contributed to heightened investment behavior and risk appetite among investors. Furthermore, it is argued that reducing the impact of pandemics or crises could expedite the recovery of the negative economic environment during such challenging times. Additionally, investors can make more informed investment decisions by closely monitoring these developments, thereby identifying suitable investment opportunities amidst the pandemic period.

Wang, Zhang, Ahmed, and Muhammed Shah (2022) examined how Covid-19 affects economic indicators, causing disruptions in financial markets due to uncertainty. The study evaluated the interrelation between several microeconomic indicators and macroeconomic indicators, which significantly disrupt operations in financial markets. The primary focus of the study lies in analyzing the impact of investment behavior on the financial market during the Covid-19 pandemic. The study aims to explore the relationship between investment behavior and the financial market.

Gupta, Maheshwari, and Gaur (2021) conducted an investigation into the repercussions of the COVID-19 pandemic, which have profoundly affected numerous economic and social activities. Consequently, this has significantly influenced individuals' perceptions regarding the management of their income, savings, and investments. The crisis triggered by the pandemic has prompted investors to reevaluate their investment decisions due to concerns related to security, life risks, liquidity, among others. This study aims to ascertain whether investors' perceptions will undergo a transformation as a result of COVID-19, and to delve into the reasons behind any such shifts in opinions concerning investment avenues.

H1: Covid-19 moderates the association between behavioral factors and investment decision-making.

3. Methodology

The primary objective of this study is to explore how behavioral factors affect investment decision-making within the Pakistan Stock Exchange (PSX). Utilizing a quantitative methodology, the study seeks to establish connections between independent and dependent variables. The formulation of research questions was guided by the study's aims, followed by hypothesis development and the construction of a conceptual framework. The target population for this investigation comprises individual investors actively participating in trading on the Pakistan Stock Exchange. The cities chosen for data collection encompassed Islamabad, Lahore, and Karachi, where a significant portion of the targeted population resides. Despite being conducted in Pakistan; the study's findings might hold relevance for investors in stock markets across several other developing nations. Questionnaires were disseminated online with a clear purpose, facilitated by brokerage firm managers affiliated with the Pakistan Stock Exchange, who randomly distributed them to investors. The target population primarily consists of individual investors within the Pakistan Stock Exchange, for which a structured questionnaire was employed to gather data through a convenient sampling approach. The sampling method utilized in this study is non-probability sampling, chosen because the target population couldn't be precisely identified. Convenience sampling was adopted for participant selection in our study for reasons including respondent convenience, cost-effectiveness, and time constraints (S. Riaz, Ahmed, Parkash, & Ahmad, 2020; Shafqat & Mohti, 2022; Wijaya & Zunairoh, 2021). Data collection involved conducting a primary survey targeting individual investors who had engaged in stock or securities transactions on the PSX, both directly and through asset management companies, before and after the onset of the COVID-19 pandemic. The global health crisis resulted in a surge in retail investors in the Pakistani markets, particularly among the country's youth, who capitalized on market downturns during lockdowns. Furthermore, the historically low-interest rates offered by financial institutions attracted new participants to the stock market. Specifically, we distributed 364 questionnaires among Pakistan Stock Exchange investors and collected the completed questionnaires from respondents. Due to time limitations, the study exclusively focused on individual investors. These questionnaires, comprising 19 items, delved into theories of behavioral finance and factors influencing investors' decision-making processes. Through this questionnaire, significant items and critical factors were identified (S. Riaz et al., 2020). The questionnaire's questions are crafted to be concise and clear, aiming to minimize any challenges for the respondents while completing it. Upon data collection, it was noted that certain investors either improperly provided data, incorrectly filled out the questionnaire, or only responded to a

subset of questions. Consequently, these incomplete questionnaires were excluded from the analysis, following the approach outlined by (Abideen, Ahmed, Qiu, & Zhao, 2023). The Structural Equation Model (SEM) and Smart PLS software have been employed for testing hypotheses. The researcher has assessed the constructs for both direct and indirect effects. Additionally, SEM has been recognized as a primary methodology and has been utilized for regression models and techniques. It is also employed to explore the structural relationships between exogenous and endogenous variables, incorporating multivariate analysis and factor analysis. Moreover, it elucidates the causality of each construct to evaluate the cause-and-effect relationships, while other factors in the model demonstrate their causal effects simultaneously. Similarly, to ensure the application of bootstrapping techniques for both large and small sample sizes, this model is utilized. Bootstrapping is applied to examine both direct and indirect effects. To assess the outer model, the researcher has employed convergent and discriminant validity analyses using Smart PLS to ensure the validity and reliability of the instruments.
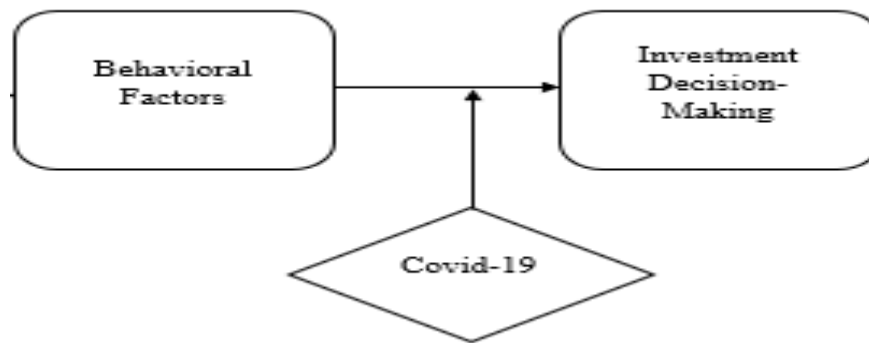
Conceptual framework

Figure1. Conceptual Research Model

After conducting a thorough analysis of the existing literature, the researchers have established a conceptual research model for this study. This model incorporates herding behavior, loss aversion, and risk perception as indicators for the behavioral factors (Independent Variable). Investment decision making is used as the dependent variable, while the study incorporates Covid-19 as a moderator.

4. Results

4.1 Demographic

The data in table 1 show demographic characteristics of the sample, it presents the gender distribution in a sample comprising 364 respondents. Among these, 306 respondents identify as male, accounting for 84% of the total sample, while female participants are 58, representing 16% of the sample. This analysis provides insight into the gender distribution of the sample relative to the total population. The primary age group within the participants is between 31 to 40 years, constituting 51% of the total sample. Following closely, participants aged 41 to 50 years represent the second-largest group, making up 23% of the sample. Notably, individuals aged 21 to 30 years account for 22% of the sample, indicating a significant presence of individuals in their twenties. There is a minor fraction 3% of participants aged 51 and above, suggesting a limited representation of older individuals in the study.

Additionally, the data reveals a mere 1% of participants below the age of 20, implying a minimal presence of younger individuals within the sample population. The most significant portion of participants, totaling 40% of the overall sample, hold a Bachelor's degree. Following closely behind are participants with a Master's degree, comprising 39% of the sample. Additionally, there are participants with educational levels at or below high school, accounting for 12% of the sample. Those with qualifications equivalent to a Ph.D. or higher make up 9% of the sample, indicating a smaller but still significant number of highly educated individuals. The largest portion of participants, comprising 38% of the total sample, have been actively involved in investments for a duration of 1 to 3 years. Following this, the second-largest group consists of participants engaged in investments for less than 1 years, making up 24% of the sample. Participants with a tenure of 4 to 6 years in investments account for 21% of the sample, those with over 10 years of investment experience represent 10% of the sample indicating a notable presence of individuals with a longer investment history. A fraction of participants, totalling 7% of the sample, have been involved in investments for less than 1 year. The majority of investors, totalling 57% of the total sample, favoured direct stock investments, while 43% preferred investing through an asset management company.

Table 1. Demographic Characteristics of the Sample.

| Demographic Characteristics	Frequency	Percentage
Gender		
Male	306	84%
Female	58	16%
Respondent's Age		
Less than 20 years	5	1%
21–30 years	79	22%
31–40 years	187	51%
41–50 years	83	23%
51 and above	10	3%
Respondent's Education		
High School or Below	42	12%
Undergraduate (Bachelors)	146	40%
Postgraduate (Masters)	144	39%
Postgraduate (PhD)	32	9%
Association time with Investment		
Less than 1 year	87	24%
1 – 3 years	139	38%
4 - 6 years	75	21%
7 - 10 years	26	7%
More than 10 years	37	10%
Investment Method		
Direct Investment (Stocks)	207	57%
Asset Management Company	157	43%

4.2 Assessment of Measurement Model
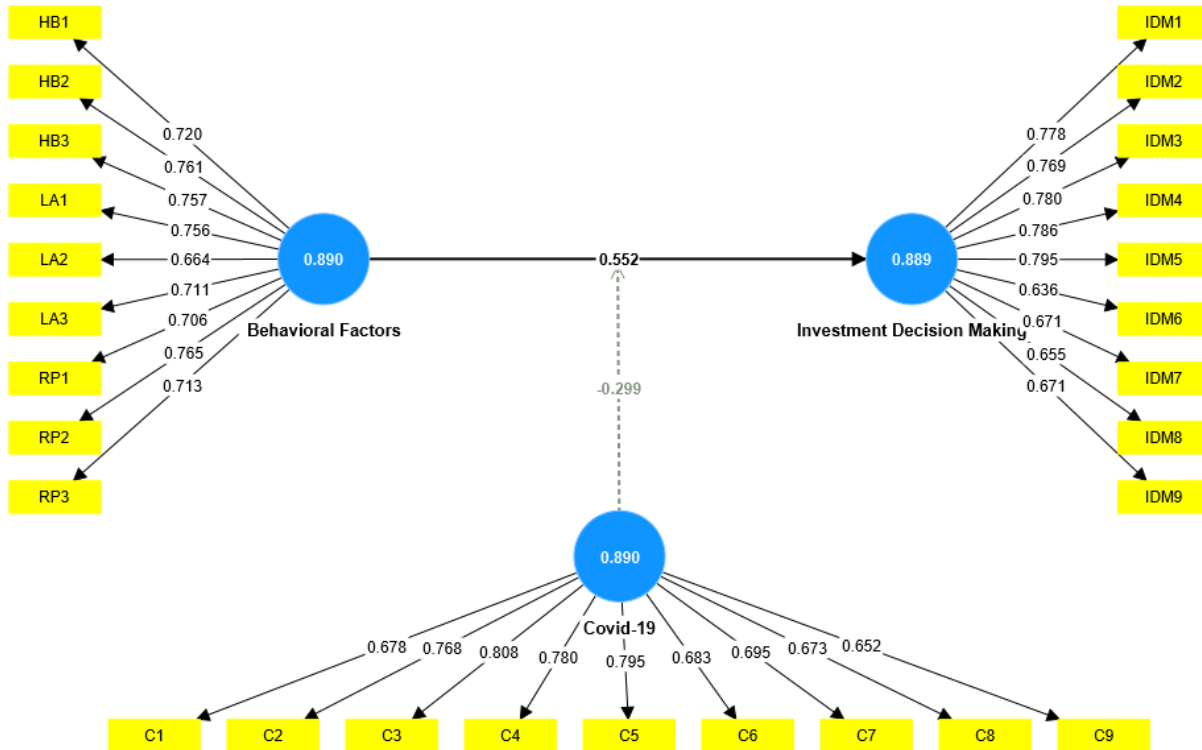
Figure 2. PLS SEM Measurement Model

4.3 Construct Reliability and Validity

When a researcher reuses questionnaires among similar populations with the aim of obtaining consistent results, it demonstrates the high repeatability and consistency of the survey. Composite Reliability is crucial for ensuring the stability of questionnaire outcomes. The primary objective is to uphold fairness and maintain quality, which encompasses the legitimacy and dependability of the research. In traditional social science research, Cronbach's alpha has been the standard for measuring internal consistency reliability. However, in Partial Least Squares Structural Equation Modeling (PLS-SEM), it tends to yield conservative measurements. Previous studies have recommended using Composite Reliability as an alternative (Joe F Hair, Ringle, & Sarstedt, 2011). Cronbach's alpha measures the internal consistency of variables it suggests that the reliability of the questionnaire is considered satisfactory when the values for each variable exceed 0.70. Table 2 displays values exceeding the required threshold indicating high levels of internal consistency reliability across all three reflective latent variables. Composite reliability is employed to gauge the instruments' reliability. Purwanto (2021) suggested a threshold value of 0.70 for composite reliability, and all values surpass this threshold. Furthermore, RhoA values exceed 0.70, also demonstrating satisfactory reliability in the model. Convergent validity indicates the level of agreement among at least two measures of the same construct; all constructs exhibit an Average Variance Extracted (AVE) greater than 0.5. To assess convergent validity, the AVE of each latent variable is examined. It is evident in the Table 2 that all AVE values surpass the acceptable threshold of 0.5, confirming convergent validity (Khurshid et al., 2021).

Table 2. Construct Reliability and Validity

	Cronbach's alpha	RhoA	Composite reliability	Average variance extracted (AVE)
Behavioral Factors	0.890	0.891	0.911	0.531
Covid-19	0.890	0.906	0.910	0.530
Investment Decision Making	0.889	0.896	0.910	0.523

4.4 Discriminant Validity Through HTMT and Fornell-Larcker Criterion

Discriminant validity assesses how distinct constructs are from each other empirically, taking the degree of disparity between overlapping constructs. Evaluation of discriminant validity involves techniques such as the Heterotrait-monotrait (HTMT) ratio of correlation and the Fornell & Larcker criterion. Discriminant validity is assessed through the Heterotrait-monotrait (HTMT) ratio of correlation. HTMT values close to 1 suggest a lack of discriminant validity. To utilize HTMT as a criterion, it is compared to a predefined threshold. If the HTMT value exceeds this threshold, it indicates a lack of discriminant validity. Some researchers propose a threshold of 0.85 (Ab Hamid, Sami, & Sidek, 2017). The values presented in the Table 3 indicates that the HTMT is satisfactory.

Fornell and Larcker (1981) proposed that the square root of the Average Variance Extracted (AVE) for each latent variable can serve as an indicator of discriminant validity, these values should exceed other correlation coefficients among the latent variables. According to Table 4, the square root values of AVE in this study exceed the correlation of the construct, meeting the requirement for discriminant validity. This outcome signifies that discriminant validity is adequately established (Al-Maroof & Al-Emran, 2018).

Table 3. Discriminant Validity through HTMT

	Behavioral Factors	Covid-19	Investment Decision Making
Behavioral Factors	1		
Covid-19	0.092	1	
Investment Decision Making	0.645	0.310	1
Covid-19 x Behavioral Factors	0.117	0.214	0.464

Table 4. Discriminant Validity through Fornell-Larcker Criterion

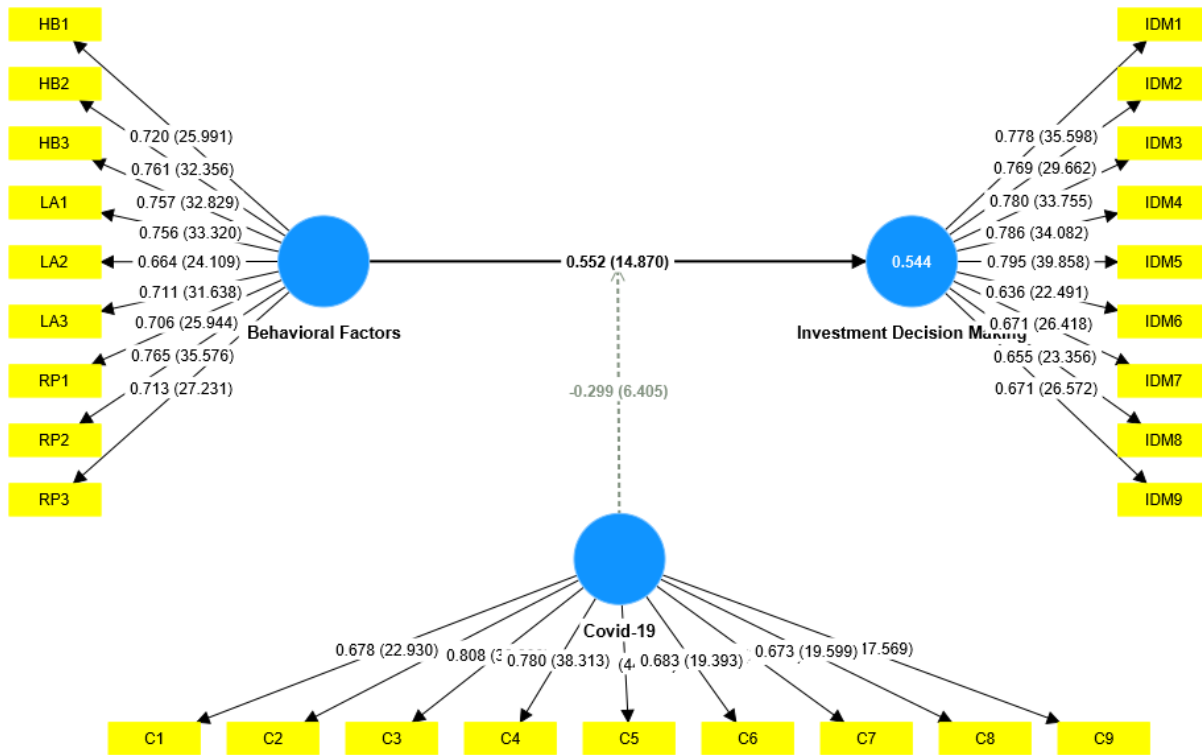|	Behavioral Factors	Covid-19	Investment Decision Making
Behavioral Factors	0.729		
Covid-19	-0.019	0.728	
Investment Decision Making	0.584	-0.298	0.730

4.5 Assessment of Structural Model

Figure 3. PLS SEM Structural Model

4.6 Model Fit

The adequacy of the estimated model's fit was evaluated using the SRMR as an approximate fit measure, providing empirical support for the proposed theory. Additionally, the SRMR fell below the preliminary recommended threshold of 0.080, indicated in Table 6 signifying a satisfactory model fit. This outcome indicates that the proposed model effectively confirms and explains the relationship between behavioral factors and investment decision-making (Purwanto, 2021).

Table 6. Model Fit

	Saturated model	Estimated model
SRMR	0.066	0.064
d_ULS	1.639	1.551
d_G	0.415	0.412
Chi-square	1089.779	1071.299
NFI	0.825	0.828

4.7 R Squared

According to Joe F Hair et al. (2011); Purwanto (2021) R square values around 0.75, 0.50, and 0.25 are generally considered to indicate substantial, moderate, and weak explanatory power, respectively. The value of R square suggesting a moderately positive association between the independent variables (behavioral factors) and the dependent variable (investment decision-making). With an R Square value of 0.544, it can be inferred that the model's independent variables account for approximately 54.4% of the total variation in the dependent variable. The Adjusted R Square value of 0.541 serves as a more reliable measure of model fit compared to the original R Square, as it adjusts for the number of independent variables. Additionally, the estimate features offering insight into the model's accuracy by indicating the average discrepancy between observed and predicted values (Joseph F Hair, Ringle, & Sarstedt, 2013).

Table 7. R-Squared

	R-square	**R-square adjusted**
Investment Decision Making	0.544	0.541

4.8 Path Coefficient

The path coefficient estimates represent standardized regression coefficients, allowing for assessment of their sign and absolute magnitude. These coefficients indicate the change in the dependent construct, measured in standard deviations, when an independent construct increases by one standard deviation, while holding all other explanatory constructs constant. To draw conclusions about population parameters, statistical tests and sample mean can be utilized. A path coefficient estimate is deemed statistically significant at a 5% significance level when its p-value is below 0.05, or when the 95% bootstrap percentile confidence interval constructed around the estimate does not encompass zero. Following the confirmation of the significance of the relationships, indicated by a path value of 0.552, researchers are prompted to underscore the importance of these significant relationships. The results derived from PLS-SEM, after examining the path relationships, unveil a noteworthy positive correlation between behavioral factors and investment decision-making, thereby supporting the acceptance of hypothesis H1. Conversely, with a coefficient of -0.209, there exists a negative correlation between COVID-19 and investment decision-making, suggesting that as the impact of COVID-19 intensifies, investors may display a reduced inclination towards making investment decisions. Furthermore, the coefficient value of -0.294 underscores a significant negative moderating effect of COVID-19 on the relationship between behavioral factors and investment decision-making. This implies that the influence of behavioral factors on investment decision-making is reduced in the presence of COVID-19, therefore H2 is accepted.

Table 8. Path Coefficients

	Original sample (O)	Sample mean (M)	Standard deviation (STDEV)	T statistics	P values
Behavioral Factors -> Investment Decision Making	0.552	0.550	0.037	14.870	0.001
Covid-19 -> Investment Decision Making	-0.212	-0.212	0.041	5.141	0.001
Covid-19 x Behavioral Factors -> Investment Decision Making	-0.299	-0.303	0.047	6.405	0.001

5. Conclusion

The conclusion drawn is that behavioral finance encompasses a wide range of topics, with numerous researchers contributing to its exploration through various publications. Despite this, there remains a gap in understanding the behavior of Pakistani investors, particularly concerning aspects such as herding behavior, loss aversion, and risk perception. Consequently, the researcher has formulated the thesis, aiming to investigate these relationships within the context of Pakistani behavioral finance. Additionally, the study seeks to explore the influence of behavioral factors on investment decision-making and elucidate the underlying mechanisms of this relationship. Specifically, the study intends to identify and analyze investor behavior in the Pakistan Stock Market, particularly during the extraordinary circumstances presented by the Covid-19 pandemic. It is anticipated that post-pandemic, there will be a heightened need for additional insights into the psychological behavior of investors worldwide. This research delves into the behavioral factors of herding, loss aversion, and risk perception among investors, and their impact on investment decision-making. Through analysis, it has been observed that herding exerts a positive and significant influence on investors' decisions, as evidenced by Hirdinis (2021) in the Jakarta region during the Covid-19 crisis. The impact of investor herding behavior was observed across both the overall model and bearish market conditions during the Covid-19 period, whereas it was not evident during bullish market conditions. This suggests the presence of herding behavior among investors, potentially influencing investment decisions (Sadewo & Cahyaningdyah, 2022). Key findings from research in behavioral finance theory indicate that during the Covid-19 pandemic individuals tend to exhibit loss aversion influencing their investment decisions towards safer and risk-free options. This preference for low-risk investments within economic uncertainty can contribute to increased volatility in the economy and impacting individuals' financial well-being. Essentially, individuals' reluctance to take significant risks during uncertain times reflects a broader inclination towards risk aversion in their lives, shaped by personal attitudes and subjective norms. The study suggests that individuals who typically demonstrate risk-averse behavior in their daily lives may not necessarily avoid taking risky investment decisions. These findings align with the principles of behavioral finance, which emphasize how individuals process information to make decisions while balancing risk and return optimally (Dita et al., 2023). Halim and Pamungkas (2023) proposed that risk perception positively affects investment decisions. Various investors exhibit different attitudes towards risk, ranging from acceptance to neutrality to risk aversion, as they assess potential risks in their decision-making processes. The findings suggest that investors' risk propensity and anxiety concerning market volatility impact their behavior. This study aims to identify the psychological influences of

behavioral factors on investors' investment decision-making, considering the moderating effect of COVID-19, results from Partial Least Squares Structural Equation Modelling (PLS-SEM) analysis indicate that behavioral factors significantly influence investment decision-making and Covid-19 moderates this relationship negatively. The findings of the study support hypothesis, as recommended by (Khurshid et al., 2021; Kiruba & Vasantha, 2021) that the impact of COVID-19 moderates the relationship between behavioral factors and individual investors' decision-making regarding investments. It is advisable for investors to thoroughly assess market conditions before committing to investments, considering the influence of COVID-19 updates and news on decision-making, as highlighted by the PLS results. Consequently, investors may consider devising investment strategies tailored to such circumstances. Moreover, it is recommended that governments take preventive measures to avoid resorting to lockdowns in the future. However, this study is limited to examining the relevance of behavioral factors alone in investment decision-making. Future research could broaden its scope to include various aspects such as investors' decisions based on company accounting information, government responses to COVID-19, business activities during the pandemic, share returns, and more. It is anticipated that this research will not only benefit current investors but also those facing similar situations in future pandemics.

This study offers valuable insights that can enrich the field of behavioral finance. In particular, policymakers must emphasize policy recommendations to address gender disparities that arise in investment decision-making and enhance financial education and literacy across diverse demographic groups. The demographic characteristics of investors, including gender, age, and educational backgrounds, significantly influence investors' behaviors and their investment choices. The uncertainties brought forth by COVID-19 underscore the critical need for relevant policies to support recovery efforts and mitigate risks. Implementing risk management strategies is crucial to navigate the challenges posed by the COVID-19 pandemic, alongside the adoption of a regulatory framework. By ensuring the implementation of these policies, policymakers can contribute to fostering a more resilient, informed, and equitable investment environment. Despite decades of research into individual investment decision-making, numerous crucial questions remain unanswered, and novel research avenues continue to emerge. Investigation could explore into the efficacy of behavioral interventions such as nudges, defaults, and choice architecture in fostering improved decision-making outcomes. Longitudinal studies tracking the evolution of investor attitudes and behaviors could shed light on the persistence of behavioral biases and their effects on investment results.

5.1 Future derision

Future researchers may examine the area of behavioural finance such as impact of age, occupations, investment limit as moderation or mediation, and anchoring biasness, confirmations biasness and including Fintech as main variables in Model. Moreover, researches may work on comparative analysis of KMI 30 index and KES 30 index investors behaviour or investment intention and Risky intention too.

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