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The Impact of Behavioural and Social Biases on Investment Performance of Individual Investors: The Mediating Role of Perceived Market Efficiency In Pakistan

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ABSTRACT

Behavioural finance is a philosophy that combines psychological and sociological theories with finance. The present study investigated the influence of behavioural and social components on perceived market efficiency and then, in turn, on the investment performance of individual investors. A survey method was used to gather data from the individual investor. The sample size consisted of 307 respondents. Data were analysed with the help of smart PLS and SPSS software. The finding of the study indicates that the behavioural (overconfidence and representativeness) and social (herding and social interaction) factors have a positive impact on perceived market efficiency and investment performance. This research consists of two behavioural variables and two social variables to determine the impact on investment performance. Hence this research helps practitioners and investors to upgrade their investments at the individual level.

KEYWORDS

Overconfidence, Representativeness, Social interaction, Herding, Perceived market efficiency, and investment performance.

1. INTRODUCTION

When it comes to investing in securities, several investment theories explain investor interests and market movements. In accordance with Wall Street, investment theories have two broader classes. Inefficient Market Theory: Investors who assume that stock values do not accurately reflect complete information that certain investor actions will influence stock prices. On the other hand Efficient Market Theory, investors assume that the stock price accurately represents all available details about the stock and describes the behaviour of the market. There are two branches of finance named standard finance and behavioural finance.

Conventional financial theories posit that individuals exhibit rational behaviour and incorporate all relevant information in their investing decision-making processes. This indicates that when an investor gets information, he or she makes an investment decision based on their beliefs and current data (Keswani, Dhingra, & Wadhwa, 2019). In several research, markets have been proven to be inefficient in practices due to individual biases and irregularities that exist in the sector, leading to an inefficiency (Ajmal, Mufti, & Shah, 2011; Hadi, 2017). According to traditional theories, investors are risk-averse in their investment decisions, preferring low risk over high risk at an assumed level of return (Arora & Kumari, 2015). Numerous psychologists present a critique of the rational underpinning of conventional finance. The assumptions of fairness, unbiasedness, and rationality of investors were subject to criticism by these psychologists. People's financial choices can be influenced by behavioural perceptions, and they are not always rational (Diamantopoulos et al., 2012). As a result, behavioural finance study is necessary for finance, where cognitive science is used to better understand human behaviour. Scholars in the field of behavioural finance have posited that investors are inherently subject to psychological biases that hinder their ability to make rational decisions. Therefore, these choices have negative implications for investment choice and market efficiency (Mahmood et al., 2020). In recent decades, Behavioural finance has been a philosophy that combines sociological and psychological concepts with finance. In 2002, the Nobel Prize in Economics was conferred upon psychologists Daniel Kahneman and Vernon Smith, with the latter being recognised as the pioneering figure in the field of behavioural finance. During the 1980s, psychologists Daniel Kahneman and Amos Tversky made significant contributions to the subject of psychology and investment by introducing the term "behavioural finance." This concept primarily focuses on examining the behaviour and decision-making processes of individual investors inside the stock markets (Keswani et al., 2019).

One of the most fundamental and important issues in stock exchanges is a variation from the right and effective investment choices, which mostly leads to poor returns for stakeholders (Diamantopoulos et al., 2012). Hence, determining factors that contribute to poor investment decisions will help you make better choices. Several Researchers have described behavioural finance in diverse ways. The field of behavioural finance provides empirical evidence and theoretical frameworks that contribute to the comprehension of the causes and mechanisms underlying market inefficiencies (Hong, 2007). According to

Baltussen (2011), behavioural finance operates under the presumption of a less strict rationality assumption and entails the application of psychological and sociological knowledge to improve financial decision-making. The fields of micro and macro behavioural finance are two separate subfields of behavioural finance. Micro behavioural finance offers information about the psychological characteristics of individual investors and the biases that affect their judgment. Macro behavioural finance, on the other hand, focuses on examining financial market behaviour and the anomalies connected to it (ul Abdin et al., 2017).

Investment performance is dependent on the wise investment choices made by individual individuals. However, individual investors exhibit a limited grasp of the underlying understanding regarding the various behavioural elements that impact their investment decisions. Behavioural finance plays a crucial role in evaluating investment success within the framework of investment happiness. Therefore, the behavioural finance perspective is more important in measuring the investment performance of risk, return, and level of satisfaction. According to (Arora & Kumari, 2015), investors rely on a rational model to measure the risk and return on their investment. However, in the market, investors show irrational behaviour, such as trading excessively, purchasing stock without knowing its intrinsic value, purchasing stocks that their peers are purchasing, basing their decisions on past results, and holding winning stock and selling loss stock and feeling satisfied with their investment (Shah, Ahmad, & Mahmood, 2018). Numerous scholars have conducted investigations into the explicit correlation between biases and investment performance. However, limited attention has been given to the underlying mediating mechanism that facilitates the occurrence of these associations and their subsequent impact (ul Abdin et al., 2017).

Due to the inherent limitations of human rationality, behavioural biases can exert an influence on individuals' financial decision-making processes. Behavioural finance study holds significant importance within the realm of finance, as it delves into the social and psychological variables that contribute to the comprehension of human behaviours. The primary concern of this study pertains to whether the perceived market efficiency might serve as a mediating factor in examining the investment performance of individual investors in relation to behavioural and social biases.

Previous studies in the field of Behavioural Finance have demonstrated that the behaviour of individual investors significantly influences their investment performance. These studies have established a clear and direct correlation between the utilisation of heuristics and investment performance (Cao, Nguyen, & TRAN, 2021; Hadi, 2017; ul Abdin et al., 2017). Numerous scholars have conducted investigations on the explicit association between biases and investing decisions. However, limited attention has been given to the underlying mediating mechanism that gives rise to these relationships and their subsequent effects (ul Abdin et al., 2017). This study will evaluate two appropriate components of behavioural, i.e., overconfidence bias and representativeness bias and two components of social, i.e., social interaction and herding treat them individually to investigate the

difference in their effects on perceived market efficiency and returns on investment. A few studies were conducted on psychological biases. However, the impact of either personality or psychological and social factors at the same time has not been taken before this, and perceived market efficiency was used as a mediator. This study is helpful for investors to take investment decisions in the future. This study was conducted in developing countries in the context of, especially, Pakistan.

According to the problem statement, this study presents four research questions. This study employs the concept of perceived market efficiency to assess the investment performance of individual investors within the given setting. The present study posits that the assessment of individual investors' investment performance can be significantly influenced by their perception of market efficiency. The current study postulates that these preceding factors have the potential to forecast the investment success of individual investors by means of the mediating influence of perceived market efficiency. Thus, in order to tackle the research challenge, the present study created a hypothetical model to examine the perceived efficiency of the market. The following research questions are presented:

The main objective of this research is to assess the influence of behavioural and social biases, including overconfidence, representativeness, social interaction, and herding, on the performance of individual investors in the Pakistan Stock Exchange (PSX). The primary objective of this study is to examine the potential mediating role of perceived market efficiency in the links between behavioural and social characteristics (namely, overconfidence, representativeness, social contact, and herding) and investor performance at the Pakistan Stock Exchange (PSX). The researcher may conduct an observation of the link between the following indicators:

a) To examine the relationship between overconfidence bias and representativeness bias on perceived market efficiency.
b) To assess the relationship between social interaction and herding on perceived market efficiency.
c) To determine the relationship between perceived market efficiency and investment performance.
d) To investigate the impact of overconfidence bias and representativeness bias on individual investor investment performance.
e) To judge the relationship between social interaction and herding on the investment performance of individual investors.

The performance of stocks is contingent upon the logical investment decisions made by individual investors. However, there is a dearth of comprehension among individual investors regarding the various behavioural elements that exert an influence on their investment decision-making. This scenario poses challenges for investors in making rational decisions, resulting in unfavourable investment outcomes. Hence, the outcomes of this research will assist individual investors in comprehending the many behavioural and social aspects and their substantial influence on investing success among individual investors. This research will

also enrich the literature on behavioural finance. Researchers and scholars will use the research as a future direction when advancing their information in behavioural finance.

The study could serve as a good example of stock investment activities for investors to understand and examine before making proper investment decisions. This research may be conducted in the hopes of evaluating the suitability of behavioural finance for financial markets. Future researchers will be able to gain better theoretical and practical insights through this study.

Even though there were certain limitations, great care was taken to ensure that they did not affect the results or conclusion. The study addressed this restriction by using general theories about social and behavioural biases, as well as investment performance. The study's reliance on primary data collected via questionnaires was excessive, leading to shortcomings stemming from the absence of secondary data.

2. LITERATURE REVIEW

This chapter's objective is to evaluate the relevant research on the effects of behavioural and social biases on individual investors' perceptions of market efficiency, investment success, and related ideas. Behavioural bias refers to an outline of disparity in the verdict that arises in certain states, which may occasionally lead to perceptual change, erroneous decisions, and an unreasonable explanation is largely called the irrationality (Mittal, 2022). Daniel Kahneman, the founder of behavioural finance, was awarded the Nobel Prize in Economics for his prospect theory.

Amos Tversky, Daniel Kahneman, and Richard Thaler are early behavioural finance researchers who have made important contributions. They formed behavioural biases, which are thought to be the foundations of behavioural finance. The inconsistencies between traditional finance and behavioural finance are caused by behavioural biases. Numerous experiments have challenged rationality, resulting in the creation of the Behavioural finance (Madaan & Singh, 2019). In this study, overconfidence, representativeness, social interaction, and herding were used as independent variables, Perceived market efficiency was used as a mediator, and investment performance as a dependent variable. It is suggested to follow a study model with hypotheses during the research.

2.1. Heuristics Theory

The relationship between biases and the process of choosing investments has been the subject of several hypotheses. The theory of heuristics is described as "thumb rules" or mental shortcuts that practitioners in the financial sector (both individual and community level) use to make decisions easy and successful in dynamic and unpredictable situations. Usually, when decision-makers have a certain amount of time and information, these heuristics are useful and helpful. Although they lead to Ahmad and Shah (2020); Tversky and Kahneman (1974).

These heuristics are often quite helpful, especially when there is a short time period

(Waweru, Munyoki, & Uliana, 2008). Three crucial heuristics—representativeness, availability, and anchoring—that investors utilise in their decision-making were first established by Tversky and Kahneman in 1974 (Bilal et al., 2022; ul Abdin et al., 2017). Gambler's fallacy and overconfidence were included as new variables to Waweru et al.'s (2008) heuristic theory. Overconfidence and representativeness biases will serve as the underpinnings of this theory in the Pakistani stock market. This study investigates the effects of overconfidence and representativeness biases on perceived market efficiency and investment success. An overview of earlier studies on this subject is provided in the section that follows.

2.2. Social Interaction Theory

Blau proposed the theory of social interaction for the first time in 1964, and it aims to investigate the origin of human actions in sharing information. Individual interactions with one another are based on personal cost and benefit analysis, according to theory. In reality, individuals aim to maximise their income while minimising the time cost of sharing information based on this theory (Razak et al., 2016). In this study, social interaction within the stock market plays a key role because early social relationships between individual investors have been helpful in making investment decisions.

Shanmugham and Ramya (2012) said that social factors are the external powers that interrupt the investor's decision-making. Social interaction with peers and family has become useful for investment decision and return. According to Akhtar, Thyagaraj, and Das (2018), when people interact with each other to collect knowledge and analyse other people's emotional responses to form opinions. Herding is a result of this observing experience; individuals who prefer to adopt and copy the acts of others rather than performing independently are said to have this trait. In this study, the author measures the impact of Herding and social interaction on perceived market efficiency and investment performance.

2.3. Overconfidence Bias and Perceived Market Efficiency

Overconfidence is a bias. However, cognitive bias is described as an unjustified confidence in intuitive reasoning, decisions, and cognitive abilities. It is a reflection of overestimation when investor overvalue their expertise and skill (Ahmad & Shah, 2020). Overconfidence is a form of erroneous assessment whereby people enhance the subjective likelihood of particular outcomes by overestimating their skill, knowledge, or ability to analyse evidence (Madaan & Singh, 2019). Overconfidence is a form of erroneous assessment in which individuals inflate their skills, knowledge, or perception of the world, as well as the subjective likelihood that a particular result will occur (Madaan & Singh, 2019). Over-precision indicates that investors are overconfident in their judgment and are oblivious to the risks connected with their decisions (Odean, 1999; Shah et al., 2018).

Researchers analyse the investing behaviour of individual men and women and conclude that men are more invested as compared to women, and this significantly reduces their return on investment because of excessive trading. Such difference between single male

and female investors in trading activity is more apparent (Barber & Odean, 2001; Metawa et al., 2019). Overconfidence is a well-known and pervasive bias that leads people to overestimate their talents and abilities while downplaying the risk of investments. Previous studies in this area have demonstrated how the overconfidence bias interferes with logical decision-making (Hameed et al., 2021; Kumar & Goyal, 2015). From various circumstances of overestimation, overconfidence emerges.

It is an error that occurs when the individual investor is very sure of his or her skills and knowledge. Various biases exist in each individual investor, according to behaviour finance, which prevents them from making suitable financial decisions. The market would be ineffective because of a poor decision. Hence, overconfidence is a heuristic mistake in which individuals' traders enhance their knowledge, skills, and unwarranted faith in their personal information and underestimate the risk factor.

In the financial market, some traders who want to earn more profit could voluntarily mislead investors. Due to incorrect information, shareholders take wrong decisions as a result market would be inefficient (Hadi, 2017). Various perspectives on overconfidence and its impact on perceived market efficiency may be found in the literature, as can be seen above. Hence, researchers propose the following hypothesis:

H1: The higher level of overconfidence of individual investors will be the cause of high perceived market efficiency.

2.4. Representativeness Bias and Perceived Market Efficiency

Tversky and Kahneman (1974) are the leading experts who classify heuristic approaches into three categories: representativeness bias, availability, and anchoring. Representativeness is a bias expressed as a conceptual shortcut in which investment choices are made based on mental stereotypes (Ahmad, Shah, & Abbass, 2021). People make choices based on the similarity of events in representativeness. They respond the same way as they did previously. They do so because activities are identical and have participants in common. In this situation, investors underestimate the importance of sample size in the investment decision. Investors offer more weight to recent events for short-term gains and neglect long-term gain, which leads to prejudices in investment decisions (Mahmood et al., 2020). According to the representativeness heuristic error, investors make predictions based on limited sample size and update beliefs with basic classifications rather than complex data, reducing the consistency of their decisions (Ahmad et al., 2021). According to Javed, Bagh, and Razzaq (2017) stock market investors buy securities based on; Price index volatility, the latest price change in a company's stock, and economic indicators all affect investment results.

It is concluded that from the previous studies, the stock market investors put high importance on recent investment experience, and as a result, they often neglect the long-term average return (Ritter, 2003). Representativeness is often influenced by sample size, which contributes to results being drawn from a limited number of models. According to Javed et al. (2017) representativeness bias has a direct connection with investment

efficiency; investors are drawn to the attention-grabbing stocks that are in the mass media or have had a significant unexpected trading volume or stocks that have delivered strong market dynamics in terms of returns, sending a positive signal. Thus, representativeness bias established arguments that an individual investor's confidence in past stock performance is an indicator of future outcomes in which they use a small sample size to update opinions via simple classifications rather than difficult data.

Studies on representativeness bias and perceived market efficiency have been conducted, with some finding a positive relationship and a few observing a negative relationship between these two variables. The market is influenced by representative error because investors become overly optimistic or negative because of recent successes or losses, which affect investor decisions; thus, the stock market's price differs from its intrinsic value. Chong (2011) which may lead to an inefficient market. According to Hadi (2017), heuristics decision-making techniques discourage psychological effort in decision-making, which leads to wrong decisions. Representative bias has an impact on business practices in the stock market, such as over and under the value of securities, either directly or indirectly.

A study carried out by Hadi (2017) to explain the influence of individuals' Representative biases on the perceived efficiency of the Pakistani stock market has observed that there was no significant effect on the perceived efficiency of the Pakistani financial market. As a result of the investment decision process that involves less psychological effort, errors occur in decisions making. Representative bias has an impact on trading behaviours directly or indirectly in the stock market. Thus, the researcher can conclude that representative bias has a positive effect on stock market efficiency.

H2: Representative bias has a positive impact on perceived financial market efficiency.

2.5. Herding and Perceived Market Efficiency

Herding is a behaviour of people who adopt others' decisions and choices because it is easier for them to do so than to process their details. When uncertainty and fear are present, or when taking one's decision could outcome in substantial losses, most of the making investor's investment decisions to earn accurate market information by following other investors (Javed et al., 2017). Baker and Nofsinger (2010) describe "herding" as a lot of shareholders trading in the very same direction throughout the duration of time. Investors who are herded prefer to neglect their personal information or values in favour of copying the decisions of other shareholders, whether fair or not (Chang, Shie, & Yang, 2019). Herding is a normal circumstance in the stock market. During the uncertain situations of the financial market, it is observed that the human environment replicates the actions of others (Madaan & Singh, 2019; Yu et al., 2018).

Herding is an environment in which rational people tend to behave irrationally by imitating others' judgment while making choices. Herd behaviour between different investors can be caused by a variety of factors. Individual investors are exposed to crowd action because they obey the actions of a wide community of traders, also known as noise traders (Kumar

& Goyal, 2015). Herding investors make financial judgments based on the collective purchasing and selling actions of the stock market. Informed and logical investors frequently follow the herd, which helps the market function effectively. Contrarily, herding leads to an inefficient economy, which is typically identified by speculative bubbles. Herding shareholders act similarly to early humans who banded together for mutual aid and protection when they had a limited understanding of the outside world (Le Luong & Thi Thu Ha, 2011; Nisar & Yaseen, 2022). The research mentioned above leads to the conclusion that herding is essential to a financial market's efficiency.

H3: Herding has a positive impact on Perceived Market Efficiency.

2.6. Social Interaction and Perceived Market Efficiency

Interactions among individuals and their networks of interconnections embed and are used to interchange information. Social relations form a strong information channel that helps to gather more information within a limited time. The importance of a network of social relationships in combining and exchanging information has been recognised as a vital mechanism for achieving favourable outcomes. Mutual trust, effective communication, and teamwork are examples of social interactions that can ensure organisational members' motivation and capacity for innovation (Huang & Li, 2009).

The functional concept of an external social networking relationship is one in which managers in companies maintain contacts and links with external stakeholders (Agyapong, Mensah, & Ayuuni, 2018). Observing other people's decisions can affect investment decisions to the point that some investors neglect their confidential information. Individual desires can be influenced by others' behaviours and decisions. Investor welfare may be influenced by social experiences in either a positive or negative way. Individuals usually follow others' even in investment plans for their future well-being (Baker & Nofsinger, 2010). Thus, social interaction has a significant role in people's investment decisions which leads to perceived market efficiency.

H4: High level of Social Interaction leads to high Perceived Market Efficiency.

2.7. Perceived Market Efficiency and Investment Performance

In addition to outlining three different types of market efficiencies—weak form, semi-strong form, and strong form—Fama (1970) introduced the concept of market efficiency and described it in his study. Market efficiency suggests that even if some investors make mistakes as a result of biases, the stock price will remain at its fair value. Several types of research have shown that markets are inefficient in practice due to individual biases and irregularities that exist in the market that would be the cause of inefficiency (Hadi, 2017).

Market inefficiency, according to Shah et al. (2018), arises because stock prices cannot completely represent all available information. There might be overpriced or undervalued stocks. As a result, market efficiency is a complex idea that is now under discussion. Several variables affect the effectiveness of the market, including herding, overconfidence, representativeness, social contact, and social influence. In this study, the

researcher will concentrate on determining how these biases impact the effectiveness of the financial market in Pakistan.

The Efficient Market Hypothesis, according to Ritter (2003), is predicated on the notion that investors and decision-makers are rational and seeking to maximise profit and that securities prices maintain their fundamental value as a result of competition among profit-seeking investors. In response to the performance of the stock market, investors may sell stocks in which they are losing money and purchase profitable stocks. The stock price diverges from its fair or basic worth as a result of this response. (2018) Shah et al. Investors in behavioural finance are not always rational. The market value of securities differs from its intrinsic worth due to heuristic biases and social factors, which makes markets inefficient (Shah et al., 2018).

H5: Perceived market efficiency has a positive impact on investment performance.

2.8. Overconfidence Bias and Investment Performance

Overconfidence is a cognitive bias, reflecting a chance to overestimate one's ability to accomplish tasks and underestimate one's probability of losing a job. This bias affects corporate finance and investment decisions (He, Chen, & Hu, 2019). In their study, Ahmad and Shah (2020) identified a noteworthy inverse correlation between the Overconfidence bias and investment return. Investors frequently make suboptimal investing choices as a result of their excessive self-assurance, hence diminishing the returns on their investments (Mittal, 2022). In his study, Grežo (2021) also identified a positive correlation between managerial overconfidence and excessive investment.

In their study, Tekçe, Yılmaz, and Bildik (2016) conducted an investigation using data from the Turkish market to examine the factors influencing overconfidence, familiarity bias, and representativeness heuristic among Turkish investors. The researchers found substantial evidence indicating the presence of overconfidence and familiarity bias among investors. Additionally, it was noted that there is a notable prevalence of overconfidence in the investment behaviour of young male investors, as well as investors with smaller portfolio values and those hailing from developing countries in terms of education and earnings. Therefore, it can be deduced from the existing body of evidence that the degree of overconfidence significantly influences the performance of investments.

H6: There is a positive relationship between Overconfidence and investment performance.

2.9. Representativeness Bias and Investment Performance

Like other Behavioural factors, representation bias is as same important as others in the investment decision process. The term "representativeness" relates to the assessment of how correctly a sample represents a broader population, how closely an instance fits into a category, how closely an act and its actor fit together, or, more broadly, how closely a result fits into a model (Siraji, 2019). The notion is that the historical performance of a firm serves as an indicator of its prospective achievements. Representativeness is an investor's tendency to make investments based on their previous experience and

psychological state. Because they always rely on their investment experience, this feature may lead some of them to make a decision too quickly without completing a thorough examination (Novianggie & Asandimitra, 2019).

According to Jain, Walia, and Gupta (2020), the concept of representativeness has been identified as a potential source of biases in decision-making. This is due to the tendency of individuals who exhibit representativeness to assign greater value to current events while overlooking the significance of long-term events. Individuals afflicted with representative bias occasionally rely on a limited number of samples, thereby neglecting the importance of sample size. According to Javed et al. (2017), the presence of representational bias has a statistically significant beneficial influence on individuals' perception of investment performance. Hence, it is justifiable to assert that representational bias exerts a substantial influence on an individual's decision-making process, thereby impacting investment success.

H7: Higher the levels of representativeness bias better the investment performance.

2.10. Social Interaction and Investment Performance

Pleasant returns experienced by local peers promote stock market participation (Liang & Guo, 2015). Strong social interaction networks may help to incorporate information more quickly and facilitate the variety of knowledge needed for effective and efficient decision-making (Huang & Li, 2009). The interplay between peer conduct and peer effects has a significant impact on investing decisions. Specifically, persons who have lower levels of equity exposure compared to their co-workers are motivated to increase their risk share when their co-workers achieve higher outcomes (Lu & Tang, 2015). The importance and effect of social interaction on investment decisions are clarified by selecting one of two choices to determine the impact of social interaction on financing performance under uncertainty. Participants that were more publicly active with other participants invested in less risky investments, and participants who were publicly excluded preferred to finance extra risky investments (Moueed et al., 2015). Social interaction relays to the social relations and the social networks that individuals make time for their accessibility and sometimes forcefully. These social networks help in the interchange of information between family, friends, neighbours, and other people everywhere. It is described the importance and effect of social communication on financing decisions by selecting a choice from two to identify the influence of this social interaction on financing behaviour under uncertainty. The results have shown that members who were further involved socially with other participants invested in less risky investments, and socially excluded investors chose to spend on more risky investments (Moueed et al., 2015).

H8: Social Interaction has a positive relationship with the Investment performances of individual investors.

2.11. Herding and Investment performance

This section reviews the literature on herding behaviour and then introduces the

connection between herding and investment performance and herding behaviour under extremely positive or negative returns. By Javed et al. (2017) there is a positive significant connection between herding Bias and perceived investment performance. Metawa et al. (2019) carried out a study in the Taiwan stock market and observed the impact of idiosyncratic uncertainty on investment performance. They determine significant evidence of herd behaviour, which exhibits a distinctive trend in the idiosyncratic volatility of different industries.

Herding is a phenomenon characterised by the tendency of individuals to base their decision-making on the behaviours and choices of others. The bulk of investors tend to emulate the buying and selling activity of other investors. However, investors who make rational selections do not adhere to alternative decisions that result in market efficiency. Investors tend to engage in herding behaviour as a risk management strategy to mitigate potential losses. According to Mahmood et al. (2020), the herding variable exhibits the most significant beneficial influence on performance when compared to other behavioural variables. Therefore, it is postulated that:

H9: Herding has a positive relationship with Investment performance.

2.12. Research Model

These above relationships between indicators and hypotheses propose the model shown in Figure 2.1

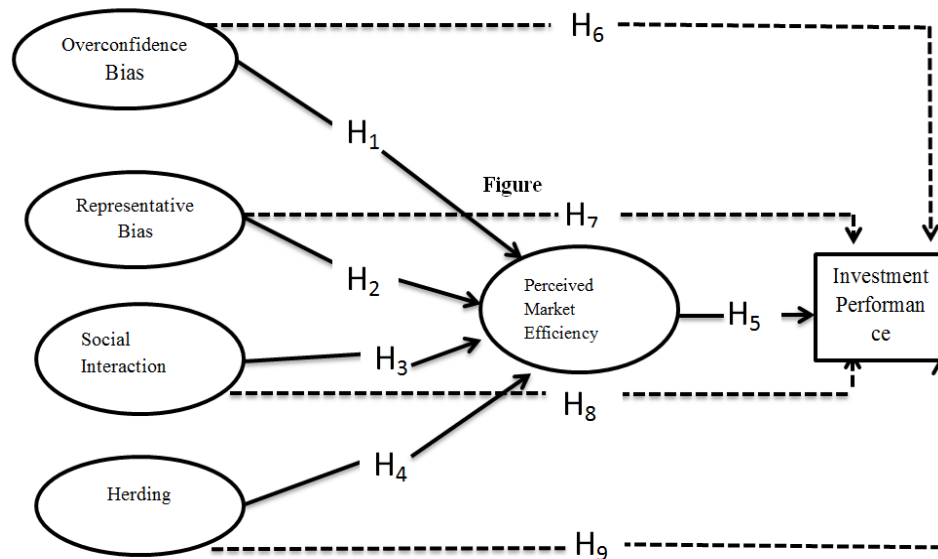**Figure 2.1:** Conceptual behavioural and social model

(▬ ▬ ▬ ▪) These dot lines represent the indirect relationship.

3. METHODOLOGY

This chapter will provide a view of the research methodology opted in this study, i.e. research design, a sample of the population, report of the measurement of items. Furthermore, this chapter provides an in-depth examination of the instrument, data

collection plan, and procedures that will be employed for data analysis. The next two divisions address the data analysis approach (i.e. SEM, partial least squares) and the statistical analysis performed to examine the study model's reliability and validity. Finally, after satisfying the desires of reliability and validity, the research model will be tried to respond to the hypothesis.

3.1. Research Methodology

The robustness and dependability of a research study are contingent upon the systematic procedure of effectively collecting and assessing data through suitable methodologies. The determination of research methodology and research design is influenced by the nature of the research analysis. The present study has a cross-sectional design, wherein the researcher employs a quantitative approach for data analysis. The goal of this research is to look at the relationships between variables and interpret the results from the collected data. The current study employed a quantitative research methodology in order to address the research objectives and research issues. The present study will employ a purposive sampling technique. The data collection process will involve the utilisation of a survey method to obtain information from individual investors.

3.2. Data Collection Procedure

An integral part of the study is data collection. The study used primary data that was collected and analysed. Data can be collected through various social media. For data collection, the researcher will fill out the questionnaire online through email with the help of brokerage houses and agents. However, only those respondents who demonstrated a willingness to take part in this study were selected. The objectives of the study were made clear to each respondent. They were assured that all information would remain private and would only be used for this research purpose. Moreover, email and electronic-based questionnaires were also sent to the respondents for data collection.

3.3. Population

The current study examines how behavioural and social biases affect investors' investment performance, with perceived market efficiency serving as a mediating factor. Investors who transact on the Pakistan Stock Exchange are thus study participants. The researcher collects data with the help of brokerage houses and agents. The questionnaire will be distributed through social media to respondents who will be active individual investor in the financial market (Ain & Shafique, 2022).

3.4. Unit of analysis and sample selection

Due to the difficulties in successfully focusing on actual individual investors in a complicated setting, the current study employs individual investors as the unit of analysis. In order to better understand how behavioural and social biases impact investing performance, the author also looks at how these biases affect how individual investors perceive market efficiency with respect to the stock market. Examining individual investors' stock market investment practices is the main goal of this study. The survey's

items were used to create the sample.

According to Roscoe, Lang, and Sheth (1975) minimum of 10 responses is required. There are 27 items in the survey. Hence, a 270 minimum sample is required for further analysis. The sample is taken from the individual investors of the Pakistan Stock Exchange. The researcher collects data with the help of brokerage houses and agents. The questionnaire will be distributed through social media among 1100 respondents who will be active individual investors in the financial market, but some questionnaires were found not properly filled.

Hence, only 307 responses were used as a sample. These respondents will be selected according to the criteria and describe the purpose of the study clearly before giving the questionnaire. After collection, the completed questionnaires will be coded.

3.5. Sampling technique

In the current study, the researcher used a non-probability purposive sampling approach. Judgment sampling, another name for purposeful sampling, is the deliberate selection of participants based on particular traits they each possess. The aforementioned method is non-probability and does not call for a set amount of participants or underlying hypotheses. The data collection process will involve the utilisation of a survey approach to acquire information from individual investors. Prior to conducting the final survey, the previously measured and validated instruments will be verified. Additionally, this study used self-administered questionnaires to get data from individual investors.

3.6. Survey Instruments

The adopted questionnaire is used to collect data from individual investors and to respond to the research questions. The questionnaire is divided into two sections. The first section deals with demographic data such as income, age, gender, and educational attainment. The remaining second section consists of questions adapted from related instruments reported by previous researchers to measure the investment pattern of individuals. The 7-point likert scale has been adopted from previous research in the study (Ahmad, Shafique & Jamal, 2020; Ain & Shafique, 2022; Jariyapan, Mattayaphutron, Gillani, & Shafique, 2022; Shafique & Ahmad, 2022). Structured questions draw on the Likert scale from (1) for very strongly disagree to (7) for very strongly agree used in the Questionnaire.

4. DATA ANALYSIS AND RESULTS

The findings from collected data performs analysis of data collected and cover the outcomes of this data collected from respondents. In this chapter, the measurement model's validity and reliability are measured, and the structural model is validated. Therefore, the main data source for this research was collected data from a survey or questionnaire. Data analysis consists of two parts: the first portion belongs to demographic information of the participants that **were** analysed using Statistical Package for Social Science (SPSS), while the second part consists of the analysis of respondents' answers to the answer questions using Smart Partial Least Squares (PLS). This chapter also presents the outcomes of the preliminary research, concluding through a summary.

For data collection, the researcher distributed a total of 1100 surveys to a target sample comprising individual investors of the stock market. While the total of 307 filled questionnaires was collected back out of 1100, which were further used for analysis. Thus, the response rate was 27.90%, as shown in table 4.1.

Table 4. 1: Response Rate

Questionnaire Distributed	Not Responded	Filled	Response Rate
1100	793	307	27.90

Table 4.2: Gender

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Female	94	30.6	30.6	30.6
	Male	213	69.4	69.4	100.0
	Total	307	100.0	100.0	

4.1. Marital Status

Table 4.3 represents the marital status demographic instruments of the study. Through the result of the table, it can be said that most respondents were single (64.8%) with the frequency of 199 out of 307 respondents and a few respondents (35.2%) with the frequency of 108 out of 307were married. One of the reasons is since the age group of our respondents is between 26 to 35 (and less); thus, normally, in this age bracket most people are unmarried**.**

Table 4.3: Marital Status

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Married	108	35.2	35.2	35.2
	Single	199	64.8	64.8	100.0
	Total	307	100.0	100.0	

4.2. Monthly Income

Table 4.4: Monthly Income

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	10,000-20,000	63	20.5	20.5	20.5
	21,000-30,000	114	37.1	37.1	57.7
	31,000-40,000	80	26.1	26.1	83.7
	40,000+	50	16.3	16.3	100.0
	Total	307	100.0	100.0	

Table 4.4 indicates the monthly income of the demographic instruments of the study. Through the result of the table, it can be said that most of the participants were monthly income of 21,000-30,000 which show (37.1%) with the frequency of 114 out of 307 respondents and (26.1%) respondents with the frequency of 80 out of 307 was relied on

between 31,000-40,000. In this study, sixty-three investors' monthly income was in the range of 10,000-20,000, and fifty respondents fall under the monthly income limit of above 40,000 participate with (16.3%).

4.3. Respondents by Age

Table 4.4 describes the age demographic variable of the research. According to the results of the table, it shows that a large portion of the participants falls in the age segment of 26-36 years. The total number of respondents in this age group was 127, which is 41.4% of the total no. of participants. After this age limit, the respondents with a minor percentage fall into the age group of 15-25 years with a frequency of 80 (26.1%). Whereas 69 respondents, fall under the age limit of 36-45 years. The age group of respondents 46-55 years with the frequency of 29(9.4) are participating as respondents.

Table 4.5: Age

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	15-25	80	26.1	26.1	26.1
	26-35	127	41.4	41.4	67.4
	36-45	69	22.5	22.5	89.9
	46-55	29	9.4	9.4	99.3
	55+	2	.7	.7	100.0
	Total	100.0	100.0		

4.4. Investment Experience

Table 4.6 shows the investment experience demographic variable of the study. Results show that most of the respondents related to the second experience group i.e., category of 01-05 years. The number of respondents in the stated experience was 133, which is 43.3% of the total number of respondents. After this, the respondents with percentage difference fall in the first group Under 01 years with a frequency of 87 out of 307 and a percentage of 28.3%. The most frequently experienced 116 group was 06-10 years, with a percentage of 26.7 % and frequency of 82. It can be said that most of the respondents had total experience in the present job of 01-05 years, followed by respondents having more than 10 years of investment experience in the stocks market.

Table 4.6: Investment Experience

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Under 1 Year	87	28.3	28.3	28.3
	01-05 Years	133	43.3	43.3	71.7
	06-10 Years	82	26.7	26.7	98.4
	Above10Years	5	1.6	1.6	100.0
	Total	307	100.0	100.0	

4.5. Respondents by Qualification

Table 4.7 represents the qualification variables and shows that most of the respondents had degrees MS/M.Phil. With a percentage of (36.8%) and a frequency of 113 after that, most of the respondents had master's degrees, with a percentage of 30.0% and a frequency of 92. Most of the respondents in the MS/M.Phil. Degree holders

Table 4.7: Qualification

		Frequency	Percent	Valid Percent	Cumulative Percent
	Bachelors	69	22.5	22.5	22.5
	Masters	92	30.0	30.0	52.4
Valid	MS/M.Phil.	113	36.8	36.8	89.3
	PhD	15	4.9	4.9	94.1
	Other	18	5.9	5.9	100.0
	Total	307	100.0	100.0	

4.6. Descriptive Statistics

The descriptive data for all indicators are shown in Table 4.8.

Table 4.8: Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
Gender	307	1	2	1.69	.462
Marital Status	307	1	2	1.65	.478
Age	307	1	5	2.17	.946
Month Income	307	1	4	2.38	.988
Investment Experience	307	1	4	2.02	.786
Qualification	307	1	5	2.42	1.070
Overconfidence	307	1	7.00	5.1674	1.36050
Representative	307	1	7.00	6.2956	.91240
Social Interaction	307	1	7.00	5.3844	1.17857
Herding	307	1	7.00	5.6059	1.11189
Perceivedmarketefficiency	307	1	7.00	5.0098	1.37486
Investment performance	307	1	7.00	5.7959	1.11158
Valid N (listwise)	307				

4.7. Correlations

The relationship among two variables is measured through correlation analysis, in situations where the change in one variable reasons the change in another indicator. This statistical implement not only measures the strength of correlations among variables but also the way of relationship, either negative or positive. The Person correlation was used to test the relations between variables and Check to see if any of the variables in the sample have perfect covariance (Sekaran & Bougie, 2016). The resulting value (known as the

correlation coefficient) varies from +1 to -1 and defines the power of the relationship, while the symbol with values shows whether the correlation is negative or positive. Table 4.9 displays the results of correlation analysis.

Table 4.9: Correlations

Variables	1	2	3	4	5	6
Overconfidence	1					
Representativeness	.213**	1				
Social Interaction	.151**	.386**	1			
Herding	.318**	.356**	.483**	1		
Perceived Market Efficiency	.173**	.240**	.389**	.328**	1	
Investment Performance	.070	.583**	.452**	.349**	.305**	1

**. Correlation is significant at the 0.01 level (2-tailed).

Table 4.10: Constructs Reliability

Constructs	Composite Reliability	AVE	Items	Loading
Overconfidence	0.885	0.612	OC1	0.57
			OC2	0.771
			OC3	0.773
			OC4	0.869
			OC5	0.888
Representativeness	0.915	0.728	RE1	0.843
			RE2	0.864
			RE3	0.847
			RE4	0.859
Social Interaction	0.889	0.615	SI1	0.771
			SI2	0.816
			SI3	0.721
			SI4	0.826
			SI5	0.782
Herding	0.88	0.649	HD1	0.709
			HD2	0.832
			HD3	0.917
			HD4	0.748
Perceived Market Efficiency	0.923	0.668	PME1	0.836
			PME2	0.797
			PME3	0.813
			PME4	0.760
			PME5	0.791
			PME6	0.899
Investment Performance	0.941	0.841	IP1	0.921
			IP2	0.904
			IP3	0.926

Table 4.11: Discriminant Validity

	1	2	3	4	5	6
Herding	0.806					
Investment Performance	0.353	0.917				
Overconfidence	0.314	0.086	0.782			
Perceived Market Efficiency	0.367	0.309	0.214	0.817		
Representativeness	0.363	0.585	0.213	0.246	0.853	
Social Interactions	0.501	0.454	0.193	0.403	0.395	0.784

Table 4.8 displays the correlation analysis's compiled findings. At 0.000, the majority of the results are significant. The results of the analysis demonstrate a significant correlation between overconfidence bias and investment performance, with a p-value of 0.000; representativeness bias and investment performance; social interaction and investment performance, with a p-value of 0.000, and between herding and investment performance, with a p-value of 0.000. A similar correlation is also found between perceived market efficiency and investment performance.

4.8. Discriminant Validity

The verification of discriminant validity is established by ensuring that the square root of the average variance extracted (AVE) for each variable exceeds the correlation value of all other variables (Fornell & Larcker, 1981). This research model's discriminant validity was satisfactory.

4.9. Coefficient of Determination (R2)

The amount of variance in the dependent variable that the independent variables can explain is measured by the R-squared (R2) coefficient. Put simply, the measurement model's explanatory power is indicated by the extent to which it accounts for the variability observed in the data. A high value of this parameter is desirable in order to effectively account for the variation of the endogenous latent variable. Consequently, the predictive capability of the structural model is enhanced with an increase in the R2 value (Shmueli & Koppius, 2011). The coefficient of determination, denoted as R2, is a statistical metric used to quantify the extent to which a regression model explains the variability of the dependent variable. Ranging from 0 to 1, larger values of R2 indicate a greater degree of explanatory power. R-squared values of 0.75, 0.50, and 0.25 are deemed to indicate strong, moderate, and modest levels of association, respectively (Hair et al., 2019). The R2 values are calculated using the Smart PLS algorithm function in this study.

4.10. Multicollinearity

In SPSS, multiple regressions are employed to compute the Variance Inflation Factor (VIF) and tolerance, as well as to assess the presence of multicollinearity among the independent variables. Multicollinearity refers to a statistical phenomenon when one predictor variable exhibits a high degree of correlation with another predictor variable, resulting in the provision of duplicate information regarding the response variable

(Cooper, 2018). In order to assess the presence of a significant correlation among independent variables, the researcher conducted a multicollinearity test.

The results of the multicollinearity test are presented in Table 4.12. Tolerance (TOL) and Variation-Inflation Factor (VIF) are used to measure the multicollinearity among the variables. According to Cooper (2018), If the TOL is less than 0.2 and the VIF is greater than 5, there is collinearity. The greatest number for VIF in Table 4.12 is 1.499, which is significantly less than the typical value of VIF in multicollinearity, which is 5. In the situation of TOL, all of the values are more than 0.2, indicating that the results are good and confirming that the independent variables are not multicollinear.

Table 4.12: Multicollinearity

Construct	Tolerance Value	VIF
Overconfidence	0.882	1.134
Representative	0.799	1.251
social interaction	0.667	1.499
Herding	0.673	1.487
perceived market efficiency	0.815	1.227

4.11. Structural Path Model

After validating the measurement model, examine the structural model. Validating the structural model allows for testing its hypotheses. R2 and path coefficients help evaluate a structural model's performance in PLS.The R-squared (R2) coefficient measures how much of the dependent variable's variability is explained by the independent factors.

This study used SEM and created models that used perceived market efficiency as a mediator to evaluate the presumptive hypotheses. This model enables the estimation of the direct and indirect effects of the two behavioural factors (overconfidence and representativeness) and the two social factors (social contact and herding) on the mediator and the mediator on the performance of the investments. The mediator and dependent factors are provided in Table 4.13 below, and the author measured the direct and indirect impacts of all independent variables on them.

The findings demonstrate that overconfidence bias has a favourable impact on the perception of market efficiency. (H1: β = 0.094, P>0.05). The representativeness bias has a positive effect on perceived market efficiency (H2: β =0.052, P>0.05). Social interaction has a positive effect on perceived market efficiency (H3: β =0.273, P<0.001) and herding has a positive effect on perceived market efficiency (H4: β =0.181, P<0.05).

Market efficiency mediates behavioural characteristics like overconfidence, representativeness, and social ones, including herding, social contact, and investment success. Individual investment success is positively correlated with perceived market efficiency (H5: β =0.309, p<0.001). Direct influence helps measure the mediational process between behavioural, social, and investment success.

Table 4.13: Direct and Indirect Effects

Independent variables	Dependent Variable			
	Direct effects on Perceived Market Efficiency		The indirect effect on Investment Performance	
	B	P value	B	P value
Overconfidence	0.094^{ns}	0.079	0.029^{ns}	0.119
Representativeness	0.052^{ns}	0.361	0.016^{ns}	0.421
Social Interaction	0.273^{***}	0.000	0.084^{**}	0.012
Herding	0.181^{**}	0.015	0.056^{*}	0.033
Perceived Market Efficiency	Direct effects on Investment Performance			
	B	P-value		
	0.309^{***}	0		

*Significant at 0.05, **Significant at 0.01, ***Significant at 0.001, ^{ns}Not Significant at >0.05

Second, the author explores how all independent factors (overconfidence, representativeness, social interaction, and herding) indirectly affect investment performance through the mediator variable (perceived market efficiency). Overconfidence positively impacts investment performance (H6: $\beta=0.029$, P>0.05) through perceived market efficiency, supporting hypothesis 6. The representative positively impacts individual investment performance (H7: $\beta=0.016$, P>0.05) through perceived market efficiency, supporting hypothesis 7. Social contact positively impacts investment performance (H8: $\beta=0.084$, P<0.05) through perceived market efficiency. Therefore, Hypothesis 8 is supported.

Hypothesis 9 (H9: $\beta=0.074$, P<0.039) supports the favourable impact of herding on individual investment performance through perceived market efficiency. Thus, perceived market efficiency mediates overconfidence, representativeness, social interaction, herding, and investment success. The perception of market efficiency boosts individual investment performance. Table 4.13 shows direct and indirect impacts.

5. DISCUSSION AND CONCLUSION

The study's findings, which relate to the social and behavioural elements that affect the success of individual investors, are all summarised in this chapter. This chapter also makes recommendations for future study while taking into account the research's contribution, limitations, and implications.

The study's specific goals are to examine the effects of social and behavioural factors, including herding and social interaction, on the investment performance of individual investors at the Pakistan Stock Exchange through the mediating function of perceived market efficiency. The second goal is to assess how social characteristics, such as social contact and herding, affect people's investment performance by acting as a mediator for perceived market efficiency. A purposive sampling technique was employed to choose a sample of 1100 individual investors from the public, and questionnaires were utilised to

obtain the critical demographic data. Individual investors were asked to rate the impact of behavioural and social biases on their investing decision-making on a 7-point Likert scale. After that, the data were coded and subjected to SEM analysis. This made it possible to use the research on the influence of behavioural and social aspects on the performance of individual investors at the Pakistan Stock Exchange.

The study's initial hypothesis sought to determine how overconfidence bias affected the perception of market efficiency at the Pakistan Stock Exchange. The results of the study show that overconfidence has a beneficial impact. (H1: $\beta= 0.094$, $P<0.079$) on perceived market efficiency. Hence, Hypothesis 1 is supported. Investors are involved in overconfidence bias. They believe they have complete control over their investments, so they engage in excessive trading and gather more information before investing in the stock market and overestimate the information or their ability because overconfident investors believe that they have complete control over the market; as a result, overconfident investors exceed their competitor (Rafique, Sultan, & Anam ul Haq, 2021).

This study's second hypothesis is that representativeness biases impact how efficient the Pakistan Stock Exchange is considered to be. This study demonstrates that representativeness has a favourable impact on perceived market efficiency (H2: = 0.052, P0.361). As a result, this supports the study's hypothesis (H2). This study aimed to determine how herding affected the perception of market efficiency on the Pakistani stock exchange. The results showed that herding has a favourable impact on perceived market efficiency (H3: = 0.181, P0.05). H3 is therefore supported. Because the majority of investors follow their purchasing and selling patterns. However, investors who make rational decisions do not follow those that result in market efficiency. To prevent losing money, investors imitate others (Mahmood et al., 2020).

This study's fourth hypothesis looks at how social contact affects how efficient markets are regarded at the Pakistan Stock Exchange. The study's findings suggest that social interaction has a favourable impact on how efficiently markets are viewed (H4: = 0.0273, P0.001). So too, is Hypothesis 4 supported. Information is embedded and used for exchange through interactions between people and their networks of connections. In order to gather more information in a short amount of time, social relationships are a powerful information channel (Huang & Li, 2009).

This study also examines how perceived market efficiency affects Pakistan stock exchange investment success. The results show that perceived market efficiency improves investment performance (H5: = 0.309, P0.001). Hypothesis 5 is verified. Another study goal was to examine how overconfidence bias affects Pakistan stock exchange investing performance. The study found that overconfidence improves investment success (H6: = 0.029, p>0.05). Hypothesis 6 is verified. In a Turkish market data analysis, Tekçe et al. (2016) revealed characteristics that impact Turkish investors' overconfidence bias and significant investor investment success.

Greo (2021) found that excessive investment and overconfidence had a good association

in his research. The study's findings suggest that representativeness influences investment performance favourably (H7: = 0.016, P>0.05). As a result, Hypothesis 7 is confirmed. In their investigation of the New York Stock Exchange, Bracha and Brown (2012) found that the representational bias has a favourable effect on investing performance and that people who adhere to its guidelines frequently outperform their peers in terms of returns.

This research shows that social interaction has a positive effect (H8: β= 0.084, P<0.01) on investment performance. Hence, Hypothesis 8 is supported. Social interaction refers to the social activities and social networks that people establish via time, sometimes voluntarily, for their convenience. These social networks enable information sharing among family, friends, neighbours, and other people in the area. (Moueed et al., 2015). The finding of the study indicates that herding has a positive effect (H9: β= 0.056, P<0.05) on investment performance. Hence, Hypothesis 9 is supported.

5.1. Implication of the study

The study's findings will assist financial advisers understand how behavioural and societal biases impact investors' investing decisions. Effective investing choices affect investment performance. Investor psychology may reduce investor errors and increase investing success.

This research will enrich financial literature and improve expertise. Researchers and future scholars will be using the research as future reference material when advancing their information in behavioural finance. After the study, the researcher highlighted areas that deserve additional research. Future scholars and researchers will be able to formulate their research problems on this foundation.

This study could serve as a good example of stock investment behaviour for shareholders to understand and examine before making proper investment decisions. This research may be carried out in the hopes of testing the suitability of behavioural finance for financial markets. Future researchers will be able to gain a better theoretical and practical understanding of the stock market as well as behavioural finance concepts because of this study.

5.2. Limitation of the study

Individual investors are the focus of this study, but institutional investors may be the focus of future research. Researchers suggest that in future studies, a larger sample size of investors be used for data analysis. Furthermore, the study relied too heavily on primary data gathered through questionnaires, resulting in a study restriction. This research is confined to a few selected variables which are mentioned.

5.3. Conclusion

The major goal of this study is to investigate how behavioural and social biases affect investment performance on the PSE, with perceived market efficiency serving as a mediating factor so that the behaviour of the investor can be clearly identified. Overconfidence, representativeness, social interaction, and herding were the four biases used in this investigation. Based on the findings, this study came to the conclusion that

herding, representativeness, overconfidence, and social contact had a favourable effect on market efficiency and investment success.

Results indicate that representativeness and overconfidence enhance the standard of investment performance and market effectiveness. The study's findings also suggest that herding and social contact enhance the standard of investment performance. The heuristic explanation is consistent with the findings, which demonstrate that individual investors behave irrationally as a result of behavioural biases. The goal of this research is to learn about real-life investment practices rather than theoretical or standard ones. It can also help investors to upgrade their investments at the individual level.

5.4. Future Direction

More research is needed to confirm the conclusions of this study with a larger sample size and a wider range of responders. It's also recommended that more research can be done to improve the measurements of behavioural finance. More study is needed to apply behavioural finance to the behaviours that influence institutional investors' investing decisions at the Pakistan Stock Exchange. Some of the future directions are recommended where further research can be conducted. This research consists of two behavioural variables and two social variables to determine the impact on investment performance. In the future, researcher will include more variables to determine their relationship between these dependent and independent variables. In this study, the researcher uses the primary source of data, and another researcher can be used a secondary source of the data collection method.

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