

EFFECT OF BEHAVIORAL BIASES ON INVESTMENT DECISIONS WITH MODERATING EFFECT OF LOCUS OF CONTROL: AN EMPIRICAL STUDY ON PAKISTANI INVESTORS

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Abstract

The link between behavioral biases, locus of control, and investment decision making in Pakistan is examined in this study. In this study, the independent variables are self-attribution, overconfidence, and over optimism, while the moderating variable is locus of control, and the dependent variable is investment decision making. However, the target group for the investigation on the correlation between the aforementioned factors is investors of Pakistan. The primary data was gathered using an adopted structured questionnaire with a five-point Likert scale, which is a quantitative research approach. Through the convenience sample approach, 180 respondents (Pakistani investors) provided their replies. Using SPSS software, statistical tests including correlation, regression, and moderation analysis are performed on the recorded responses. The findings show that Pakistani investors' decision making is significantly impacted by self-attribution, overconfidence, and over optimism. The association between self-attribution, overconfidence, and over optimism (independent variables) and investment decision making (dependent variable) in Pakistan is, however, strongly moderated by locus of control, according to moderation analysis.

INTRODUCTION

Behavioral finance, which examines how investors make economic decisions, is acknowledged as a fast expanding field of finance. The study of people's economic decision-making behavior in behavioral finance is aided by the merging of economics and traditional finance with cognitive psychology theory (Zahera & Bansal, 2018). Markets, foundations, and participants in the financial industry are sensible or astute in terms of expectations for

conventional finance. Such people, who are active in logical decision-making, enhance wealth. The people who make illogical decisions, on the other hand, will encounter unfavorable outcomes (da Silva et al., 2020). People often become more aware of their ability to make logical conclusions or make balanced decisions as time goes on. However, people's lack of reasonable choices ultimately has a significant impact on their investments (Raheja & Dhiman, 2019). Numerous studies conducted in the past have shown that experienced investors focus on all

probabilities and accessible information before making any transaction in order to lower the associated risk. As a result, experienced investors are very careful to avoid making illogical decisions in order to prevent abnormalities and operate efficiently in the market (Koestner et al., 2017). Nobody, however, disputes the fact that there are no abnormalities in any market. However, behavioral finance is a subfield of finance that develops psychologically connected ideas to explain stock market oddities (De Bortoli et al., 2019). According to Rezaei & Elmi (2018), bias is nothing more than a propensity towards failure. Bias is now understood to be the propensity for making decisions while the person making the choice has previously been exposed to an underlying idea or credence. Biases come in many different forms in human psychology.

These biases influence financial judgments and investment decisions made in financial markets and organizations. Due to unwise decisions, investors' wealth is impeded, and these biases also have a detrimental impact on the productivity of businesses (Tuyon & Ahmad, 2016). As Areiqat et al. (2019) note, the process of making investment decisions is influenced by a variety of mental states, leading to the identification of several biases by numerous academics. The locus of control, self-attribution, regret aversion, and risk aversion are a few of these states, and prospect theory has been employed in this study to emphasize several mental states influencing the process of making investment decisions (Qasim et al., 2019).

Self-attribution bias is described as the prejudice that leads people to feel that their abilities and skills are the primary causes of their success while their shortcomings are not the cause of their failure (Bakar & Yi, 2016). According to Hadbaa & Boutti (2019), when individuals succeed, they credit themselves, and when they fail, they place the blame on others. The prejudice that leads people to feel that their accomplishments are mostly the result of their talents and abilities, as opposed to their own shortcomings, is known as the self-attribution bias (Baker et al., 2019). But overconfidence is described as a bias that reflects a mental state in which a person's talents or

capabilities for carrying out a given activity are underestimated (Mittal, 2019).

In their investigation of the many biases, Baker et al. (2019) discovered that excessive optimism and overconfidence are two personality qualities that have a significant influence on how individuals make decisions because excessive optimism is reinforced by excessive confidence. As opposed to this, the research by Ateş et al. (2016) shows that overconfidence bias can be damaging for different types of investors, with frequent investors experiencing higher overconfidence bias than infrequent investors. While excessive optimism is described as a bias in which a person overestimates the frequency of desired/desirable results while underestimating the frequency of results that are less favorable (Bodnaruk & Simonov, 2015). The majority of the firm is found to be very enthusiastic when launching new products, which may lead to over optimism, as demonstrated by Zahera & Bansal (2018).

The belief that a person has about his or her actions and the results of those actions is known as locus of control, which is a personality attribute. People with an internal locus of control have a propensity to believe that actions taken by an individual or their efforts are what influence results (Filbeck et al., 2017). According to De Bortoli et al. (2019), excessive optimism has an adverse effect on investors' moods and their capacity to value security. This means that investors have also been negatively impacted by this bias. Although overconfidence and over optimism have a nearly identical nature, these biases are not regarded as being the same. A person who is overly optimistic may not be overconfident in his or her own abilities and capabilities, but rather in the results that will come about as a result of their efforts. However, someone who is overconfident has total trust in both their own talents and the results of their activities (Filbeck et al., 2017).

Raheja and Dhiman (2019) provide evidence that an investor is incapable of making rational decisions and are unstable and illogical in their behavior. Investors have met a variety of uncertain scenarios before coming to sensible judgments and choices. The field of finance

known as “behavioral finance” offers the necessary proof for the causes of people’s systematic errors and the significance of psychological factors influencing people’s capacity for decision-making. This study is based on common biases that lead to market anomalies because they have an impact on how investors make investment decisions (Rezaei & Elmi, 2018). The results of the current study also show the link between the biases and how these biases influence the investor’s decision-making process by leading them to make unfavorable and illogical choices.

Numerous scholars have conducted their studies to examine the connection between biases and investing decision making (Andersen et al., 2020). In Pakistan, there hasn’t been much study done on biases and how they affect investment decision making, therefore scholars haven’t given this literature enough attention (Khan et al., 2018). However, several academics in Pakistan have made an attempt to investigate numerous factors that have a significant impact on how investors make decisions (Asad et al., 2018). However, there has been a glaring study void in Pakistan for examining how biases affect investment decision making (Asad et al., 2018; Khan et al., 2018). According to Kafayat (2014), the moderating variable locus of control has not yet been employed to examine the connection between behavioral biases and investment decision making. Hence, this study aims to test the impact of behavior biases (self-attribution, overconfidence and over optimization) on investment decision making in Pakistan with moderating role of locus of control.

This research offers the guidance required for making investment decisions and for formulating policies that can lead to future decisions. Additionally, investors and shareholders might use the study’s results to manage highly relevant portfolios and select the best firms to invest in without being swayed by prejudices. Additionally, it might be used by financial brokers to evaluate their clients’ exposure to bias and how frequently this exposure occurs. The same may be said for taking remedial action to deal with prejudices and improve financial circumstances. This study’s

main objective is to determine how different biases and heuristics affect investment decision making in Pakistan, with the locus of control acting as a moderator. In the meanwhile, this study explores the impact of biases on investment decision making and tries to establish a connection between the biases. In the meanwhile, this study gives investors guidance on how to make investing decisions without being swayed by prejudices (such as self-attribution, overconfidence, and over optimism).

LITERATURE REVIEW

Self-attribution bias is the tendency for people to feel that their accomplishments are mostly the result of their talents and abilities, as opposed to the fact that failure was not caused by their own mistakes (Baker et al., 2019). This bias arises when people attribute their success to their talents and abilities while blaming external factors for their failure or unfavorable circumstances (Jain et al., 2015). According to Bakar & Yi (2016), people evaluate their talents based on their successes or failures rather than on a self-evaluation of their abilities. People have given themselves much too much credit for their achievements, and self-attribution bias has distorted people’s perceptions of their skills and prowess. Cognitive components (such as locus of control and self-esteem) and motivational processes combine to produce self-attribution (such as self-preservation and self-enhancement). Furthermore, self-attribution bias prevents people from drawing lessons from their prior successes (Nofsinger et al., 2020).

Overconfidence is a bias that reflects a mental state in which a person’s abilities or skills for carrying out a particular task are overestimated. This bias shows a lack of ability on the part of the individual to recognize the limits of his knowledge. Overconfidence among investors is mostly brought on by things like self-declaration of competence and self-commitment to the enterprise (Asad et al., 2018). When people fail to assess the potential of their talents and abilities, they become overconfident. According to psychological researchers, overconfidence bias has an impact on investor behavior (Ngacha,

2019). When investors make judgments in the face of uncertainty, overconfidence frequently results. Overconfidence bias manifests itself as excessive optimism, which makes overconfidence bias more pronounced (Baker et al., 2019). Overconfidence bias has a major impact on financial decisions made by investors, as demonstrated by a 2015 study by Jain et al. overconfident investors tend to overvalue their information and make riskier investment decisions.

Over optimism is a bias in which a person overestimates the frequency of desired/desirable results while underestimating the frequency of results that are less favorable. Over optimism is described as underestimating bad results and overestimating good results in plain English (Ngacha, 2019). People are too optimistic when they believe that they may not be exposed to future things and occurrences because they believe that they will still be in control of those things and that they will be able to produce favorable results from those happenings (Khan et al., 2018). In comparison to people who don't experience over optimism, those who do have a greater chance of experiencing an undesirable situation. The study also showed that over optimism bias might have different effects on various age groups and domains. People who are overly enthusiastic and eager to enjoy their holidays, for instance, might not be happy with how much fun they had (Asad et al., 2018).

According to Mittal's research (2019), effective supervisors may grow overconfident as a result of their propensity for self-attribution. In the meantime, the research by Qasim et al. (2019) shows that the CEO's ability and self-attribution occur as a result of overconfidence. The unilateral self-attribution of speculators (representatives) results in overconfidence. Financial professionals typically increase unilateral self-attribution when confronted with weakness, which eventually results in overconfidence in them (Asad et al., 2018). People are found to become more and more self-confident rather than self-assessed when there are no other attribution tendencies (Bodnaruk & Simonov, 2015). According to Jain et al. (2015), a

person's overconfidence is a result of a variety of factors, including self-enhancement, sources of control, and a lack of consistency and accuracy considerations. Financial professionals overestimate their ability to achieve positive effects and can provide instances (Zahera & Bansal, 2018). Therefore, self-improvement will lead to overconfidence in investors or those who make financial decisions.

As overconfidence and over optimism are not the same, they can readily follow bias. Overly optimistic people may not misrepresent their talents, but they also timidly inflate the likelihood of getting good outcomes, in contrast to overconfident people who exaggerate both their abilities and the chance of reaching significant accomplishments (Bakar & Yi, 2016). A person is too optimistic if they do not underestimate their abilities and are certain that certain outcomes would be excellent and favorable. The fundamental distinction between overconfidence and over optimism is that both inclinations include expecting good outcomes from one's actions. As a result, excessive optimism might result from overconfidence since those who have unrealistic expectations are unimportant (Kumar & Goyal, 2015). Overestimating someone's talent and the outcomes of a certain profession is overconfidence, but overestimating the ideal outcomes of a specific work is overoptimistic (Khan et al., 2018). According to Kafayat (2014), overconfidence and a propensity for self-attribution are stable and simple to acquire even when Yang deficit is present.

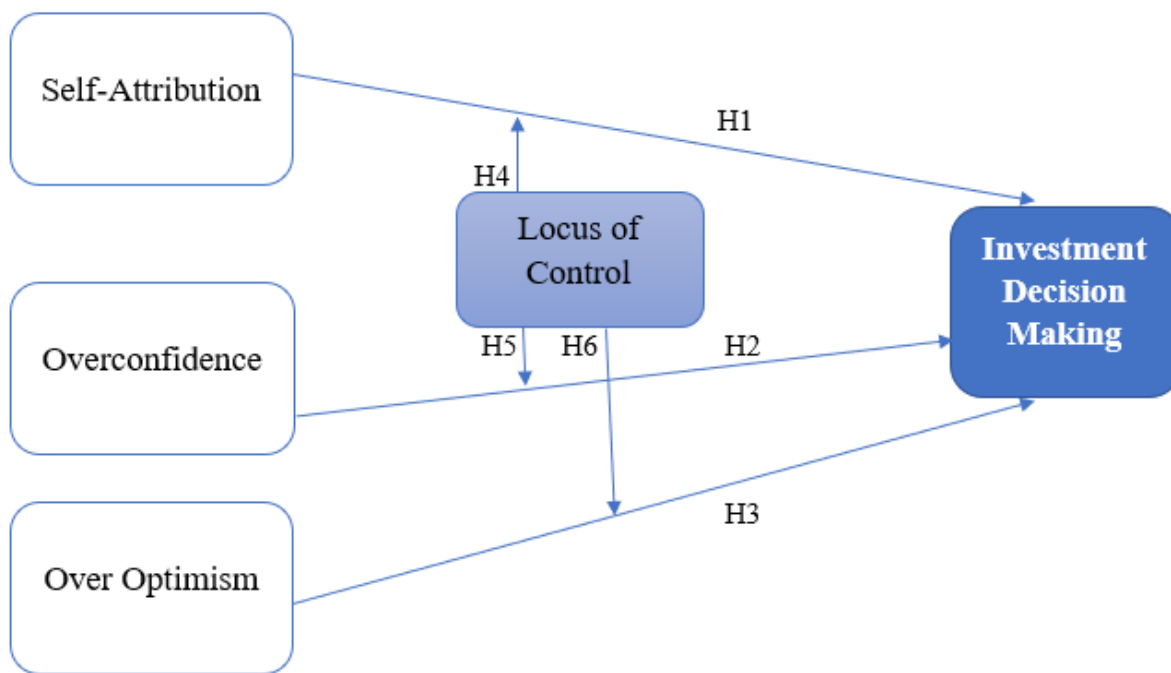
A person's view or belief about their action and its results is known as their locus of control. Employees in organizations have two different sorts of loci of control, including internal and external locus of control (Bodnaruk & Simonov, 2015). Employees with internal locus of control frequently believe that their actions or efforts have an impact on how things turn out. Employees with an external locus of control, however, are more likely to believe that the results of their actions and efforts are outside their control (Zahera & Bansal, 2018). The locus of control refers to how many people accept that

they have more influence over the outcomes of various circumstances in their professional life than they have over forces outside of their control. When certain events occur in their life, individuals with strong internal control will accept them. For instance, when test results are revealed, people with strong internal control often praise or criticize themselves and their talents (Baker et al., 2019).

Performance is the primary factor that investors consider before taking a choice; therefore investors must decide whether to invest in stocks or not (Hadbaa & Boutti, 2019). Numerous indicators have been created since the ones described by Qasim et al. (2019) to evaluate the

performance of equities before buying them. Along with contemporary indicators, conventional indicators have been measuring circumstances like asset allocation and determining how consistently a certain company is doing. Although having a large number of indicators for evaluating and measuring performance has advantages, the downside is that a large number of indicators can deceive investors and make it difficult for them to accurately assess a fund's performance. Additionally, different measurement indicators will direct investors in different directions, leading to inconsistent results and stock rankings that may differ (Areiqat et al., 2019).

Research Framework



Research Hypotheses

H₁. Self-attribution bias negatively effects investment decision making in Pakistan.

H₂. Overconfidence bias negatively effects investment decision making in Pakistan.

H₃. Over optimism bias negatively effects investment decision making in Pakistan.

H₄. Relationship among self-attribution and investment decision making is significantly moderated by locus of control in Pakistan.

H₅. Relationship among overconfidence and investment decision making is significantly moderated by locus of control in Pakistan.

H₆. Relationship among over optimism and investment decision making is significantly moderated by locus of control in Pakistan.

RESEARCH METHODOLOGY

Research Design

Given that it uses primary data, the current study is based on a quantitative methodology. In this study, the deductive approach and quantitative research methodology are used to determine the link between the variables.

Research Philosophy

As positivism entails the belief that only information obtained via observation is reliable, positivism is employed as a research philosophy.

Research Approach

To achieve neutrality, the current study uses a positivism paradigm in conjunction with a quantitative research methodology. The current investigation is cross-sectional in style and is restricted to deductive approach.

Research Strategy

An adopted structured questionnaire was utilized in this study's survey research approach to gather information on respondents' perspectives.

Research Nature

Since the locus of control (a moderating variable), self-attribution, overconfidence, and over optimism (independent variables), as well as investment decision-making (dependent variable) in Pakistan, are related in a cause-and-effect manner, the current study is causal in nature.

Research Instrument

A structured questionnaire is adopted from (Asad et al., 2018; Hadbaa & Boutti, 2019; Koestner et al., 2017) and employed as a research instrument for data collecting and assessing respondents' views of the variables of interest. An adopted questionnaire with a 1 to 5 Likert scale is

employed (1 being strongly disagree, and 5 being strongly agree).

Unit of Analysis

Investors from Pakistan are the individuals that make up the unit of analysis in the current study.

Population

The study's target audience is Pakistani investors who invest in businesses listed on the Pakistan Stock Exchange.

Sample Size

Using the "Sample Size Calculator," a final sample size of 180 respondents for this study was determined. 180 respondents (Pakistani investors) make up the final sample size chosen to accurately reflect the community.

Sampling Technique

The chosen questionnaire is employed in the current study's convenience sample approach to get data from respondents (Pakistani investors).

Data Collection Procedure

To gather information from the responses, the researcher used internet tools like "Google Docs" and physical distribution of surveys to reach out to participants. For the convenience of the respondents, surveys are available in both hard copy and electronic form (soft copy).

Data Analysis Techniques

In order to analyze data and determine the strength and direction of the association between self-attribution, overconfidence, and over optimism (independent variables), locus of control (moderating variable), and investment decision making (dependent variable) in Pakistan, SPSS software is employed.

DATA ANALYSIS AND FINDINGS

Descriptive Frequencies

Demographics		Frequencies	Percentages	Cumulative Percentage
Gender	Male	159	88	88
	Female	21	12	100
Age	Less than 30 years	37	21	21
	30 to 45 years	91	50	71
	More than 45 years	52	29	100
Education	Intermediate	27	15	15
	Undergraduate	59	33	48
	Graduate	94	52	100
Annual Income	Less than 500,000	27	15	15
	500,000 - 10,00,000	113	63	78
	More than 10,00,000	40	22	100

Out of 180 respondents, based on gender, 159 respondents having percentage of 88 were males. Whereas, 21 respondents having percentage of 12 were females. Based on age, 37 respondents having percentage of 21 have their age less than 30 years. Whereas, 91 respondents having percentage of 50 have their age between 30 to 45 years. However, 52 respondents having percentage of 29 have their age more than 45 years. Based on education, 27 respondents having percentage of 15 were intermediate. However, 59

respondents having percentage of 33 were undergraduate. Furthermore, 94 respondents having percentage of 52 were graduate. On the basis of annual income, 27 respondents having percentage of 15 have their annual income less than 500,000. Whereas, 113 respondents having percentage of 63 have their annual income between 500,000 - 10,00,000. Similarly, 40 respondents having percentage of 22 have their annual income more than 10,00,000.

Reliability Analysis

Variable	Cronbach's Alpha	N of Items
Self-Attribution	.805	6
Overconfidence	.760	6
Over Optimism	.762	6
Locus of Control	.801	6
Investment Decision Making	.771	6
Total	.784	30

Self-attribution, overconfidence, over optimism, locus of control, and investment decision-making had respective reliability values of 0.805, 0.760, 0.762, 0.801, and 0.771. The dependability statistics-based Cronbach’s Alpha rating of 0.784 for our research is fairly respectable. The questionnaire used in this research study for data

collection has a higher level of consistency and reliability, according to the Cronbach’s Alpha value. The questionnaire employed in this research study and the data it gathered have a Cronbach’s alpha rating of 0.784, which is very close to 1 and indicates excellent reliability.

Correlation Analysis

		Self_Attribution	Overconfidence	Over_Optimism	Locus_of_Control	Investor_Decision_Making
	Pearson Correlation	1				
Self_Attribution	Sig. (2-tailed)					
	N	180				
	Pearson Correlation	.412	1			
Overconfidence	Sig. (2-tailed)	.000				
	N	180	180			
	Pearson Correlation	.394	.458	1		
Over_Optimism	Sig. (2-tailed)	.000	.000			
	N	180	180	180		
	Pearson Correlation	.467	.473	.399	1	
Locus_of_Control	Sig. (2-tailed)	.000	.000	.000		
	N	180	180	180	180	
	Pearson Correlation	-.446	-.457	-.472	-.491	1
Investor_Decision_Making	Sig. (2-tailed)	.000	.000	.000	.000	
	N	180	180	180	180	180

Self-attribution and investment decision making have a substantial, negatively skewed relationship with a correlation of .446 magnitude. On the other hand, there is a strong negative correlation with a magnitude of .457 between overconfidence and investment decision making.

Additionally, there is a negative link with a magnitude of .472 between over optimism and investment decision making. However, there is a substantial, negative association with a magnitude of .491 between locus of control and investment decision making.

Regression Analysis

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.474 ^a	.467	.458	.57162

a. Predictors: (Constant), Over_Optimism, Overconfidence, Self_Attribution

According to the model's R Square value, self-attribution, overconfidence, and over optimism were responsible for 46.7% of the variation in

investment decision making. On the other hand, Adjusted R2 reveals a 45.8% match for the theoretical model.

ANOVA

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	7.361	4	3.182	25.910	.000 ^b
	Residual	71.192	174	.289		
	Total	78.553	178			

a. Dependent Variable: Investor_Decision_Making

b. Predictors: (Constant), Over_Optimism, Overconfidence, Self_Attribution

The model's F value is 28.182 (higher than 4) and its significance value is.000 (less than 0.05),

according the ANOVA findings. It is evident that the model has statistical significance as a result.

Coefficient

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	1.108	.231		2.981	.001
Self_Attribution	.237	.054	.234	2.371	.000
1 Overconfidence	.362	.062	.354	2.641	.000
Over_Optimism	.346	.061	.340	2.584	.001

a. Dependent Variable: Investor_Decision_Making

The above table demonstrates that, with contributions of 23.7%, 36.2%, and 34.6%, respectively, and significance values of .000, .000,

and .001, selfattribution, overconfidence, and over optimism have a considerable impact on investment decision making.

Moderation Analysis

Model Summary

R	R-sq	F	df1	df2	p
.6284	.4479	42.1768	4.0000	154.0000	.0000

Model

coeff	se	t	p			
Constant		.5729	1.0018	2.4701	.0012	
LOC	1.0172	.2384	3.7217	.0007		
SA		.6180	.2819	2.0146	.0013	

int_1	.1261	.0649	2.1609	.0011
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Interactions: int_1 = SA x LOC
Outcome Variable: IDM

Results reveal that self-attribution (X) has a strong correlation with investment decision making (Y) with the magnitude of (Coeff. 0.6180, $p < 0.05$). However, there is a substantial association between locus of control (M) and investment decision making (Y) with the magnitude of (Coeff. 1.0172, $p < 0.05$), and the interaction term (self-attribution x locus of control) is significant with the magnitude of (Coeff. 0.1261, $p < 0.05$). Based on these results, we may conclude that

locus of control is acting as a major moderating variable in this model. Self-attribution is significant with investment decision making, but locus of control is also significant when tested as an interaction term by multiplying with self-attribution. Therefore, our findings do suggest a moderated locus of control between self-attribution and investment decision making, we might infer.

Model Summary

R	R-sq	F	df1	df2	p
.6274	.4184	42.1179	4.0000	154.0000	.0000

Model

coeff	se	t	p		
Constant		1.2780	1.1716	2.0908	.0027
LOC		1.0765	.2975	3.6190	.0004
OC		.9344	.3735	2.5019	.0034
int_1		.1665	.0924	2.8029	.0033

Interactions: int_1 = OC x LOC
Outcome Variable: IDM



According to the results, overconfidence (X) has a substantial correlation with investment decision making (Y) with the magnitude of (Coeff. 0.9344, $p < 0.05$). However, there is a substantial link between locus of control (M) and investment decision making (Y) with the magnitude of (Coeff. 1.0765, $p < 0.05$), and the interaction term (overconfidence x locus of control) is significant with the magnitude of (Coeff. 0.1665, $p < 0.05$). Based on these results, we may conclude that

locus of control is acting as a substantial moderating variable in this model since, in addition to overconfidence being significant with investment decision making, locus of control is also significant when tested as an interaction term by multiplying with overconfidence. We may thus draw the conclusion that our research does indeed suggest a moderated locus of control between overconfidence and investment decision making.

Model Summary

R	R-sq	F	df1	df2	p
.6017	.4714	41.7429	4.0000	154.0000	.0000

Model

coeff	se	t	p
Constant		1.1926	1.1372 2.0718 .0013
LOC		1.0258	.2718 3.2196 .0006
OO		.8162	.3872 2.5617 .0017
int_1		.1381	.0816 2.6712 .0012

Interactions: int_1 = OO x LOC

Outcome Variable: IDM

Results demonstrate a strong correlation of over optimism (X) with investment decision making (Y) with the magnitude of (Coeff. 0.8162, $p < 0.05$). However, the interaction term (over optimism x locus of control) is significant with the magnitude of (Coeff. 0.1381, $p < 0.05$), as is the link between locus of control (M) and investment decision making (Y). Based on these results, we may conclude that locus of control is

acting as a major moderating variable in this model since, in addition to over optimism being significant with investment decision making, locus of control is also significant when tested as an interaction term by multiplying with over optimism. We may thus draw the conclusion that our research does indeed indicate a moderated locus of control between over optimism and investment decision making.

Data Findings

Hypothesis	Statement	Accepted/Rejected
H1	Self-attribution bias negatively effects investment decision making in Pakistan.	Accepted
H2	Overconfidence bias negatively effects investment decision making in Pakistan.	Accepted
H3	Over optimism bias negatively effects investment decision making in Pakistan.	Accepted
H4	Relationship among self-attribution and investment decision making is significantly moderated by locus of control in Pakistan.	Accepted
H5	Relationship among overconfidence and investment decision making is significantly moderated by locus of control in Pakistan.	Accepted
H6	Relationship among over optimism and investment decision making is significantly moderated by locus of control in Pakistan.	Accepted

CONCLUSION AND RECOMMENDATIONS

The purpose of this study was to evaluate how biases that are connected to one another, locus of control, and investment decision-making in Pakistan are related. Self-attribution, overconfidence, and over optimism were

regarded as the independent variables in this study. Instead, the moderating variable was the locus of control. Making investment decisions, nevertheless, was taken into account as the dependent variable. The intended audience for the investigation on the link between the aforementioned factors has been determined to

be Pakistani investors. The respondents (Pakistani investors) were surveyed using an adopted structured questionnaire. A scale with a range of 5% of the significance level was devised to look at whether or not the study's hypotheses were accepted or rejected. Depending on the significance level, H1, H2, and H3 would either be accepted or rejected. The significant threshold for self-attribution, overconfidence, and over optimism for investment decision making was less than 0.05. As a consequence, the developed theoretical framework-based hypotheses (H1, H2, and H3) were acknowledged and proved to be pertinent. As a result, regression analysis demonstrates substantial association between Pakistani investment decision-making (dependent variable) and self-attribution, overconfidence, and over optimism (independent variables). The moderating influence of locus of control between self-attribution, overconfidence, and over optimism (independent variables) and investment decision making (dependent variable) in Pakistan has also been demonstrated using moderation analysis, accepting H4, H5, and H6.

The goal of this study was to examine how Pakistan's locus of control affected investment decisions by acting as a moderator. In order to collect information and assess the effects of each variable in this study on self-attribution, overconfidence, over optimism, locus of control, and investment decision making, the respondents (investors from Pakistan) were given an adopted structured questionnaire. Self-attribution, overconfidence, over optimism, and locus of control were empirically evaluated with regard to investment decision making to demonstrate the link and a negative association between them was discovered. While this is going on, correlation analysis has revealed that self-attribution, overconfidence, and over optimism were all adversely connected with investment decision making, respectively, with magnitudes of .446, .457, and .472. Furthermore, self-attribution, overconfidence, and over optimism (independent variables) are significantly correlated with investment decision making (dependent variable), according to regression analysis. Additionally, the Hayes Process was used to conduct a moderation

study to look at the moderating impact of locus of control. However, locus of control has a strong moderating influence on the association between self-attribution, overconfidence, and over optimism (independent variables) and investment decision making (dependent variable), as demonstrated by moderation analysis. The results of this study indicate that associated biases (self-attribution, overconfidence, and over optimism) have a detrimental impact on Pakistan's investment decision-making. While in Pakistan, the connection between behavioral biases (self-attribution, overconfidence, and over optimism) and investment decision making is strongly moderated by locus of control.

In this study, the majority of the aspects have been covered. To improve the efficacy of the research, it could be modified somewhat in the meantime. There may be room for improvement in the study's scope, sample size, type of research, etc. The time frame for conducting this study may be extended since allowing adequate time would enable the researcher to get information from respondents with various backgrounds. The population may respond to the questionnaire sent out for data collection with greater fervour if the researcher is given more time, which would increase the validity and dependability of the data acquired and reviewed. The present study additionally considered Pakistani investors because the researcher may use investors from a range of countries to gather data. To conduct a comprehensive, in-depth investigation, the sample size may also be increased. Only by extending the time frame provided for conducting this study can the sample size be increased. Last but not least, doing cross-sectional research hasn't gotten much attention from academics in the past. To assess this literature issue, the researcher can do a longitudinal study in the future.

REFERENCES

- Andersen, S., Hanspal, T., Martinez-Correa, J., & Nielsen, K. M. (2020). Beliefs and Behavioral Biases. *Available at SSRN*.

- Areiqat, A. Y., Abu-Rumman, A., Al-Alani, Y. S., & Alhorani, A. (2019). Impact of behavioral finance on stock investment decisions applied study on a sample of investors at Amman stock exchange. *Academy of Accounting and Financial Studies Journal*, 23(2), 1-17.
- Asad, H., Khan, A., & Faiz, R. (2018). Behavioral Biases across the Stock Market Investors: Evidence from Pakistan. *Pakistan Economic and Social Review*, 56(1), 185-209.
- Ateş, S., Coşkun, A., Şahin, M. A., & Demircan, M. L. (2016). Impact of Financial Literacy on the Behavioral Biases of Individual Stock Investors: Evidence from Borsa Istanbul. *Business & Economics Research Journal*, 7(3).
- 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, 319-328.
- Baker, H. K., Kumar, S., & Goyal, N. (2019). Personality traits and investor sentiment. *Review of Behavioral Finance*.
- Baker, H. K., Kumar, S., Goyal, N., & Gaur, V. (2019). How financial literacy and demographic variables relate to behavioral biases. *Managerial Finance*.
- Bodnaruk, A., & Simonov, A. (2015). Do financial experts make better investment decisions?. *Journal of financial Intermediation*, 24(4), 514-536.
- da Silva, E. M., Ramos, M. O., Alexander, A., & Jabbour, C. J. C. (2020). A systematic review of empirical and normative decision analysis of sustainability-related supplier risk management. *Journal of Cleaner Production*, 244, 118808.
- De Bortoli, D., da Costa Jr, N., Goulart, M., & Campara, J. (2019). Personality traits and investor profile analysis: A behavioral finance study. *PLoS one*, 14(3), e0214062.
- Filbeck, G., Ricciardi, V., Evensky, H. R., Fan, S. Z., Holzhauser, H. M., & Spieler, A. (2017). Behavioral finance: A panel discussion. *Journal of Behavioral and Experimental Finance*, 15, 52-58.
- Flick, U. (2015). *Introducing research methodology: A beginner's guide to doing a research project*. Sage.
- Hadbaa, H., & Boutti, R. (2019). Behavioral Biases Influencing the Decision Making of Portfolio Managers of Capital Securities and Traders in Morocco.
- Hrnjic, E., Reeb, D. M., & Yeung, B. (2019). Financial decisions, behavioral biases, and governance in emerging markets. In *The Oxford Handbook of Management in Emerging Markets* (p. 161). Oxford University Press.
- Jain, R., Jain, P., & Jain, C. (2015). Behavioral biases in the decision making of individual investors. *IUP Journal of Management Research*, 14(3), 7.
- Kafayat, A. (2014). Interrelationship of biases: effect investment decisions ultimately. *Theoretical & Applied Economics*, 21(6).
- Khan, Y., Khan, A. W., Shah, M., & Rehman, D. S. U. (2018). Heuristic and Biases Related to Financial Investment and the Role of Behavioral Finance in Investment Decisions: A Case Study of Pakistan Stock Exchange.
- Koestner, M., Loos, B., Meyer, S., & Hackethal, A. (2017). Do individual investors learn from their mistakes?. *Journal of Business Economics*, 87(5), 669-703.
- Kumar, R. (2019). *Research methodology: A step-by-step guide for beginners*. Sage Publications Limited.
- Kumar, S., & Goyal, N. (2015). Behavioural biases in investment decision making—a systematic literature review. *Qualitative Research in financial markets*.
- McCusker, K., & Gunaydin, S. (2015). Research using qualitative, quantitative or mixed methods and choice based on the research. *Perfusion*, 30(7), 537-542.

- Mittal, S. K. (2019). Behavior biases and investment decision: theoretical and research framework. *Qualitative Research in Financial Markets*.
- Ngacha, S. W. (2019). *Influence of Behavioral Biases Influencing Individual Investments Decisions by University Students': A Case of United States International University-Africa* (Doctoral dissertation, United States International University-Africa).
- Nofsinger, J. R., Patterson, F. M., & Shank, C. A. (2020). On the physiology of investment biases: the role of cortisol and testosterone. *Journal of Behavioral Finance*, 1-12.
- Qasim, M., Hussain, R., Mehboob, I., & Arshad, M. (2019). Impact of herding behavior and overconfidence bias on investors' decision-making in Pakistan. *Accounting*, 5(2), 81-90.
- Raheja, S., & Dhiman, B. (2019). Relationship between behavioral biases and investment decisions: The mediating role of risk tolerance. *DLSU Business & Economics Review*, 29(1), 31-39.
- Rezaei, N., & Elmi, Z. (2018). Behavioral finance models and behavioral biases in stock price forecasting. *Advances in mathematical finance and applications*, 3(4), 67-82.
- Tuyon, J., & Ahmad, Z. (2016). Behavioural finance perspectives on Malaysian stock market efficiency. *Borsa Istanbul Review*, 16(1), 43-61.
- Zahera, S. A., & Bansal, R. (2018). Do investors exhibit behavioral biases in investment decision making? A systematic review. *Qualitative Research in Financial Markets*.

