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EXPLORING THE DYNAMICS OF INVESTORS' DECISION MAKING IN PAKISTAN STOCK MARKET: A STUDY OF HERDING BEHAVIOR

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ABSTRACT

Stock markets are often considered as a yardstick for economic growth and development. Therefore, understanding investment behavior in stock markets is pivotal for better regulation and promoting growth and stability. Hence current study is aimed at understanding the influence of one of the most significant factors, i.e. herding behavior on the Pakistan stock market. Besides, it also investigates the impact of demographical differences among investors. The herd behavior or tendency to follow peers is a counterintuitive behavior to the traditional paradigm of rationality and efficiency. This can influence the whole decision-making process by making it irrational. Data from (n=210) investors trading at Lahore and Islamabad are gathered to test this proposed linkage. Structural equation modeling is used for establishing these associations. The results revealed that herding significantly influences the rational decision-making process of investors. For a better and contextualized understanding of these results, demographical characteristics are considered, which indicate that a non-business related occupation, higher income and lower age are associated with a higher tendency towards herding, and conclusively demography plays a significant role. These findings can be extremely useful for investors, policymakers, and investment professionals and can be utilized to make the decision-making process optimal. Investors need to account for the influence of their inclination to follow peers and their occupation, income, and age before making any decision. Theoretically, these findings are the pioneer in providing a comprehensive linkage of the behavioral aspect of the stock market functioning and to explore the whole decision making process instead of focusing on a dimension.

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INTRODUCTION

Investment in stock exchanges is of vital concern for investors due to its ability to grow capital, gain dividends, and provide a hedge to the inflationary erosion against the devaluation of the currency (Teweles & Bradley, 1998). Apart from that, some other characteristics that brands this option particularly attractive above other types of investment is its liquidity (Jaswani, 2008) and their desire to be the owners of the firm, from which they can gain through dividends and stock price increases alongside playing a part in the management of the company (Croushore, 2006). On the other hand, businesses gained from stock markets by capitalizing them as a source for financing their future investments and capital requirements. Stock exchanges also have various other functions, such as it acts as a mechanism that provides signals to managers regarding their upcoming ventures and also influence corporate governance (Samuel, 1996). Lastly, for the overall economy of a country, stock exchanges are also considered a measure of the strength of an economy and its development.

Therefore understanding and exploring stock market behavior is of significance not only for investors and organizations but also for the overall economy.

Pakistan is one of the rising economies with a stock market working as the Pakistan stock exchange (PSX). The latest upgrades in ease of doing business index, decrease oil prices, and an early elevate of lockdown amid the Covid-19 pandemic result in a brighter outlook for the economic system of Pakistan. Hence buyers throughout the globe eyeing Pakistan as their destiny venture. Therefore it's vital to have a look at and recognize the conduct of the stock marketplace in Pakistan and because the stock marketplace conduct is the direct manifestation of investors' choices working on the Pakistan stock marketplace. That's why it's far critical to have a look at the underlying elements influencing their investment conduct to recognize the real-life functioning of the stock marketplace in Pakistan.

According to the conventional view of finance, each investor such as buyers at stock markets are flawlessly rational and

wealth maximizer of their economic selections and could make investments at the lowest stage of risk for any given stage of return or will select the very best stage of return at a given stage of risk (Markowitz, 1952) however at the observance of the decision-making techniques of buyers, this fundamental fails to hold. Investors do try to get the most advantage from their alternatives and examine capital marketplace conditions with vigilance with the aid of using analyzing marketplace determinants and signs; however, this technique is also motivated with the aid of buyers' emotions, feelings, and intuition. This leads them to act irrationally eventually. Therefore literature of the sphere from the last four decades is seeking to discover those elements which cause such deviations within the decision-making techniques (Kahneman & Tversky, 1979). The studies conducted by Babajide and Adetiloye (2012), Bashir et al. (2013), Gul and Akhtar (2016), and Rasheed et al. (2018, 2020) discovered that individuals in real life are not always as rational as they are assumed by traditional theories of finance. These anomalies of traditional financial theories identified by researchers gave birth to a new area of finance known as behavioral finance. Which accepts that investors are not mechanistic beings instead they do behave irrationally. Behavioral finance aids to identify the causes behind such deviations. Among this anomalous behavior, the most significant is the herding behavior of investors in the stock markets. The herding behavior of investors leads stock markets toward sudden crashes and the creation of stock bubbles (Chang et al., 2020; Clements et al., 2017). Rasheed et al. (2021) inferred from the socioeconomic theory of finance that individuals are innately influenced by behavioral and cognitive factors, and their biased behavior manifests itself in the form of over and underreaction. This over/underreaction then leads towards market anomalies like herding behavior. Therefore it is vital to study herding behavior as a subsequence of the existence of behavioral factors among stock market investors. Komalasari et al. (2020) explored existing literature on herding behavior and concluded that the majority of the prior research on herding behavior focused on the existence of herding in the stock markets and explored its impact on investors' portfolios. A few studies also explored its impact on rational decision-making (Adiputra et al., 2021). The particular relationship of herding behavior with the rational decision-making process is rarely explored. The overall majority of the research in the field focused on the impact of behavioral and cognitive factors on the decision-making of investors and fails to explore the relationship of market anomalies and investors' rational decision-making process in the context of Pakistan. So the current study will address this missing link, as the current research is of the view that behavioral and cognitive factors influence individual investors to leads towards herding behavior and this irrational herd behavior cause irrational decision on part of investors. Since social sciences, including financial-economic, is not an exact science, so it relies on statistical models to predict the most likely outcomes due to the numerous social factors that can influence human behavior. So the researchers in the field are focusing on determining all the statistically significant determinants of relationships existing in the field of social sciences. This is why the recent studies in the field including

studies of Gumus and Dayioglu (2015) and Rasheed et al. (2021a), are also focusing on the influence of demographical variables to get a deeper understanding of proposed relationships. The demography of an individual consists of various factors that make each individual and their behavior unique. Demographical variables like gender, education, age, etc., also impact the degree of biased behavior in an individual (Bashir et al., 2013). The current study also incorporates these variables, which will add to its generalizability for various demographical statistics in an economy and a better understanding of the results.

Investment Decision Making

Investment is a process through which investor place their monetary resources with the aim of some expected future benefits, but as the future can't be predicted with certainty hence the world of investment is volatile, and expectations are not always realized. The financial theory is of the view that this volatility can be minimized. By utilizing tools of scientific research and following the basic principles of economics can bring investors success in their ventures. Therefore financial theory assumes that every investor wants to get desired return from the investment by making an optimal investment decision and such investors are labeled as rational investors. Rational decision-makers follow logic and reason for making an optimized decision (Nozick, 1993). The overall rational decision-making process is comprised of the three steps which include; the identification of the problem, development of alternative solutions to the problem, and finally, the selection of the alternative for an optimal solution (Mintzberg et al., 1976). By following this rational process of financial decisions, investors intend to best available options. Sharpe (1964) established the benchmark for selection among these alternatives and inferred that investors would prefer an alternative with the minimum level of risk for a specific level of return and an alternative with maximum level of return with a specific level of risk but the fact in financial markets that the dissemination of information is not equal among participants made this mode purely theoretical and ideal. In reality, managers have advanced data than a single trader due to the fact traders simply interpret outside elements at the same time as making funding selections, and on the contrary, the managers are aware of a few inner data and outside as well besides having superior knowledge and resources in comparison to their counterparts (Myers & Majluf, 1984) therefore the selections are based at the restricted data available for an individual investor and so making of investment on the stock marketplace may be drastically distinct and irrational in comparison institutional traders. In the past few decades, some researchers also considered another factor that impacts optimal and rational decisions is the impact of financial literacy (Merton, 1987). In reality, managers have access to advanced statistics and are more qualified than personal buyers due to the fact buyers simply interpret outside elements even when making investment selections instead, managers are privy to a few inner statistics and outside as well (Myers & Majluf, 1984). Consequently, the selections are primarily based totally on the limited information to be had that investors made even as investing in

the stock marketplace, and these decisions are then drastically exclusive and greatly irrational compared to institutional buyers. In the last few decades, a few researchers have additionally taken into consideration other components that affect the rational selections that are the know-how of the sector of finance (Merton, 1987). An investor with adequate knowledge of finance is better equipped to utilize the information available regarding rational selection among alternatives. So a lack of adequate financial and relevant information can cause an investment decision to be irrational from the perspective of the researcher but can be rational from the point of view of the investor (Harrison & Harrell, 1993). Apart from information asymmetry among the various group of investors, both institutional and individual investors are also influenced by various behavioral and cognitive factors (Nofsinger, 2005; Shefrin, 2007). So lastly, aside from those outside elements, the behavioral faculty of thought additionally considers the inner mental description of an investor's intellectual procedures that performs an important role in monetary choice making (Jaros et al., 1993). Factors that affect the investment technique additionally consist of returns from preceding investments and the degree of their impact on the coverage of the company wherein they're going to invest (David et al., 1998) and the price of funding. Apart from those inner and outside elements, inventory marketplace traders within the temptation of better returns primarily based rely upon their instinct in place of rational analysis (Cascio et al., 1997). Furthermore, the funding choice-making technique is likewise laid low with many contextual elements along with the environment, history, and varieties of investments, etc. (Papadakis et al., 1998). "Cognitive unconscious" that's having perceptions, memories, and mind without awareness, is used to explain the motive why sane traders make a mistakes in funding choices (Hilton, 2001). It is consequently usually hard to make a rational choice due to the provision of restrained facts, insufficient time, and cognitive limitations. Therefore, Simon et al. (2000) changed the term rationality with the idea of bounded rationality. Researchers endorse that bounded rationality isn't irrationality and sellers also are now no longer irrational they're bounded rational. Generally, due to the shortage of whole facts and knowledge, usage of shortcuts within the shape of adopting the route of easy fashions that affects in suboptimal choices (Gigerenzer & Gaissmaier, 2011; Tversky & Kahneman, 1974). In different words, man or woman traders concerned in funding activities additionally analyzed and compare funding alternatives that appear to be a rational choice-making technique however because of the distinctive mental elements that choices aren't premiere as predicted by the rationality principle. Hence deriving from this argument we suggest that there's a big effect of behavioral elements on the technique of investor's choice making.

Herding Behavior in Investment Decision Making

The current study will focus on exploring the relationship between the phenomenon of herding behavior, which defies the basic principles of rationality and the rational decision-making process. Herding behavior refers to the "follow the leader" approach. It is the trend of an individual to follow the multitude for the reason that the decisions made by the

common are implicit to be for all time acceptable (Clements et al., 2017; Komalasari et al., 2020). This behavior is aligned with the socionomic theory of finance. Socionomic theory is the study of the overall social mood existing in a society and exploring its influence on financial behavior. According to Nofsinger (2005) and Prechter (2016), individuals are influenced by behavioral and cognitive factors which influence their decision-making process and spread across society through social interaction causing an overall social mood. Nofsinger (2005) inferred that this overall social mood leads towards over/reaction in the stock market creating anomalies like herding behavior (Rasheed et al., 2021b). Apart from that, the vast overload of irrelevant information available, alongside the impact of emotions and other behavioral factors, also leads investors towards suboptimal or irrational financial decisions resulting in under or overreaction on the part of investors (Adiputra et al., 2021). Hence it's argued by Lo (2002) that the economic knowledge isn't a scientific device; instead, it's a social device, which was given inspired through social interactions with others, and those interactions lead in the direction of a combination of social response or herding within the society that produces waves of pessimism and optimism. Prechter (2016) is of the view that this usual social temper is neither aware nor rational and is inspired through behavioral elements, i.e., biases, heuristics, and framing effects. Socionomic principle posits that social activities are decided through social mood. The principle of socionomic is primarily based totally on the paradigm of human interaction. Humans can have interaction with every other, and due to those interpersonal communicate skills, people, as a race, have the capacity to reply collectively (Shiller, 2006), and this collective reaction may be located as herding conduct within the economic markets. According to Luong and Thi Thu Ha (2011), the herding character will locate his funding choice at the multitude proceedings of purchasing and selling, developing speculative bubbles prevalence it truly is why inflicting the inventory marketplace to be inefficient. This collective herd contributes to extra volatility within the marketplace. There is blended proof of the effect of herding on inventory markets. According to Hirt and Block (2006), herding is not an unusual place with an institutional investor than with character investors. Wamae (2013) concluded that herding effects undoubtedly lead to overvaluations of funding alternatives. Kengatharan and Kengatharan (2014) have additionally located herding conduct to have a comparable effect on investors' assessment. On the contrary, Lim (2012) found that herding has no significant impact on investors' assessment" (Braha, 2012). It is seen that in times of fear and uncertainty, many investors dispose of their stocks because of other investors who they consider to have more information about the market behavior (Landberg, 2003). At the time of crisis the individual investors consider the best option is to copy others' information and rely on them. Hence they usually go behind the institutional investors and when they sell a stock they follow the same course and vice versa (Persaud, 2000). Hence based on this discussion it is established that it is vital to explore the impact of herding behavior on rational decision making process, as herding behavior is a manifestation of social interactions based on behavioral factors, so it will have an

impact on rational decision making process and the following is proposed.

H1: Herding behavior has a significant association with the rational decision-making process.

H1a: Herding behavior has a significant association with Demand identification.

H1b: Herding behavior has a significant association with Information search.

H1c: Herding behavior has a significant association with evaluating alternatives.

Demography and Herding Behavior

Social sciences, including financial-economic, are not an exact science, so it relies on statistical models to predict the most likely outcomes due to the numerous social factors influencing human behavior. So the researcher in the field is focusing on determining all the statistically significant determinants of relationships existing in the field of social sciences. This is why the recent studies in the field including studies of Gumus and Dayioglu (2015) and Rasheed et al. (2021a) are focusing on the influence of demographical variables. The demography of an individual consists of various factors that make each individual and their behavior unique. Demographical variables like gender, education, age, etc., also impact the degree of biased behavior in an individual (Bashir et al., 2013). Besides that, consideration of demographical variables in the analysis also aids in enhanced generalizability of the findings of the study. Existing literature indicates that females are found to be more affected by the biases as females are innately more prone to emotions and feelings.

Experienced traders are determined to be extra vulnerable to the usage of heuristic shortcuts primarily based totally on their previous reviews leading to suboptimal choices (Kudryavtsev et al., 2013). Similarly, age is likewise determined to be extensively related to education levels. Lastly, career or

profession additionally impacts the selections an investor makes. Investors with an understanding of the area of economics and finance are anticipated to be much less biased (Gumus & Dayioglu, 2015). Hence those extra factors also are going to be analyzed with a focal point at the distinction within the stage in their herding inclinations. Lin (2011) defined that even though individual traders take the rational selection-making method to pick out their investments. They also are inclined towards distinct behavioral biases. Mathuraswamy and Rajendran (2015) determined that the demographical traits of individual traders impact investment rationality. Zaidi and Tauni (2012) additionally inferred this identical fact from their examination that demographical variables like age, experience, and training have a huge impact on overconfidence bias (Dhar & Zhu, 2006). Bhandari and Deaves (2006) exhibited in their work that males are more assured than women. From this existence of a direct relationship between demographic characteristics and behavioral biases (Mayfield et al., 2008). It could be inferred that herding is a conduct that is manifested via biased conduct. So there might be an instantaneous and huge effect of the demographical character of traders on their herding conduct. Lin (2011) determined that ladies are extra involved in herding sprees than males. In addition, it's far installed that more youthful traders are extra willing to herd conduct than older ones. Based on the preceding arguments and findings, it can be proposed that demographical variables have an impact on the underlying mechanism of biased behavior and through this influence, they can make investors more prone toward herding behavior and can impact the decision-making process of investors; hence it is proposed;

H2: Demography has a significant effect on herding behavior.
 H2a: Gender affects herding behavior.
 H2b: Occupation affects herding behavior.
 H2c: Income affects herding behavior.
 H2d: Age affects herding behavior.

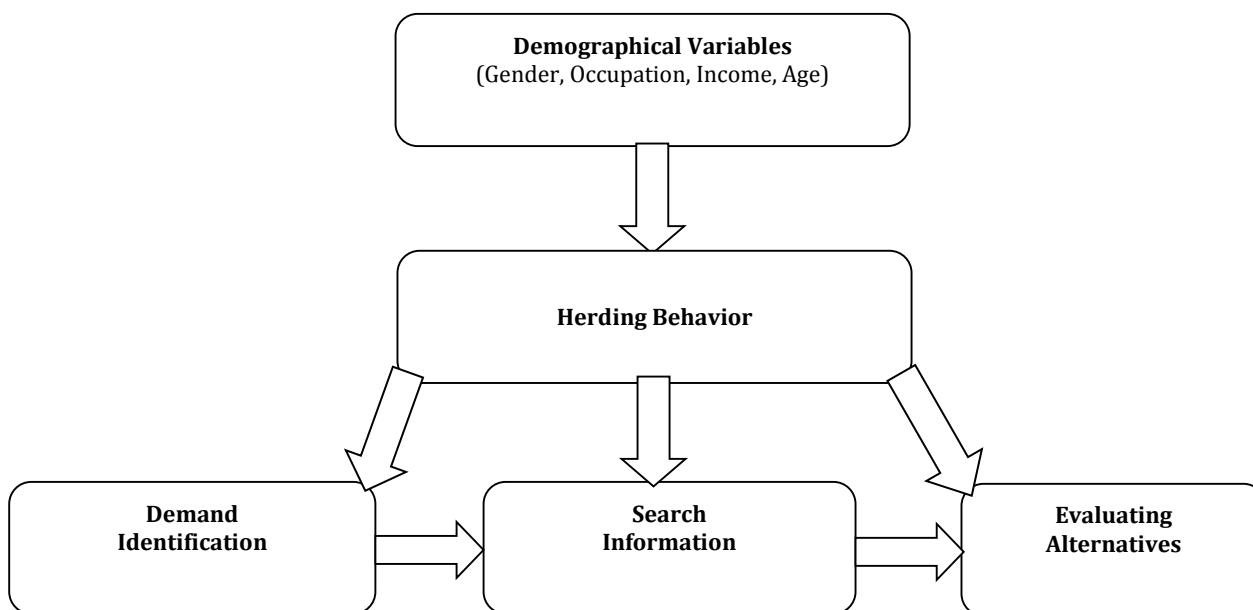


Figure 1. Theoretical Framework.

METHODOLOGY

Now we can recognize the general method of this study in this section. For the research in which the purpose is to attempt to apprehend the behaviors of individual buyers within the actual world, there may be a want to have a look at a surprisingly large group of the sample at a single time. Therefore, the cross-sectional layout is most suited. The proposed associations via literature are then tested with the aid of the adopted quantitative or quantifiable statistics (Saunders et al., 2009). A distinctive questionnaire that includes adopted measures from different sources is applied as a tool to gather primary statistics from a pattern of three hundred buyers from the Stock Market of Pakistan (PSX). This sample is chosen by randomly approaching the broker's places of work after which by approaching their available customers to fill up the questionnaires. The structural shape of the questionnaire is categorized into two portions. The first element includes descriptive questions, which include Gender, Occupation, Annual income, Job Type, and Age. The second element includes adopted measures of figuring out Herding Bias alongside Demand identification, seeking information, and evaluating options from the study of Kumar et al. (2016) and Lin (2011). In this section, the Likert scale is utilized, which is the most widely used scale, and respondents are asked to the degree to which they agree or disagree with the statements asked. The scale ranged from 1 to 5, which represented Strongly Disagree, Slightly Disagree, Neutral, Slightly Agree, and Strongly Agree, respectively.

Out of three hundred questionnaires distributed, two hundred and thirty-one were returned, and among these two hundred thirty-one questionnaires, two hundred ten were considered for the final analysis remaining were discarded due to missing

values and unclear selection. The demographic distribution of the sample is shown in Table 1.

Reliability and Validity

The adopted instrument was already tested on similar populations and in similar contexts in the studies of Kumar et al. (2016) and Lin (2011). Hence there is no need to re-establish the reliability and validity of the instrument using structural equation modeling, but still, the reliability and validity of the instrument are also reported through Cronbach's alpha and confirmatory factor analysis (CFA) in SEM. Cronbach's alpha is the most commonly utilized test conducted to check the reliability of the instrument (Liu & Salvendy, 2009). It is used for data that is continuous, like a 5-point Likert Scale. It assists in evaluating the reliability of data gathered from respondents (Helms et al., 2006). The maximum value associated with this indicator is 1. The closer the value is to 1, the better or more reliable the data is. In general value of less than 0.60 is considered poor (Sekaran, 2006). Further, it is also recommended to consider the corrected item-total correlations while using Cronbach's Alpha. It is suggested that it should be a minimum of 0.30 or higher to be acceptable (Shelby, 2011). The inter-item correlation can also be taken into consideration to assess reliability. It should be in the range of 0.15 to 0.50 (Clark & Watson, 1995). Results indicated that Cronbach's Alpha of all the variables which as it can be observed above 0.70. The value of Cronbach's alpha for dimensions of rational decision making of demand identification, search information, and evaluating alternatives is 0.79, 0.72, and 0.71 respectively whereas the alpha value for herding is 0.79 and the corrected item-total correlation is more than 0.30 for all the items of the scales.

Table 1. Demographic statistics.

Demographic Variables		Frequency	Percent	Cumulative %
Gender	Male	171	81.4	81.4
	Female	39	18.6	100.0
	Total	210	100.0	
Age	>25	24	11.4	11.4
	25-35	77	36.7	48.1
	36-45	54	25.7	73.8
	46-55	39	18.6	92.4
	55<	16	7.6	100.0
	Total	210	100.0	
Occupation	Self Employed	148	70.5	70.5
	Salaried	62	29.5	100.0
	Total	210	100.0	
Job Type	Finance	30	14.3	048.4
	Other	32	15.2	051.6
	Total	62	29.5	100.0
	Self Employed	148	70.5	
	Total	210	100.0	
Annual Income	<2Lac	79	37.6	037.6
	2-5Lac	98	46.7	084.3
	6-10Lac	24	11.4	095.7
	>10Lac	09	04.3	100.0
	Total	210	100.0	

Suitability of the items is also backed by the value of significance of the test which should be maximum up to 0.05 which in our case all are significant at the level of 0.00, hence all of these indices shows that all the items and data gathered for the variables are reliable and is sound enough to follow further analysis and to test the relations.

As far as the validity of the instrument is considered, it is affirmed following the criteria set by Fornell and Larcker (1981). According to which discriminant validity is established if the average variance extracted (AVE) for each variable is higher than the squared correlation among the variables; AVE value of 0.50 or above also indicates good validity (Iqbal et al., 2012). Apart from that, discriminant validity is also validated by using the criteria of Campbell and Fiske (1959), which is to compare the correlation of an item with the items of the same factor and with items of other factors and in 50 percent or above comparisons correlation between the construct should be higher. Then criterion-related validity is established if the predictor variables are significantly correlated with the criterion variables (Iqbal et al., 2012). All the variables of the study are found to be significantly ($p < 0.10$) correlated with each other, thus providing significant criterion-related validity for further process. Convergent validity is accessed using confirmatory factor analysis. The value of all of the factor loadings is also above 0.70. According to Bagozzi and Yi (1988) convergent validity is established if the factors loadings are significantly linked with their underlying construct in confirmatory factor (CFA) analysis. Which in our case are all highly significant. So in conclusion overall the instrument is valid and indicates good psychometric properties.

herding behavior of the investors in the case of demand identification (D.I). Indicating support for our hypothesis. Secondly, it is also found to be linked with searching information (S.I) at a significance level of $p < 0.1$ and Lastly also in the case of evaluating alternatives (E.A) which in current results also found to be significantly linked to the Herding behavior, hence completely supporting the hypothesis H2 of the study whereby accepting H2a, H2b, and H2c. These results are aligned with the direction of the existing literature based on which these proposed relationships were tested. These findings further established that herding behavior as a representation of the overall biased behavior of investors is significantly influencing the whole decision-making process. These findings empirically affirmed the theoretical proposition presented in the studies of Nofsinger (2005) and Shefrin (2007). These findings established that investors behave irrationally not only for the selection of alternatives; instead, their process for demand identification is also biased, leading to over or underestimation of actual needs and the relevant importance associated with such needs. Secondly, information search is also found to be a significant bias that can lead to the incorporation of irrelevant information and over or under evaluation of relevant information. This can lead to wrong and, in the words of Nofsinger (2005), optimistic or pessimistic evaluations on parts of investors and managers. Lastly, based on these biases-driven needs and collection of alternatives, the investors choose, and this final choice is also found to be influenced by herding behavior. This concludes that the whole rational decision-making process is infested with behavioral and cognitive factors.

The fitness of the overall model is also assessed by using various fitness indices including CFI of 0.924, GFI of 0.908, and other model fitness criteria. Which all indicate that the model is adequately fit. Further establishing the overall results of the model. The Amos model is represented in Figure 2.

RESULTS AND DISCUSSION

The result of structural equation modeling to test the proposed hypothesis is given in Table 2. The result indicates that the decision-making of investors is significantly linked with the

Table 2. Impact of herding.

Relationships		$U\beta$	$S\beta$	S.E.	C.R.	P-Value
Demand Identification	<--- Herding	0.154	0.242	0.075	2.044	0.041
Search Information	<--- Herding	0.249	0.377	0.147	1.693	0.090
Evaluating Alternative	<--- Herding	0.271	0.443	0.107	1.873	0.061

$U\beta$ = Unstandardized Estimates $S\beta$ = Standardized Estimates

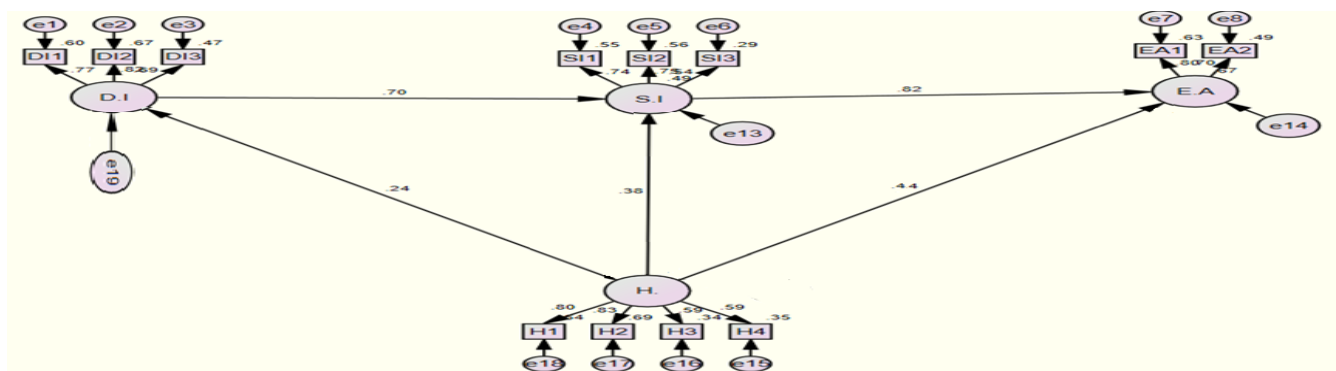


Figure 2. Hypothesis Testing (SEM).

Table 3. Impact of demography on herding behavior.

Demographic Characteristics	Sum of Squares	df	Mean Square	F	Sig.	
Gender	Between Groups	1.571	1	1.571	1.816	.179
	Within Groups	180.007	208	.865		
	Total	181.579	209			
Occupation	Between Groups	19.408	1	19.408	24.893	.000
	Within Groups	162.170	208	.780		
	Total	181.579	209			
Income	Between Groups	31.107	3	10.369	14.195	.000
	Within Groups	150.472	206	.730		
	Total	181.579	209			
Age	Between Groups	33.954	4	8.488	11.788	.000
	Within Groups	147.625	205	.720		
	Total	181.579	209			

Impact of Demography on Herding Behavior

Lastly, the demographic variables that are considered for analysis are gender, occupation, income, and age; the result of one-way ANOVA is reported below in Table 3. All these results indicate that there is a significant difference in the degree of herding behavior among various groups of investors, except for the impact of gender. All the other results are in favor of our hypothesis that investors with various backgrounds tend to behave differently regarding their decision-making in the stock market.

In the context of investors in Pakistan, the stock market is not the mainstream choice of preference for investment; instead, the banking sector in Pakistan is particularly established, and therefore the participation of female investors is quite low. The limited representation of female investors in the sample can be one of the underlying reasons for this insignificance. As traditionally in the studies like Bhandari and Deaves (2006) and Gumus and Dayioglu (2015), it was established that females tend to behave significantly different from their male counterparts. Females tend to rely more on their emotions and feeling, making them prone to biased behavior. The remaining results were in line with the existing literature and indicated a significant difference in biased behavior based on these demographical characteristics.

CONCLUSIONS

The main focus of the whole article was on the linkage of the decision-making process of investors operating in the Pakistan stock market (PSX) with their intention to herd. This relationship is already tested and supported theoretically and empirically in the studies of Kudryavtsev et al. (2013), Waweru et al. (2008), and Kumar et al. (2016), but not in the context of Pakistan. The study aimed to get insight into how an individual makes investment choices in the real world instead of how they should behave based on traditional financial theories. The purpose of the study was not to prove the theories of standard finance outdated instead it was an attempt to better understand the actual life behavior of investors. To do so the study tried to link the real life behavior of investors with the behavior expected by the theories of standard finance and to provide a better explanation of their deviation from standard and rational behavior through empirical evidence.

This study extended the current literature by linking the rational decision-making process with the herding behavior of investors in the context of Pakistan. Empirical evidence suggests that investors do follow the rational decision-making process and

start the investment procedure for demand identification and analyzing their current financial status, and then they search for relevant information to find all possible alternatives through their available resources and then after analyzing the alternatives, they finally choose an option but this study established that apart from following the rational decision-making process, their process of rational decision making is also found to be linked significantly with the herding behavior. Indicating that although the investors follow the rational decision-making process due to the imperfect market conditions, lack of complete information, and different psychological factors, investors do tend to overreact or underreact to the available information and follow the market trend blindly by tending to rely too much on information from relatives and news, instead of making their complete analysis. All these factors hinder the rational decision-making process, and investors' decisions fail to get optimal results as expected under rational decision-making. Kudryavtsev et al. (2013) established that all the biases are highly correlated with each other, indicating that investors that rely on one bias will certainly rely on other biases too in their decision making. By establishing the link between herding behavior and the rational decision-making process, the current study is of the view that behavioral biases do interfere with each step of the rational decision-making process. Earlier studies by Gul and Akhtar (2016), Rasheed et al. (2021a), and Gul et al. (2021) among many others, only focused on the selection aspect of rational decision making and ignored the remaining process. The current is of particular significance as it established that not only the final decision is biased, but the whole process leading to the decision is also infested with similar behavioral factors.

The second aspect that this study focused upon is the contextual background of the investors or, in other words, the demography of the investors. Given the growing focus on the contextual variables and generalizability of results. The behavior of individuals tend to vary with different cultures, environments, income level, etc., and for a study to be of significance at any level, it is vital to imply specified groups; hence we incorporated the demographic variables in our study to examine in depth the difference in biased behavior among different demographic subgroups and how their decision-making style vary. The analysis results indicated that in the case of investors in Pakistan, the behavior varies as far as biases and decision making is concerned based on their demographic factors that include age, income, and occupation but not gender. The reason behind these results may be related to the fact that Pakistan is a

demographically rich country with investors with a range of demographic distinctions, and although the sample is limited to two hundred ten respondents only and there isn't a statistically sufficient and reliable number of observations related to each demographic subgroup apart from the female portion of the investors where adequate representation can't be collected. Another aspect of limitation of the results is that investors in Pakistan are not inclined toward investing in the stock market, and it's just recently that the trend and awareness of investing in the stock market are building and that the sample is collected from a demographically limited area from only Lahore and Islamabad, where investors with demographically similar context operate. These limitations can be overcome and clarified in future studies by increasing the sample size and covering a larger geographical area. Future researchers need to explore the dynamics of particular behavioral factors that lead to market anomalies like herding behavior to establish a complete framework. Lastly, some of the methodological limitations that can be addressed in upcoming research include probability sampling with increased sample size and in-depth analysis of demographical variables to verify the impact and nature of each demographical variable as proposed by existing literature.

REFERENCES

- Adiputra, I.G., Rahardjo, T.H., 2021. Analysis of investment decision making through overconfidence, herding effect, and self-monitoring variable during the Covid-19 pandemic in Indonesia, in: Ninth international conference on entrepreneurship and business management (ICEBM 2020). Atlantis Press, pp. 184–190.
- Babajide, A.A., Adetiloye, K.A., 2012. Investors' behavioural biases and the security market: An empirical study of the Nigerian security market. *Account. Financ. Res.* 1, 219–229.
- Bagozzi, R.P., Yi, Y., 1988. On the evaluation of structural equation models. *J. Acad. Mark. Sci.* 16, 74–94.
- Bashir, T., Azam, N., Butt, A.A., Javed, A., Tanvir, A., 2013. Are behavioral biases influenced by demographic characteristics & personality traits? Evidence from Pakistan. *Eur. Sci. J.* 9, 319–328.
- Bhandari, G., Deaves, R., 2006. The demographics of overconfidence. *J. Behav. Financ.* 7, 5–11.
- Braha, D., 2012. Global civil unrest: contagion, self-organization, and prediction. *PLoS One* 7(10), e48596.
- Campbell, D.T., Fiske, D.W., 1998. Convergent and discriminant validation by the multitrait-multimethods matrix. *Psychol. Bull.* 56, 81–105.
- Cascio, W.F., Young, C.E., Morris, J.R., 1997. Financial consequences of employment-change decisions in major US corporations. *Acad. Manag. J.* 40, 1175–1189.
- Chang, C.-L., McAleer, M., Wang, Y.-A., 2020. Herding behaviour in energy stock markets during the Global Financial Crisis, SARS, and ongoing COVID-19. *Renew. Sustain. Energy Rev.* 134, 110349. doi.org/10.1016/j.rser.2020.110349.
- Clark, L.A., Watson, D., 2016. Constructing validity: Basic issues in objective scale development. *Psychol. Assess.* 7, 309–319.
- Clements, A., Hurn, S., Shi, S., 2017. An empirical investigation of herding in the US stock market. *Econ. Model.* 67, 184–192.
- Croushore, D., 2006. Money and banking: a policy-oriented approach. Published by Cengage learning pp. 608.
- David, P., Kochhar, R., Levitas, E., 1998. The effect of institutional investors on the level and mix of CEO compensation. *Acad. Manag. J.* 41, 200–208.
- Dhar, R., Zhu, N., 2006. Up close and personal: Investor sophistication and the disposition effect. *Manage. Sci.* 52, 726–740.
- Fornell, C., Larcker, D.F., 1981. Evaluating structural equation models with unobservable variables and measurement error. *J. Mark. Res.* 18, 39–50.
- Gigerenzer, G., Gaissmaier, W., 2011. Heuristic decision making. *Annu. Rev. Psychol.* 62, 451–482.
- Gul, F., Akhtar, N., 2016. Predictors of Investor Overconfidence in Karachi Stock Exchange. *J. Manag. Sci.* 10, 301–315.
- Gumus, F.B., Dayioglu, Y., 2015. An analysis on the socio-economic and demographic factors that have an effect on the risk taking preferences of personal investors. *Int. J. Econ. Financ. Issues* 5, 136–147.
- Harrison, P.D., Harrell, A., 1993. Impact of "adverse selection" on managers' project evaluation decisions. *Acad. Manag. J.* 36, 635–643.
- Helms, J.E., Henze, K.T., Sass, T.L., Mifsud, V.A., 2006. Treating Cronbach's alpha reliability coefficients as data in counseling research. *Couns. Psychol.* 34, 630–660.
- Hilton, D.J., 2001. The psychology of financial decision-making: Applications to trading, dealing, and investment analysis. *J. Psychol. Financ. Mark.* 2, 37–53.
- Hirt, G.A., Block, S.B., 2006. Fundamentals of investment management. McGraw Hill.
- Iqbal, T., Khan, B.A., Talib, D.N., Khan, N., 2012. TQM and organization performance: The mediation and moderation fit. *Life Sci. J.* 9, 1571–1582.
- Jaros, S.J., Jermier, J.M., Koehler, J.W., Sincich, T., 1993. Effects of continuance, affective, and moral commitment on the withdrawal process: An evaluation of eight structural equation models. *Acad. Manag. J.* 36, 951–995.
- Jaswani, T., 2008. Function and purpose of stock market. Accessed online from <http://www.articlesbase.com/investing-articles/function-and-purpose-of-stock-market-582881.html>.
- Kahneman, D., Tversky, A., 1979. Prospect theory: An analysis of decision under risk. *Econometrica*, 47, 263–291.
- Kengatharan, L., Kengatharan, N., 2014. The influence of behavioral factors in making investment decisions and performance: Study on investors of Colombo Stock Exchange, Sri Lanka. *Asian J. Financ. Account.* 6, 1, 23.
- Komalasari, P.T., Asri, M., Setiyono, B., 2020. Bibliometric analysis of herding behavior in capital market, in: 3rd Asia Pacific International Conference of Management and Business Science (AICMBS 2019). Atlantis Press, pp. 226–232.
- Kudryavtsev, A., Cohen, G., Hon-Snir, S., 2013. Rational'or'Intuitive: Are behavioral biases correlated across stock market investors? *Contemp. Econ.* 7, 31–53.
- Kumar, S., Goyal, N., 2016. Evidence on rationality and behavioural biases in investment decision making. *Qual. Res. Financ. Mark.* 8, 270–287.
- Landberg, W., 2003. Fear, greed and the madness of markets. *J. Account.* 195, 79–82.
- Lim, A.L.C., 2012. The relationship between psychological biases and the decision making of investor in Malaysian share market. Unpublished paper international conference on

- management, economics & finance (ICMEF 2012) Proceeding.
- Lin, H-W., 2011. Elucidating the influence of demographics and psychological traits on investment biases. *Int. J. Econ. Manag. Eng.* 5, 424-429.
- Liu, Y., Salvendy, G., 2009. Effects of measurement errors on psychometric measurements in ergonomics studies: Implications for correlations, ANOVA, linear regression, factor analysis, and linear discriminant analysis. *Ergonomics.* 52, 499-511.
- Lo, A.W., 2002. Bubble, rubble, finance in trouble? *J. Psychol. Financ. Mark.* 3, 76-86.
- Luong, L., Thi Thu Ha, D. 2011. Behavioral factors influencing individual investors decision-making and performance: A survey at the Ho Chi Minh stock exchange.
- Markowitz, H.M., 1968. Portfolio selection, in: *Portfolio Selection.* Yale university press. *J. Financ.* 7, 77-91.
- Mathuraswamy, P., Rajendran, G., 2015. Investment rationality in equity market: an empirical study. *Int. J. Econ. Perspect.* 9, 49-59.
- Mayfield, C., Perdue, G., Wooten, K., 2008. Investment management and personality type. *Financ. Serv. Rev.* 17, 219-236.
- Merton, R.C., 1987. A simple model of capital market equilibrium with incomplete information. *J. Financ.* 42, 483-510.
- Mintzberg, H., Raisinghani, D., Theoret, A., 1976. The structure of "unstructured" decision processes. *Adm. Sci. Q.* 21, 246-275.
- Myers, S.C., Majluf, N.S., 1984. Corporate financing and investment decisions when firms have information that investors do not have. *J. Financ. Econ.* 13, 187-221.
- Nofsinger, J.R., 2005. Social mood and financial economics. *J. Behav. Financ.* 6, 144-160.
- Nozick, R., 1993. *The nature of rationality.* Princeton, NJ: Princeton university press. Doi 10.2307/2219666.
- Papadakis, V.M., Lioukas, S., Chambers, D., 1998. Strategic decision-making processes: the role of management and context. *Strateg. Manag. J.* 19, 115-147.
- Persaud, A., 2000. Sending the herd off the cliff edge: the disturbing interaction between herding and market-sensitive risk management practices. *J. Risk Financ.* 2, 59-65.
- Prechter, R.R., 2016. *The Socionomic Theory of finance.* socionomics institute press Gainesville. PROBUS publishing company.
- Rasheed, M.H., Faid Gul, D., Hashmi, A.M., 2021a. Personality antecedents of investors' biased behavior in Pakistan. *Int. J. Sci. Technol. Res.* 10, 1-7.
- Rasheed, M.H., Gul, F., Akhtar, M.W., Tariq, S., 2020. Dynamics of overconfidence among stock market investors in Pakistan. *Int. Trans. J. Eng. Manag. Appl. Sci. Technol.* 11, 1-11.
- Rasheed, M.H., Gul, F., Hashmi, A.M., Mumtaz, Z., 2020b. Predictability of return in Pakistan stock market through the application of the threshold quantile autoregressive models. *Iran. Econ. Rev.* 25, 815-828.
- Rasheed, M.H., Rafique, A., Zahid, T., Akhtar, M.W., 2018. Factors influencing investor's decision making in Pakistan: Moderating the role of locus of control. *Rev. Behav. Financ.* 10, 70-87.
- Samuel, C., 1996. *Stock market and investment: the signalling role of the market.* World Bank, operations policy department, operations policy group.
- Saunders, M., Lewis, P., Thornhill, A., 2009. Understanding research philosophies and approaches. In *research methods for business students.* pp. 128-171.
- Sekaran, U., 2006. *Research methods for business: A skill building approach.* John Wiley & Sons.
- Sharpe, W.F., 1964. Capital asset prices: A theory of market equilibrium under conditions of risk. *J. Financ.* 19, 425-442.
- Sharpe, W.F., 1964. Capital asset prices: A theory of market equilibrium under conditions of risk. *J. Finance* 19, 425-442.
- Shefrin, H., 2007. *Behavioral corporation finance: decisions that create value.* Oxford university press, USA.
- Shelby, L.B., 2011. Beyond cronbach's alpha: Considering confirmatory factor analysis and segmentation. *Hum. Dimens. Wildl.* 16, 142-148.
- Shiller, R.J., 2006. Irrational exuberance revisited, in: *CFA institute conference proceedings quarterly.* pp. 16-25.
- Simon, M., Houghton, S.M., Aquino, K., 2000. Cognitive biases, risk perception, and venture formation-Implications of interfirm (mis) perceptions for strategic decisions. *J. Bus. Ventur.* 15, 113-134.
- Teweles, R.J., Bradley, E.S., 1998. *The stock market.* John Wiley & Sons.
- Tversky, A., Kahneman, D., 1974. Judgment under Uncertainty: Heuristics and Biases: Biases in judgments reveal some heuristics of thinking under uncertainty. *Science* 185, 1124-1131.
- Wamae, J.N., 2013. Behavioural factors influencing investment decision in stock market: A survey of investment banks in Kenya. *Int. J. Soc. Sci. Entrep.* 1, 68-83.
- Waweru, N.M., Munyoki, E., Uliana, E., 2008. The effects of behavioural factors in investment decision-making: a survey of institutional investors operating at the Nairobi Stock Exchange. *Int. J. Bus. Emerg. Mark.* 1, 24-41.
- Zaidi, F.B., Tauni, M.Z., 2012. Influence of investor's personality traits and demographics on overconfidence bias. *Inst. Interdiscip. Bus. Res.* 4, 730-746.

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