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ABSTRACT:

This article aims to clarify the mechanism by which herding behavior influences perceived market efficiency, investment decisions, and the performance of individual investors actively trading on the Pakistan Stock Exchange (PSX).

The deductive approach was used in this study, as the research is based on the theoretical framework of behavioral finance. A questionnaire and cross-sectional design were employed to collect data from the sample of 309 investors trading on the PSX. The collected data were analyzed using SPSS and Amos graphics software. Hypotheses were tested using Structural Equation Modeling (SEM).

The article provides further empirical insights into the relationship between herding behavior and investment management and perceived market efficiency. The results suggest that herding behavior has a markedly negative influence on perceived market efficiency and investment performance, while positively influencing the decision-making of individual investors.

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The current study is the first to focus on links between herding behavior and investment management activities and perceived market efficiency. This article enhances the understanding of the role that herding behavior plays in investment management and, more importantly, it improves understanding of behavioral aspects and their influence on investment decision-making in an emerging market. It also adds to the literature in the area of behavioral finance, specifically the role of herding behavior in investment management; this field is in its initial stage, even in developed countries, while little work has been done in developing countries.

Does Herding Behavior Matter in Investment Management and Perceived Market Efficiency? Evidence from an Emerging Market

Abstract

Purpose – This article aims to clarify the mechanism by which herding behavior influences perceived market efficiency, investment decisions, and the performance of individual investors actively trading on the Pakistan Stock Exchange (PSX).

Design/methodology/approach – The deductive approach was used in this study, as the research is based on the theoretical framework of behavioral finance. A questionnaire and cross-sectional design were employed to collect data from the sample of 309 investors trading on the PSX. The collected data were analyzed using SPSS and Amos graphics software. Hypotheses were tested using Structural Equation Modeling (SEM).

Findings – The article provides further empirical insights into the relationship between herding behavior and investment management and perceived market efficiency. The results suggest that herding behavior has a markedly negative influence on perceived market efficiency and investment performance, while positively influencing the decision-making of individual investors.

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Paper type - Research paper

1. Introduction

It is commonly believed that people who deal in finance are very sensible; that is, they make their decisions very carefully and rationally. If this assumption were correct, all investors in any given financial market (e.g., stock exchange) would behave in virtually the same way; the market would almost always be perfect, and fluctuations in share prices would be minimal, infrequent, and only depend on extraordinary events. However, history has shown us that investors do behave irrationally, almost no financial market is ever perfect, and share prices fluctuate disproportionately to any given piece of new information. This paradox can only be explained by accepting the fact that investors do not always make rational decisions individually and, as a consequence, the financial markets (a term for all investors collectively) are seldom close to perfection. A study of behavioral finance can help us understand why different individuals (or groups of individuals) react differently to a situation and how financial markets are affected by the differences in investors' decision-making styles. According to behavioral finance scholars, unavoidable behavioral biases in the personality of every individual prevent them from making rational decisions, as well as having bad consequences on investment decisions, investors' performance (Ahmad & Shah, 2021), and perceived market efficiency (Shah, Ahmad, & Mahmood, 2018).

Much of this research is based upon the idea that humans are "boundedly rational" (Simon 1956). Simply said, a human's information processing capacity is limited, preventing economically rational behavior (Itzkowitz & Itzkowitz 2017). We deal with limited processing capacity through the use of shortcuts that simplify decisions but sacrifice information use (Tversky & Kahneman 1973); these shortcuts can cause systematic errors in judgment and lead to satisfactory investment choices, but do not maximize utility. Investors often use heuristics or shortcuts, causing many behavioral biases, when trading, specifically displaying the herding behavior that leads investors to make less than optimal choices. Behavioral biases are the main reason for irrationality in decision-making (Shefrin 2007).

Investment decision and market efficiency is still an unclear idea – all the debate on its various aspects has not yet produced objective rules or theories. There is a positive connection between the economy and the securities exchange; a decrease in the stock exchange will adversely influence the progress of the economy and vice versa. Thus, investors' choices on securities exchanges play a critical part in deciding market development, which then manages the economy (Kengatharan & Kengatharan, 2014). In order to understand and explain investors' choices, it is necessary to investigate those behavioral components that influence individual investors' choices on the Pakistan Stock Exchange (PSX) and how they influence investors' performance. In this article, the researcher investigates the role of herding behavior in perceived market efficiency and the investment management activities (investment decisions and investment performance) of individual investors actively trading on the PSX. To the best of the author's knowledge, the herding tendency has never been systematically tested with these investment management activities and perceived market efficiency, nor has its predictive power been examined in an emerging economy.

Kumar and Goyal (2015) emphasized the scarcity of studies on herding bias in developing economies. Developing economies have higher growth possibilities, and investors are more likely to invest in the stock market. Kumar and Goyal also highlighted that empirical studies based on secondary data dominate the field, and there is a dearth of studies based on primary data. Ahmad (2022) argues convincingly that future research studies in this area can focus on emerging stock markets because emerging markets contain less certain conditions than developed markets. The uncertainty prevails in the form of more sparse informational environments, fewer analysts

following, reduced accounting disclosure, and the like. In such a context, behavioral heuristics work better, which needs to be studied further. A handful of studies have shown that fast and frugal rules and other mental shortcuts cause inevitable behavioral biases in investment decisions in both developing economies (Metawa et al., 2018; De Vries et al., 2017; Jaiyeoba & Haron, 2016) and developed economies (Yalcin et al., 2016; Wang et al., 2011; Hirshleifer, 2001; Coval & Moskowitz, 1999; Tversky & Kahneman, 1986). The findings of various studies were inconclusive in explaining herding tendency among investors. Therefore, this study has tried to provide the desired empirical evidence from a developing economy by using a unique primary data set of individual investors who invest in the stock market.

Thus, the current study makes a few contributions to the existing body of literature on herding behavior, investment management activities, and market efficiency. First, the present study improves the understanding of the role that herding behavior plays in investment management activities and market efficiency. The current research provides an explanation of how and why investors' behavior deviates from rationality and markets become inefficient. Second, the findings of the current research offer novel contributions to the existing literature by suggesting that investors displaying herding behavior underestimate their downside risk and trade excessively in the stock market, which can have a detrimental effect on their returns and market efficiency. Hence, the present study also advances an important stream of existing research, which posits that the human mind relies on heuristic strategies affected by systematic and predictable errors (biases), that allow only sub-optimal decisions (Tversky & Kahneman, 1974). Most existing research emphasizes the importance of herding behavior in complex and uncertain environments, as it guides the decision-maker in searching information by effectively and efficiently exploiting information structures in the environment (Bertel & Kirlik, 2010), but ignores its negative consequences on investment management activities and market efficiency. This study is the first which reveals the heterogeneous impact of herding behavior on investment management activities and perceived market efficiency, enriches the antecedents of irrational investment management activities and market inefficiency, which contributes to the existing body of literature on the behavioral finance paradigm.

Third, this study has important practical as well as theoretical implications, since investors act in environments characterized by a high level of uncertainty and ambiguity (Sarasvathy, 2001). In doing so, we address "the thinking-feeling-doing connection" (Cardonet et al., 2012). This article contributes to the extant literature demonstrating the effect of herding behavior on perceived market efficiency and investment management activities from the behavioral finance perspective using the instrument of the questionnaire. This research work is a pioneering study in this context. Fourth, the primary reason for this research is to investigate if herding behavior matters in stock investors' decision-making and investment performance. This study also enhances the understanding of the psychology of the choices of investors from an emerging market. Moreover, understanding investor behavior can help investors avoid herding bias and can improve their decisions when choosing investment services, products, and plans. The study provides a significant and meaningful contribution to the prevailing young and emerging finance paradigm. Most studies focus on individualistic cultures and well-developed financial markets, and very little is known about the profiles, inspirations, and conduct of institutional investors in collectivist cultures and less-developed markets (Ahmad & Shah, 2021). This article also helps fill this gap by considering how investors' herding behavior influences investment management activities and perceived market efficiency, especially in an emerging country like Pakistan where the market fundamentals are different from those in developed countries.

Of two theories supporting the research phenomenon, one is known as prospect theory, and the other is known as bounded rationality theory. The behavioral theory of bounded rationality, which Simon explained (in 1955), states that decision-makers cannot make a rational decision due to the limited information they have, the cognitive limitations of their minds, and the limited time they have to make a decision. Thus, even decision-makers who intend to make optimal decisions are bound to make satisficing (rather than maximizing or optimizing) decisions in complex situations within their data processing and cognitive limitations. One way to deal with this limitation is through heuristics or shortcuts, which might cause systematic errors in judgment and lead to satisfactory investment choices but do not maximize utility (Ahmad, Shah, & Abbass, 2021). Prospect theory, which is explained by Kahneman and Tversky (1979), posits that people make decisions on the basis of gains and losses rather than final outcomes, as well as setting reference points and making decisions accordingly. People value gains and losses differently. This value is calculated from a reference point (Ahmad & Shah, 2021). Under conditions of environmental uncertainty and complexity (turbulence), individual investors often fell prey to herding behavior to reduce the risk of losses. Due to herding behavior, their technical knowledge and reasoning faculties are impaired, leading to errors in judgment. As a result, investors make irrational decisions, which can have a detrimental effect on their returns and market efficiency.

The remaining article proceeds as follows: In the next section, the author discusses the previous studies regarding the relationship of herding behavior with market efficiency, investment decision, and performance of individual investors and develops the hypotheses for this article. In the third section, the author describes the method of data collection and the operationalization of construct measures. The results of the article are presented in section four. In the fifth section, the author discusses the study's results. Section six shows the conclusions and implications of our results, and the seventh section suggests avenues for future research.

2. Literature Review
Many researchers have explored the role of herding behavior in investment management and market efficiency in different cultures or environments. Some of their results are very relevant and valuable for this present study. A limited review of prior studies regarding the relationship of herding behavior with perceived market efficiency, investment decision-making, and performance is provided below.

2.1 Herding Behavior
Herding behavior is a cognitive heuristic bias defined by research scholars from the behavioral finance community in several ways. To clearly understand the concept of herding, we look at the various definitions of herding that are already available in the literature.

According to Banerjee (1992), herding is defined as "everyone doing what everyone else is doing, even when their private information suggests doing something quite different." Individuals who suppress their own beliefs and base their investment decisions solely on the market's collective actions or imitate other investors' actions or reactions, even when they disagree with its prediction, display herding behavior (Christie & Hwang, 1995). Vieira and Pereira (2015) propose a definition of herding as "a group of investors ignoring their own information and beliefs and following the decisions of other investors, imitating them." According to Patterson and Sharma (2007), "herding occurs when a group of investors trades on the same side of the market in the same securities over the same period of time or when investors ignore their own private information and act as other investors do."

Moreover, as Galariotis et al. (2016) and Galariotis et al. (2015) assert, herding is a process where investors trade in the same way simultaneously, either because they are mimicking each other or because of conversion to the market average. Chen (2013) argues that herding can be defined as an investment strategy in which investors follow the market consensus and/or mimic financial experts' actions. According to Hwang and Salmon, (2004), herding is defined as the situation in which investors ignore their predictions and beliefs and copy the decisions made by their peers or the movements on the market. The phenomenon of herding occurs when a group of investors deliberately imitates the activities of other investors who they consider to be more knowledgeable, rather than following their own convictions and utilizing their own predictions when purchasing or selling similar stocks over a specific timeframe (Chen, 2017; Blasco & Ferreruela, 2008). Thus, when investors intentionally or unintentionally copy the actions or reactions of other investors and/or base their investment decisions solely on the collective actions of the market, instead of making investment decisions based on their own convictions and predictions, such behavior is referred to as herding.

The literature reveals that there are two different forms of herding: one is known as spurious herding, the second is referred to as intentional herding. We first look at spurious herding, which is also known as unintentional herding. According to Indārs, Savin, and Lublóy (2019), spurious herding is referred to as "a situation whereby investors take similar actions after receiving similar information; herding without mimicking the behavior of others." Bikhchandani and Sharma (2000) propose that unintentional herding can be defined as a situation whereby investors face the same fundamental-driven information sets; thus, they take similar trade decisions without intending to. Gavriilidis, Kallinterakis, and Ferreira (2013) assert that some common features exist among investment professionals that may lead them to take similar trade decisions, thus generating the impression of herding without deliberately imitating the behavior of others; that phenomenon is called spurious herding. Such correlation in their trades may occur as a result of professional investment being characterized by relative homogeneity, taking into consideration their common features (such as their investment experience, educational background, and indicators used for their analyses) and the common regulatory framework they are subject to (Voronkova & Bohl, 2005). Indārs, et al. (2019) argue that spurious herding, being generated by rational investors as a result of information processing, can be based on both non-fundamental and fundamental factors. Additionally, style investing, for example, momentum strategies (it is likely that they herd into recent winners and out of recent losers), used simultaneously by a group of investors, can lead to spurious herding as well (Guney, Kallinterakis, & Komba, 2017).

On the contrary, intentional herding is real herding, which results from investors intentionally imitating other investors' actions regardless of whether the latter make smart investment decisions or not (Kim & McKenzie, 2007). According to Bikhchandani and Sharma (2001), intentional herding can be defined as a situation where investors emulate each other's behavior with intent in order to protect remuneration and preserve reputation or due to informational cascades. Furthermore, Indārs et al. (2019) assert that intentional herding may occur due to investors' strong willingness to mimic others' behavior in the market. In this type of herding, investors disregard their predictions and convictions, deliberately copy the actions of others and/or follow some market consensus for the purpose of reputation and compensation or blindly mimicking. Normally investors herd intentionally when they wish to preserve reputation and secure a profit from such behavior in the form of a positive externality, either professional or informational (Gavriilidis et al., 2013). Based on the above definitions, intentional herding is

further categorized into two different forms of herding: rational herding and irrational herding. Firstly, we discuss rational herding.

According to Vieira and Pereira (2015), "herding can be entirely rational and that it results from the deliberate intention of investors to mimic each other". When investors intentionally mimic the actions or reactions of other investors and/or base their investment decisions solely on the collective actions of the market to preserve reputation and secure a profit, by simply ignoring rational analysis, this type of herding behavior is referred to as rational herding. Bikchandani and Sharma (2001) assert that rational herding is likely to emanate from information cascading, compensation concerns, reputation concerns, information asymmetry, and information-based intentional herding or it occurs when investors work in an imperfect information environment. In this situation, investors have difficulty in interpreting the imperfect data. They infer private information from other investors' behavior who they regard as better informed; thus, herding emerges. The literature shows that there are five models of rational herding: one is compensation-based herding, the second is information acquisition, the third is the informational cascades, the fourth is principal-agent, and the fifth is behavioral models—a brief discussion of these models is given below.

The model of compensation-based herding was developed by Brennan (1993); it may take place when remuneration of the investment manager (an agent) is contingent on comparison of his performance with benchmark investors (other professionals) (Bikchandani & Sharma, 2001). The remuneration of an investment manager is an increasing function of the profit he earns and a diminishing function of other professionals' (benchmark investors) profits; both the benchmark investor and agent make decisions about stock returns based on imperfect private information. Consequently, the agent's portfolio choice decision is followed by the action of the benchmark investor. However, imitating other professionals' investment decisions threshold the maximum remuneration; simultaneously it provides insurance against low compensation as poor performance in comparison to the benchmark investor can be avoided (Indārs et al., 2019).

The model of information acquisition herding was introduced by Hirshleifer, Subrahmanyam, and Titman (1994), focusing on investors' patterns of information acquisition. Information acquisition herding emerges when a group of investors decides to consider similar information sources or purchase information only if numerous different speculators do. According to Devenow and Welch (1996), under certain situations, investors find it advantageous to procure additional information only if other professionals do. Thus, investors herd on information acquisition and, as a result, trade in the same way simultaneously. Bikchandani, Hirshleifer, and Welch developed the model of informational cascade herding in 1992. The informational cascades model shows that investors' actions transmit information or signals to observing investors. At one point, these investors will ignore their own information and follow the others' decisions and, as a result, engage in herding behavior. Scharfstein and Stein presented the principal-agent model of herding in 1990. This type of model's key characteristic is that it encompasses the comparative performance appraisal, and concern for managers or analysts' reputation causes principal-agent problems. In this situation, agents will herd and imitate other agents' investment decisions or earnings forecasts to convey their principles that they possess superior skills.

Shiller and Pound introduced the behavioral model of herding in 1989, according to which three underlying factors (interpersonal communication, mimetic contagion, and investor psychology) encourage herding behavior among investors. The interpersonal communication among aristocrats seems to bring a kind of focus and encouragement that leads to behavior change. Shiller and Pound (1989) assert that investors seem to have no systematic buying decisions, and

other investors have stimulated initial interest in stocks by individual and institutional investors. According to Topol (1991), mimetic contagion is more concerned with short-term behavior when investment managers do not really have time to interpret news and follow other market participants' actions spontaneously. Lux (1995) demonstrates that mimetic contagion occurs when agents or investment managers try to infer information regarding fundamentals from the ask and bid prices of others (who may be as uninformed as they are themselves). Simulation is more likely to occur when the decision is made for the first time, when the decision-making environment is competitive or challenging, and/or when the decision-making environment changes. The Lux (1995) model also explicitly considers psychosomatic factors that have a significant influence on non-sophisticated traders' behavior. These traders are unable to obtain information regarding fundamental values; as a result, their decisions rely on market observation. Psychological factors are demonstrated as follows: traders can either be pessimistic or optimistic; if a high proportion of traders are optimistic, because traders are non-sophisticated and susceptible to other traders' actions, the remaining pessimistic traders are very likely to change their attitudes and become optimistic as well. Herding is thus classified as an epidemic of sentiment (Oehler & Chao 2000).

On the other hand, irrational herding occurs "when investors with insufficient information and inadequate risk evaluation disregard their prior beliefs and blindly follow other investors' actions" (Lin, Tsai, & Lung, 2013). When individuals refer to others' actions as a determinate social norm and emulate others' actions passively, such a phenomenon is referred to as irrational herding (Wang, Guo, & Sun, 2019). According to Devenow and Welch (1996), irrational herding relies on investor psychology, where investors simply ignore rational analysis and follow others' actions blindly. Vieira and Pereira (2015) demonstrate that irrational herding occurs due to herding instinct, through which groups of investors make similar decisions.

Several researchers have endeavored to identify potential reasons for the existence of the herding phenomenon, some of them discussed here. As Hirshleifer, Subrahmanyam, and Titman (1994) argue convincingly, herding depends on the tendency of investors to follow similar sources of information, homogeneously interpret the signals delivered to the market, and, as a result, take similar economic decisions. Consequently, correlated behavior patterns occur when individuals have access to the same information sources and interpret it similarly (Vieira & Pereira 2015). Trueman (1988) states that institutional investors support herding behavior in financial markets because they engage in negotiations excessively or analyze the same group of securities and transact similarly. There are many other potential underlying factors, such as trading noise in prices (Lin, Tsai, & Lung, 2013; Black, 1986), compensation schemes (Demirer & Kutan, 2006), the desirability of similar assets (Patterson & Sharma, 2006), the cost of reputation (Calvo & Mendoza, 1997), the degree of complexity of the market and the quality of the information conveyed to the market, that encourage herding (Scharfstein & Stein, 1990; Rajan, 1994).

The consequences of herding are that decision-makers fail to diversify their investment portfolio, which in turn adversely affects their investment performance. In financial markets, herding can distort stock prices and other financial assets, such as currencies, because they are traded below or above their fundamental value. Herding by market participants destabilizes markets, exacerbates volatility, and increases the fragility of the financial system. This article measures the impact of herding behavior on investment management activities (i.e., investment decision-making and investment performance) and perceived market efficiency. A limited review of prior studies regarding herding behavior and their effect on investment management activities and perceived market efficiency is discussed below.

2.2 Herding Behaviour, Investment Decisions, and Investment Performance

Investment is the process of purchasing assets using available resources to reap greater future benefits. In terms of the capital market, these assets refer to financial assets, that is, securities and tradeable instruments. Investment performance is the return on an investment portfolio. An investment portfolio may contain two or more assets. Every investor wants to make optimal investment decisions (Sharp, 1964). According to Merton (1987), optimal and rational investment decisions depend on advanced financial knowledge. Standard finance assumes that people have complete information and make rational decisions at all times (Ameur, Boujelbène, Prigent, & Triki, 2019). Behavioral finance, however, assumes that investment decisions are often irrational due to imperfect information (Bikhchandani et al., 1992), bounded rationality (Pompian, 2006), anomalies (Ajmal, Mufti, & Shah, 2011), fundamental heuristics (Baker & Nofsinger, 2010), and psychological biases (Baker & Nofsinger, 2002) or behavioral biases (Shefrin, 2007). Basarir and Yilmaz (2019) argue that investors do not always act rationally in their financial decisions, especially in the financial purchasing decisions of individual investors. Instead, they make irrational decisions by following the majority. Chiang and Zheng (2010) found evidence of herding in developed stock markets other than the U.S. They further found evidence of herding in Asian markets, but they could not find evidence of herding in Latin American markets.

Jain, Walia, and Gupta (2020) used the fuzzy analytic hierarchy process to study the impact of behavioral biases on individual equity investors' decision-making. The results reveal that eight behavioral biases, including herding behavior, significantly influence individual equity investors' decision-making. Investors who fell prey to herding overestimate expected profit poorly, diversify their portfolios and trade excessively, and consequently experience lower profits or returns than the market (My & Truong, 2011). According to Bikhchandani and Sharma (2000), excessive trading occurs on stock exchanges, resulting in low returns for investors because of their herding behavior. Agrawal, Singhal, and Swarup (2016) investigated the role of herding behavior in the decision-making of individual investors trading at the Indian Stock Exchange. Their results show that herding behavior has a significant effect. Madaan and Sanjeet (2019) examine the effect of behavioral biases, namely overconfidence, anchoring disposition effect and herding on investment decision-making, and found that overconfidence and herding behavior significantly affect investment decision making. Javaira and Hassan (2015) found the presence of herding behavior in the Pakistani stock market during crises. Zahera and Bansal (2018) assert that its investors tend to follow the decisions of the other investors in the stock market. In their study, Mohd Adil, Singh, and Ansari (2021) investigated the impact of behavioral biases on investment decisions by gender. The results reveal that risk-aversion and herding have a significant negative effect on the decision-making of both male and female investors.

After reviewing the relevant literature, the researchers concluded that herding behavior has a negative effect on rational decision-making. Individual investors who exhibit herding behavior underestimate their downside risk and trade excessively in the stock market, which can have a negative effect on their returns. Based on the empirical literature, the following relationships are expected:

H1: *Herding behavior has a significant negative influence on the investment decisions of individual investors on the* PSX

H2: *Herding behavior has a significant negative influence on the investment performance of individual investors on the* PSX

2.3 Herding Behaviour and Market Efficiency
According to Fama (1970) and other believers in the fundamental theories of standard finance, markets are almost always efficient. Market efficiency means the price of securities dominating

the financial market reflects all available information (Fuentes, 2011). The implication of the "efficient market hypothesis" is that no investment strategy can consistently beat the market and get a superior return over a long period. In recent years, the behavioral approach has also emerged, stating that financial markets are made up of individuals who can make irrational decisions, leading to inefficiencies in financial markets (Akerlof & Shiller, 2010).

Several studies demonstrated that markets are inefficient in real life because of behavioral biases and other aspects of capitalism. In reality, markets are never absolutely efficient nor absolutely anomalous (Pompain, 2006). Behavioral factors are the main reason for inefficiencies in financial markets. Bikhchandani and Sharma, (2000) explore the effect of herding behavior in financial markets through a systematic literature review. Their results reveal that herding behavior can misrepresent the price of shares and other financial assets, such as currencies, in financial markets because they are swapped below or above their fundamental value (Dewan & Dharni, 2019). They also highlighted that market participants' herding behavior destabilizes markets, encourages volatility, and increases the financial system's frailty. Shah, Ahmad, and Mahmood (2018) investigated the possible effects of behavioral factors on perceived market efficiency. Their study suggested that individual investors' behavioral biases, such as overconfidence, representativeness, availability, and anchoring, have a significant negative effect on perceived market efficiency. Based on the empirical literature, the following relationship is expected:

H3: Herding behavior has a significant negative influence on the perceived market efficiency

2.4 Research Model

As mentioned in the literature review, herding behavior undoubtedly impacts perceived market efficiency, investors' decisions in financial markets, especially in stock markets, and has a significant impact on investment performance. Based on the gaps analysis theories and evidence, the conceptual framework in Figure 1 is derived to empirically examine the role of herding behavior in investment management activities (investment decision-making and performance) and perceived market efficiency.
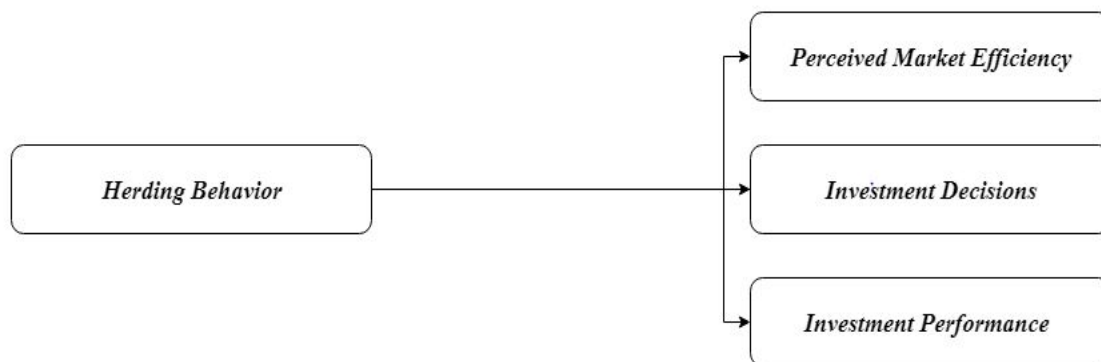
Figure 1 Conceptual Framework

3. Research Methodology

3.1 Research Design
The current study analyzes a relatively large sample at a single time. Consequently, a cross-sectional design is suitable for this study. The core purpose of the study is testing hypotheses because testing hypotheses "offers an enhanced understanding of the relationship that exists among variables" (Sekaran, 2006; Bryman & Bell, 2007; Ghauri & Gronhaug, 2010; Collis & Hussey, 2009; Saunder et al., 2009).

3.2 Research Approach
The research approach in this study aims to explore the impact of behavioral factors on the investment decisions and performance of individual investors, which are already "out there." Thus, a deductive approach is a more appropriate choice than the inductive approach (Sekaran, 2006; Kappeler et al., 2005; Bryman & Bell, 2007; Saunder et al., 2009; Ghauri & Gronhaug, 2010).

3.3 Sampling and Data Collection
In order to achieve the research objective, the sample of this study includes individual investors trading on the Pakistan Stock Exchange (PSX). While the present study was conducted in the Pakistani context and its focus is on the investment management activities and perceived market efficiency of individual investors in this market, it may be relevant to investors in stock exchanges in other emerging markets.

Osborne, Costello, and Kellow (2008) suggested a ratio of 10 to 15 respondents to one item as an acceptable criterion for deciding the sample size to get unbiased estimates. Following this criterion (21 items x 10 = 210 responses), a total number of 650 questionnaires were delivered to investors in four major cities of Pakistan, namely Lahore, Rawalpindi, Islamabad, and Karachi, trading on the PSX, to get a response of at least 210. Of these, 398 were returned; 89 questionnaires were found incorrectly filled in with missing values and were dropped. Thus 309 questionnaires were fully and correctly completed by individual investors and used for analysis, representing an effective response rate of 47.53%. A convenient purposively sampling technique was used in this study for data collection.

There are different kinds of data collection methods, such as structured interviews, unstructured interviews, semi-structured interviews, observation, and group discussions. One of the most common methods of quantitative research is the self-reported questionnaire, which was selected as the data collection method for this study because it was more time and cost-effective than other methods, such as interviews, video conferencing, and brainstorming (Bryman & Bell, 2007). Another reason was the natural tendency among investors to avoid personal interviews or to give sufficient time to researchers. Questionnaires were considered the best method for data collection in this situation as it allowed the respondents to complete them whenever they had free time and without the possibility of direct influence from the researchers. Each copy of the questionnaire was accompanied by a cover letter that clearly stated that: confidentiality and secrecy of information will be strictly maintained, the data will be used only for research purposes, and respondent information will not appear in any document meant for public access.

3.4 Operationalization of Variables
The research aims to explore how herding behavior influences investment management activities and perceived market efficiency. To achieve this research objective, a survey method was used and, where possible, developed a questionnaire based on existing measurement instruments from

the literature. For all multi-item construct measurements, the authors used a five-point Likert scale from 1 (strongly disagree) to 5 (strongly agree) unless otherwise stated. All constructs were operationalized with reflective measurement models.

Herding behavior was measured with seven items adapted from Prosad, Kapoor, and Sengupta (2015). To measure herding behavior, investors were asked to what extent they agree/disagree with "you prefer to buy stocks if many 'buy' orders were placed from the beginning of the trading session" and "discussing your investment decisions with colleagues reduces your pressure of being successful" etc. Five items were used to measure investment decision-making. The items were adapted from Rasheed et al. (2018). To measure the investment decision-making of investors, respondents were asked to what extent they agree/disagree with "When making an investment, you trust your inner feelings and reactions." and "When I make an investment, it is more important for me to feel the investment is right than have a rational reason for it," etc. Three items were used to measure investment performance, which were adopted from ul Abdin et al. (2017). To measure investment performance, respondents were asked to what extent they agree/disagree with "the return rate of your recent stock investment meets your expectation" and "You feel satisfied with your investment decisions in the last year (including selling, buying, choosing stocks, and deciding the stock volumes)," etc. Six items were used to measure perceived market efficiency. Questions were adapted from Shah, Ahmad, and Mahmood (2018). To measure perceived market efficiency, respondents were asked to what extent they agree/disagree with "You carefully consider the price changes of stocks that you intend to invest in" and "Market information is important for your stock investment".

3.5 Data Analysis Method

The data gathered through the survey were examined by utilizing SPSS and Amos graphics software. Firstly, a pilot test was conducted to check the validity and reliability of the instrument. Then statistics for demographic variables were presented. After that, confirmatory factor analysis (CFA) was run to confirm the factor structure, evaluate the convergent validity of the study constructs, and remove the items with low standardized factor loading. The common method bias was tested to check whether the problems of common method bias exist as cross-sectional data were used to achieve the research objectives of this study. Statistical techniques used to achieve the research objectives include correlation analysis and structural equation modeling (SEM). The data analysis process adopted for this study is consistent with Ahmad (2021).

4. Empirical Findings

4.1 Pilot Testing

A pilot study was conducted to find out the reliability of items included in the instrument, using data from 52 investors. For pilot testing, 100 questionnaires were delivered by hand to investors operating at the PSX and collected right after completion. Only 63 were returned, from which 52 questionnaires were useable, representing an effective response rate of 52 percent. The Cronbach's Alpha coefficient estimated the degree of the consistency of the variables. Overall, the variables presented values ranging between 0.779-0.875 (See Table 1), thus being classified as satisfactory. Therefore, the estimation of all components incorporated into the variables provided a good representation of each of the variables under study, thus allowing further analysis (SEM).

Table 1
Analysis of variables reliability using the Cronbach's alpha

Variables	Cronbach's alpha
Herding Behavior	0.875
Perceived Market Efficiency	0.831
Investment Decisions	0.779
Investment Performance	0.864

4.2 Statistics for Demographic Variables

Table 2 shows the statistics for the demographic characteristics of the sample used for analysis. The sample for the study was composed of 78.3% male and 21.7% female investors, reflecting the social and cultural norms of Pakistan. The sample for research included 69.9% married, 23.6% single, and 6.5% divorced participants. In terms of qualification, 48.5% held a master's degree, 33.3% held a bachelor's degree, 7.4% of the investors had done a M.S./MPhil, while 6.1% of the investors had done intermediate and 4.5% investors had other qualifications. In terms of age, the major portion of the sample (about 39.2%) lay within the age group of 41-50 years, while 31.4% were 30-40 years old, 18.4% were below 30, and 11.0% were above 50. The sample for the study included 31.7% investors with less than five years' investment experience, 41.1 % investors with from 5 to 10 years' investment experience, 18.1% investors with between 11 and 20 years' investment experience, and 9.1% of investors had more than 20 years' experience of attending the stock market

Table 2
Statistics for demographic variables

Category		Frequency	Percentage %
Gender	Male	242	78.3
	Female	67	21.7
Marital Status	Single	73	23.6
	Married	216	69.9
	Divorced	20	6.5
Qualification	Intermediate	19	6.1
	Bachelors	103	33.3
	Masters	150	48.5
	MS/MPhil	23	7.4
	Others	14	4.5
Age	Below 30 years	57	18.4
	30-40 years	97	31.4
	41-50 years	121	39.2
	Above 50 years	34	11.0
Investment experience	Less than 5 years	98	31.7
	5-10 years	127	41.1
	11-20 years	56	18.1
	More than 20 years	28	9.1

4.3 Confirmatory Factor Analysis (CFA)

CFA was run in AMOS 20 to authenticate the factor structure, evaluate the convergent validity, discriminant validity, and internal consistency reliability of the study constructs as well as removing the items with low standardized factor loading. In order to test the validity and reliability of the constructs, the measurement model shown in Figure 2 was performed. A satisfactory model fit was accomplished by following the model modification tactics proposed by Hair et al. (2014), after dropping a few items that had either high error terms cross-loading or weak factor loadings.

The values regarding the model fit indices (see Table 3) were found within the accepted thresholds where CMIN/DF = 1.261, CF1 = 0.992, GFI = 0.941, AGFI = 0.923 represent good model fit values. Similarly, RMSEA = 0.030, SRMR = 0.043, and PCLOSE = 0.998 indicate good model fitness as per the recommended thresholds of previous studies (Hair et al., 2014; Vieira, 2011; Hu & Bentler,1999; Tanaka, 1993). The factor loadings for each latent construct range from 0.852 to 0.888 and were found to be statistically significant (see Table 4).

Additionally, the measurement model was approved by establishing convergent validity, discriminant validity, and internal reliability of the study constructs. To evaluate convergent validity, the average variances extracted (AVE) for each set of measures were computed. The results, reported in Table 4, show that AVE values range from 0.746 to 0.756 for the constructs which are all above the minimum threshold of 0.50. Scholars (for example, Hair et al., 2014) have suggested that an AVE value above 0.50 reveals that the loaded items exhibit higher variance in the respective construct than the error term. Thus, the results suggest that convergent validity was accomplished. Similarly, to assess discriminant validity, the square root of AVE values for each set of measures were computed, which are above the benchmark of 0.70 (see Table 4), suggesting that the constructs are different from one another (Hair et al., 2014; Hu & Bentler, 1999). Furthermore, the value of the square root of AVE is higher than the highest square correlation of the construct with any other latent construct, which confirms that acceptable discriminant validity was attained. Moreover, composite reliability (CR) values were utilized to evaluate the internal consistency reliability of the study constructs. The CR values, as reported in Table 4, are all above the benchmark of 0.70 (Bagozzi & Yi, 2012) indicating that the scales are internally consistent. Hence, the achievement of all the criteria for fitness of measurement allowed the study to proceed to SEM testing.

Table 3
Goodness of fit statistics

Models	CMIN	DF	CMIN/DF	GFI	CFI	SRMR	AGFI	PCLOSE	RMSEA
Measurement	184.045	146	1.261	0.941	0.992	0.043	0.923	0.998	0.030
Structural Model	338.860	149	2.274	0.912	0.962	0.064	0.861	0.074	0.051
Acceptable range	-	-	1−3	>0.90	>0.95	< 0.08	>0.80	> 0.05	< 0.06

Table 4
Factor loadings, validity and reliability for individual investors

Construct	Indicator	Factor Loadings	CR	AVE	√AVE
Herding Behaviour	HB1	0.856	0.947	0.748	0.865
	HB2	0.875			
	HB4	0.854			

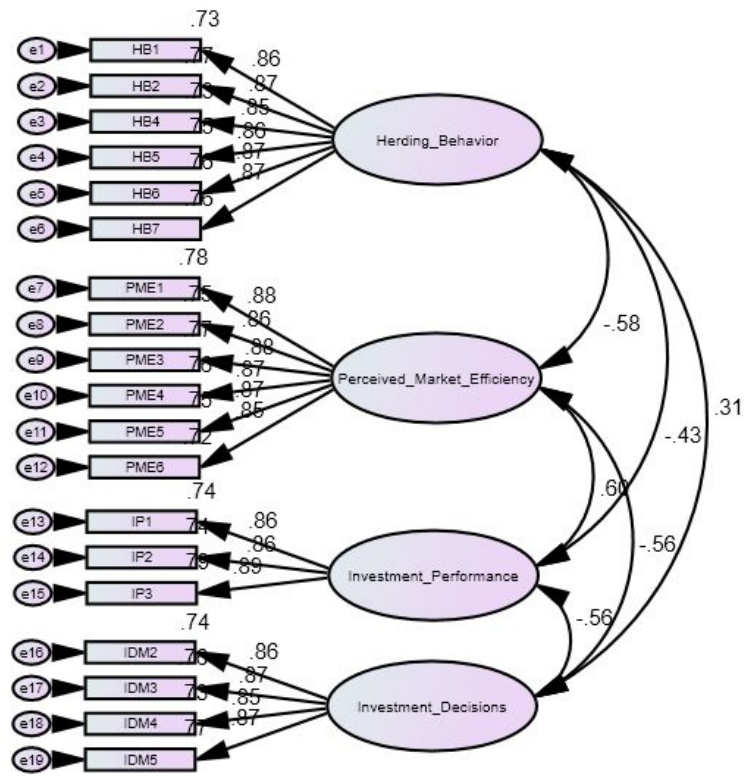|					
	HB5	0.864			
	HB6	0.869			
	HB7	0.871			
Perceived Market Efficiency	PME1	0.881	0.949	0.754	0.868
	PME2	0.863			
	PME3	0.880			
	PME4	0.870			
	PME5	0.868			
	PME6	0.849			
Investment Decisions	IDM2	0.858	0.922	0.746	0.864
	IDM3	0.870			
	IDM4	0.852			
	IDM5	0.875			
Investment Performance	IP1	0.862	0.903	0.756	0.869
	IP2	0.859			
	IP3	0.888			

Figure 2 Measurement Model

4.4 Common Method Bias
Common method bias (CMB) problems may arise when cross-sectional data are used to achieve the research objectives, which may badly affect statistical results (Podsakoff & Organ, 1986). A cross-sectional design was used in this present study; thus, CMB was tested, applying Harman's single-factor test using SPSS through principle component analysis as an extraction method. The output of the analysis shows four factors with eigenvalues greater than 1, of which the first factor explains only 43.74 percent variation of total variance, which is less than 50 percent. This confirms that there is no threat of CMB affecting the statistical results.

4.5 Correlation Analysis
Pearson correlations among the variables are displayed in Table 5. They give initial support to the proposed hypotheses of the research. The output of the analysis shows the correlation coefficient for four variables. The results show that each variable is perfectly correlated with itself because the value of the correlation coefficient is one (r = 1). The results reveal that herding behavior is negatively related to perceived market efficiency, with Pearson's correlation coefficient of r = -0.547, which is significant at p < 0.01, and investment performance with a Pearson's correlation coefficient of r = -0.401, which is significant at p < 0.01. These findings are consistent with research by Shah, Ahmad, and Mahmood (2018), who reported a negative correlation between cognitive heuristic biases and perceived market efficiency, and with Ahmad and Shah (2021), who reported a negative association between heuristic bias, namely overconfidence, and investment performance. Herding behavior has a positive correlation with investment decisions with Pearson's correlation coefficient of r = 0.289, which is significant at p < 0.01. The finding is consistent with research by Rasheed, et al. (2018), who reported a positive relationship between heuristic-driven biases and investment decisions.

Table 5
Means, standard deviations, Pearson correlation

Variables	Mean	SD	1	2	3	4
1. Herding Behavior	3.1861	0.98497	1			
2. Perceived Market Efficiency	2.0611	0.58859	-0.547**	1		
3. Investment Decisions	2.9667	0.61884	0.289**	-0.523**	1	
4. Investment Performance	3.3400	0.73717	-0.401**	0.555**	-0.511**	1

Notes: N =309; **P < 0.01

4.6 Structural Equation Modeling
SEM (see Figure 3) was performed to test the influence of herding behavior on investment management activities (investment decisions and investment performance) and the perceived market efficiency of individual investors actively trading on the PSX. Acceptable model fit values were found for the SEM as shown in Table 3 which shows CMIN/DF = 2.274, GFI = 0.912, CF1 = 0.962, AGFI = 0.861, RMSEA = 0.051, PCLOSE = 0.074 and SRMR = 0.064. All these parameters are within the minimum thresholds suggested by Hair et al. (2014), Hu and Bentler (1999), Tanaka (1993). Table 6 presents the results of SEM.

4.6.1 Perceived Market Efficiency
The hypotheses predicted that herding behavior would be negatively associated with the perceived market efficiency of individual investors. To test these predictions, the researcher regressed perceived market efficiency on herding behavior (see Figure 3). The results of SEM show that

herding behavior (β = -0.623, p < 0.001) has a significant negative influence on the perceived market efficiency of individual investors. These findings support H3.

4.6.2 Investment Decisions
The hypotheses predict that herding behavior is negatively related to the investment decisions of individual investors. The results reported in Table 6 show that herding behavior (β = 0.349, p < 0.001) was related to investment decisions but in directions opposing those anticipated in H1. These results suggest that individual investors who exhibit herding behavior intend to engage in excessively high investment or overinvestment behaviors. These findings fail to support H1. Though not hypothesized, a positive relationship of herding behavior emerged for investment decisions.

4.6.3 Investment Performance
The hypotheses predicted that herding behavior would be negatively related to the investment performance of individual investors. The results presented in Table 6 show that herding behavior (β = -0.460, p < 0.001) has a significant negative effect on investment performance. These results demonstrate that herding behavior reduces the investment performance of individual investors. These findings support H2. Overall, the results of the analysis suggest that herding behavior negatively influences the perceived market efficiency and individual investors who display herding behavior intend to engage in excessively high investment in the stock market which in turn adversely affects their investment performance.

Table 6
Results of Structural Equation Modeling

	Estimates	S.E.	C.R.	p-value
Relationships: (unstandardized)				
Perceived Market Efficiency <--- Herding Behavior	-0.623	0.060	-10.437	***
Investment Decisions <--- Herding Behavior	0.349	0.062	5.580	***
Investment Performance <--- Herding Behavior	-0.460	0.061	-7.601	***

Notes: N= 309; ***p < 0.001
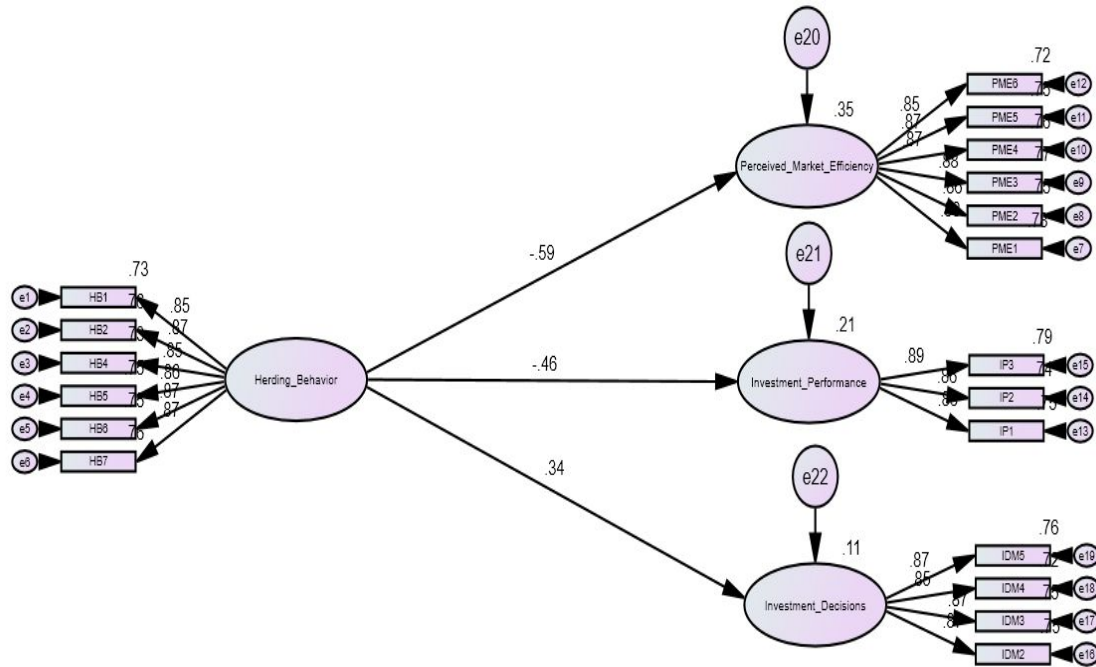
Figure 3 Structural Equation Modeling

5. Discussion

Making decisions relating to investment management activities is a complex task for all types of investors these days. Investors mostly confront unstable financial conditions with elevated levels of uncertainty. This instability makes the decision-making process more intricate than at any other time. It is quite challenging to utilize the available opportunities and resources in rapidly evolving conditions and to make decisions related to investment management using all available information to be a rational business actor. By the time a decision has been made, it is likely that the opportunity no longer exists. Under conditions of environmental uncertainty and complexity (turbulence), investors often display herding behavior which adversely affects their investment decisions and investment performance. This article has expanded prospect theory and bounded rationality theory with regards to investment management activities and market efficiency, by measuring the perceptions of individual investors in regard to their herding behavior, market efficiency, and investment management activities.

The idea for this article developed from the existing literature and was tested with the help of the SEM technique, using Amos graphics software. The findings suggest that herding behavior has a significant negative effect on perceived market efficiency, which is consistent with research by Shah et al. (2018) who found that behavioral biases, namely representativeness, anchoring, overconfidence, and availability, negatively affect perceived market efficiency. Herding behavior has a significant positive influence on the decision-making of individual investors. These results suggest that individual investors who display herding behavior intend to engage in excessively high investment in the stock market. Psychologically, this means that herding behavior deteriorates the quality of decisions made by individual investors because investors who exhibit herding behavior perceive that they lack financial knowledge and underestimate their abilities. As a result,

they follow the actions of others which badly affects their investment decisions. The findings match those of Madaan and Sanjeet (2019), who found that herding behavior has a significant effect on investment decision-making. The results of the study also indicate that herding behavior has a significant negative effect on investment performance. These results demonstrate that herding behavior reduces the investment performance of individual investors. Overall, the analysis results suggest that individual investors who display herding behavior intend to engage in excessive trading in the stock market, which adversely affects their investment performance. Herding behavior has a significant negative effect on the perceived market efficiency. Thus, the findings of this study confirm that individual investors behave irrationally and make trading mistakes due to herding tendency, which diminishes their investment performance. These results are consistent with bounded rationality theory, and prospect theory, which holds that decision-makers use heuristics to avoid the risk of losses in uncertain situations, but that leads to errors in judgment; hence, investors make irrational decisions, which may cause the market to overreact or underreact – in both situations the market becomes inefficient.

In emerging markets, investors have to cope with additional difficulties in making decisions related to their investment management activities. Socio-political factors seem to create uncertainty in a highly volatile market, encouraging investors to be extremely conservative in their investment decisions. It is probably one of the major reasons they suffer from herding behavior when trading in the stock market. When individual investors display herding behavior, their technical knowledge and reasoning faculties are impaired, leading to errors in judgment. As a result, anomalies persist in the market, misrepresenting the price of shares and destabilizing markets, leading investors to make irrational decisions, which in turn adversely affect their investment performance. The high levels of economic uncertainty and a lack of information influence the decisions made by investors in an emerging economy such as Pakistan. Furthermore, the present study suggests that one of the major differences in investment decisions made by emerging and developed economies is the socio-economic background against which decisions related to investment management activities are made.

6. Conclusion and implications
The present article demonstrates herding behavior as well as its impact on perceived market efficiency and investment management activities in an Asian context. This study further reveals that herding behavior worsens the decision-making process. Individual investors displaying herding behavior trade excessively in the stock market, and their investment performance adversely affects them. The results of the analysis also show that herding behavior has a significant negative influence on perceived market efficiency.

6.1 Theoretical implications
The findings of the current research contribute to the existing body of literature on herding behavior, investment management activities, and perceived market efficiency in at least four ways. First, the present study contributes toward understanding of the role that herding behavior plays in investment management activities and market efficiency. The current research provides an explanation of how and why investors' behavior deviates from rationality and markets become inefficient. This study combines the theoretical fields of cognitive psychology and herding behavior research with investment management activities and perceived market efficiency. Thus, the article makes an academic contribution by providing further insights into herding behavior, investment management activities and the perceived market efficiency relationship by exploring

how investment management activities and perceived market efficiency are affected by investors' herding behavior.

The second contribution is to the evolving research on the discrepancy effect of herding tendency on investment management activities and perceived market efficiency. The findings of the current research offer novel contributions to the existing literature by suggesting that investors exhibiting herding behavior underestimate their downside risk and trade excessively in the stock market, which can have a detrimental effect on their returns and market efficiency. Hence, the present study also advances an important stream of existing research, which posits that the human mind relies on heuristics strategies affected by systematic and predictable errors (biases), that allow only sub-optimal decisions (Tversky & Kahneman, 1974). Most existing research emphasizes the importance of herding behavior in complex and uncertain environments as it guides the decision-maker in searching information by effectively and efficiently exploiting information structures in the environment (Bertel & Kirlik, 2010), but ignores its negative consequences on investment management activities and market efficiency. This study is the first to show the heterogeneous impact of herding behavior on investment management activities and perceived market efficiency, enriching the antecedents of irrational investment management activities and market inefficiency, which contributes to the existing body of literature on the behavioral finance paradigm.

Third, this study has important practical as well as theoretical implications since investors act in environments characterized by a high level of uncertainty and ambiguity (Sarasvathy, 2001). In doing so, we address "the thinking-feeling-doing connection" (Cardonet et al., 2012). This article contributes to the extant literature demonstrating the effect of herding behavior on perceived market efficiency and investment management activities from the behavioral finance perspective using the instrument of the questionnaire. This research is a pioneering study in this context.

Fourth, most studies focus on individualistic cultures and well-developed financial markets, and very little is known about the profiles, inspirations, and conduct of institutional investors in collectivist cultures and less-developed markets (Ahmad & Shah, 2021). Moreover, studies conducted in western contexts cannot be generalized to Asian countries. They may not inevitably have any applicability to Pakistan due to a contextual paradigm difference (i.e., collectivist vs. individualist). This article helps fill this gap by considering how investors' herding behavior influences investment management activities and perceived market efficiency, especially in an emerging country like Pakistan where the market fundamentals are different from developed countries. The thinking levels of Pakistani investors also differ from investors in developed countries; thus, this study is likely to contribute contextually. Financial speculators in Pakistan are not fully conscious of their behavioral biases, so it is beneficial for them to become aware of them and to gauge the impact of their own cognitive and emotional factors on their investment management activities.

6.2 Practical Implications

In addition to the above theoretical contributions, the findings of this research have also generated important policy implications for finance practitioners, such as investors who play at the stock exchange, financial strategists/advisors in investment firms, portfolio managers, financial planners, investment bankers, traders/brokers at the stock exchange, and financial analysts. But most importantly, the term also includes all those persons who manage corporate entities and are responsible for making its financial decisions. For instance, the findings of the present research suggest that finance practitioners should not rely on herding behavior while making decisions

related to investment management activities, but should rather conduct a proper analysis of investment opportunities, develop quantitative investment criteria and establish investment objectives and constraints, base decisions on their financial capability and experience levels, to make better investment decisions, and move towards appropriate investment opportunities. It provides awareness and understanding of herding behavior in investment management activities and perceived market efficiency, which could be very useful for investors when making investments in the stock market

This study suggests that investors should select better investment tools and avoid repeating the expensive errors that occur due to herding behavior. They can improve their performance by recognizing their biases and errors of judgment, to which we are all prone, resulting in a more efficient market. The study also aims to facilitate financial advisors in gaining a better understanding of their customers' psychology. It helps them in devising a behaviorally modified portfolio, which best suits their customers' inclination. It assists investment bankers in understanding market emotions because these sentiments create public issues for their companies. It helps the financial strategists to make better forecasts; and aids security analysts in formulating efficient stock recommendations.

7. Directions for Future Research

This study walks around the influence of herding behavior on the perceived market efficiency and investment management activities, specifically in Pakistan. It would, therefore, be imperative for researchers to substantiate the findings of this research with a greater diversity of respondents from other areas of the country as well. It is also recommended, for further research, to probe the link between herding behavior and perceived market efficiency and investment management activities by taking other suitable mediators and moderator variables to understand comprehensively how herding behavior impacts perceived market efficiency and investment management activities. Moreover, a further extension can be made by including additional biases like alphabetical ordering, name memorability, and name fluence because limited research has been carried out on these name-based behavioral biases among investors. Furthermore, it may be helpful if a study were carried out that covers data from three different markets, for example one from a developed country, the second from a developing country, and the third from not so developed economy. Such a comparative study could prove to be a meaningful addition to the body of knowledge on behavioral finance.

References

Agrawal, D., Singhal, T., & Swarup, K. S. (2016). Role of herding behavior in influencing investor decision making in India. Indian Journal of Research in Capital Markets, 3(4), 43-48.

Ahmad, M. (2022), The Role of Recognition-Based Heuristics in Investment Management Activities: Are Expert Investors Immune? – A Systematic Literature Review.

Ahmad, M. (2021), "Does under-confidence matter in short-term and long-term investment decisions? Evidence from an emerging market.", Management Decision, Vol. 59 Issue: 3, pp. 692-709.

Ahmad, M., and Shah, S.Z.A. (2021), "Overconfidence Heuristic-Driven Bias in Investment Decision-Making and Performance: Mediating effects of risk perception and moderating effects of financial literacy." Journal of Economic and Administrative Sciences, Vol. ahead-of-print No. ahead-of-print. https://doi.org/10.1108/JEAS-07-2020-0116

Ahmad, M., Shah, S.Z.A. and Abbass, Y. (2021), "The role of heuristic-driven biases in entrepreneurial strategic decision-making: evidence from an emerging economy", Management Decision, Vol. 59 Issue: 3, pp. 669-691.

Ajmal, S., Mufti, M., & Shah, Z.A. (2011). Impact of illusion of control on perceived efficiency in Pakistani financial markets. Abasyn Journal of Social Sciences, 5(2),100-110.

Akerlof, G. A., & Shiller, R. J. (2010). Animal spirits: How human psychology drives the economy, and why it matters for global capitalism. Princeton university press.

Ameur, H. B., Boujelbène, M., Prigent, J. L., & Triki, E. (2019). Optimal Portfolio Positioning on Multiple Assets Under Ambiguity. Computational Economics, 5(4), 1-37.

Baker, H. K., & Nofsinger, J. R. (2002). Psychological biases of investors. Financial Services Review, 11(2), 97116.

Baker, H. K., & Nofsinger, J. R. (2010). Behavioral finance: An overview. Behavioral Finance: Investors, Corporations, and Markets, 1-21.

Banerjee, A. V. (1992). A simple model of herd behavior. The quarterly journal of economics, 107(3), 797-817.

Basarir, C. and Yilmaz, O. (2019), "Herd behavior and its effects on the purchasing behavior of investors", Contemporary Issues in Behavioral Finance, Vol. 101, pp. 215-226.

Bikhchandani, S., & Sharma, S. (2000). Herd behavior in financial markets. IMF Staff papers, International Monetary Fund 47(3), 279-310.

Bikhchandani, S., & Sharma, S. (2001). Herd behavior in financial markets. IMF Staff papers, 47(3), 279-310.

Bikhchandani, S., Hirshleifer, D., & Welch, I. (1992). A theory of fads, fashion, custom, and cultural change as informational cascades. Journal of political Economy, 100(5), 992-1026.

Black, F., 1986. Noise. Journal of Finance 41, 529 – 544

Blasco, N., & Ferreruela, S. (2008). Testing intentional herding in familiar stocks: An experiment in an international context. Journal of Behavioral Finance, 9(2): 72-84.

Bryman, A., & Bell, E. (2007). Business Research Methods (2nd ed.). Oxford University Press.

Chen, T. (2013). Do investors herd in global stock markets?. Journal of Behavioral Finance, 14(3), 230-239.

Chen, T. (2017). Investor attention and global stock returns. Journal of Behavioral Finance, 18(3), 358-372.

Chiang, T. C., & Zheng, D. (2010). An empirical analysis of herding behaviour in global stock markets. Journal of Banking and Finance, 34(8), 1911–1921.

Christie, W. and Huang, R. (1995), "Following the pied piper: do individual returns herd around the market?", Financial Analysts Journal, Vol. 51 No. 4, pp. 31-37

Collis, J., & Hussey, R. (2009). Business Research: Palgrave Macmillan.

Demirer, R., & Kutan, A. M. (2006). Does herding behavior exist in Chinese stock markets?. Journal of international Financial markets, institutions and money, 16(2), 123-142.

Devenow, A., & Welch, I. (1996). Rational herding in financial economics. European Economic Review, 40(3-5), 603-615.

Dewan, P., & Dharni, K. (2019). Herding Behaviour in Investment Decision Making: A Review. Journal of Economics, Management and Trade, 1-12.

Fama, E.F. (1970), "Efficient Capital markets: a review of theory and empirical work", The Journal of Finance, Vol. 25 No. 2, pp. 383-417.

Galariotis, E.C., Krokida, S.I., Spyrou, S.I., 2016. Herd behavior and equity market liquidity: evidence from major markets. Int. Rev. Financ. Anal. 48, 140–149.

Galariotis, E.C., Rong, W., Spyrou, S.I., 2015. Herding on fundamental information: a comparative study. J. Bank. Financ. 50, 589–598.

Gavriilidis, K., Kallinterakis, V., & Ferreira, M. P. L. (2013). Institutional industry herding: Intentional or spurious? Journal of International Financial Markets, Institutions and Money, 26, 192-214.

Ghauri, P., & Gronhaug, K. (2010). Research methods in business studies (4th ed.). Great Britain: Pearson Education Limited.

Guney, Y., Kallinterakis, V., & Komba, G. (2017). Herding in frontier markets: Evidence from African stock exchanges. Journal of International Financial Markets, Institutions and Money, 47, 152-175.

Hair Jr, J. F., Sarstedt, M., Hopkins, L., & Kuppelwieser, V. G. (2014). Partial least squares structural equation modeling (PLS-SEM). European business review.

Hirshleifer, D., Subrahmanyam, A., & Titman, S. (1994). Security analysis and trading patterns when some investors receive information before others. The Journal of Finance, 49(5), 1665-1698.

Hu, L.T. and Bentler, P.M. (1999), "Cutoff criteria for fit indexes in covariance structure analysis: conventional criteria versus new alternatives", Structural Equation Modeling: A Multidisciplinary Journal, Vol. 6 No. 1, pp. 1-55.

Hwang, S., & Salmon, M. (2004). Market stress and herding. Journal of Empirical Finance, 11(4), 585-616.

Indārs, E. R., Savin, A., & Lublóy, Á. (2019). Herding behavior in an emerging market: Evidence from the Moscow Exchange. Emerging Markets Review, 38, 468-487.

Itzkowitz, J., & Itzkowitz, J. (2017). Name-based behavioral biases: are expert investors immune?. Journal of Behavioral Finance, 18(2), 180-188.

Jain, J., Walia, N., & Gupta, S. (2020). Evaluation of behavioral biases affecting investment decision making of individual equity investors by fuzzy analytic hierarchy process. Review of Behavioral Finance, Vol. ahead-of-print No. ahead-of-print. https://doi.org/10.1108/RBF-03-2019-0044

Javaira, Z. and Hassan, A. (2015), "An examination of herding behavior in Pakistani stock market", International Journal of Emerging Markets, Vol. 10, No. 5, pp. 474-490.

Kahneman, D. and Tversky, A. (1979), "Prospect theory: an analysis of decision-making under risk", Journal of Econometrica, Vol. 47 No. 2, pp. 263-291.

Kappeler, V. E., Potter, G. W., & Blumberg, M. (2005). Mythology of crime and criminal justice.

Kengatharan, L. and Kengatharan, N. (2014), "The influence of behavioral factors in making investment decisions and performance: study on investors of Colombo Stock Exchange, Sri Lanka", Asian Journal of Finance & Accounting, Vol. 6 No. 1, p. 1.

Lin, W. T., Tsai, S. C., & Lung, P. Y. (2013). Investors' herd behavior: Rational or irrational?. Asia-Pacific Journal of Financial Studies, 42(5), 755-776.

Lux, T. (1995). Herd behaviour, bubbles and crashes. The economic journal, 105(431), 881-896.

Merton, R. C. (1987). A simple model of capital market equilibrium with incomplete information. The journal of finance, 42(3), 483-510.

Mohd Adil, Singh, Y. and Ansari, M.S. (2021), "How financial literacy moderate the association between behaviour biases and investment decision?", Asian Journal of Accounting Research.

My, T. N., & Truong, H. H. (2011). Herding behavior in an emerging stock market: Empirical evidence from Vietnam. Research journal of business management, 5(2), 51-76.

Oehler, A., & Chao, G. G. C. (2000). Institutional herding in bond markets. Bamberg University Dept. of Finance Working Paper. available at https://papers.ssrn.com/sol3/papers.cfm?abstract_id=294460

Patterson, D. M., & Sharma, V. (2006). Intraday trading: Herding versus market efficiency". Working paper, Virginia Polytechnic Institute and State University.

Patterson, D. M., & Sharma, V. (2007). Did herding cause the stock market bubble of 1998–2001? University of Michigan-Dearborn. Working Paper (accessed04.10.12).

Pompain, M.M. (2006), Behavioral Finance and Wealth Management (How to Build Optimal Portfolio That Account for Investor Biases), 1st ed., John Wiley&Sons, New Jersey, Canada.

Prosad, J. M., Kapoor, S., & Sengupta, J. (2015). Behavioral biases of Indian investors: a survey of Delhi-NCR region. Qualitative Research in Financial Markets.

Rasheed, M. H., Rafique, A., Zahid, T., & Akhtar, M. W. (2018). Factors influencing investor's decision making in Pakistan. Review of Behavioral Finance.

Saunders, M., Lewis, P., & Thornhill, A. (2009). Research methods for business students (5th ed.). Italy: Pearson Education Limited.

Scharfstein, D. S., & Stein, J. C. (1990). Herd behavior and investment. The American economic review, 465-479.

Sekaran, U., & Bougie, R. (2003). Research Methods for Business, A Skill Building Approach, John Willey & Sons. Inc. New York.

Shah, S. Z. A., Ahmad, M., & Mahmood, F. (2018). Heuristic biases in investment decision-making and perceived market efficiency. Qualitative Research in Financial Markets, Vol. 10 No. 1, pp. 85-110. https://doi.org/10.1108/QRFM-04-2017-0033

Sharpe, W. F. (1964). Capital asset prices: A theory of market equilibrium under conditions of risk. The journal of finance, 19(3), 425-442.

Shefrin, H. (2007), Behavioral Corporate Finance: Decisions That Create Value, McGraw Hill/Irwin, New York, NY.

Tanaka, J.S. (1993), Multifaceted Conceptions of Fit in Structural Equation Models, Sage Focus Editions, pp. 154, 10-10.

Topol, R. (1991). Bubbles and volatility of stock prices: effect of mimetic contagion. The Economic Journal, 101(407), 786-800.

Trueman, B. (1988). A theory of noise trading in securities markets. The Journal of Finance, 43(1), 83-95.

Tversky, A. and Kahneman, D. (1973), "Availability: a heuristic for judging frequency and probability",Cognitive Psychology, Vol. 5 No. 2, pp. 207-232.

ul Abdin, S. Z., Farooq, O., Sultana, N., & Farooq, M. (2017). The impact of heuristics on investment decision and performance: Exploring multiple mediation mechanisms. Research in International Business and Finance, 42, 674-688

Vieira, E. F. S., & Pereira, M. S. V. (2015). Herding behavior and sentiment: Evidence in a small European market. Revista de Contabilidad, 18(1), 78-86.

Voronkova, S., & Bohl, M. T. (2005). Institutional traders' behavior in an emerging stock market: Empirical evidence on polish pension fund investors. Journal of Business Finance & Accounting, 32(7-8), 1537-1560.

Wang, W., Guo, L., & Sun, R. (2019). Rational herd behavior in online learning: Insights from MOOC. Computers in Human Behavior, 92, 660-669.

Zahera, S.A. and Bansal, R. (2018), "Do investors exhibit behavioral biases in investment decision making? A systematic review", Qualitative Research in Financial Markets, Vol. 10, No. 2, pp. 210-251.

Appendix 1: Questionnaire

SECTION A: HERDING BEHAVIOR

Please insert a check mark (√) in the appropriate column to indicate whether you agree or disagree with each of the following statements:

Herding Behavior		1 Strongly Disagree	2 Disagree	3 Not Sure	4 Agree	5 Strongly Agree
HB1	You prefer to buy stocks if many "buy" orders were placed from the beginning of the trading session					
HB2	You would increase your trading activity if the past trading volume of stock market was higher than usual.					
HB3	Discussing your investment decisions with colleagues reduces my pressure of being successful					
HB4	Your disappointment after losing money on an investment diminishes a little if others have also experienced the same loss.					
HB5	You feel extremely disappointed if you take a contrarian position (opposite to the general trend) and lose while my friends make profits by following the crowd					
HB6	How important are your peers for you as a source of information?	Extremely Important	Important	Not Sure	Least Important	Not Important at all

HB7	How important are other market participants (includes brokers, fund managers, institutional investors, analysts etc.) for you as a source of information?	**Extremely Important**	**Important**	**Not Sure**	**Least Important**	**Not Important at all**

SECTION B: INVESTMENT PERFORMANCE

Please insert a check mark (√) in the appropriate column to indicate whether you agree or disagree with each of the following statements:

Investment Performance		1 **Strongly Disagree**	2 **Disagree**	3 **Not Sure**	4 **Agree**	5 **Strongly Agree**
IP1	The return rate of your recent stock investment meets your expectation					
IP2	Your rate of return is equal to or higher than the average return rate of the market					
IP3	You feel satisfied with your investment decisions in the last year (including selling, buying, choosing stocks, and deciding the stock volumes)					

SECTION C: INVESTMENT DECISION-MAKING

Please insert a check mark (√) in the appropriate column to indicate whether you agree or disagree with each of the following statements:

Investment decision-making		**1 Strongly Disagree**	**2 Disagree**	**3 Not Sure**	**4 Agree**	**5 Strongly Agree**
IDM1	When making investments, you rely upon your instincts					
IDM2	You generally make investments that feel right to you					
IDM3	When you make investment, you tend to rely on your intuition					
IDM4	When making an investment, you trust your inner feelings and reactions					
IDM5	When you make an investment, it is more important for you to feel the investment is right than have a rational reason for it					

SECTION D: PERCEIVED MARKET EFFICIENCY

Please insert a check mark (√) in the appropriate column to indicate whether you agree or disagree with each of the following statements:

Perceived market efficiency	1 **Strongly Disagree**	2 **Disagree**	3 **Not Sure**	4 **Agree**	5 **Strongly Agree**

PME1	You carefully consider the price changes of stocks that you intend to invest in						
PME2	Market information is important for your stock investment.						
PME3	You put the past trends of stocks under your consideration for your investment.						
PME4	You have the over-reaction to price changes of stocks.						
PME5	You analyze the companies' customer preference before you invest in their stocks.						
PME6	You study about the market fundamentals of underlying stocks before making investment decisions						

SECTION E: DEMOGRAPHICS

Gender	1	2		
	Male	Female		

MARITAL STATUS	1	2	3	
	Single	Married	Divorced	

Age	1	2	3	5
	Below 30 years	30-40	41-50	Above 55

Qualification	1	2	3	4	5
	Intermediate	Bachelors	Masters	MS/M.Phil.	Others

Experience	1	2	3	4
	Less than 5 years	5-10 years	11-20 years	above 20

Thank you for taking the time to answer, the questions to the best of your ability. Your assistance is appreciated.