Article:	**Elucidating the Impact of behavioral biases in Pakistan Stock Market: Moderating Impact of Financial Literacy**

Author(s):	Muhammad Haroon Rasheed[1*] , Amir Rafique[2], Usama Kalim[3], Faid Gul[4]
Affiliation:	[1]University of Sargodha, Sargodha, Pakistan [2]COMSATS University, Islamabad, Pakistan [3]Southwest University in Chongqing, Chongqing, China [4]National University of Modern Languages, Islamabad, Pakistan

Journal QR

Article QR

Indexing

A publication of the
Department of Economics and Statistics, Dr. Hasan Murad School of
Management, University of Management and Technology, Lahore, Pakistan

Elucidating the Impact of Behavioral Biases in Pakistan Stock Exchange: Moderating Impact of Financial Literacy

Muhammad Haroon Rasheed[1*], Amir Rafique[2], Usama Kalim[3], Faid Gul[4]

[1]University of Sargodha, Sargodha, Pakistan
[2]COMSATS University, Islamabad, Pakistan
[3]Southwest University in Chongqing, Chongqing, China
[4]National University of Modern Languages, Islamabad, Pakistan

ABSTRACT

This study aims at understanding the influence of herding, overconfidence, anchoring, and loss aversion on the decision-making style of investors. Besides, it also investigates the role of financial literacy, since the traditional paradigm of finance declares that financial literacy is directly associated with the degree of irrational outcomes. To explore this linkage, data from investors trading in Lahore, Karachi, and Islamabad were gathered. Structural equation modeling (SEM) was used to establish the proposed associations. The results revealed that behavioral biases significantly impact the decision-making style of investors. The results of moderation analysis indicated that financial literacy plays a significant role in de-biasing decision-making. These findings can be extremely useful for investors, policymakers, and investment professionals and can be utilized to optimize decision-making. Theoretically, these findings provide a deeper understanding of the daily stock market behavior.

Introduction

For an economy, the significance of the stock market can be attributed to multiple factors including acting as an intermediary for channelizing funds (Zuravicky, 2005). According to Rasheed et al. (2018), it is also considered to be an indicator of a nation's growth and progress. The stock markets also act as an investment avenue for investors and provide profit through investing in stocks (Teweles &

---

* Corresponding Author: haroon.rasheed@uos.edu.pk

Bradley, 1998). Investors are particularly interested in stocks because of the dividend income, appraisal of capital, and the hedge it provides against the inflationary erosion of purchasing power (Teweles & Bradley, 1998). This multifaceted significance of stock markets made its proper functioning vital for an economy. For a sound economy, the importance of balanced and nonvolatile markets cannot be neglected. Any impulsiveness or uncertainty in the stock market directly disturbs the businesses operating in the economy. That's why it is of prime importance to study and identify the factors which can affect the stock market, particularly for an emerging economy like Pakistan which recently attained the status of an emerging market and is being considered by investors around the globe for investment due to its structural improvements and the bright future avenues (Mangi, 2016).

The main objective of the present study is to understand the factors impacting stock market behavior by exploring the behaviorist school of thought. The field of behavioral finance attributes the stock market behavior to the manifestation of individual investor's behavior and study investors' behavior in an attempt to elucidate real-world decision making of stakeholders and enables us to understand the volatilities occurring in the stock market (Waweru et al., 2008). The study of behavioral finance helps us to understand the stock market by knowing more about the investor's cognitive behavior and how cognitive errors impact their decision making which results in creating volatility in stock markets instead of the traditional approach which considered stock markets to be efficient. Behavioral finance theorists like Shefrin & Statman, (1985); Tversky & Kahneman, (1974) suggest that the study of human psychology explains stock market abnormalities like stock bubbles in the real world (Gao and Schmidt, 2005) and with expanding literature, behavioral finance is establishing itself as a widely accepted and feasible model to understand the real-world behavior of the financial markets (Kim & Nofsinger, 2008).

The studies from the prospect of behavioral finance for understanding the stock market dates back to the 1970s (Baker & Nofsinger, 2002). Those studies were primarily western centered, and very little light was shed on developing countries and growing economies like Pakistan (Gul & Akhtar, 2016; Shah et al., 2017). Hence, to explore this field in the context of Pakistan would be greatly beneficial for understanding and comparing the behavior of individualistic and developed economies and collectivist and developing economies. Though some

work has been done on this area of research in developing countries, the number of studies and the aspects studied are not at par if compared to the developed markets of the west (Rasheed et al., 2020). In Pakistan, very limited work has yet been done on behavioral finance. Hence, this study attempts to explain the real-world market behavior linked with investors in Pakistan by taking into account common biases present in stakeholders, i.e., overconfidence, loss aversion, anchoring, and herding. Shefrin (2007) categorized all the behavioral biases into three dimensions namely biases heuristics and framing effects. Most of the prior studies including Gul & Akhtar, (2016); Rasheed et al., (2020); Waweru et al., (2008) focused on only one dimension and none of the existing studies saw the matter from each dimension. This study will address this theoretical shortcoming by simultaneously testing for overconfidence from biases, anchoring from the heuristic and loss aversion from the dimension of framing effects. Apart from that impact of one of the most significant market anomaly herding behavior on individual investors' decision making is also tested. The prior studies including the studies of Tan et al., (2008) and Khan & Rizwan, (2018) didn't address this aspect of market anomalies. Thus the current study is of a more comprehensive and generalizable nature with regards to establishing the impact of these cognitive preferences on the decision-making style of investors in Pakistan.

This article also elucidates the role of financial literacy in making financial decisions unbiased as studies of Amisi, (2012) & Hastings et al.,(2013) suggested that the existence of financial literacy helps investors in better understanding optimal decision making and also it aids investors to overcome the cognitive errors they make in investment decision making (Hayat & Anwar, 2016). Jariwala (2015) identified that investors at the stock market who lack the basic knowledge of finance like risk diversification, inflation, and interest are more prone to involve in investment biases. This lack of knowledge from investors plays a big role in creating volatilities and inefficiencies in the stock market because they do not recognize the rational aspect of making decisions in the stock market and opt for wrong choices that originate from their emotions or cognitive trends. This irrational aspect of the investors is mainly because of the absence of understanding about the stock market and the poor know-how about general finance and economics. The presence of financial literacy plays a main role in making sound investment decisions (Hastings et al., 2013; Jariwala, 2015). For becoming rational decision-makers, investors need some knowledge about the basic concepts of finance and the financial markets. The provision of basic

financial literacy can lead the investors to improve their decision-making in the stock market (Van Rooij et al., 2011). In a nutshell, theoretically, it is established that what investors need is to have enough knowledge to make effective choices in the stock market so that they do not become involved in irrational decision making and the stock market can be efficient. That is why in this article we have statistically examined the influence of financial literacy to determine its impact on the decision-making styles of investors.

By deriving from the discussion this article tries to explore the impact of biases on market participants' choices along with an examination of the moderating effect of financial literacy to have a better understanding of the behaviors of individual investors at the Pakistan stock exchange. This study also explores the dynamics and impacts of financial literacy in making investors' investment decisions. Theoretically, the novelty of the study is related to the fact that it incorporated factors from each dimension as established by Shefrin (2006) and further it is the first to analyze their impact on the irrational decision-making of investors. The current study has also incorporated the role of financial literacy to statistically establish its impact in debasing the stock market.

Literature Review

According to conventional theories of finance, investors are perfectly rational and wealth maximizer in their financial decisions and will prefer the lowest level of risk at any given level of return or will prefer the highest level of return at a given level of risk (Markowitz, 1952) but when we observe decision making of investors in real, it is not the case. The investors do behave irrationally and their decisions deviate them from the way explained by the conventional theories of finance. The field of behavioral Finance helps to identify the reasons causing such deviations from the standard finance theories. In the world of finance, the induction of prospect theory is the pioneer that provided grounds for behavioral finance. The Prospect theory was originally developed by Kahneman & Tversky, (1979). It contradicts the traditional beliefs in the field of finance and established that investors in the real world are not rational. This irrationality is attributed to numerous behavioral factors. The current study focused on some of the most significant factors including overconfidence, anchoring, and loss aversion. These behavioral factors cause irrational exuberance by investors including herding. Hence, the current study has also explored and established that the herding behavior leads towards irrational decision making.

Overconfidence in the Stock Market

The first factor under consideration of this study is overconfidence, which according to Shefrin (2006) is the degree by which the investors rate their abilities and skills. Normally overconfident investors have a perception about themselves that they have a better knowledge of the market. According to Michailova (2010) it is the most significant and experimented factor among all the factors. According to Odean (1998) traders that have more frequency of trades receive significantly lower returns than the market. Behavioral finance experts have determined that overconfidence causes investors to overestimate their knowledge and they underestimate the risk to control events. Overconfidence remains a growing field of study around the world, especially in a collectivist culture like Pakistan. Prior studies have established that overconfidence behavior exists significantly more in Asian cultures as compared to western culture. Hence it is even more vital to explore countries like Pakistan. Overconfidence bias is further categorized into two categories, Prediction overconfidence which leads investors to have a very high confidence interval, and certainty overconfidence which leads investors to have a very certain judgment (Pompian, 2006). Various studies have shown in the past that choosing a stock to invest is the most difficult undertaking for the investors but interestingly they exhibit extreme overconfidence in this regard, leading to the choice of a suboptimal alternative (Bhandari & Deaves, 2006; Michailova, 2010; Nofsinger, 2005; Rasheed et al., 2020). Hence it is hypothesized:

H1: Overconfidence bias positively impacts the irrational decisions making of investors.

Anchoring in the Stock Market

The second factor under consideration in this study is anchoring. Anchoring impacts people by relying on past values as the base value for making decisions (Tversky & Kahneman, 1974). While making investment decisions, other investors refer to the initial purchase price when selling or analyzing the different securities at a different point in time. People tend to determine current prices by the values of the past. Investors at some point while making a financial decision think about the happenings of the past and judge themselves. Anchoring make investors believe that if in last year some particular stocks reacted at some point in time to some intensity level, the reaction would be the same at that particular

point in time of this year and when this phenomenon reflects in their judgment, they usually make the wrong decisions because the stock market does not react at the same intensity level as lots of factors play their part in making those reactions (Blankenship et al., 2008). Anchoring is a major occurrence in which the investors in the stock market estimate a range of share prices based on historical trends and make their decisions accordingly which is completely irrational from the viewpoint of investors. According to Waweru et al. (2008), individual investors rely more on their recent experiences in the market and tend to be more optimistic when the stock market rises and become more pessimistic when the market falls. This behavior leads to the under and overreaction of the investors to the unexpected changes in the stock market resulting in suboptimal decision making (Kudryavtsev et al. 2013) and hence it can be inferred:

H2: Anchoring bias positively impacts the irrational decisions making of investors.

Loss Aversion in the Stock Market

The last behavioral factor is loss aversion which is introduced in the world of finance with the induction of prospect theory which is a pioneer theory that provided grounds for behavioral finance. The Prospect theory was originally developed by Kahneman & Tversky, (1979). It contradicts the traditional beliefs in the field of finance and here from, it is concluded that humans are not always risk-averse and explains the conditions of mind that impact the individual's decision procedure. From a stock market perspective, investors tend to react differently based on their preceding knowledge in the market regarding their investment decisions (Kudryavtsev et al., 2013). When they suffer a loss in their investment decision they become more risk-taker to overcome this feeling of loss or to recover their financial loss. On the other hand, once investors gain some financial success concerning their previous financial decision they become more risk-averse to avoid any loss or to save their positive financial position in the market. The above-mentioned behavior is not rational and due to this mentality or behavior of loss aversion in the stock market, they may become the victim of irrational decisions. This behaviour also affects the standard mechanism of the market and the other investors in general. Waweru et al. (2008) have described this attitude with the help of the concepts of regret aversion and loss aversion. They conclude that investors are risk-averse when they witnessed a recent gain

but risk-takers in cases where they experience losses in recent times leading towards irrationally skewed decisions. Therefore, it is proposed that:

H₃: Loss aversion bias positively impacts the irrational decisions making of investors.

Herding behavior in the Stock Market

Another significant and frequently observed behavior is herding, which is defined as the tendency of investors to follow the larger group of investors in the stock market (Tan et al., 2008; Khan & Rizwan 2018). When investors involve in herding behavior, they seem to ignore the fundamental concept of stock prices and rather than making investment decisions based on the standard procedure of risk-return consideration, they tend to imitate the decisions of the larger group of investors and make their investment choices accordingly. Investors normally involve in such kind of behavior when the market condition is uncertain, and they can't easily trust the information available to them. In such kinds of circumstances, they try to protect themselves from the uncertain environment by simply following or copying the movements of a larger group of investors (Caparrelli et al., 2004). It is a major concern for the financial analyst because this tendency of investors can change the prices of securities from fundamental value, which is contrary to viewpoints of traditional asset pricing theory (Tan et al., 2008) and can create inefficiency in the stock market which is usually recognized by speculative bubbles (Caparrelli et al., 2004). According to Sultana & Pardhasaradhi (2012), the study of all these biases is crucial as these factors impact investment choices. Based on the above literature it is proposed that;

H₄: Herding behavior positively impacts the irrational decisions making of investors.

Role of Financial Literacy in Stock Markets

People around the globe are becoming increasingly prone to invest in stock markets and other financial activities and this increase is caused primarily due to diversified products and services offered by the financial institutes like stock markets but with this rise the complexity of these products has also increased resulting in the inability of investors to understand and read the financial conditions for optimal decision making without advance knowledge of finance (Van Rooij et al., 2011). Ability to read and analyze financial information is

referred to in the present literature as financial literacy, financial education, and financial knowledge (Huston, 2010). Now the question arises that up to which extent financial literacy exists in an economy and what is the impact of the presence or absence of this financial literacy on financial maneuvers. Several pieces of research have proved in the past that the presence of financial literacy aids people to act more rationally about their financial decisions and aid in overcoming biased behavior (Amisi, 2012; Jariwala, 2015; Van Rooij et al., 2011). Some basic levels of financial literacy did help investors to become comparatively better in their choice-making in the stock markets (Van Rooij et al., 2011). They have also suggested that financial literacy aids investors to make impartial investment decisions regarding their investment in the stock markets. It was proposed that the presence of financial literacy makes investment decisions more unbiased and rational compared to a less financially literate investor. Because from the investors' point of view, an investor who does not have adequate knowledge about finance and the financial markets cannot apply and understand the mechanism of a standard market and cannot be fully rational regarding his approach towards financial decision making. That is why this variable has been selected to be tested as a moderator to check its effects on making the financial decision sounder and more rational and based on the above discussion the following are proposed:

H5a: The association between overconfidence and the investor's decision-making style is positively moderated by financial literacy;

H5b: The association between anchoring and the investor's decision-making style is positively moderated by financial literacy;

H5c: The association between loss aversion and the investor's decision-making style is positively moderated by financial literacy; and

H5d: The association between herding and the investor's decision-making style is positively moderated by financial literacy.

Figure 1

Theoretical Framework
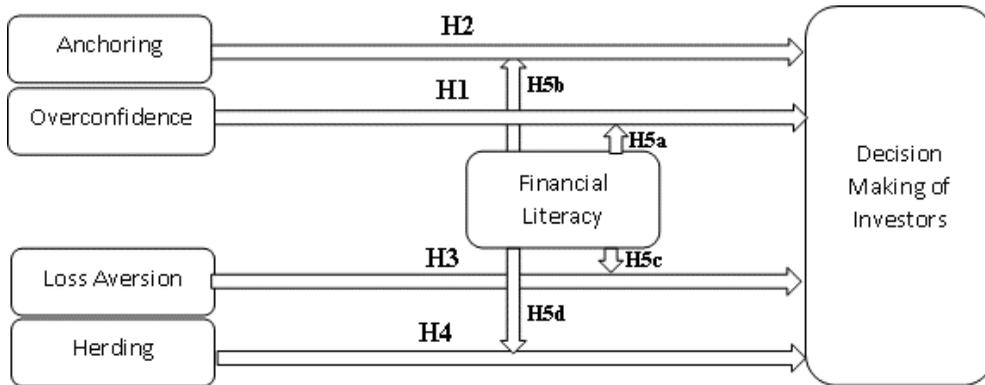
Methodology

The study followed a questionnaire-based cross-sectional approach for data collection. The questionnaire consisted of items adopted from the studies that are contextually of similar nature. The items for measuring overconfidence bias were adopted from the study of Rasheed et al. (2020), whereas the measure used to identify anchoring, loss aversion, and financial literacy were adopted from the studies of (Mouna & Anis, 2015; Phuoc & Thi, 2011). Lastly, the measure used to identify irrational tendencies in individual investors' stock market decisions have been adopted from the studies of (Rasheed et al., 2018; Scott & Bruce, 1995).

A total of three hundred fifty questionnaires were distributed amongst the individual investors operating in Karachi, Lahore, and Islamabad. This sample size is affirmed from the similar studies of Gul & Akhtar, (2016); Kudryavtsev et al., (2013); Rasheed et al., (2018); Waweru et al., (2008). Owing to the unavailability of data regarding the population of investors in Pakistan, the convenience sampling technique has been used to choose investors from the stock market. The convenience sampling technique is particularly beneficial because it provides a maximum rate of response and avoids a lot of wastage of time and other means (Bryman & Bell, 2015). The data compiled in the study have been examined through SPSS and AMOS. The "Structural Equation Modeling" (SEM) method has been utilized in this study for analysis of the relationship among variables. The structural equation modeling technique allows incorporating both

observed and latent variable values in the same model for measuring their relationship and most utilized technique for testing relationships based on latent variables.

Reliability and Validity Check

The reliability of the instrument was established using Cronbach's alpha. An instrument with a value of above 0.70 is considered reliable (Helms et al., 2006). All the values are found to be above this minimum threshold. To establish validity confirmatory factor analysis (CFA) of the studied variables is conducted. All the factor loadings of the variables indicated a value greater than 0.6 confirming the validity of the variables of the study. The covariance among the independent variables is also not very high confirming the discriminant validity. This is further affirmed by Fornell and Larcker (1981) criteria, as the average variance extracted (AVE) for each construct is higher than the square of its correlation among the variables. Before going towards the final analysis Kolmogorov-Smirnov test was performed for checking the normality of data using SPSS. The significant values of all the tested variables showing that the data collected related to all these variables were normal. Convergent validity is established as proposed by Bagozzi et al. (1991) that if the factors loadings are significantly linked with their underlying construct in confirmatory factor (CFA) analysis convergent validity is established, which in our case were all highly significant. So, the measures of this study were concluded to be reliable and valid enough to follow the further analysis.

Data Analysis

The total sample size for this study was three hundred but after detailed scrutiny of all the questionnaires, a total of two hundred forty-two properly responded questionnaires by the investors were selected for further analysis. As per the data collected in this survey most of the respondents were male covering ninety-five percent of the whole population and only eleven of this sample were female. Also, most of the investors in the survey had experience ranging from zero to ten years which accounts for almost half of the total respondents. The findings of the study also showed that seventy percent of the individual investors currently trading at the Pakistan stock exchange fall under the age group below forty, which is a very positive thing about this stock market that more young individuals are involved in trading.

Another positive aspect of the Pakistan stock exchange is that most of the individual investors have higher qualifications as found out by the survey that eighty-two percent of the sample respondents have graduation or higher qualification.

Association of Behavioral Biases with Decision Making of Investors

The results calculated by using AMOS are shown in figure 2 below. The results of AMOS show that there is a significantly positive association with herding, overconfidence, anchoring, and loss aversion with the decision making of investor.

Figure 2
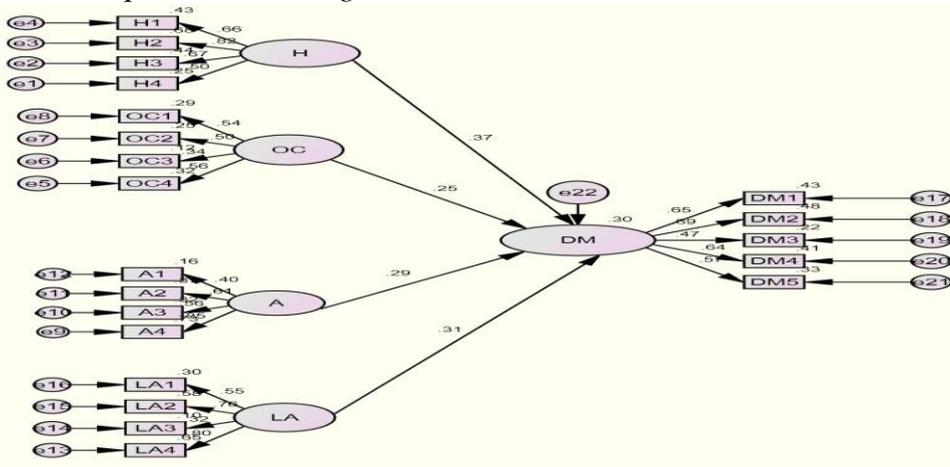
Structural Equation Modelling

Table 1 indicates that the association between overconfidence and the choices made by individual investors is positive and significant as hypothesized by the study. That proves that overconfident investors will likely be more involved in irrational decision-making, hence proving our hypothesis 1. As per the results reported in Table 1 below, there is also a significant relationship between anchoring and the decision making of individual investors establishing hypothesis 2 of our study. The same is the case with the relationship between loss aversion and the decision-making of individual investors. This can also be observed in table 1, there is a significant positive relationship between loss aversion and investor

irrational decision making, establishing hypothesis 3 of the study. Lastly, it can also be observed that there exists a significant positive relationship of herding behavior with the irrational decision making of investors. This result is also in line with our fourth hypothesis that herding behavior brings irrationality to investor's decision-making, hence validating all 4 of the study hypothesis regarding direct impact.

These findings are by the studies of Hayat & Anwar, (2016) and Anum, (2017) the investors who rely more on their judgments based upon their past experiences and have a better knowledge about the past trends and movements of the market. Blankenship et al. (2008) provide another perspective on anchoring based on the process of attitude change. Which elaborate that with the change in mechanism or context of the financial market, the anchoring behavior is also changed. In an uncertain and complex situation, people often use mental shortcuts (heuristics) that reduce complex problems to simpler judgmental operations. So, with their perspective when they are relying on past values in an uncertain environment, they are not making irrational decisions but rationalizing their choices according to the market situations.

Table 1

Results of Path Analysis

		β	S.β	S.E.	C.R.	p-value
DM <---	Overconfidence	0.313	0.250	0.125	2.498	0.012
DM <---	Anchoring	0.290	0.246	0.099	1.601	0.048
DM <---	Loss Aversion	0.279	0.310	0.075	3.729	0.000
DM <---	Herding	0.480	0.367	0.122	3.935	0.000

Moderation Analysis

Moderation analysis have been done by using the methodology of Preacher & Hayes (2004) and the results are reported below in table 2. For testing of moderation effect, an interaction term was created by multiplying our independent variables including overconfidence, anchoring, loss aversion, and herding

behavior and these interaction terms are regressed alongside the direct relationship of each variable using SPSS.

Moderation analysis for overconfidence

The results for moderation analysis of overconfidence has indicated a significant value of the interaction term and the high value of change in R square has established that moderation of financial literature is existent in case of association among overconfidence and irrational choices made by investors establishing hypothesis H5a.

Moderation analysis for anchoring

The results for moderation analysis of anchoring indicates that financial knowledge has a substantial impact as a moderator on the relationship of anchoring with irrational decision making and the results of R square and interaction terms are statistically significant establishing hypothesis H5b.

Moderation analysis for loss aversion

The results regarding moderation impact of loss aversion indicate a significant value of the interaction term and the high value of change in R square in case of association among loss aversion and decision making of investors establishing the effect of financial literacy as a moderator and establishing hypothesis H5c.

Moderation analysis for herding

Lastly, the moderation results for the impact of herding behavior have indicated that the change in R square value is low but still statistically significant and the relationship between these variables is affected by the moderator, i.e., financial literacy as the interaction point of both the variables is also significant which is indicated in table 2. Establishing all of our sub hypotheses regarding moderating impact of financial literacy.

The results of our study show that financial awareness does impact the relationship among these behavioral biases, i.e., herding, overconfidence, anchoring, and loss aversion with investor's irrational choices. The value of the interaction terms shown is significant and all the values are negative, proving the direction that as anticipated through the supporting literature that there exists a significant relationship as a moderator and the negative direction indicates that it aids in reducing biased behavior. Hence, establishing our hypothesis, that financial literacy allows investors to arrive at debiasing decisions by eliminating

the irrationality from their decisions. Earlier studies on this area like Van Rooij et al., (2011); Nisar et al., (2015); Phuoc & Thi, (2011) and Rasheed et al., (2018) showed the same effect of financial literacy. The environment of the stock market in Pakistan is uncertain and information about the events is not easily available to everyone. So, enhancing financial literacy in Pakistan can result in the smooth functioning of the Pakistan stock exchange. The higher the financial literacy will be, the higher will be the understanding of optimal decision making among market participants. Which will result in less volatility in the stock market and avoid the creation of bubbles in the stock market by keeping it at its intrinsic value.

Table 2

Moderation Analysis

Model		B	S.E	T	P
1	Financial Literacy	0.6684	0.1663	4.0193	0.0010
	Herding	0.2650	0.2364	1.1209	0.0485
	Interaction term	-0.0156	0.0608	-0.2558	0.0993
	ΔR-Square = 0.005		P = 0.0993		
2	Financial Literacy	1.2447	0.1872	6.5419	0.0000
	Overconfidence	0.5222	0.2436	2.1436	0.0331
	Interaction term	-0.1560	0.0574	-0.7194	0.0070
	ΔR-Square = 0.185		P = 0.6893		
3	Financial Literacy	1.2466	0.2057	6.0591	0.0000
	Anchoring	0.6567	0.2542	2.5828	0.0104
	Interaction term	-0.1930	0.0671	-2.8775	0.0044
	ΔR-Square = 0.0211		P = 0.0044		
4	Financial Literacy	0.9527	0.1685	5.6550	0.0000
	Anchoring	0.3788	0.1955	1.9375	0.0539
	Interaction term	-0.1026	0.0534	-1.9234	0.0456
	ΔR-Square = 0.096		P = 0.0456		

Conclusion

This research paper illustrates the real-world conduct of investors in the Pakistani stock market to analyze whether their decisions are affected by certain biases. According to researchers, such as Tversky and Kahneman (1974), and Shefrin (2007), the biases in the stock market have been identified to impact the choices of investors. The results showed that these biases are also present in Pakistani stock market investors. This could be a major cause of the routine volatilities that occur in this market. Additionally, the results can be linked to the studies of Anum, (2017); Hayat and Anwar, (2016) and Rasheed et al., (2018), who tested different cognitive biases in Pakistani stock market investors. They traced the presence of these biases in those investors (Shefrin, 2007). Apart from that, the role of financial literacy was found to be in line with earlier studies, such as Nisar et al. (2015), and Van Rooij et al.(2011). According to these studies, financial literacy aids investors to avoid becoming affected by behavioral biases (Spindler, 2011). This link is statistically established by our study since financial literacy, to some extent, affects the association among these biases. Moreover, the financial choices of investors and their financial literacy helps them to avoid irrational thinking and decision-making. This article also provides statistical evidence for the proposition suggested by Nikiforow (2010). The author reported that behavioral biases influence Pakistani stock market investors and financial literacy can help them to overcome these biases, which can have significant policy implications. This study is also beneficial for policymakers to comprehend the real-life behaviors of Pakistani stock market investors and devise policy according to their actual behavior for the smooth running of the market and for safeguarding their interests. It can also provide vital information for the brokerage houses operating in the Pakistani stock market to understand the basic mentality of the market players and provide more reliable consultancy information to the investors. Resultantly, a stable stock market will attract investors from around the globe.

References

Amisi, S. A. R. A. H. (2012). *The effect of financial literacy on investment decision making by pension fund managers in Kenya* [Doctoral Dissertation]. MBA, School of Business.

Anum, B. A. (2017). Behavioral factors and their impact on individual investors decision making and investment performance: Empirical investigation from Pakistani stock market. *Global Journal of Management and Business Research, 17*, 60-70.

Bagozzi, R. P., Yi, Y., & Phillips, L. W. (1991). Assessing construct validity in organizational research. *Administrative Science Quarterly*, *36*(3), 421–458. https://doi.org/10.2307/2393203

Baker, H. K., & Nofsinger, J. R. (2002). Psychological biases of investors. *Financial Services Review*, *11*(2), 97–116.

Bhandari, G., & Deaves, R. (2006). The demographics of overconfidence. *The Journal of Behavioral Finance*, *7*(1), 5–11. https://doi.org/10.1207/s15427579jpfm0701_2

Blankenship, K. L., Wegener, D. T., Petty, R. E., Detweiler-Bedell, B., & Macy, C. L. (2008). Elaboration and consequences of anchored estimates: An attitudinal perspective on numerical anchoring. *Journal of Experimental Social Psychology*, *44*(6), 1465–1476. https://doi.org/10.1016/j.jesp.2008.07.005

Bryman, A., & Bell, E. (2015). *Business research methods*. Oxford University Press.

Caparrelli, F., D'Arcangelis, A. M., & Cassuto, A. (2004). Herding in the Italian stock market: A case of behavioral finance. *The Journal of Behavioral Finance*, *5*(4), 222–230.

Fornell, C., & Larcker, D. F. (1981). Evaluating structural equation models with unobservable variables and measurement error. *Journal of Marketing Research*, *18*(1), 39–50. https://doi.org/10.1177/002224378101800104

Gao, L., & Schmidt, U. (2005). Self is never neutral: Why economic agents behave irrationally. *The Journal of Behavioral Finance*, *6*(1), 27–37.

Gul, F., & Akhtar, N. (2016). Predictors of Investor Overconfidence in Karachi Stock Exchange. *Journal of Managerial Sciences*, *10*(2), 301–315.

Hastings, J. S., Madrian, B. C., & Skimmyhorn, W. L. (2013). Financial literacy, financial education, and economic outcomes. *Annual Review of Economics*, *5*(1), 347–373. https://doi.org/10.1146/annurev-economics-082312-125807

Hayat, A., & Anwar, M. (2016). *Impact of Behavioral Biases on Investment Decision; Moderating Role of Financial Literacy*. https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2842502

Helms, J. E., Henze, K. T., Sass, T. L., & Mifsud, V. A. (2006). Treating Cronbach's alpha reliability coefficients as data in counseling research. *The Counseling Psychologist*, *34*(5), 630–660.

Huston, S. J. (2010). Measuring financial literacy. *Journal of Consumer Affairs*, *44*(2), 296–316.

Jariwala, H. V. (2015). Analysis of financial literacy level of retail individual investors of Gujarat State and its effect on investment decision. *Journal of Business & Finance Librarianship*, *20*(1–2), 133–158.

Kahneman, D., & Tversky, A. (1979). Prospect theory: An analysis of decision under risk. *Econometrica*, *47*(2), 263–291.

Khan, S. U., & Rizwan, M. F. (2018). Do investors herd: Evidence from an emerging market. *Lahore Journal of Business, 6*(2), 27-46. https://doi.org/10.35536/ljb.2018.v6.i2.a2

Kim, K. A., & Nofsinger, J. R. (2008). Behavioral finance in Asia. *Pacific-Basin Finance Journal*, *16*(1–2), 1–7. https://doi.org/10.1016/j.pacfin.2007.04.001

Kudryavtsev, A., Cohen, G., & Hon-Snir, S. (2013). "Rational'or'Intuitive": Are behavioral biases correlated across stock market investors? *Contemporary Economics*, *7*(2), 31–53.

Markowitz, H. (1952). Portfolio selection. *The journal of finance, 7*(1), 77-91.

Mangi, F. (2016). *Asia's Best-performing stocks may get lift with MSCI Move*. Bloomberg.Com.

Michailova, J. (2010). Development of the overconfidence measurement instrument for the economic experiment. *Munich Personal RePEc Archive*, *34475*(2), 1–44.

Mouna, A., & Anis, J. (2015). A study on small investors' sentiment, financial literacy, and stock returns: Evidence for emerging market. *International Journal of Accounting and Economics Studies*, *3*(1), 10–19.

Nikiforow, M. (2010). Does training on behavioural finance influence fund managers' perception and behaviour? *Applied Financial Economics*, *20*(7), 515–528.

Nisar, M., Ullah, S., Ali, M., & Alam, S. (2015). Juvenile delinquency: The Influence of family, peer and economic factors on juvenile delinquents. *Applied Science Reports*, *9*(1), 37–48.

Nofsinger, J. R. (2005). Social mood and financial economics. *The Journal of Behavioral Finance*, *6*(3), 144–160. https://doi.org/10.1207/s15427579jpfm0603_4

Odean, T. (1998). Volume, volatility, price, and profit when all traders are above average. *The Journal of Finance*, *53*(6), 1887–1934.

Phuoc 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*. Umea University, Faculty of Social Sciences, Umea School of Business.

Pompian, M. M. (2006). Behavioral finance and wealth management. *How to Build Optimal Portfolios That Account for Investor Biases, New Jersey*. John Wiley & Sons, Inc.

Preacher, K. J., & Hayes, A. F. (2004). SPSS and SAS procedures for estimating indirect effects in simple mediation models. *Behavior Research Methods, Instruments, & Computers*, *36*(4), 717–731. https://doi.org/10.3758/BRM.40.3.879

Rasheed, M. H., Gul, F., Akhtar, M. W., & Tariq, S. (2020). Dynamics of overconfidence among stock market investors in Pakistan. *International Transaction Journal of Engineering, Management, & Applied Sciences & Technologies*, *11*(4), 11A04T:1-11.

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. *Review of Behavioral Finance*, *10*(1), 70–87. https://doi.org/10.1108/RBF-05-2016-0028

Scott, S. G., & Bruce, R. A. (1995). Decision-making style: The development and assessment of a new measure. *Educational and Psychological Measurement*, *55*(5), 818–831. https://doi.org/10.1177/0013164495055005017

Shah, M. U. D., Shah, A., & Khan, S. U. (2017). Herding behavior in the Pakistan stock exchange: Some new insights. *Research in International Business and Finance*, *42*, 865-873.

Shefrin, H. (2007). *Behavioral corporate finance: Decisions that create value*. McGraw-Hill Irwin.

Shefrin, H. (2009). How psychological pitfalls generated the global financial crisis. *Voices of Wisdom: Understanding The Global Financial Crisis*, 224–256. http://dx.doi.org/10.2139/ssrn.1523931

Shefrin, H., & Statman, M. (1985). The disposition to sell winners too early and ride losers too long: Theory and evidence. *The Journal of Finance*, *40*(3), 777–790. https://doi.org/10.1111/j.1540-6261.1985.tb05002.x

Spindler, G. (2011). Behavioural finance and investor protection regulations. *Journal of Consumer Policy*, *34*(3), 315–336. https://doi.org/10.1007/s10603-011-9165-6

Sultana, S. T., & Pardhasaradhi, S. (2012). An empirical analysis of factors influencing Indian individual equity investors' decision making and behavior. *European Journal of Business and Management*, *4*(18), 50–61.

Tan, L., Chiang, T. C., Mason, J. R., & Nelling, E. (2008). Herding behavior in Chinese stock markets: An examination of A and B shares. *Pacific-Basin Finance Journal*, *16*(1–2), 61–77. https://doi.org/10.1016/j.pacfin.2007.04.004

Teweles, R. J., & Bradley, E. S. (1998). *The stock market* (Vol. 64). John Wiley & Sons.

Tversky, A., & Kahneman, D. (1974). Judgment under uncertainty: Heuristics and biases. *Science*, *185*(1), 1124–1131. https://doi.org/10.1126/science.185.4157.1124

Van Rooij, M., Lusardi, A., & Alessie, R. (2011). Financial literacy and stock market participation. *Journal of Financial Economics*, *101*(2), 449–472. https://doi.org/10.1016/j.jfineco.2011.03.006

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. *International Journal of Business and Emerging Markets*, *1*(1), 24–41.

Zuravicky, O. (2005). *The Stock Market: Understanding and applying ratios, decimals, fractions, and percentages*. The Rosen Publishing Group.