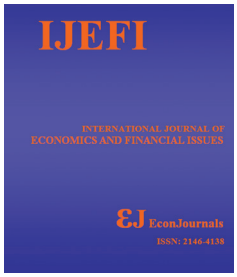

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The Behavioral Analysis and Financial Performance of Individual Investors at Pakistan Stock Exchange

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ABSTRACT

This study examines the impact of behavioral factors over investment decision making and their performance. The primary data set collected through survey questionnaires from active investors of Pakistan stock exchange was used for the analysis. Furthermore the study analyzed the role of financial literacy as a moderator variable between behavioral factors and investment decision making as the financial literacy help investors to avoid behavioral biases and make the rational decision that increase their wealth. Collected data are analyzed by using AMOS software to test the hypotheses. The analysis shows that behavioral factors including Heuristic, Prospect, Market and Herding have found highest strong impact on investment decision making of investors. The findings of the study reveal that prospect and herding have positive impact on investment performance whereas heuristic and market variable has negative impact on investment performance. The results indicate that financial literacy enhanced the relationship between behavioral factors (heuristic, prospect, market) and investment decision making of investors and lessened the relationship with herding variable and investment decision making. The analysis of this study is expected to contribute significantly in the development of the field of behavioral finance.

Keywords: Behavioral Factors, Investment Decisions, Investment Performance, Pakistan Stock Exchange
JEL Classifications: G, G01

1. INTRODUCTON

Stock market is considered the symbol for economic growth and development of a country. The upward movements in stocks prices represent the good economic health of the economy. The increase in stock prices leads towards increase in investment, which increases the firms' growth in particular and an economy in general (Jaswani, 2008). The second attribute of stock market that makes the stock market more interesting and lucrative from other modes of investment is its liquidity power (Jaswani, 2008). Stock market is the effective channel for companies to raise capital or to meet their fund needs(Dhankar and Maheshwari, 2014) .People's interest in stocks is due to long growth of capital, dividend and hedging against inflation (Teweles and Bradley, 1998).

Individuals' decision to invest in stock market is influenced by an array of factors. Individuals as human make different choices in their lives, some choice have significant consequences and others have limited. Some of these decisions are very simple and others are complex, and they need a multi-step decision making process. There are two schools of thoughts in decision making process of investors. One is traditional finance researchers who say that investors are "rational" when making investment decisions in financial markets. For long, it has been assumed by standard ordinary finance that investors are impassive about tradeoffs between risk return and exploiting values. It was presumed that they are very careful about investment decision in stock market and they have acquired and incorporated all the essential information available. So main stream finance begins with the supposition that the economic agent is rational. The assumption is not just

limited to that individual's process information correctly but also that they acquire all the essential data required to make a rational decision (Sargent, 1993).There are many conventional finance theories in the literature, such as efficient market hypothesis(Fama et al., 1998) and the Modern Portfolio Theory (Markowitz, 2010). These theories state that investors are rational and risk averse in decision making, at the given level of return they prefer low risk over a high risk. It has been documented in research that, when making investment decisions investors rely on different theories and models of standard finance to estimate risk and expected returns (Arora and Kumari, 2015).

The second school of thought is that investors behave irrationally, inefficiently and inadequately when they face with uncertainty (Lowenstein et al., 1998). Many psychologists challenge the rational assumption of traditional finance. These psychologists criticized the assumptions of fair, unbiased and rationality of investors. This new field is known as behavioral finance. Behavioral finance completely deals with psychological factors which effect on individual and corporate financial decisions (Nofsinger, 2001). Researchers of behavioral finance say that, there are unavoidable psychological biases attached with every individual that prevent them from making rationality-based decisions. As a result, these decisions have bad consequences for investment decisions and market efficiency. According to Shefrin and Belotti (2007), behavioral biases are the main reason for irrationality in decision-making and poor investment performance. Many researchers believe that behavioral finance as a good theory to understand and explain feelings and cognitive errors affecting investment decision making process (Waweru et al., 2008). Because behavioral finance deals with psychological factors which affect individual and groups when they work as investors, portfolio manager or analysts.

When investors face uncertainty they use simple rules of thumb to make investment decisions among different alternatives available. By using heuristic people reduce complexity of decision (Raines and Leathers, 2011). When behavioral factors affect investment decisions the investors suffer. Behavioral factors lead towards irrational decision making which not just creates markets inefficiencies also effect on the return of investors. Over the last forty years, standard finance has been the dominant theory within the academic community. However, scholars and investment professionals have started to investigate an alternative theory of finance known as behavioral finance. Behavioral finance tries to explain and improve people's awareness regarding the emotional factors and psychological processes of individuals and entities that invest in financial markets. Behavioral finance scholars and investment professionals are developing an appreciation for the interdisciplinary research that is the underlying foundation for this evolving discipline. Lack of financial knowledge by many stockholders in the stock market should be a reason to want to know how the individuals go about making their investment decisions. It will thus be worth establishing whether the investors' investment decisions vary from the assumptions of rationality or not.

Stock performance depends upon rational investment decision of individual investors. But individual investors have lack of understanding how different behavioral factors influencing on their investment decisions. This situation creates problems for investors to make logical decision which affect badly in investment outcome.

So, the objective of present study is to determine the behavioral factors which affect the investment decision of individual investor at Pakistan stock market and effect of these factors on investment performance. The impact of financial literacy among behavioral factors and investment decision as a moderator variable is also tested which is a unique contribution of present study to the available literature.

2. REVIEW OF LITERATURE

In the early research work on finance most attention was given to asset pricing. However, recently researchers have started focusing on other factors rather than rationality those may affect the investment decision. Kim and Nofsinger (2008) investigated behavioral biases across the continents and found that Asian people show more behavioral biases than western people. Despite the increasing number of studies in behavioral finance people are still unaware from the concept of behavioral finance and factors those cause irrational behavior (Montier, 2002). Barberis and Huang (2001) Studied different behavioral biases that effect investment decision of investors in financial markets. The study of Nofsinger (2001) found that Asian investors suffered more from behavioral biases than western investors. Theories of standard finance and economics consider that investors are always rational, make logical decision and put into consideration all relevant aspects of concerning investment opportunity before making investment decision. However, in practice there are many other factors like psychological, economical, sociology and finance which affect the decision of investors.

2.1. Heuristic Variable

The concept of heuristic theory was given by Tversky and Kahneman (1974). Heuristic use in decision-making makes investors decision easy by adopting easy rules of thumb. But in practice different situations requires different strategies to deal with them. So, in some cases heuristics give less output in changing situations (Ritter, 2003). Heuristic approach is useful in certain situations like where time is short and there is a need for quick decision (Waweru et al., 2008). In context of heuristic various behavioral biases like representatives, anchoring effects, and availability biases were found affecting investors' decision by Kengatharan and Kengatharan (2014).

In representativeness people make decisions based upon similarity of the events. They take the same decision as they took in the past. They do this because events have similarity and representatives between them. In representativeness bias investors ignore the sample size which is important in decision making. Representatives creates biases in decision making because investors give more weight to recent events for short term benefits and ignore the long-term benefits (Ritter, 2003).In representativeness bias people focus on the nature and characteristics of the events and then take decisions accordingly. This leads investors to analyze and invest in companies based upon company profitability,

returns, publicity, products and management of the company. If they find aforementioned variables satisfactory then they invest (Onsomu, 2014).

In Overconfidence bias investors rely more on their knowledge, skills and judgment. When investors give more weight to their skills and knowledge instead of ground reality, then investors overvalue or under value stock prices (Khan et al., 2017).This is the main bias in stock market (Sadi et al., 2011).

Anchoring bias rises when investors use trend analysis before investment decision. Anchoring can also be explained in another way, investors make irrational decision because investors give more weight to their recent experience, skills and knowledge instead of the market realities (Pompian and Wood, 2006). Investors are more hopeful when there is an increase in the markets and more conscious when markets go down (Waweru et al., 2008). Investors focus on historical price of company shares, dividend history, and profitability through both vertical and horizontal analysis. Through historical analysis investors set a range of share price and company profitability. This trend analysis deprives investors from any unexpected return, when any uncertain event occurs in company (Lou, 2014).Representativeness and Anchoring both are interconnected concepts. Gambler's fallacy occurs when investors believe that stock price will be reversed in future. They make decision based upon reversal concept. If stock prices reverse after a certain period, they get benefit otherwise they suffer a loss. In gambler fallacy investors make decision based upon the concept of reversal of prices because they think trend will be reversed instead of logically decision (Waweru et al., 2008). This trend analysis deprives investors from any unexpected return, when any uncertain event occurs in company (Lou, 2014).

Availability bias happens where people use simple rules to forecast the future results. People make decision based upon easily and readily available information. It is general view that people forget longer past events and remember the last and recent events and those which were inspirational. So, in availability bias investors make decision on available information (Sadi et al., 2011) Thus, it is hypothesized as

H_1: Heuristic has significant and positive impact on Investment performance.

2.2. Prospect Variable

In behavioral finance, two theories are important in decision making, Prospect theory and expected utility theories (EUT). Prospect theory was developed by Kahneman and Tversky (1977). Prospect theory is subjective in decision making of investors who are influenced from investors value system. Whereas EUT deals with logical decision making of investors. EUT give the model of rational decision making which deal with analysis of decision and risk. Prospect theory significantly influences investors' decision-making process (Waweru et al., 2008). Prospect theory is about or to know the people behavior when they deal with risk and uncertainty in financial markets. Generally, people do not like risk rather they prefer certain and sure return. If loss occurs before the gain it gives more pain to investors than that loss which occur after gains. Most investors feel more pain about prospect loss then from happiness that they gain against equal gain (Lou, 2014). If any action made gives better return than investors will repeat the same actions in the future. But if people suffer loss from last action, they will not repeat it in the future. Even now that action gives better return, but people do not repeat because of past bad experience. Due to regret aversion investors even not invest in less performing sectors of the economy just they think that they will suffer loss (Singh and Singh, 2014).These perceptions do not give better return to investors.Thus,it is hypothesized as:

H_2: Prospect has significant and positive impact on Investment performance.

2.3. Herding Variable

Herding refers to follow the others' actions in making decisions. Herding disturbs efficient markets hypothesis (Seetharam, 2013). Herding is significant factor in investment decision because it influence on risk and securities (Tan et al., 2008).Herding leads to further biases. Mostly investors follow of majority investors' buying and selling behavior. But investors who take logical decision do not follow the other decisions which lead to market efficiency. Investors follow others to avoid loss. Various factors create herding like, overconfidence and investment volume, time of investment etc. Herding behavior of individual and institutional investors is different. Individual investors are more affected from herding bias compared to institutional investors (Waweru et al., 2008) .Thus, it is hypothesized as:

H_3: Herding has significant and positive impact on Investment performance.

2.4. Market Factors

Various market factors change the investment decision of investors like market information, ups and down, ward movement in stock prices, consumer preferences and fundamentals of stocks (Waweru et al., 2008) investors' decisions are highly influenced by market information. Investor personal perception, attraction of stocks, and preferences also influence stock selection process of investors. But market factors are not considered as a behavioral variable. Despite the fact that these factors have major contribution in investor's decision-making process regarding investment. Thus, it is hypothesized as:

H_4: Market factors have significant and positive impact on Investment performance.

2.5. Financial Literacy

Financial literacy has gained significant attentions of researcher in last decade. Due to increasing complexity of financial markets and number of financial products and services available for investors financially literacy has become very important in investment decisions. The importance of financial literacy can be understood from the research report of International Net Work on Financial Education (INFE) of OCED. The findings of the report say that the cause of global financial crises 2007-2009 was due to lack of financial literacy. Financial literacy is now recognized as an important factor for economic and financial stability and

development as reported by INEF (2009). Financial literacy not only contributes in investment decision but also help to control behavioral biases. Different researchers have given different definitions of financial literacy. President Advisory Council on Financial Literacy defined financial literacy as "the ability to use knowledge and skills to manage financial resources effectively for a life time of financial well-being". Chu et al. (2017) Suggested that investor's objective and subjective knowledge and risk-taking behaviors are highly correlated. Low level of financial literacy has lack of portfolio diversification (Abreu and Mendes, 2010). Ateş et al. (2016) Stated that financial awareness of private banks employees still needs to enhance despite their higher education and professional expertise.

Prior studies in the behavioral finance field used a limited number of variables and ignored the impact of above-mentioned variables on investment performance. Present study will check the effect of all these factors together. Inclusion of financial literacy as a moderator variable is also another important contribution of this study. Barber and Odean (2001) disagreement with assumption of modern financial economics that people behave with extreme rationality will be tested to establish whether it holds true in the financial markets.

H_5: Financial literacy has significant moderating role in relationship between behavioral biases and Investment decision of individual investors.

3. METHODOLOGY

3.1. Date Collection and Sampling

The main objective of current study is to examine the impact of behavioral factors on investor's decisions and performance. The key informants of this study are the active individual investors of Pakistan Stock Market. Due to time constrain, only few brokerage firms are selected for data collection including brokerage firms located in different locations like, Johar town, Jail road, DHA Cant, Egerton road, Gulberg and stock exchange. A convenience sampling has ensured that easier access to Brokerage Firms. A total of 268 questionnaires (out of 300) were received yielding a response rate of 83.35%. A total of 18 questionnaires were wasted. The remaining sample size of were used which meets the statistical sample requirement proposed by (Hair et al., 2010).

3.2. Measurement

This research is conducted based on quantitative method. All of the measures used in this study are adapted from established and validated scales. Heuristic construct has 8 items, prospect construct has 6 items which measure the loss aversion, regret aversion and mental accounting, Market variable has 6 items, herding has 4 items, financial literacy contain 3 items, investment decision has 6 items, Investment performance has 3 items in which investors are asked to evaluate their investment return. Six- point Likert scale is used to know the respondent behavior and attitude towards investment decision and performance. The 6 points in the scale are respectively from 1 to 6: extremely disagree, highly disagree, somewhat disagree, somewhat agree, highly agree, and extremely agree. The reliability of data were checked by Cronbach alpha and collected data were analyzed through structural equation modeling (SEM) by using AMOS software.

3.3. Analysis and Results

The analysis was done through SPSS and AMOS. In the analysis of the data, the two-step approach was used as suggested by previous studies (Hair et al., 1998). In the two-step approach, the measurement model was tested for validity and reliability through different techniques as Confirmatory factor analysis, etc. Then structural model was analyzed to test the hypothesis and model fit. Firstly, data was screened through exploratory factor analysis and cross loading items were dropped from each data set. Samples of 300 hundred questionnaires were distributed among individual investors. Out of them 268 respondents replied. After sorting 250 questionnaires were finally decided for further analysis. So the response rate was 83.33%.

The above Table 1 presents that the male participants are 215 and female investors are 35 of the total sample obtained. So there is no issue of gender biasness. Because there is representation of both male and female investors in the sample. The percentage of male investors is 86% and female investors are 14%.

3.4. Questionnaire Survey-results

Consistent with (Hair et al., 2010) a three-step procedure for scale reduction, measurement and structural model assessment was conducted. First, an exploratory factor analysis was conducted which showed no issues of multi co-linearity. A Varimax rotation yielded a three-factor solution with eigenvalues >1, confirming the conceptualized model structure. The overall factor structure explained 68 % of sample variance which was deemed as very well (Hair et al., 2010) However, a cut off point for factor loadings of 0.70 (Hair et al., 2010a) resulted in the deletion of some items. After deleting the items the items for each construct scheduled as the heuristic to 6, prospect to 4 items, Market to 4 items, herding to 3 items, Investment decision to 4 items and no items were deleted from Financial Literacy and Investment performance. The resultant measurement items underwent confirmatory factor analysis and validated the conceptualized model with Goodness of Fit measures, i.e. $\chi 2$=198.07, df =71, CMIN/df=2.79, P-value=0.000, RMSEA=0.096, CFI=0.94, NFI=0.914, IFI=0.91, RFI=0.92, and TLI=0.90. The final model shows good fit with data, $\chi 2$=198.073, df=71, CMIN/df=2.79, p-value=0.000, RMSEA=0.096, CFI=0.94, NFI=0.91, IFI=0.91, RFI=0.928, and TLI=0.904.

3.5. Measurement Model

AMOS 24 was used to evaluate the measurement model and then the structural model to test the research hypotheses. The maximum likelihood estimation method was used for parameter estimation. In total, seven constructs were included in the measurement model, and were subjected to CFA (cf. Anderson and Gerbing (1988); Diamantopoulos et al. (2000); Hair et al. (2010). The

Table 1: Demographic information

Gender	Frequency	Percent
Male	215	86.0
Female	35	14.0
Total	250	100.0

model underwent a process of estimation and re-estimation by analyzing the loadings of each item on its underlying construct. All the loadings were >0.65, the significance of the loadings exceeded t-values of 1.96 in absolute terms, and each item's squared multiple correlation was also deemed desirable since in all cases R square=0.30 (Hair et al., 2010). Since the above mentioned criteria were met, this provides some indication for the unidimentionality of the scales (O'Leary-Kelly and Vokurka, 1998). Cronbach's Alpha's were used to assess reliability of constructs and were found to be acceptable for each construct, heuristic=0.75, prospect=0.93, Market=0.89., herding=0.87, financial literacy=0.87, investment decision=0.94and investment performance=0.91.

To establish validity, discriminant validity and convergent validity were also assessed. For discriminant validity, and based on Bagozzi et al. (1991) a series of two-factor CFA models were conducted for each pair of constructs. The correlations between the two constructs for each model are constrained to 1 (i.e., inferring perfect correlation) and run when sat free. Discriminant validity is deemed satisfactory if the change in $\chi 2$, between constrained and free models, is >3.84 (df=1, P=0.05) Bagozzi et al. (1991); Cadogan et al. (2006); Deery et al. (1999) In each case, the $\chi 2$ difference test is significant thus indicating that factors are deemed significantly discriminant.

For convergent validity, the degree of the factor loading estimates as well as significance (t-value) was assessed Hair et al. (2010); Diamantopoulos et al. (2000). The cut off points of 0.70 and statistical significance (t-valueW|1.96|) exceeded by each of the factor loadings thus ensuring convergent validity.

3.6. Structural Model

The research hypotheses were tested using the structural equation modeling (SEM) approach, using AMOS 24 (Arbuckle, 2010). The model shown– yielded a $\chi 2$ of 198.07 (df: 17). Since, the $\chi 2$ statistic may result in unreliable results as sample size and model complexity increases (Hair et al., 2010) other fit indicators (RMSEA=0.04, CFI =0.97, TLI=0.96, NFI=0.96, IFI=0.97, RFI=0.94) were used to assess the model fit Schumacker and Lomax (2004); Diamantopoulos et al. (2000); Hair et al. (2010). Furthermore, the R^2 values for each structural equation were estimated to further assess the models explanatory power which was acceptable i.e., 68 %. The resulting model fit indicates an acceptable model fit to the data Table 2.

3.6.1. Structure equation model of behavioral factors and investment performance

The Figure 1 shows regression weights of constructs in investment performance which all are significant. The regression weight of heuristic variable is −0.05 which shows that heuristic variable has negative impact on investment performance. Prospect variable has positive impact on investment performance with regression weight 0.59. Herding variable has highest positive impact on investment performance with regression weight 0.60. But market variable has negative impact on investment performance with regression weight −0.11

3.6.2. Structure equation model of behavioral factors and investment decision

To test the third hypothesis H03 that is "Financial literacy has no moderating role in relationship between behavioral biases

Table 2: Different value regarding measurement and structural model

Construct	Items	Standard factor loading	t value	R^2	AVE	α
Heuristic	HU6	0.867	39.621	0.44	0.951	0.757
	HU5	0.819	39.536	0.73		
	HU4	797	39.425	0.75		
	HU3	0.864	38.125	0.80		
	HU2	0.854	38.145	0.43		
	HU1	0.846	39.427	0.41		
Prospect	PR6	0.797	29.912	0.82	0.912	0.934
	PR5	0.789	29.810	0.85		
	PR4	0.758	28.95	0.81		
	PR3	0.874	28.74	0.81		
	PR2	0.876	27.524	0.86		
	PR1	0.845	24.990	0.43		
Market	MK4	0.852	30.307	0.67	1.904	0.895
	MK3	0.870	23.969	0.77		
	MK2	0.870	22.431	0.77		
	MK1	0.797	24.667	0.63		
Herding	HE3	0.893	34.852	0.84	2.839	0.880
	HE2	0.895	45.791	0.73		
	HE1	0.861	32.345	0.66		
Financial literacy	FL3	0.857	25.244	0.77	1.959	0.875
	FL2	0.794	22.627	0.66		
	FL1	0.810	33.521	0.85		
Investment descion	ID4	0.821	33.745	0.74	2.845	0.941
	ID3	0.870	29.98	0.67		
	ID2	0.790	31.455	0.78		
	ID1	0.845	33.451	0.65		
Investment peroformance	IP3	0.741	34.512	0.85	2.789	0.911
	IP2	0.740	34.592	0.74		
	IP1	0.784	34.991	0.84		

Figure 1: Theoretical framework

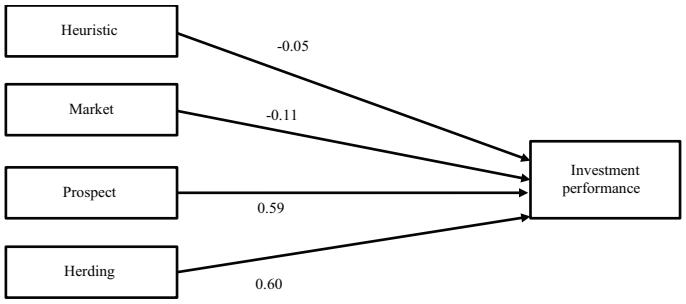
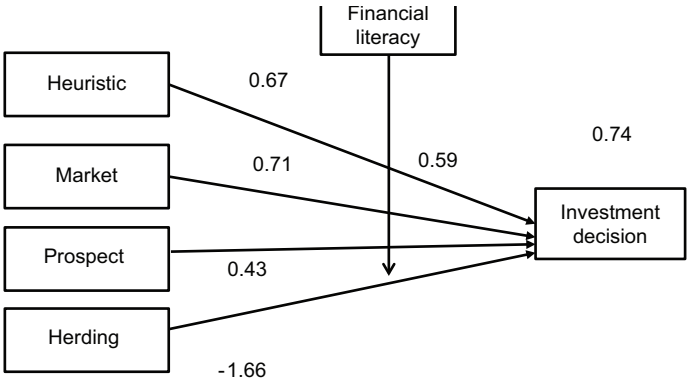


Figure 2: Theoretical framework with moderator



and Investment decision." This hypothesis was tested in two stages. In first stage simple model was run to check the impact of behavioral factors (independent variable) on investment decision (dependent variable) and in second stage same model was run with addition of moderator variable (financial literacy) to analyze/check the impact of moderator variable between behavioral factors and investment.

3.6.3. Moderating role of financial literacy b/w behavioral biases and investment decision

It shows the result of moderating role of financial literacy between behavioral variables and investment decision. First we checked the simple impact of behavioral variables over investment decision. After that above we checked the result of same variables (behavioral variables) on investment decision by introducing moderator variable. The results indicate that heuristic variable which has negative impact on investment decision with regression weight −0.05. Now after moderating variable (financial literacy) the heuristic variable has changed into positive impact on investment decision with regression weight 0.67.Whereas prospect variable regression weight 0.27 which was still positive impact but impact level has increased from 0.27 to 0.43/So, due to financial literacy the relationship between heuristic, prospect variable in relationship with investment decision has increased. Similar herding variable regression weight was 0.02 after moderating effect changed into negative impact on investment performance with regression weight −1.66. Whereas the relationship between market variable and investment decision has increased due to moderating variable with regression weight 0.32-0.71 (Figure 2).

4. CONCLUSION

There are four behavioral variables namely heuristic, prospect, herding and market variables are studied and discussed in detail. All these behavioral factors have highest impact on investment decision of individual investors. But there are few items of heuristic variable (representativeness, overconfidence) which have moderator impact on investment decision. Similar one items of prospect variable (loss aversion) has moderator impact but overall mean values of these two variables is more than 4. Heuristic and market variable have negative impact on investment performance. Whereas prospect and herding found positive impact on investment performance. Herding variable has highest positive impact on performance among behavioral variables. Financial literacy is used as a moderator variable in the model. Behavioral variables used as an independent variables and investment decision are dependent variable.

The result of the study says that financial literacy increased the relationship among behavioral variables (heuristic, prospect, market) and investment decision. Whereas the relationship between herding variable and investment decision decreased due to financial literacy. Moreover, this study used primary data to measure investment performance of the investors differentiating it from previous studies those relied on secondary data. The present study will set out to test Fisher and Statman (1999)argument that market behavior diversion from the expected rational efficient market that standard finance is built on to how investors actually behave. Most of the works done on behavioral finance is found in developed countries like U.K, USA and Japan etc.

The present study is a theoretical contribution to existing literature. In this study behavioral finance are applied to Pakistan Stock Market and behavioral factors those effects the investor's investment decision are determined. It will be useful for investors to understand their common behavioral biases which affect badly on their investment return and for increase the investment return.

Hypothesis	Statement of hypothesis	Findings
HU>IP	Heuristic has significant and positive impact on Investment performance	Rejected
PR>IP	Prospect has significant and positive impact on Investment performance	Accepted
HE>IP	Herding has significant and positive impact on Investment performance	Accepted
MK>IP	Market factors have significant and positive impact on Investment performance	Rejected
BF>FL>IP	Financial literacy has significant moderating role in relationship between behavioral biases and Investment decision	Accepted

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