Journal of Behavioral Sciences, Vol. 32, No. 1, 2022

Behavioral Factors and Individual Investor's Behavior: A Comparative Study of Islamabad and Peshawar using Partial Least Squares Approach

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Behavioral finance has been a developing area that observes human behavior in finance. The behavioral finance theories are built on human psychology; which attempts to understand the effect of emotions and cognitive errors on individual investor behavior. The objective of the present study was to identify the leading behavioral biases such as overconfidence, anchoring, herding, and mental accounting which affect the individual investor investment performance in two selected regions i.e. Peshawar and Islamabad. For the collection of primary data, adopted questionnaires have been used. The sample of the study was 302 individual investors as determined by using G power software, 151 each from Peshawar and Islamabad. For testing hypotheses of the study structural equation modeling has been used by using Smart PLS version 3.2.7. The results of the study indicated that individual investors in Pakistan incorporate behavioral biases in their investment decision-making. Moreover, the results of MGA reported that there were no significant differences among the investors' behavior were recorded in both Islamabad

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and Peshawar regions. The study is likely to contribute to the current literature on behavioral finance and particularly in the Pakistani context as no such study was conducted by comparing the individual investor behavior of different cities. Moreover, the study can be helpful in better decision-making by avoiding behavioral biases.
Keywords: Herding, Anchoring, Mental accounting, Overconfidence, Investment Return, Multi-Group Analysis

Classical economics and standard financial theories are based on the rationality of investors, which means that investor is rational all the time while making an investment decision (Toma, 2015). The conventional finance theories believe, investors behave rationally because of the access to complete information. The investor while making investment decisions has a desire to maximize the utility without any emotion or bias (Imthiyas et al., 2015). The efficient market hypothesis is established on the assumption that stock prices exhibit the entire available information, therefore, market participants are rational and market forces cannot beat their decision (Malena Johnsson, Henrik Lindblom, 2002). Traditional finance assumes that any decision related to investment has a prime objective is maximizing the expected utility, therefore, the investor behave in a rational way (Toma, 2015)

Behavioral finance has brought a revolution in standard finance, as it is a part of conventional finance which is founded on the assumption of psychology and its influence upon investment decision making. (Chandani et al., 2020). The behavioral biases may be cognitive or emotional errors, cognitive errors may be a false interpretation of data, wrong calculation, or memory error while emotional errors are originated from feelings and thinking (Imthiyas et al., 2015). Individual investor behavior may be affected by various factors such as socioeconomic, cultural, and behavioral factors (Khan, 2015). The key differentiation between conventional and behavioral finance is that conventional finance has no concern with the question that why an investor makes one or another decision (Bikas et al., 2013).

Behavioral finance supports the investors to make better decisions related to investment and avoid recurring errors and mistakes in the future

(Sajid, 2015). Researches in behavioral finance make a critique on the assumption of conventional finance which assumes the maximization of expected utility by the individual investors in the financial markets, whereas behavioral finance presents the models which exhibit that the individual investor does not show rationality because there are different behavioral biases affects their decision and hence, their trade performance is influenced (Bhatt et al., 2016). Ricciardi and Simon, (2000) clarified that behavioral finance is entirely a new area that studies psychological and sociological issues such as prospect theory, overconfidence, cognitive dissonance, and regret theory.

The decision-making of Investors shows an irrational behavior, and hence their decision is affected by many behavioral factors (Antony & Joseph, 2017). The objective of the existing study is to identify the behavioral biases which can affect the financial decision-making of investors in Pakistan, and by incorporating these biases their trade performance can be affected. The study is based on the comparison between Peshawar and Islamabad investors' behavior, because the people of Islamabad are more qualified and have more financial knowledge regarding the stock market while the Peshawar investors are more conservative and they have no investment skills. Moreover, the people of Islamabad are more aware of the stock market trend than the Peshawar because there is no stock market in Peshawar. Based on the findings of the present study some recommendations to individual investors are suggested, with the help of which they can develop their decision-making skills.

Behavioral biases include numerous kinds of behaviors related to decision making which are well documented under research in the area of psychology. All categories of behavioral biases may affect the decision-making of the individual in multiple ways related to money and investing (Chandani et al., 2020). The current study is unique in its context as the comparison of two important cities has been carried on, moreover, the studies in the area of behavioral finance are limited in emerging countries (Haritha & Uchil, 2020). From the last few years, it has been observed by psychologists and financial economists that investor behavior in the stock market cannot be explained by standard finance (Baker & Ricciardi, 2014).

To observe the behavior of investors in the context of emerging markets (Atif Sattar et al., 2020), therefore, it is imperative to study the various facets of behavioral finance in Pakistan which is an emerging market.

After searching the literature, it is believed that there was no such study conducted to analyze the behavioral biases and their influence on investor behavior and importantly the comparison between the said two regions make this study more interesting. . Hence, the current study is expected to contribute to the existing literature regarding behavioral finance in developing market context and mainly in Pakistani context by comparing the individual investor's behavior of different cities. Besides, contribution to the literature the current study has also theoretical, methodological, and contextual contribution as well which is going to enrich the knowledge of policy and decision-makers that they can avoid behavioral biases. Based on the above discussion the current study has the subsequent research objectives.

- To identify the dominant behavioral factors that affect the individual investor's behavior.
- To investigate the impact of behavioral factors on investors' trade performance in the stock market.
- To compare the investment behavior of individual investors in Peshawar and Islamabad.
- To give recommendations to individual investors to avoid behavioral biases in their decisions.

Review of Literature

Theoretical Overview

Prospect theory. The prospect theory was established by Kahneman & Tversky (1979) that explains that behavioral biases are existing in the decision-making of individual investors. Prospect theory represents a model which explains the decision-making under circumstances of risk, prospects theory presents a simple description of the relationships of environmental contingencies in the form of gains and losses (Fowler, 2014). It was normally believed that the rationality of the investor cannot be influenced in the market, and the expected utility theory

was commonly considered to be a rational model. Briefly explained the prospect theory, which indicates how individuals have a different response to a similar situation depending upon whether they are confronted with a situation of loss or profit. Most investors like to be risk-averse while trying to earn profit gains but on the other hand, they like to take risks for avoiding the loss (Brahmbhatt & Shah, 2016).

Heuristics theory. Heuristics is a dimension of psychology that explains that people follow simple and effective rules in their investment decision making and shortcuts are used in complex problems. Anwar, Nazir, Khan, and Khan (2013) explain that individuals have a natural tendency for making quick decisions, and whenever they are faced with a complicated situation simple policies are made for the solution of the problem. Sandri (2009) described that heuristics are the simple methods to assess the probabilities, and which is based on the rule of thumb. Heuristics are the shortcuts and rule of thumb which take place in the decision-making process. It is based on judgment in a situation of uncertainty (Kahneman, 1973).

Behavioral Biases

Overconfidence. Overconfidence is a behavioral bias where the situation is misinterpreted and misjudged by the individual. Ritter (2003) argues that overconfidence is a kind of feeling in which an individual expect too much of his abilities. Barber and Odean (2001) investigated the overconfidence of investors in the financial market, furthermore, he explains that overconfident investors are those who overestimate the accurateness of their knowledge regarding the stock market and hence the estimated gains of trading. As result, the overconfident investors may trade in the stock market in circumstances when the market trend is negative. Investors with high overconfidence are normally earned low profits (Özkoçak, 2021). Malmendier and Tate (2005) investigated the impact of overconfidence on corporate investment; the results showed that overconfidence affects the behavior of corporate governance. The overconfidence factor has a positive and significant influence on the behavior of individual investor decisions (Bakar & Yi, 2016).

Anchoring. Anchoring is a situation where the individual relies upon the initially available information while making his decision. According to Subash (2012) Anchoring is a kind of psychosomatic heuristics that arises when the investors give too much value to mathematically random information, and psychologically established 'anchors' and as a result, it leads them to an irrational investment decision. Whenever it is required for an individual to make a transaction such as to buy a product or shares in the financial market, so the individual is more likely to use or rely on the initial value – called the "anchor" – instead of having a thorough analysis of the situation. Murithi (2014) explained that anchoring is known as circumstances where the investors depend upon the past information as well as prices and avoid new information. Anchoring is a process where the decision is taken by the individual based on the initial anchor (Mc Ewen & Welsh, 2001). The anchoring bias influence the investment decision-making of investors (Gupta & Ahmed, 2016).

Herding. Herding can be defined as the collective direction of a group without a centralized direction. Herding is a situation where the individual is expected to follow the maximum or the group, and hence this behavioral bias influences the investment decision of investors in the financial market. According to Poshakwale and Mandal (2014) in herd behavior, the investor instead of relying upon his information follows the others with a belief that their information is superior. Fernandez, Garcia-Merino, Mayoral, Santos, and Vallelado (2011) analyzed the herd behavior of investors. The results of the study indicated that uncertainty, lack of confidence, and subsequently informational limitations, favor herd behavior among investors. Gupta and Ahmed (2016) concluded that herding affects the decision-making of investors. According to Rahayu et al., (2021), herding behavior affects investor decision-making in the stock market.

Mental Accounting. Mental accounting is a concept which indicates the preference of the people where they set aside their saved money into diverse accounts that are built subjectively. People make

different decisions that should be combined in principle (Ritter, 2003). Thaler (1999) described mental accounting as a combination of cognitive processes applied by individuals and households to organize, estimate, and keep tracking economic transactions. Just like financial accounting the households and organizations identify, record, and summarize the reports and results. Giacomin, Janssen, Guyot, and Lohest (2011) studied mental accounting, and the findings showed that mental accounting influences the individual investor decision process in India. The investors incorporate mental accounting bias which ultimately affects their decision-making (Chandani et al., 2020).

The present study considers the evaluation of the investor's behavior of Peshawar and Islamabad which are not considered in the previous studies. It is assumed that Islamabad is the capital of Pakistan and the people of Islamabad are more accomplished regarding education and having investment skills. They have more literacy in the financial markets as compared to Peshawar which is the capital of Khyber Pakhtunkhwa, where the people are conservative and do not have knowledge about the stock market. It is hypothesized that the investors of Peshawar incorporate more behavioral biases as compared to Islamabad.

Hypotheses

Based on the above discussions, the following are the proposed hypotheses of the study.

H1: Anchoring has an impact on investor trade performance.

H2: Overconfidence has an impact on investor trade performance.

H3: Herding has an impact on investor trade performance.

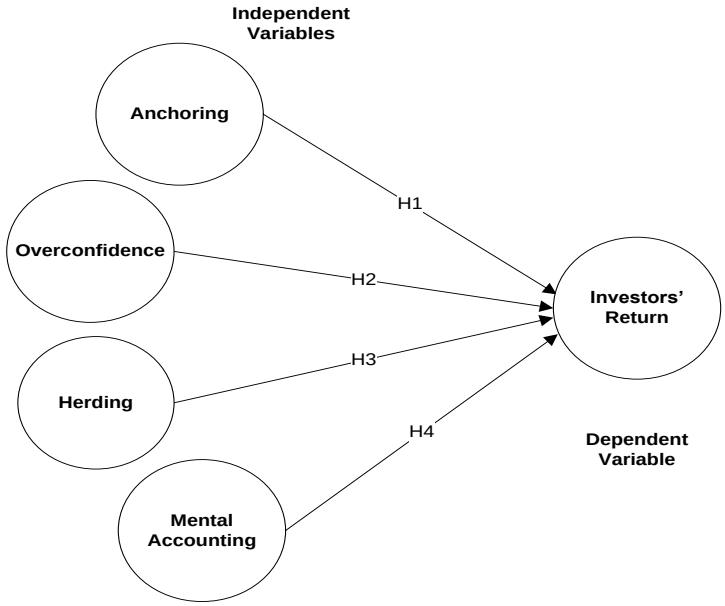
H4: Mental accounting has an impact on investor trade performance.

H5: Peshawar investors incorporate more behavioral biases than Islamabad investors.

Conceptual Framework

Figure 1

Conceptual framework



Research Approach

Generally, the theory is established and tested on two major approaches i.e. induction and deduction. The current study is consistent with a deductive approach as the hypotheses have been developed based on theory and then data was collected to test the developed hypotheses.

Research Instrument

The study adopted questionnaire items from previous literature i.e. (Luong and Hu, 2011) and (Kengatharan and Kengatharan, 2014) which are composed of five main constructs. These five constructs were anchoring, overconfidence, mental accounting, herding, and trade returns. The measurement of all constructs was measured by a five-point Likert scale from 1 "strongly disagree" to 5 "strongly agree". The minimum and maximum reliability of the scale was recorded from 0.69 to 0.77.

Sample size and data collection

The current study is quantitative while it has used primary data for analysis. The research population is consists of individual investors used to trade in the stock market of two regions i.e. Peshawar and Islamabad. In research, it is not possible to consider the overall population, G*Power software was employed to calculate the minimum sample size with a significant level of 0.05 and the power of 0.95. A priori power analysis using a medium effect size suggested a sample size of 280 from both regions. Thus, the present sample size (N = 280) for this research was deemed appropriate. Total 280 individual investors were determined by G*Power software as a sample size from both the regions Peshawar and Islamabad. However, an additional 10 percent was taken in the study of the recommended sample size to have better results (Hair, Black, Babin, Anderson, & Tatham, 2006). Hence, in the end, the size of the sample of the study was a total of 302 investors from Peshawar and Islamabad (151 from each region). For data collection, the study preferred a convenient sampling method to save time and get an easy response. Convenience sampling is a technique that enables the researchers to analyze the sample conveniently available to them (Zikmund, 2003).

Research Model

After the collection of data for testing the anticipated hypotheses of the study, the following research model was applied to each region.

$$TR_R = \beta_0 + \beta_1 ANC_R + \beta_2 MA_R + \beta_3 OC_{R+} \beta 4 HER_R \ldots\ldots. \varepsilon_R$$

Where:

IR	= Investors return
ANC	= Anchoring
MA	= Mental accounting
OC	= Overconfidence
HER	= Herding
e	= Error term
R	= Region

Demographic characteristics of the respondents

The questionnaires were distributed to individual investors in both cities. In Peshawar, the individual investors were found with help of brokerage houses, while in Islamabad same was distributed among the investors in the Islamabad stock market. Before, the delivery of questionnaires the consent of data collection, ethical considerations, and privacy of the respondents was ensured to them. After the consent, the purpose of the study was also described to them. Finally, the data were collected from respondents (individual investors) having diverse gender, ages, and education levels. Out of 308 circulated questionnaires, 302 (151 from each sector) were returned and hence the response rate was recorded as 98.05%. A reasonable response rate was received from respondents due to convenient sampling and willingness. Table 1 indicates the demographic information of the respondents to the questionnaire.

Table 1

Demographic Profile of Respondents

Regions – Islamabad and Peshawar *(No. of respondents 151 each region)*											
Gender			**Age**			**Education**			**Income (p.m)**		
Male	284	94%	30 to 40 years	212	70.2%	SSC or Less	22	7.3%	<20000	62	20.5%
Female	18	6%	40 to 50 years	42	13.9%	Undergraduate	52	17.2%	20000-40000	124	41.1%
Total	302	100%	50 to 60	48	14.9%	Graduate	66	21.9%	40000-60000	30	9.9%

			years								
Marital Status			Total	302	100%	Masters	120	39.7%	60000-80000	54	17.9%
Single	128	42.38%	-	-	-	MPhil or PhD	42	13.9%	80000-100000	20	6.6%
Married	174	57.62%	-	-	-		302	100%	>100000	12	4%
Total		302	-	-	-				Total		100
Trading Experience			**Investment**			**Other than Bank Investment Experience**					
Nil	72	23.8%	<100000	98	32.5%	< 2 Years	88	29.1%	-	-	
< 1 Year	106	35.1%	10K to 30K	82	27.2%	2-5 Years	100	33.1%	-	-	
1-3 Years	68	22.5%	30K to 50K	10	3.3%	6-10 Years	40	13.2%	-	-	

3-5 Years	36	11.9%	50K to 100K	8	2.6%	> 10 Years	10	3.3%	-	-
5-10 Years	6	2.0%	>100K	38	12.6%	No Experience	64	21.2%	-	-
>10 Years	14	4.6%	NIL	66	21.9%	-	-	-	-	-
Total	302	100	-	302	100	Total	302	100		

Among 151 respondents, 94% were represented by male respondents while only 6% were represented by female investors. The number of male respondents is greater than the female as the males are leading society in Pakistan. Regarding the educational background of the respondents, it was found that 25% were undergraduates, 21.9% were graduates, and 39.7% were master's degree holders while 13.9% had MPhil and Ph.D. degrees. The respondent's age statistics show that the maximum of them was in the range of 30 to 40 years which represents 70.2% of the respondents, 13.9% fall in the age bracket of 40 to 50 years, 14.9% fall between the ages of 50 to 60 years. As far as respondents trading experience is concerned Table 1 is showing that 35.1% have less than one-year trading experience, 22.5% of the respondents have one to three years of trading experience, 11.9% of respondents have three to five years' experience, only 2% are having five to ten years experience and 23.8% have no trading experience in the stock market. Most of the investors fall in the category of less than one year and have no experience because in Pakistan the people have not tended to invest in the stock market.

After the data collection, the study used Partial Least Squares, Structural Equation Modelling (PLS-SEM) using SmartPLS 3.2.7. PLS-SEM modeling is a more robust option with limited assumptions and an unbiased approximation of the small sample size. It does not require a

normal distribution of data and is not restricted or a considerable number of observations as input data (Hair, Hult, Ringle 2014). For analysis of the proposed hypotheses of the study by using PLS-SEM, the current study applied two techniques which were suggested by the previous literature (Hair et al., 2014; Vinzi, Chin, Henseler and Wang, 2010). These techniques comprised of the assessment of measurement model and structural model. In order to test the measurement model, the study used two methods i.e. convergent validity and discriminant validity tests. Convergent validity measures the correlation between constructs. Factor loadings, composite reliability (CR), and average variance extracted (AVE) represent measuring the convergent validity (Hair et al., 2014).

Table 2

Measurement Model Construct Reliability and Validity

Items	Factor Loadings	Cronbach's Alpha	CR	AVE	rho_A
Invest Return (IR)		0.770	0.839	0.514	0.811
IR1	0.820				
IR2	0.751				
IR3	0.815				
Anchoring (Anc)		0.770	0.839	0.514	0.811
Anc1	0.796				
Anc2	0.568				
Anc3	0.616				
Anc4	0.791				
Anc6	0.780				
Herding (Her)		0.692	0.804	0.513	0.821
Her1	0.865				
Her2	0.729				
Her4	0.689				

Her5	0.545				
Mental Accounting (MA)		0.763	0.838	0.569	0.877
MA1	0.586				
MA3	0.873				
MA4	0.844				
MA5	0.678				
Overconfidence (OC)		0.727	0.828	0.547	0.739
OC1	0.707				
OC4	0.758				
OC5	0.707				
OC6	0.783				

The previous literature benchmarked for factor loadings is above 0.6 regarding an individual item on behalf of a construct. In the same way, the value of composite reliability and AVE should be more than 0.7 and 0.5 respectively as standards. If the values of CR and AVE measures are greater than the recommended threshold, then there is adequate convergent validity (Hair et al., 2014; Vinzi et al., 2010). The above-mentioned measures results as reported in Table 2 reflects that the entire values are higher than the standard values and hence, the measurement model is suitable for all the constructs.

Table 3

Fornell-Larcker Criterion

	Anc	Her	IR	MA	OC
Anc	**0.717**				
Her	0.559	**0.716**			
IR	0.469	0.375	**0.796**		
MA	0.563	0.422	0.443	**0.755**	

OC	0.433	0.371	0.353	0.618	**0.739**

Note: *The square roots of AVE are shown diagonally in bold*

Furthermore, discriminant validity has been demonstrated with the HTMT 0.90 criterion as well, as all the values of Table 4 are below 0.90. These findings are elaborated further through graphs as shown in Figure 1.

Table 4

Discriminant Validity (HTMT 0.90 Criterion)

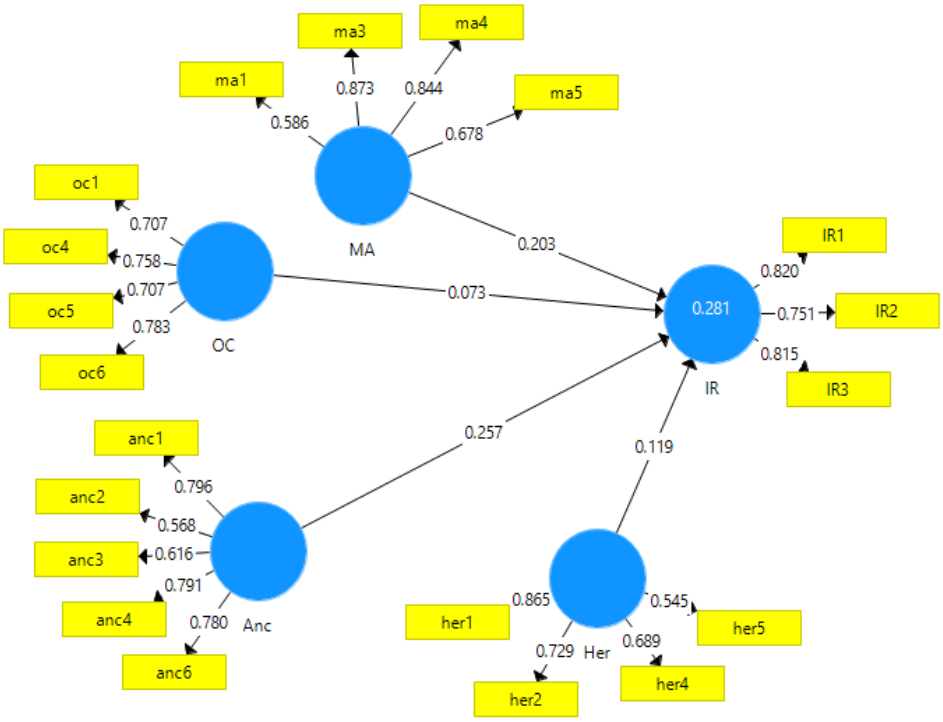
	Anc	Her	IR	MA	OC
Anc					
Her	0.730				
IR	0.564	0.463			
MA	0.735	0.563	0.512		
OC	0.560	0.487	0.439	0.820	

Note: *(HTMT0.90 Criterion)*

For the measurement model assessment, the study applied discriminant validity. Discriminant validity demonstrates the level to which each construct is dissimilar from its other counterparts (Hair et al., 2014). The procedure for evaluating discriminant validity is that the values in diagonal must be higher than all other values in the respective row and column (Hair et al., 2014; Vinzi et al., 2010). All the diagonal values are greater than the others as shown by table 3 and hence, the discriminant validity exists in measurements.

Figure 2

Conceptual Model with Loadings, Beta, and R-Square values



As the measurement model showed satisfactory results, therefore, for testing the already established hypotheses structural model has been applied. The structural model contains the assessment of R-Square beta and resultant t-values for all the hypotheses of the research. Table 5 reports the structural model results.

Table 5
Assessment of the Structural Model

Hypotheses	Std. Beta	Std. Error	t-value	P-Value	Decision
H1: Anchoring -> Investment Return	0.257	0.068	3.782	0.000	Supported
H2: Herding -> Investment Return	0.119	0.050	2.382	0.017	Supported
H3: Mental Accounting -> Investment Return	0.203	0.074	2.740	0.006	Supported
H4: Overconfidence -> Investment Return	0.073	0.071	1.024	0.306	Not Supported

Note: 99% (0.01) and 95% (0.05) Significance Levels

The first hypothesis presumed that Anchoring has an impact on the investment return of the individual investor. The above table displays (β = 0.257, t-value = 3.782, $p < 0.05$) which is satisfactory and above the threshold, hence, there is an impact of anchoring on the investment performance of the investor. In the light of the above findings hence H1 is accepted. The findings are similar to the previous studies who found a positive influence of anchoring on the decision-making of investors i.e. Imthiyas, Shyamasundar, and Ramar Sudha (2015), Bhatt, Kishore, and Pahuja (2016), and Aziz and Khan (2016). The second hypothesis H2 of the study assumed a significant relationship between Herding and trade returns. From the above statistics (β = 0.119, t-value = 2.382, $p < 0.05$) which indicates that Herding has a significant influence on investment returns, therefore, H2 is also accepted. These results are similar to the studies conducted by Antony and Joseph (2017) and Aziz and Khan (2016) where they also found a significant impact of overconfidence on investors' investment performance. This is true especially in the perspective of Pakistan where people do not make logical judgments rather they simply follow the opinion and approaches of the other while making any

investment decision. The third hypothesis H2 predicted that mental accounting influences individual investor performance. The findings from the above table shows ($\beta = 0.203$, t-value = 2.740, $p < 0.05$), these values are above the standard, hence mental accounting also has a positive as well as significant effect on investors trade performance. Therefore, the H3 is also accepted. The results of the study resemble Giacomin, Janssen, Guyot, and Lohest (2011) and Thaler (1999) who found the same results. The fourth hypothesis assumed that overconfidence influences the investor's performance. The result from the above table shows ($\beta = 0.073$, t-value = 1.024, $p > 0.306$) a positive and insignificant impact of overconfidence on the investor investment decision making. The result of overconfidence is different from the previous studies, the reason may be that due to awareness and lack of knowledge regarding the stock market, the investor may not have adequate confidence in their decision making.

Table 6

Multi-Group Analysis (MGA) Region wise

	Parametric Test			Welch-Satterthwait Test
Hypotheses	Coeff. (R1 –R2)	t-Value (R1 vs R2)	p-Value (R1 vs R2)	p-Value (R1 vs R2)
Anc -> IR	0.129	0.897	0.370	0.371
Her -> IR	0.120	1.160	0.247	0.248
MA -> IR	0.138	0.915	0.361	0.362
OC -> IR	0.238	1.666	0.097	0.098

R1 = Region 1 (Islamabad) R2 = Region 2 (Peshawar)
Anc = Anchoring; Her = Herding; MA = Mental Accounting; OC = Overconfidence; IR = Investment Returns

Table 6 reported a multi-group analysis of two regions. Two tests have been performed to observe the difference in investment behavior of two regions' investors. Based on the above results of both parametric and Welch-Satterthwait tests, there has not been any significant difference reported between the behavior of investors in two regions Islamabad and Peshawar, hence H5 is rejected. Among the reasons for these insignificant findings, it could be due to region distances as Islamabad and Peshawar are near to each other's and the investors can easily move from one market to another. Moreover, the results are not significantly different because the sample size considered in the study is very low. As both the above test are highly sensitive to the sample size and the results inside it.

Discussion

The purpose of the present study was to examine the behavioral biases that affect the individual investor's trade performance. Moreover, to compare the investment behavior of investors in Peshawar and Islamabad is another objective. These two regions were targeted in the study as Peshawar is the capital of Khyber Pakhtunkhwa while Islamabad is the capital of Pakistan, therefore, the study was focused to investigate the difference in their financial decisions making specifically in the stock market. Overconfidence, herding, anchoring, and mental accounting were taken as the independent variable while their effect is seen in investor trade performance. For this purpose, the hypotheses were established based on behavioral finance literature. As the research is based on primary data, therefore, the questionnaire has been used as a source of data collection distributed among Peshawar and Islamabad individual investors.

The results of the research indicated that investors in both the areas Peshawar and Islamabad incorporate behavioral biases in their decision-making as regards investment. Overconfidence, Anchoring bias, mental accounting, and herding are positively and significantly affect the decision-making of Peshawar and Islamabad investors and hence, their trade performance is affected. In the light of these results, all the alternative hypotheses are accepted. To examine a significant difference in the investment performance of both the areas, a Multi-Group Analysis (MGA) was performed, which showed no significant dissimilarity among the

investor behavior in Peshawar and Islamabad. It may be because of a few reasons such as both Peshawar and Islamabad are capital cities where the people have many similarities regarding education, lifestyle, population, etc. besides it both the regions are near to each other that the investor can easily move from one region to another.

One of the reasons for similarity is that there is no stock exchange in Peshawar, so the people of Peshawar mostly use the Islamabad stock exchange for the investment, therefore, their behavior is similar to the people of Islamabad. Based on these results, H5 is rejected, and it can be concluded that both Peshawar and Islamabad investors incorporate behavioral biases in decision making regarding investment and there is no difference shown in the study between the investors' behaviors in both areas. The findings of the current study are consistent with Kengatharan and Kengatharan (2014), Luong and Hu (2011), and Bakar & Yi (2016). The reason may be that all these studies were conducted in the emerging market of Asia, therefore, showing similar results with the current study. Moreover, the results of the study are in contrast with Mahmood et al. (2016) who conducted a similar study in Pakistan. The reason may be the sample size and the data collection from all over the country, while the current study considered only two regions for data collection.

Implications

The study has several theoretical, methodological, and practical contributions such as;

First of all the study has a logical and valid contribution as it's a new study in the context of Pakistan where two different cities of developing countries have been compared which is going to enrich the current literature. Moreover, most of the studies have been carried by focusing on one theory while in the current study two different theories have been applied such as prospect theory and heuristics theory.

The study has methodological implications as Smart-Pls has been applied which is a new software for social sciences research analysis. Furthermore, for comparison of two different cities multi-group analysis (MGA) has been used which has never been used in any study in the area of behavioral finance.

This study has numerous practical implications as it explains the limitation of standard finance that has failed to study behavioral biases such as anchoring, overconfidence, herding, etc. which affects the decision making of individual investors in the financial market, therefore, the study is helpful for the individual investor to understand these behavioral biases and by evading these behavioral biases, the decision making regarding investment can be improved which ultimately can be better to raise their trade return.

The study is also helpful for institutional investors, regulators, and fund managers to better understand their behavior by studying different behavioral biases due to which they deviate from an optimal financial decision. It will help them to analyze all relevant information before making an investment decision. They can also provide training and awareness sessions about behavioral biases which can improve decision-making for all the stakeholders.

The study is also helpful for the policymakers as they can understand the individual investor behavior which is very much important in the stock market, hence it can help them in the smooth operation of the stock market.

Recommendations

The current study was directed to ascertain the difference between Islamabad and Peshawar investors' behavior, and how various behavioral biases are being incorporated by them in their decision making the financial market. The future study can be done to compare other cities in Pakistan. Additionally, in this study, only four behavioral factors were considered which can affect investment decision making i.e. overconfidence, herding, anchoring, and mental accounting. It is recommended that in the future more behavioral biases can be included in the study to evaluate the individual investor financial performance. The focus of the study was to consider the individual investors' performance in the market, therefore, it is recommended to consider institutional investors in the future. Furthermore, small sample size has been taken in the study, hence, it is suggested to take a large sample size for future studies to have more accurate results.

Limitations

- While assembling data from investors it was found that numerous investors were illiterate and they were unable to fill out the questionnaire.
- The results of the present study are about Islamabad and Peshawar; it cannot be generalized for other cities in Pakistan.
- Most of the respondents in the study were male, the ratio of female respondents is below 20% which is why it can be a limitation of the study in a broader context.
- Normally the investors do not fill out the questionnaire with full concentration, therefore, biases of the respondents may also be a limitation of the study.

References

Antony, A., & Joseph, A. I. (2017). Influence of Behavioural Factors Affecting Investment Decision — An AHP Analysis. *Indian Institute of Management, Lucknow*, *16*(2), 107–114. https://doi.org/10.1177/0972622517738833

Anwar, Z., Nazir, M. S., Khan, M. K., & Khan, A. (2013). Behavior of Small Equity Investors in Pakistan ' s Stock Exchanges. *Elixir International Journal*, *18*(3), 321–326. https://doi.org/10.5829/idosi.mejsr.2013.18.3.11684

Atif Sattar, M., Toseef, M., & Fahad Sattar, M. (2020). Behavioral Finance Biases in Investment Decision Making. *International Journal of Accounting, Finance and Risk Management*, *5*(2), 69. https://doi.org/10.11648/j.ijafrm.20200502.11

Aziz, B., & Khan, M. A. (2016). Behavioral factors influencing individual investor's investment decision and performance, Evidence from Pakistan Stock Exchange. Dr. Bilal Aziz 1. *International Journal of Research In Finance and Marketing*, *6*(7), 74–86.

Bakar, S., & Yi, A. N. C. (2016). The Impact of Psychological Factors on Investors' Decision Making in Malaysian Stock Market: A Case of Klang Valley and Pahang. *Procedia Economics and Finance*,

35(May), 319–328. https://doi.org/10.1016/S2212-5671(16)00040-X

Baker, H. K., & Ricciardi, V. (2014). Investor Behavior: An Overview. *Investor Behavior*, *July 2015*, 1–24. https://doi.org/10.1002/9781118813454.ch1

Barber, B. M., & Odean, T. (2001). Boys will be Boys: Gender, Overconfidence, and Common Stock Investment. *The Quarterly Journal of Economics*, *116*(1), 261–292. https://doi.org/10.1162/003355301556400

Bhatt, A. K., Kishore, C. A., & Pahuja, K. (2016). Analysing impact of behavioral finance factors of investment decision. *Internatinal Journal of Applied Research*, *2*(7), 96–102.

Bikas, E., Jurevičienė, D., Dubinskas, P., & Novickytė, L. (2013). Behavioural Finance: The Emergence and Development Trends. *Procedia - Social and Behavioral Sciences*, *82*, 870–876. https://doi.org/10.1016/j.sbspro.2013.06.363

Brahmbhatt, M., & Shah, K. (2016). Pattern of Investment and Risk Seeking Behavior among Investors. *International Journal of Advance Research in Computer Science and Management Studies*, *4*(8), 131–140.

Chandani, A., Ratnalikar, V. A., Bhatia, A., & Mehta, M. (2020). An empirical study to analyze the human behavioral aspects on individual financial decisions based on Indian context. *Materials Today: Proceedings*. https://doi.org/10.1016/j.matpr.2020.09.655

Fernandez, B., Garcia-Merino, T., Mayoral, R., Santos, V., & Vallelado, E. (2011). Herding, information uncertainty and investors' cognitive profile. *Qualitative Research in Financial Markets*, *3*(1), 7–33. https://doi.org/10.1108/17554171111124595

Fowler, H. (2014). On the of Prospect Evolutionary Origin Theory Preferences. *Journal of Politics*, *70*(2), 335–350. https://doi.org/10.1017/S0022381608080341

Giacomin, O., Janssen, F., Guyot, J., & Lohest, O. (2011). Determinants of Individual Investor Behaviour: An Orthogonal Linear Transformation Approach. *Munch Personal RePEc Archive*, *29506*, 1–30.

Gupta, Y., & Ahmed, S. (2016). The Impact of Psychological Factors in

Investment Decision Making of Investors: An Empirical Analysis. *ISI Impact Factor*, *44*(1), 40–52.

Hair, J. F., Black, W. C., Babin, B. J., Anderson, R. E., & Tatham, R. L. (2006). *Multivariate data analysis* (Vol. 6). Pearson Prentice Hall Upper Saddle River, NJ.

Hair, J., Hult, G., & Ringle, C. (2014). *Partial Least Squares Structural Equation Modeling (PLS-SEM)*.

Haritha, P., & Uchil, R. (2020). Influence of investor sentiment and its antecedent on investment decision-making using partial least square technique. *Management Research Review*, *43*(11), 1441–1459. https://doi.org/10.1108/MRR-06-2019-0254

Imthiyas, Y., Shyamasundar, K., & Ramar Sudha, S. (2015). a Study on Behavioral Bias of. *IJER © Serials Publications*, *12*(4), 885–899.

Kahneman, D., & Tversky, A. (1979). Prospect Theory: An Analysis of Decision under Risk. *Econometrica: Journal of the Econometric Society*, *47*(3), 263–291. https://doi.org/10.1111/j.1536-7150.2011.00774.x

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 Journal of Finance & Accounting*, *6*(1), 1. https://doi.org/10.5296/ajfa.v6i1.4893

Khan, F. (2015). Factors Influencing Investors' Decisions in Stock Market Investment in Bangladesh [A Study on Khulna City]. *Journal of Finance and Accounting*, *3*(6), 198. https://doi.org/10.11648/j.jfa.20150306.14

Luong, L. P., & Hu, D. T. T. (2011). Behavioral Factors Influencing Individual Investors ' Decision-Making and Performance. A Survey at the Ho Chi Minh Stock Exchange. In *Umeâ School of Business*.

Mahmood, Z., Kouser, R., Abbas, S. S., & Saba, I. (2016). The Effect of Hueristics, Prospect and Herding Factors on Investment Performance Syed Shafqat Abbas. *Pakistan Journal of Social Sciences (PJSS) Pakistan Journal of Social Sciences*, *36*(1), 475–484. http://www.bzu.edu.pk/PJSS/Vol36No12016/PJSS-Vol36-No1-42.pdf

Malena Johnsson, Henrik Lindblom, P. P. (2002). Behavioral Finance. In *School Of Economics and Management* (Issue January).

Malmendier, U., & Tate, G. (2005). Does overconfidence affect corporate investment? CEO overconfidence measures revisited. *European Financial Management*, *11*(5), 649–659. https://doi.org/10.1111/j.1354-7798.2005.00302.x

Mc Ewen, R. A., & Welsh, M. J. (2001). The Effect of Bias on Decision Usefulnes : A Review of Behavioral Financial Accounting Research. *Accounting Behavioral Research*, *4*(1/2), 3–24. https://doi.org/10.1108/S1475-1488(2012)0000015005

Murithi, D. (2014). *the Effect of Anchoring on Investment Decision Making By Individual Investors in Kenya By Dolreen Kaimuri Murithi a Research Project Submitted in Partial Fulfillment of the Requirement for the Award of the Degree of Master of Business Administration Schoo*.

Özkoçak, G. (2021). The Impact of Behavioral Economics on Investment Decision. *JURNAL MANAJEMEN DAN KEUANGAN*, *10*(1), 121.

Poshakwale, S., & Mandal, A. (2014). Investor Behaviour and Herding: Evidence from the National Stock Exchange in India. *Journal of Emerging Market Finance*, *13*(2), 197–216. https://doi.org/10.1177/0972652714541341

Rahayu, S., Rohman, A., & Harto, P. (2021). Herding Behavior Model in Investment Decision on Emerging Markets: Experimental in Indonesia. *Journal of Asian Finance, Economics and Business*, *8*(1), 053–059. https://doi.org/10.13106/jafeb.2021.vol8.no1.053

Ricciardi, V., & Simon, H. K. (2000). What is Behavioral Finance? *The Business, Education and Technology Journal*, *2*(2), 26–34. https://doi.org/10.1063/1.882926

Ritter, J. R. (2003). Behavioral Finance. *Pacific-Basin Finance Journal*, *11*(4), 429–437. https://doi.org/10.3905/jwm.2000.320382

Sajid, M. (2015). Factors Affecting Investment Decision Making : Evidence from Equity Fund Managers and Individual Investors in Pakistan. *Journal of Basic and Applied Scietific Research*, *6*(9), 135–142.

Sandri, S. (2009). Heuristics, Biases and Methods for Debiasing.

Springer, *1999*, 101–118. https://doi.org/10.1007/978-3-7908-2092-8_5

Subash, R. (2012). Role of Behavioral Finance in Portfolio Investment Decisions: Evidence from India. In *Faculty of Social Science Institute of Economic Studies*. http://ies.fsv.cuni.cz/default/file/download/id/20803

Thaler, R. H. (1999). Menta accounting matters. *Journal of Behavioral Decision Making*, *12*(3), 183–206. https://doi.org/10.1002/(SICI)1099-0771(199909)12:3<183::AID-BDM318>3.0.CO;2-F

Toma, F.-M. (2015). Behavioral Biases of the Investment Decisions of Romanian Investorson the Bucharest Stock Exchange. *Procedia Economics and Finance*, *32*(15), 200–207. https://doi.org/10.1016/S2212-5671(15)01383-0

Tversky, A., & Kahneman, D. (1973). Judgment Under Uncertainty: Heuristics and Biases. *Judgment Under Uncertainty: Heuristics and Biases*, *185*(2), 1124–1131. c:%5CICT%5CEILS%5CHypergole Systeme%5C1973 Rep Effect of Pressure on Ignition of Hypergolic Liquid Propellants.pdf TS - RIS

V. Esposito Vinzi, W.W.Chin, J. Henseler, & H. Wang. (2010). Handbook of Partial Least Squares: Concepts, methods and applications. In *Methods*. Springer.

Zikmund, W. (2003). *Business research methods 7th ed., Thomson/South-Western*.

Received June 22, 2018
Revisions Received November 11, 2021