

Impact of Behavioral Biases on Manager's Investment Decision-Making Process with Moderating Effect of Financial Literacy

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Article History:	ABSTRACT
Received: 29 Sep, 2022	Purpose: This study examines the impact of behavioural biases such as Overconfidence, representativeness, and Self-attribution on managers' investment decisions by using financial literacy as a moderator for the banking sector existing in less developed market Pakistan. The study used the financial literacy moderating factor.
Revised: 21 Nov, 2022	Design and Methodology: The data was collected through questionnaires. The population of this study consists of managers from the banking sector of Pakistan. The sample size consists of 200 respondent managers from different banks. The study used a descriptive summary, Structure Equation Model (SEM) technique, and Confirmatory Factor Analysis (CFA) to capture the results. The study also used the Alpha test, Correlations matrix, simple and linear regression model, etc.
Accepted: 13 Dec, 2022	Findings: Findings of this study show that factors of Overconfidence, Representativeness, and Self-attribution have a significant relationship with Managers' Investment Decisions in less developed markets in Pakistan. The study is implacable for managers, researchers, investors, other policymakers, etc. Implications: The study is implacable for managers, researchers, students, investors, other policymakers, etc. This study is implacable for the managers of the financial sector to make their investment decisions without biases. Finally, the study can be extended by adding some other behavioural biases, and also by making the markets survey for managers financial analysts, and investors' investment decisions. Keywords: <i>Behavioural Biases, Overconfidence, Representativeness, Self-attribution, Financial Literacy</i>

1. Introduction

In light of the existing body of literature, various researchers examined the determinants of investment decisions in the most advance, emerging, and developing markets. For instance, the research on traditional finance remained fully explored by many researchers in all markets. On the

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other hand, the problem needs to address, research on behavioral biases mainly remained less tapped. Furthermore, the research on individual investors and the influences of behavioral biases on investors' decisions making process in the developing market of Pakistan remained less explored. To fill this gap study tends to focus on overconfidence, representativeness, and self-attribution behavioral biases that influence investors' decision-making process. The study also added financial literacy as moderating factor to examine the investor's decision under uncertainty.

A paradigm shift exists in the historical background of traditional finance to behavioral finance. For instance, behavioral finance is a new trend and an addition to the theoretical background of traditional finance. The concept of traditional finance started in the 1930s with the theory of investment, later on from the 1950s to the 1970s major theories of traditional finance were highlighted. Additionally, a new trend in finance takes place in how individual investors evaluate gains and losses under the assumptions of the Prospects Theory (Tversky and Kahneman 1974). This contribution is different the traditional finance and behavioral finance. The major difference between traditional finance and behavioral finance is to think rationally in traditional finance and irrationally from a behavioral perspective. In the concept of traditional finance, people are rational and make judgments or decisions through rational thinking. In contrast, behavioral finance is relatively a new trend in finance, it tends to focus on investors' emotions, psychological thoughts influences, and irrational decisions making processes. People make decisions and often try to use mental shortcuts. In the behavioral finance concept, people don't think rationally, they use biases and a shortcut way to reach the final judgment.

The major biases included self-attribution, over-confidence, representativeness, etc. mainly people use in decisions making. Benartzi and Thaler (1995) argued that "the strongest result identified by psychological research is overconfidence, in which investors overestimate the accuracy of information probability with success and capabilities. Barber and Odean (2001) explain that investor confidence shows their pride in their beliefs and ignores any belief in rational investors, which will be a difference of opinion and an increase in the volume of transactions. Tversky and Kahneman (1974) defined "representative is a mental short the tendency to with irrationally attribute characteristics to inferring another. Furthermore, another definition reported by (Shefrin 2001), "Heuristic representativeness is a stereotype in nature serve to do quickly but in irrational judgment". The efficient market is the market in which average results cannot be higher than those justified by its risk, despite the applied investment strategy" (Barber and Odean 2001). Markowitz (1952) suggested the portfolio's Modern Theory decision maker finds alternative options for investments and compares them to establish relationships in these elections. According to the Efficient Market Assumptions (EMH), all investors are not rational, but markets should be rational. Despite this theory, behavioral finances suggested that sometimes markets are not efficient in information (Ritter 2003).

In the light of traditional finance theory, it is assumed that individual investors should be rational when making investment decisions with the deliberation of ideal earnings. In contrast

according to Tversky and Kahneman (1974), prospect theory explained that investors' behavior is influenced by various biases irrationally. Various researchers explored that people decide irrationally, mainly the investors act irrationally investing in the stock market (Elton, Gruber, et al. 2011). According to Rubaltelli, Tedaldi et al. (2020) investors used cognitive skills rather than technical to make uncertain decisions regarding investment. Cheng, Kondo, et al. (2007) reported that people are irrational in decision-making in behavioral finance. Various theories supported the biases that influence the investment decision. Previous studies also argued that investors who have no capital market information remain outside and make decisions based on their colleagues' proposals. Kratini and Katiaya (2021) checked the impact of behavioral biases on individual investors' investment decisions in Indonesia. The study included anchoring bias, herding, overconfidence, and representativeness as explanatory factors representing the behavioral factors.

This study describes the most imperative bias, i.e., the self-attribution bias with the moderating role of financial education. Shefrin (2001) worked with behavioral biases and investment decisions in India. They also added the financial literacy accordance with, financial literacy is the ability to evaluate, analyses, recognized, and communicate on stock market investment. However, an investor's financial literacy is all about understanding, awareness, and information regarding effective investment decisions. Some researchers take bias-based investment decisions due to a lack of financial, economic, and behavioral knowledge, risk diversification, and inflation (Jappelli and Padula 2013). Investors must take effective decisions by gaining sufficient knowledge and skills. For this purpose, financial literacy can affect a mechanism of investment decisions and helps the investor to make an unbiased investment decision (Van Rooij, Lusardi, et al. 2011). This study contributing by focusing on financial education as a moderator has not been proven in the existing body of literature. A few studies were conducted in less developing markets including Pakistan on behavioral biases, in contrast, the moderator factors remain less explored. The objective is to discover the effect of overconfidence, representativeness, and self-attribution bias on the investment decision-making process with the moderating role of financial literacy in the banking sector of Pakistan. The consequence of these biases on the investment decision-making process can be strengthened or weakened because of the investor's monetary information. In the light of the background of the study, various researchers examined the relationship between investment decisions and behavioral biases, but still, a gap exists to add a new moderator and mediator factors to avoid irrational decisions.

The main aim of this study is to examine the behavioral biases' impact on managers' investment decisions. The study also added financial literacy as moderating factor for the managers of developing market Pakistan. The mediating role of financial literacy is to examine the impact on individual investors' investment decisions. The objectives of this study firstly, to examine the impact of overconfidence on investor behavior in developing market Pakistan. Similarity, the second objective is the influence of representativeness on investor behavior in developing market Pakistan. Thirdly, to check the impact of self-attribution on investors' behavior

in developing market Pakistan. Finally, studies also tend to examine the moderating role of financial literacy between overconfidence, representativeness, self-attribution, and investors' behavior.

2. Literature Review

In the light of the existing body of literature, the traditional vs. behavioral finances arguments are vice versa i.e. traditional finance suggests to investors increase performance by making some rational decisions supported by expected utility theory (Savage and Roberts 1975). In contrast, behavioral finance recent or modern perspective argued that an investor's decisions can influence by irrational thinking based on cognitive and psychological factors (Kahneman and Tversky 1979; Ritter 2003). Most recent number of researchers examined the cognitive, behavioral factors with financial literacy, financial acuity and other mediating factors to influence the investment decision of investors. Especially from developed market researchers used financial literacy as moderator, some other also used as independent variable. Another evidence found from US market to examine the influence of behavioral and cognitive factors on traders decisions rather than investors (Czaja and Röder 2020; Ahmed et al. 2022; Hsu et al. 2021; Hsu 2022). For instance in context of Pakistan recently Zulfiqar et al. (2022) examined the cognitive factors and other behavioral biases influences on investment behavior.

According to Thales (1994), financial markets contain two types of investors rational and irrational who take decisions based on their predictions. Tversky (1972) reported that individuals not only focus on mental accounting but also carefully analyze the decision-making, they behave differently, when they have more than alternatives and make decisions. It stated that several researchers reported the importance of behavioral finance in financial markets. Some recent evidence has also been found to examine the behavioral biased and other psychological factors that influence an investment decision. Behavioral finance is a new trend in a finance perspective, recently a group of researchers examined the behavioral biases that influence investment decisions. Mainly the research on behavioral biases remain tapped in developed markets for example (Tversky 1972, Worthington, Ram, et al. 2006, Pairojana, Phasuk, et al. 2021).

Zahid (2021) worked on the moderating effects of financial literacy in Pakistan. They found that financial literacy has a positive significant impact on investors' decisions making. The study was conducted including financial behavior and financial attitude influences on investor's decisions making. For instance, financial literacy was also added as a moderator. The findings are linked with the output of Prospect Theory represented by (Tversky 1972). Lack of financial literacy may cause bad decision-making with terrible results. Financial knowledge has some importance for all humanity living and facing economic barrier, attractiveness, growing behavior, and causative to bigger liquidity for the economic market places. In contrast, financial literacy gives information about all products existing in financial markets, income dangers, and making

the right decisions. Finally, it can be said that financial literacy changes the behavior of investors their attitudes, and beliefs and also creates strong trust among them. Zahid et.al. (2021) investigated the less-developing market in Pakistan, and they suggested that the financial literacy of the public needs to increase so that people tend to focus on high investment in financial markets with financial information that leads to helping the economic growth of Pakistan.

Studies with positive findings showed that individual investors especially managers in the banking sector have much knowledge of financial literacy. The culture and societal system of Pakistan engage the investors to decide on other strains of private information. Similarly, Worthington, Ram, et al. (2006) argued that it is similar to understanding the economic situations and events that influence investment decisions. For instance, in the light of the existing body of literature, researchers measured financial literacy utilizing financial knowledge and behavior, financial attitude, and outlets of financial dimensions (Agarwal and Karim 2015). Furthermore, a few pieces of evidence also found some other markets like India, China, Bangladesh, etc. Pairojana, Phasuk, et al. (2021) directly checked the impact of financial literacy and behavioral biases on investors' investment decisions. The findings of this study show that investors have a greater level of behavioral biases during their investment decisions in the Indian market. These behavioral biases exist in investors' attitudes due to a lack of technical skills, and effective and analytical decisions making. For instance, financial literacy can play a vital role to assimilate this irrational behavior and make effective decisions to attain the target profit. Finally, both financial literacy and behavioral biases involve governing investment decisions, especially for individual investors. Financial literacy guides investors to seek investment effective decisions, similarly, behavioral biases provide simple and meaningful ideas about the individual investor's investment decisions.

Djou and Lukiastuti (2021) worked on the determinants of individual investors' investment decisions. They added the financially reported as moderator and other explanatory factors such as financial attitude and financial self-efficiency in the model. The study found that due to a low level of financial literacy the individual makes wrong investment decision that leads to losses. As mentioned in previous literature the Prospect theory also highlighted the evolution of profit and losses from a behavioral perspective. Finally, the findings are supported from a theoretical perspective. Furthermore, the findings of behavioral biases including financial attitude and financial self-efficiency show that investors have a great level of behavioral biases during their investment decisions. According to Fellner (2009), the investor has an overweight of the selected choices of the options available in which he likes them fundamentally. Tabak (2008) elaborated that people who agreed to invest equivalently in both situations can control or can't control. In the light of the existing body of literature, various observed the impact of behavioral biases on investors' investment decisions. Self-attribution and overconfidence are the major decisions. It represents the natural tendency to behave in a particular way that people to entitlement an irrational credit degree for their achievement and the irrational disowning of accountability for disaster

Heider (1958). Various other groups of researchers explained that management and people take credit for positive consequences and lead to negative results to be external factors (Miller and Ross 1975, Larwood and Whittaker 1977, Shkedy, Vandersmissen, et al. 2005). However, Phan, Hassink, et al. (2015) reported in a study that management attributes the company's better performance, and refuses to take responsibility for the weak performance. Based on traditional finance, the financial output can be used as an important buffer to reduce the likelihood of a partial decision and helps investors to make rational decisions. Investors knowing the financial markets can take better investment decisions regarding their future investments. For instance, investors have less knowledge about financial markets leads to bad investment decisions.

2.1 Overconfidence Bias and Investment Decision-Making Process

Investors deal with the first information that leads to misleading choices, maintain their positions even if they do not achieve a profit, and lose how to keep their level of trust constant (Odean, 1998). Another measure of hazard is when people deliberate themselves better and better than others "(Larrick, Burson & Soll, 2007) Too many people overestimate what they are not and underestimate what they are (Malcolm S. Forbes). Soll (2007) highlighted that due to overestimation of investors' ability, they think they make a better decision but in reality, they did not. There are two main implications of excessive confidence compared to the investor's point of view, one is the lack of generalization of information and the second is to make further transactions due to this failure (Shefrin, 2000).

2.2 Representativeness Bias and Investment Decision-Making Process

The human attitude of representativeness can influence investment decisions. The scale of the representatives affects the decision-making process of the investors and therefore affects the prices of the shares (Hirshleifer, 2001). An investor may consider a single factor and ignore others to the growth of a company's actions thus can react irrationally and react in an exaggerated way (Antunovich and Laster, 1998). People appreciate the most relevant evidence and try to companion that material with the achievement or failure of the company by ignoring other factors that may be more important to make a rational decision (Kirs, Pflughoeft, and Kroeck, 2001). Kim and Byun (2011) described that due to representativeness investors tend on a small sample from the entire population, disregarding the sample size and eventually also ignoring the law of possibility. Investors frequently participate in stocks that have abnormal high returns in the near past and the investor selects such securities due to the representational bias (Dhar and Kumar, 2001).

2.3 Self-Attribution Bias and Investment Decision-Making Process

An in-depth investigation was conducted after the development of prospect theory to highlight the behavioral biases that can influence the individual in decision-making regarding their investment. Similarly, after representative biases, self-attribution bias is also an important distortion that can influence individual investment decisions. Several studies explained the

relationship of self-attribution with investment decisions. Some researchers elaborated that people and management claim take credit for positive consequences and leave or linked the negative outcomes with external factors (Miller and Ross 1975; Bradely 1976; Clapham and Schwenk 1991; Aerts 2005). Hassink et.al. (2012) reported that management often refuses the poor performance of the company and attributes its good performance. People emit the selfish attribution bias and attribute the factors to failure and success (Sweeny 2008). Managers, when they make merger and acquisition decisions, turn them into excess of trust, which results in a self-attribution bias that lends itself (Doukas and Petmezas, 2007). The investment decisions of the organization's managers are distorted by their attribution biases as they make decisions about acquisitions and other decisions. Rennekamp (2012) said that managers underestimate external factors and overestimate the internal factors while making investment decisions. Another study conducted on 20 participants suggested that factors of success and failure of people are the factors (Krusemark, Keith, and Clementz, 2008). The management refused to take the failure responsibility and takes its positive results on company performance (Clapham & Schwenk, 1991). Hales (2007) argued that people cc that is usually linked with its positive consequences. Individuals in investing decisions are taken from selfish attribution bias.

2.4 Financial Literacy and Investment Decision-Making Process

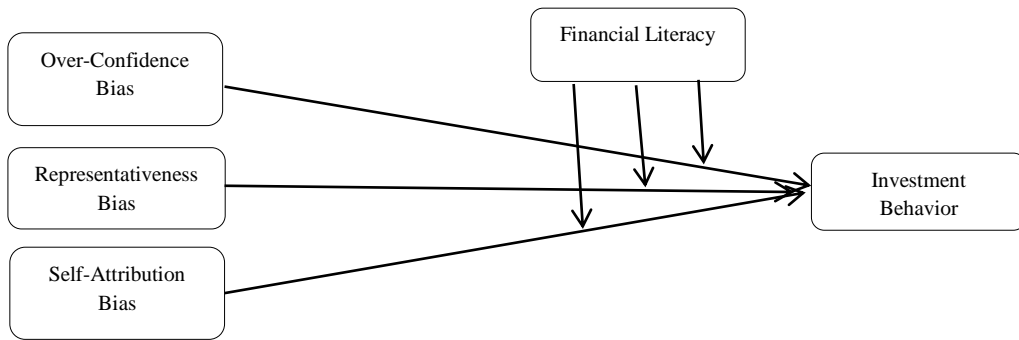
People can make better decisions if they have sufficient knowledge about financial matters and their instruments. In contrast, people who don't have sufficient knowledge of financial matters can't take better decisions. According to Jappeli and Padula (2013), most people don't have basic knowledge of behavioral finance, economics, diversification, inflation, and finance, they are more likely to fall into biases than investment. Financial information helps to investors make empirical decisions regarding investment, it also influences the investment decision mechanism and reports that those who do not know the capital market reduce in margin and take decisions based on suggestions from other people (Alessie et.al. 2007). Various researchers reported that financial literacy helps the stockholders to make better decisions about allocating and managing resources to maximize performance (Zahid 2021; Phasuk et al. 2021; Djou and Lukiastuti; 2021). Low literacy levels will cause adverse resource allocation, lower yield management, and increased risk maximizations (Oldfield, 2007). A group of researchers reported the positive influence of financial information on investment decisions and helps individuals to get a high ROI i.e. (Lusardi & Mitchell, 2007, Lusardi, Mitchell, and Curto, 2010; Jappeli & Padula, 2013 Czaja and Röder 2020;Ahmed et al. 2022).

2.5 Overconfidence

Representativeness, Self-Attribution Bias, Investment Decision Making Process and Moderation Role of Financial Literacy. Over-confidence is related to people in their judgment; these people underestimate the limitations of errors likely to be committed (Shiller, 1997). Investment decisions can be influenced by representative bias (Hirshleifer, 2001). Kahneman and

Tversky (1979) argued that investment decisions are influenced by many other biases. Investment decisions of managers about acquisitions and mergers are also influenced by attribution biases (Doukas and Petmezas 2007). Mitchell and Curto (2010) argued that people who have financial knowledge can make better investment decisions and maximize their wealth. It is stated that the decisions can be better if individuals have greater knowledge about the financial instruments and financial markets or vice versa. Finally, financial literacy plays a vital role in reducing the impact of psychological biases in investment decisions.

2.6 Theoretical Framework



- H1;** There is positive significant relationship between overconfidence and the manager's investment decision-making process.
- H2;** There is positive significant relationship between representativeness and the manager's investment decision-making process.
- H3;** There is positive significant relationship between self-attribution bias and the manager's investment decision-making process.
- H4:** Financial literacy moderates the relationship between overconfidence, representativeness, self-attribution and the manager's investment decision-making process.

3. Research Methodology

This section briefly presents the target population, survey instrument, sampling design, and data collection method. The research is qualitative and used questionnaires to collect the data from the banking sector.

3.1 Survey Instrument

The questionnaire used in this paper was adopted from previous studies. The instrument has two sections in which section 1 explains the demographic information of respondents and

section 2 explains the variables and their items. The second variable representativeness has three items adapted from Chun and Ming (2008). The third variable, self-attribution bias has five items adapted from the paper by Greenberg, Pyszczynski, and Solomon (1982). The fourth variable, the manager's investment decision-making process has seven items adopted from Hira and Loibl (2008). The fifth and last variable of the research, financial literacy has seven items adopted from Cude et al (Zahid 2021; Pairojana, Phasuk, et al. 2021; Djou and Lukiastuti; 2021). Age, gender, qualifications, and experience were used as control variables and with the help of one-way ANOVA, these control/demographic factors were analyzed.

3.3 Sampling Design

The study used a convenient sampling technique for data collection. A sample of 200 respondents was asked to take part in filling the questionnaire and all questionnaires were selected. The data was collected through convenience sampling. The purpose of the study and questions were explained to the respondents before giving them the questionnaire, so they were easily able to fill the questionnaire. Data was collected through structured questionnaires and then analyzed the same by Skewness, kurtosis, mean, median, and standard deviation in a descriptive summary. Similarly, a correlation matrix is also used to examine the correlation between independent variables. The items of each latent variable are confirmed by the structural equational model. Factors that show less than the standard values will be excluded from the measurement. On the other hand, each factor will be included within the acceptable range. The study also applied linear and multiple regression to examine the cause and effects relationship between independent variables to dependent factors. The linear regression model is also applied to examine the fitness of the model. The study also used the structural equational model, Measurement of Latent Variables (Elements or items). Relevant items are confirmed by using CFA.

4.1 Reliability Test

Table 1: Reliability Statistics

Variables	Cronbach's Alpha	N. of Items
Overconfidence	.881	7
Representativeness	.711	6
Financial Literacy	.735	7
Self-attribution	.719	5
Investment Decisions	.768	7

The above table included behavioral biases as independent factors used in this study. Alpha test for all factors shows that the reliability is greater than 70% for every factor. According to the above results, Cronbach's Alpha for overconfidence is .881, representativeness .711, financial

Literacy .735, self-Attribution .710, and investment decision is .768. However, the number of items for mentioned factors are as follows, overconfidence 7, representativeness 6, Financial Literacy 7, self-Attribution 5, and investment decision 7. These are further items used for construct variables. It is summarized in the light of the above discussions that the standard value of reliability is above 70%. Under the above discussions, there is no single value that is less than 70%. It is stated that reliability in all mentioned factors exists. For instance, overconfidence showed the highest value with .881, which means the reliability exists highest in overconfidence. The study also reported the descriptive summary including, mean, median, minimum, maximum, mode, standard deviation, kurtosis, sequences, etc. The details for each factor in as follow.

A descriptive summary is used to examine the behavior of data. The mean, median, mode, and standard deviation show the behavior. For example, a medium always exists between the minimum and maximum values. It indicates the range of minimum to maximum values.

4.2 Descriptive Summary

Table 2: Descriptive Statistics

	N	Min. Stat.	Max. Stat.	Mean Stat.	Std. Dev. Stats	Skewness Stats	SE	Kurtosis Stats	SE
Demographics (gender)	200	1.00	2.00	1.6750	.46955	-.753	.172	-1.448	.342
Demographics (age)	200	1.00	4.00	1.8800	.95402	.804	.172	-.380	.342
Demographics(qualification)	200	4.00	8.00	4.8400	.92122	1.181	.172	1.271	.342
Demographics (Experience)	200	1.00	4.00	1.9200	.88175	.513	.172	-.748	.342
Demographics (Income)	200	1.00	9.00	4.0400	2.61007	.340	.172	-1.112	.342
Valid N (listwise)	200								

Descriptive summary of the demographic factors including age, gender, education, and experience reported in the above table. Firstly, the total number of respondents shown in the output is 200. The minimum value is 1 and the maximum value is 9 reported. The mean value for gender is 1.6750, age is 1.8800, qualification 4.8400, experience 41.92, and income 4.0400 respectively. However, standard deviation shows the risk in factors. As mentioned in the above table the standard deviation of gender is .46955, age .95402, qualification .92122, experience .88175, and std. the deviation is 2.61007. Finally, the results for Kurtosis and sequences are as follows.

The above table also explains the Skewness and Kurtosis Statistics. Results indicate that the values of Skewness and Kurtosis Statistics are within limits or near about 3. Furthermore, to check the issue of multicolenarty study also used a correlation matrix table. The details and critical analysis are given below. A test of the correlation matrix is used to examine the correlation among independent variables. The standard value of the highest correlation among explanatory factors is

(0-1). For instance, if the value in the correlation matrix table exists more than .70%, it indicates the issue of multicolenarty among variables. The issue of multicolentry means both factors are used for the same purposes are have similarities more than limits. The results of this study showing a correlation matrix are as follows.

4.3 Correlation Matrix

Table 3: Correlation Statistics

	OC	REPS	FL	SELFA
OC	1			
REPS	.229**	1		
FL	.369**	.456**	1	
SELFA	.468**	0.1	.324**	1
	0.00	0.00	0.00	0.00
	199	200	200	200

OC_Overconfidence, REPS_Representativeness FL Financial Literarcy SELFA Self Attribution

As shown in the above table correlation between explanatory factors is reported. The major behavioral biases like Overconfidence, Representativeness, Self-attribution, and financial literacy were added to the model to examine the correlation among each other. The output of the above table shows that overconfidence and representativeness correlate with .229, Overconfidence with financial literacy .369, and overconfidence with self-attribution is .468 respectively. Similarly, representativeness correlates with financial literacy by .456, with self-attribution by .160. Finally, financial literacy correlates with overconfidence with .369 and the correlation with self-attribution is .324.

It is summarized in the light of the above discussion that the highest value in the table among the behavioral factors is .468. It is among self-attribution and overconfidence. In contrast, the standard value to report the issue is more than 70%. It indicates that there is no single value that is greater than 70%. Finally, there is no issue of multicolentry existing among the factors.

4.4 Model Summary

The model summary indicates the fitness of the model consisting of explanatory variables combination. It includes R, R square, adjusted r square, Durbin Watson, etc.

Table 4: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.651 ^a	.423	.414	3.67476	1.493

a. Predictors: (Constant), SELFA, REPS, OC
b. Dependent Variable: INV

The study also reported the model summary as shown R is .651 it shows the regression power. Secondly, R-square is .423 it shows the power of explanatory factors to explain dependent variables. It means with the capacity of 42% explanatory factors explaining the dependent variable in this study. Similarly, the adjusted R square is .414 which is less than R-square. It shows the statistical change in factors.

The value of D-Watson is 1.493.

4.5 ANOVA results

Table 5: ANOVA

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	1932.751	3	644.250	47.709	.000 ^a
	Residual	2633.249	195	13.504		
	Total	4566.000	198			

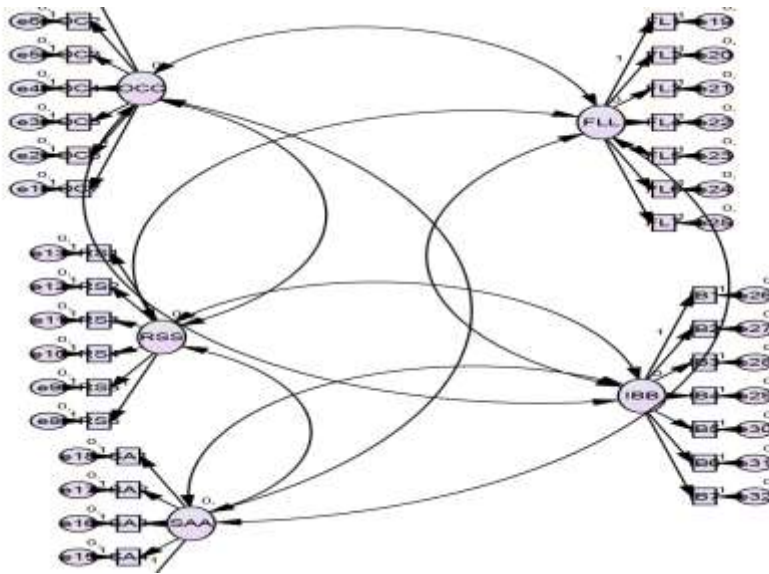
a. Predictors: (Constant), SELFA, REPS, OC
b. Dependent Variable: INV

ANOVA test is used to check the possibility of Regression. The probability of ANOVA results is significant at the 99% level. It indicates that the regression on the data set is applicable. However, the study used regression analysis to examine the cause and effects relationship between explanatory factors to the dependent variable. The F –statistics of independent factors is 47.709, which indicates that the explanatory factors better explain the dependent variable. However, the linear relationship between behavioral biases and managers' investment decisions is highly significant i.e., the probability is (0.000 significant at a 99% level).

4.6 CFA by AMOS

We used Confirmatory Factor Analysis (CFA) by using AMOS for the determinants of investors' investment decisions i.e., behavioral biases overconfidence, representativeness, self-

attribution, and financial literacy as moderator factors. To assess the fitness of the model the Chi-square, IFI, CFI, TLI, and RMSEA were used as measurement indicators. The values of X-square are 2.436 less than 3. Considered good, similarly, the d.f. is 2.647 also less than 3. However, the CFI and GFI are greater than .95. Finally, RMSEA is less than 0.05 or 5%. All these measurement models provide excellent values and show the fitness of data. The table below included the results captured by AMOS software and also added the discriminant validity and Confirmatory Factor Analysis.



4.7 Measurement Model

Seeking the determinants of investors' investment decisions in Pakistan, this research investigated the relationship between various biases and investment decisions including some further items. To check the fitness of the model following outputs are reported. Accordance with the fitness of the model is reported as compared to standard values i.e. chi-square and df less than 3, CFI and GFI should be greater than .95, RMSEA less than 5% respectively.

Table 6

Model	Factors	X2	df	X2/df	RMSEA	IFI	TLI	CFI
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	Five	2.64	0.9202		0.97	0.93	0.97
Baseline Model	Factors	2.436	7	9	0.0165	6	3

Comparative Fit Index (CFI), Tucker Lewis Index (TLI), Incremental Fit Index (IFI), and Root Mean Square Error of Approximation (RMSEA). Value for Comparative Fit Index (CFI) is 0.973, Tucker Lewis Index (TLI) 0.933, Incremental Fit Index (IFI) 0.976, and Root Mean Square Error of Approximation (RMSEA) is 0.165 is less than 5% or 0.05. It is summarized that all values are in an acceptable range and show the fitness of the model.

4.8 Regression

Table 7: Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	T	Sig.
1	(Constant)	4.753	1.846		2.574	.011
	OC	.320	.048	.418	6.637	.000
	REPS	.437	.074	.329	5.882	.000
	SELFA	.108	.050	.133	2.156	.032

a. Dependent Variable: INV

The dependent variable in this study is investment decisions and other explanatory factors are behavioral factors including Overconfidence, Representativeness, Self-attribution, and financial literacy. For instance, financial literacy is used as a moderator factor. The study reported OLS regression to examine the cause and effects relationship between behavioral factors and investment decisions in Pakistan.

According to the above results, the sign of the coefficient for overconfidence is positive with .320 and its probability is significant with .000 or a 99% level of significance. It indicates that overconfidence has a significant relationship with investment decisions in Pakistan. It can be said that overconfidence biases exist among Pakistani managers during making an investment decision. Similarly, the sign of the coefficient for representativeness is .437 and its probability is significant at a 99% level. It indicates that there is significant relationship exists between representativeness and investment decisions of managers in Pakistan. The managers used representativeness bias during investment decisions.

Finally, the sign of the coefficient for self-attribution is .108 and its probability is significant with .032 or a 95% level of significance. It indicates that there is significant relationship

exists between managers' self-attribution and their investment decision. It can be said that managers used self-attribution or consider their decision always better. The self-attribution biases also exist in the manager's attitude, especially in the Pakistani banking sector.

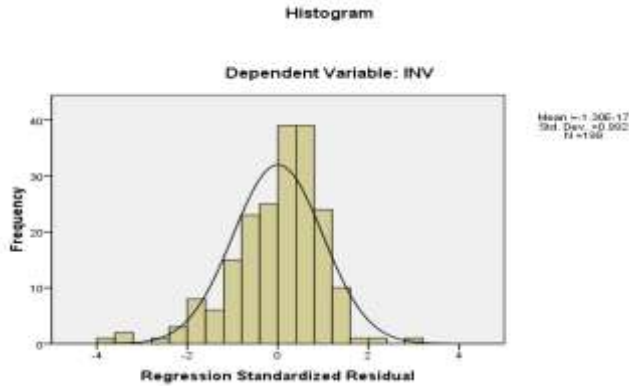
4.9 Evaluation of Moderator Affects (Financial Literacy as Moderator factor)

Table 8:

Moderator Path	Effects	t	SE	LLCI	ULCI	P_VALUE	Hypothesis Accepted /Rejected
FL	SELF	1.97	0.1275	18.8770	21.3353	0.0001	Accepted
FL	REPS	1.98	0.144	39.76	49.65	0.0002	Accepted
FL	OC	1.96	0.155	16.492	34.545	0.0001	Accepted

The above table shows the moderator effects of financial literacy on investment decisions. The moderator role of financial literacy along with representativeness, self-attribution, overconfidence, etc. The sign of the coefficient for self-attribution is positive at 20.7995 and its probability is significant. The LLCI and ULCI values are 18.8770 and 21.3353 respectively. Financial literacy is used as a moderator factor in the model. As shown in the above results the R square is .3242 and its probability is highly significant. It indicates that the self-attribution and investors' investment decisions are influenced by the moderating role of financial literacy. Financial literacy influenced positively the relationship between self-attribution and investment decisions. Finally, T is greater than 1.96 and the hypothesis is accepted. It is finalized that financial literacy has significant moderator effects to examine the relationship between self-attribution and investment decisions. Similarly, financial literacy also influenced the relationship between representativeness and investment decisions positively. R square is .4565 it indicates the power of the factor to explain its dependent variable. The sign of the coefficient for self-attribution is positive at 20.7995 and its probability is significant. The LLCI and ULCI values are 39.76 and 49.65 respectively. Financial literacy is used as a moderator for the relationship between representativeness and investment decision. The p-value is < 5% significant and t is < 1.96 respectively. Financial literacy is used as a moderator factor in the model. As shown in the above results the R square is .3242 and its probability is highly significant. It indicates that the self-attribution and investors' investment decisions are influenced by the moderating role of financial literacy. Financial literacy influenced positively the relationship between self-attribution and investment decisions.

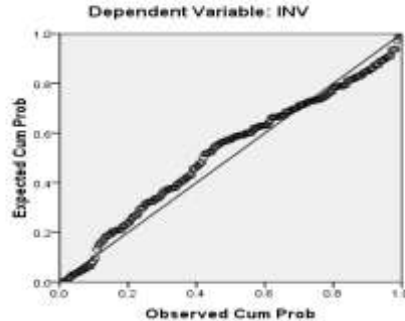
4.10 Linear Model



Above the bell, the shaped diagram shows the normal distribution of data. It indicates the normal distribution of data. The bell shape representation of data is acceptable to evaluate the influences among various factors. As shown in the above shape the data is normally distributed.

4.11 Linear Line

Normal P-P Plot of Regression Standardized Residual



The line shows the goodness of the data. The data is in line with the 5% range. The deviations are normal it indicating that the data is fit for analysis.

5. Discussions

The findings of this study show that major independent variables of behavioral biases including Overconfidence, Representativeness, and Self-attribution have a significant relationship with managers’ investment decisions in Pakistan. The behavioral biases consist of further elements that indicate that all managers have some behavioral biases during their investment decisions. The

significant relationship of behavioral biases indicates their business in managers' attributes, behavior, and decisions regarding investment in financial markets. For instance, financial literacy is used as a moderator factor. Mitchell and Curto (2010) argued that people who have financial knowledge can make better investment decisions and maximize their wealth. Findings show that financial literacy moderates the relationship between independent factors and investment decisions. Findings of this study fully support with the arguments of previous literature. The findings relate with the arguments of Shiller, (1997) over-confidence is related to people in their judgment; these people underestimate the limitations of errors likely to be committed. Investment decisions can be influenced by representative bias (Hirshleifer, 2001). Kahneman and Tversky (1979) argued that investment decisions are influenced by many other biases. Investment decisions of managers about acquisitions and mergers are also influenced by attribution biases (Doukas and Petmezas 2007).

In short financial literacy has a significant association to moderate the explanatory factors with dependent variables. The study reported examines the relationship between behavioral factors and investment decisions in Pakistan. According to the above results, the sign of the coefficient for overconfidence is positive and its probability is significant. It indicates that overconfidence has a significant relationship with investment decisions in Pakistan. It can be said that overconfidence biases exist among Pakistani managers during making investment decisions.

Similarly, the sign of the coefficient for representativeness is positive and its probability is significant. It indicates that there is significant relationship exists between representativeness and investment decisions of managers in Pakistan. The managers used representativeness bias during investment decisions. They target a few samples and make self-attribution on the other hand this brings biases in decisions making. Finally, the sign of the coefficient for self-attribution is positive and its probability is significant. It indicates that there is significant relationship exists between managers' self-attribution and their investment decision. It can be said that managers used self-attribution or consider their decision always better. The self-attribution biases also exist in the manager's attitude, especially in the Pakistani banking sector.

5.1 Implications

The study is implacable for managers, researchers, students, investors, other policymakers, etc. This study is implacable for the managers of the financial sector to make their investment decisions without biases. It can be implemented to reduce biases during the investment decision process for other organizations. The study is implacable for managers, researchers, students, investors, other policymakers, etc.

5.2 Limitations and future Recommendations

This study has some limitations like conducting for less developing markets and checking the behavioral influences on managers' investment decisions. This study has some limitations like

conducting for less developed markets and checking the behavioral influences on managers' investment decisions. Finally, the study can be extended by adding some other behavioral biases, and also by making the market survey for managers' and investors' investment decisions. The study enhances the behavioral biases that influence managers' investment decisions in Pakistan. The study can be extended by adding some other behavioral biases, making across the markets survey for managers and investors' investment decisions for other organizations.

6. Conclusion

It is concluded that this research tends to examine the influence of behavioral biases on managers' investment decisions by using financial literacy as a moderator for the banking sector existing in less developed markets in Pakistan. The dependent factor is the manager's Investment decision and other explanatory factors are Overconfidence, representativeness, and Self-attribution. The study also added financial literacy moderating factor. Findings of this study show that factors of Overconfidence, Representativeness and Self-attribution have a positive significant relationship with Managers' Investment Decisions in developing market Pakistan. The study is implacable for managers, researchers, students, investors, other policymakers, etc. This study is implacable for the managers of the financial sector to make their investment decisions without biases. It can be implemented to reduce biases during the investment decision process for other organizations. The study is implacable for managers, researchers, students, investors, other policymakers, etc. This study has some limitations like conducting for less developing markets and checking the behavioral influences on managers' investment decisions. Finally, the study can be extended by adding some other behavioral biases, and also by making the market survey for managers' and investors' investment decisions. The study enhances the behavioral biases that influence managers' investment decisions in Pakistan. The study can be extended by adding some other behavioral biases, making across the markets survey for managers and investors' investment decisions for other organizations.

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