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# Behavioral biases affecting investors' financial decisions - A study of a sample of individual investors in Relizane (Algeria)

## GHALMI Ettayib \*1, BOUDJERFA Bennacere 2

<sup>1</sup> Mustapha Stambouli University, Mascara, Algeria, ghalmitayeb@gmail.com
<sup>2</sup> University of Maghnia, Algeria, benasser@gmail.com

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#### **Abstract:**

This paper aims to analyze the impact of behavioral biases (emotional and cognitive) on the financial decisions of investors and owners of institutions or their representatives in the decision-making (financial managers or managers), by developing a questionnaire according to the scale of the Likart five and distributed to the study sample.

Using regression models, we found a statistically significant relationship between emotional biases and financial decisions at a level of 0.01, We also found no statistically significant relationship between cognitive biases and financial decisions of investors.

**Keywords:** Behavioral biases; Financial decisions; Emotional biases; Cognitive biases; Financial performance.

Jel Classification Codes: G40, G41.

#### 1. INTRODUCTION

For a long time everyone believed that traditional finance theory was accurate and that investors were thinking rationally and making decisions based on estimates and using economic models. However, after a number of investigations, it has been observed that human decisions often depend on intuition, habits, and cognitive or emotional biases hidden deep in the back of the mind (Daiva & Kristina, 2012).

\* Corresponding author

Investor behavior is part of the academic discipline known as "behavioral finance" that explains how emotions and cognitive errors affect investors and the decision-making process (Maheran & Muhammad, 2009). This field also reveals how decision processes are affected by the psychological factor (OIsen, 1998).

Behavioral finance relies on its interpretation of investor behavior on a set of biases that influence investor mindset and interfere with decision-making. Through this article, we try to study the most common biases affecting investors' financial decisions by dividing them into emotional and cognitive biases, as this division is considered one of the most common divisions in this field.

#### 1.1 Problem Statement:

The problem of the study is represented in showing the effect of behavioral biases on financial decision-makers in small and medium enterprises, where decisions are taken individually, and accordingly the problem is posed according to the following question:

To what extent do behavioral biases (emotional and cognitive) affect investors' financial decisions?

## 1.2 Study Hypotheses:

To answer the problem at hand, the following hypotheses are proposed:

The first hypothesis: emotional biases affect investors' financial decisions.

 $H_{10}$ : There is no statistically significant relationship between emotional biases and investors' financial decisions.

 $H_{11}$ : There is a statistically significant relationship between emotional biases and investors' financial decisions.

The second hypothesis: cognitive biases affect investors' financial decisions.

 $H_{20}$ : There is no statistically significant relationship between cognitive biases and investors' financial decisions.

 $H_{21}$ : There is a statistically significant relationship between cognitive biases and investors' financial decisions.

#### 1.3 Study Objective:

This research paper aims to study behavioral biases (emotional and cognitive) that affect the financial decision-making process for individual investors, who are the owners of institutions or their representatives from financial managers or managers charged with managing projects and making decisions.

## 1.4 Research Methodology:

In this study, we relied on the descriptive and analytical approach because it is suitable for studying the characteristics of behavioral factors relying on gathering facts and analyzing them to extract evidence. On the practical side, a measure of behavioral biases affecting investors 'financial decisions was developed by preparing a questionnaire divided according to the study's variables, i.e. behavioral biases in addition to financial performance. As a dependent variable representing financial decisions.

#### 2. Literature Review

#### 2.1 Behavioral Biases:

The assumption that investors are completely rational and that the information is processed promptly and correctly is unrealistic. It is difficult to explain this because human behavior is often unpredictable and investors 'decision-making is often influenced by psychological factors (Tona & Bambang, 2017).

Investor behavior is one of the main axes of behavioral finance as it detects the actual behavior of investors rather than the rational behavior stipulated in standard finance theories. Researchers in this field found that investors are affected by a wide range of behavioral biases, especially when making financial decisions, and they have classified them into groups, each according to their perspective, In this study we rely on (Pompian M. , 2006) classification, i.e. emotional and cognitive biases.

#### 2.2 Emotional Biases

#### 2.2.1 Overconfidence Bias:

The overconfidence bias is the tendency of the individual to attribute his success to his talent and abilities while blaming "bad luck" for his failure, causing him to overestimate his talent (Suzaida & Amelia, 2016).

Overconfidence bias is a bias in which people display an unjustified belief in their reasoning, judgment, and / or intuitive cognitive abilities. This overconfidence may be the result of overestimating levels of knowledge, capabilities and access to information (Raman & Anu, 2015). In its simplest way it can be defined as an inappropriate belief towards logical reasoning, judgment, and a person's cognitive abilities. Overconfidence bias has an important role to play in stock trading. Models of overconfidence have covered most psychological studies (Rasoul, Hassan, Mohammad, Aryan, & Fattaneh, 2010).

#### 2.2.2 Loss Aversion Bias:

Loss aversion is the investor's preference to avoid loss at the expense of making profits, i.e, the investor seeks to reap profits by selling successful assets for fear of loss (Ghalmi & Boudjerfa, 2018).

Loss aversion is referred to as the tendency of individuals to avoid losses compared to gains. The more negatively any problem is framed, the more severe loss aversion will be, so the individual will go to a different decision when faced with a problem with a negative frame (Anum & Ameer, 2017). Losses after gains are less painful than after losses (Barberis & Huang, 2001).

## 2.2.3 Regret Aversion Bias:

Regret aversion is a human tendency to feel the pain of regret for making mistakes, even small mistakes. Regret is an emotion we experience when we don't make the right decision. If one wishes to avoid the pain of regret, this may alter their behavior in ways that may be irrational in some cases (Raman & Anu, 2015). The reason for this bias is that people often do not acknowledge their mistakes. They try to avoid decision-making due to fear that any decision he makes will be sub-optimal (Anum & Ameer, 2017).

In addition to the pain of financial loss, it also includes regret for bad decisions, through which the loss was raised. Due to regret aversion, investors try to hold underperforming assets. Regret aversion also influences decisions about new investments (Anum & Ameer, 2017).

#### 2.2.4 Self-Control Bias:

People often lack self-control as they prefer to satisfy current desires over achieving long-term goals. If we assume that someone wanted to save, and at the same time got a salary bonus of 7000 DA, he would often not be able to control himself and give up the whole amount of the bonus in favor of the savings.

Lack of self-control leads to rushing into investment decisions, especially after missing an opportunity or deal in the recent past.

## 2.2.5 Optimism Bias:

People tend to be unjustified optimism regarding their abilities and skills and consider them above average, but regarding the possibility of accidents or losses for them, they value them below the average.

The optimism bias is defined as the difference between a person's expectations and the next outcome. If the expectations are better than the reality then the bias is optimistic, if the reality is better than expected then the bias is pessimistic (Sharot, 2011). Decision makers are often very optimistic about their impact on project outcomes, and they are also optimistic that projects will provide better returns than can be achieved through traditional methods (Meyer, 2014).

## 2.2.6 Status Quo Bias:

The "status quo," formulated by (SAMUELSON & ZECKHAUSER, 1988) is an emotional bias in which people do nothing (in the sense of maintaining the "status quo") rather than making a change. People are usually more comfortable keeping things the same than changing because there is no obvious problem that requires a decision (Raman & Anu, 2015). This bias is more general because it implies that the current situation is preferable to any difference, despite its nature and possible consequences (Cruciani, 2017, p. 16). Therefore, investors hate change, especially in the

event that conditions and returns are stable. This also enhances the avoidance of ambiguity associated with the change and the fear of taking responsibility for a bad decision.

## 2.3 Cognitive Biases

#### 2.3.1 Representativeness Bias:

Representativeness is a cognitive bias that leads decision-makers to evaluate probabilities and events with similar ones that occurred in the recent past.

Representativeness leads to bias in decision-making because people due to representativeness try to evaluate recent events and ignore long-term ones (Ritter, 2003).

#### 2.3.2 Anchoring Bias:

It is when the investor establishes reference points "anchors" for the decision-making process, When information is lacking, these anchors are often the latest price trends.

Anchoring is a phenomenon in the absence of better information, investors assume current prices are correct. In a bull market, for example, each new high is "anchor" due to its proximity to the recent record, and the distant history becomes more and more irrelevant. People tend to give a lot of weight to modern experience (Maheran & Muhammad, 2009).

Anchoring is a psychological reasoning that affects the way people perceive possibilities. It refers to a decision-making process where quantitative evaluation is required and these evaluations may be influenced by suggestions. Investors will repair some reference points (anchors) (Raman & Anu, 2015).

#### 2.3.3 Gambler's fallacy Bias:

The gambler's fallacy often arises when the investor assumes the independence of an event and is not affected by other events. This understanding pushes him to expect the end of the period and the change in the prices trends (Ghalmi & Boudjerfa, 2018).

Gamblers fallacy is the behavioral bias that occurs when an individual believes that the sample resembles the community from which it is drawn (Statman, 1999). The gambler's fallacy arises when people

inappropriately predict that the trend will reverse. This may lead investors to expect the end of the period of good (or bad) market returns (Waweru, Munyoki, & Uliana, 2008).

## 2.3.4 Availability bias:

Availability bias is a general rule or shorthand that lets people guess the likelihood of getting an outcome and what percentage it might appear in their daily lives. Those who commit such a prejudice consider easy-to-recall events more likely than those they can barely imagine or perceive. (Rasoul, Hassan, Mohammad, Aryan, & Fattaneh, 2010).

Availability is a judgmental inference that arises when people easily perceive a consequence in their judgments of probabilities. This bias may lead to unimaginable risks being ignored (or mitigated) or overestimated risks that can be so clearly imagined (Raman & Anu, 2015). Availability bias is a person's tendency to make decisions and judge based on available and easily accessible data (Rasoul, Hassan, Mohammad, Aryan, & Fattaneh, 2010).

### 2.3.5 Mental Accounting Bias:

Mental accounting is placing various assets and transactions in different mental accounts, such as sources of funds and their investments, for example if a certain amount is borrowed, risk must be avoided, but if this amount is from profits, it can be risked(2019 ، وعجمي) .

The process by which individuals analyze and evaluate transactions related to their financial decisions is referred to as mental accounting (Barberis & Huang, 2001). It is the tendency of individuals to organize their world in separate mental accounts (Waweru, Munyoki, & Uliana, 2008).

Mental accounting describes the tendency of people to segment and evaluate economic outcomes by grouping their assets into a number of familiar mental accounts (Raman & Anu, 2015).

#### 2.3.6 Illusion of Control Bias:

The illusion of Control is the false belief that one can influence outcomes in situations in which one cannot control it (Rudski, 2004). The illusion of control is a psychological term that indicates the tendency of people to overestimate their ability to control any event (Qadri & Shabbir, 2014). It is usually intensified by a sense of skill or competence, even when the outcome is purely random (Fellner, 2009). The illusion of control gives the false impression that the outcome can be influenced by personal participation when the reality is very different. Moreover, people tend to display overconfidence in conjunction with an illusion of control, highlighting their willingness to go wrong (Inga, Michael, & Barry, 2008).

## 3. Data Analysis

## 3.1 Study Population and Sample:

This study deals with the subject of behavioral biases and their impact on investors' financial decisions. Where the study population was made up of a group of local investors in Relizane state, and we mean by investors here owners of small and medium enterprises or those who represent them in management and decision-making such as financial managers and managers. The reason for choosing this category is the individuality and centralization of decision-making in this type of institution.

In this regard, we distributed 35 questionnaires and retrieved 28 questionnaires valid for study, i.e. 80%.

#### 3.2 Study Tool and Model:

We developed a questionnaire as a tool to collect data, and we divided it into two parts, the first for personal data and the second for questions related to the study axes, which were as follows:

Two axes of behavioral biases (emotional and cognitive) represent the independent variables;

An axis of financial performance that represents investors' financial decisions as a dependent variable.

The following table shows the study variables and the distribution of its paragraphs:

Table 1. Variables and the distribution of the study tool items

Domain¤	variables¤	biases¤	paragraphs
	¶	Overconfidence	01¤
	¶ Rosational	loss∙Aversion¤	02-03¤
	Emotional.	Regret-Aversion©	04-05¤

#### **Source:** Prepared by researchers.

The questionnaire was designed according to the five-fold Likart scale, the following table shows the scale trends and the weighted averages in addition to the degree of influence.

**Table 2.** The values of the weighted averages and the degree of influence of the five-fold Likart scale

Trend¤	Weighted∙average¤	Influence·degree¤
Absolutelynotagree	From·01·to·1.80¤	Very weak¤
notagree¤	From·1.81·to·2.6¤	Weak¤
neutral¤	From·2.61·to·3.4¤	Moderate¤
agree¤	From·3.41·to·4.2¤	strong¤
Strongly-agree¤	From·4.21·to·5¤	Very strong

**Source:** Prepared by researchers.

#### 3.3 Reliability Measurement:

We calculated the reliability of the scale with Cronbach's Alpha for all study axes in order to test its reliability as shown in the following table:

**Table 3.** Reliability coefficients for the study axes

Variables¤	Number•of•Items¤	Cronbach's•Alpha•value¤
Emotional·biases¤	¤ <b>10</b>	¤0.646
Cognitive biases =	¤ <b>08</b>	¤0.65
Financial performance	¤03	¤0.634
the scale =	¤ <b>21</b>	¤ <b>0.807</b>

**Source:** Prepared by researchers, depending on the outputs of the SPSS program.

The results obtained indicate that the values of the alpha coefficient of all study axes are greater than (0.6), and this indicates that the scales used have internal stability.

#### 4. RESULTS ANALYSIS AND DISCUSSION

## 4.1 Descriptive analysis of the sample:

**Table 4.** Description of the sample according to personal information

Sex¤									
Statement	Male¤			Female¤					
Repetition	¤2	7					<b>¤01</b>		
percentage¤	96.	4%	ĭ				3.5	%¤	
Educational·level¤									
Statement	Baccalaureate or College degrees			P	hD¤	]	Professional· certificate¤		
Repetition	□03		¤ <b>1</b> 4	1	<b>¤</b> (	00		p <b>11</b>	
percentage¤	10.7%¤		500	<b>%</b> ¤	0	0%¤		39.3%¤	
		T	he·posi	tion¤					
Statement	Managero	E		ncial· agero			Own	er∙or∙partner¤	
Repetition	□03			¤04				p <b>21</b>	
percentage¤	10.7%¤			14.3%¤		75%¤			
	D	urat	ion·in·	positi	on¤				
¶ Statement¤	less than one year a				m·3∙ •5¤		om·5· o·10¤	More·than· 10¤	
Repetition	∞00	¤01		¤0	6	¤10		p <b>11</b>	
percentage¤	0%¤	3	.6%¤	21.	<b>4%</b> ¤	35.7%□		39.3%¤	

**Source:** Prepared by researchers, depending on the outputs of the SPSS program.

It is worth noting that almost all of the business owners are 96.4% male, and most of them are owners or partners at 75%. They also have an educational level, as half of the sample of university graduates and those below the baccalaureate represent only 10.7%.

## 4.2 Weighted means and standard deviations of the study variables:

Table 5. Weighted means and standard deviations of emotional biases

Emotional·biases¤	Weighted· average¤	standard· deviation¤	Trend¤	Influence· degree¤
Overconfidence <sup>©</sup>	¤4.25	¤1.00462	Strongly-Agree	Verystrong
loss-Aversion¤	¤4.3571	¤0.55872	Strongly:Agree	Verystrongo
Regret · Aversion	¤4.3036	¤0.45824	Strongly Agree	Verystrongo
Self-Control¤	¤3.0714	¤1.24510	neutral¤	Moderate¤
Optimism¤	¤3.5714	¤1.06904	Agree¤	strong¤
Status · Quo¤	¤3.6786	¤1.05597	Agree¤	strong¤
pTotal·biases	n <b>3.9866</b>	ш <b>0.50842</b>	Agree¤	strong¤

**Source:** Prepared by researchers, depending on the outputs of the SPSS program.

The results in the above table indicate that all biases range from strong to very strong influence while self-control bias has a moderate effect on investors.

Table.6: Weighted averages and standard deviations of cognitive biases

cognitive biases¶	Weighte d· average¤	standard∙ deviation¤	Trend¤	Influence degree¤
Representativeness	¤3.6607	¤0.85042	Agree¤	strong¤
Anchoring¤	¤4.3571	¤0.55872	Strongly-Agree¤	Verystrongo
Gambler's Fallacy¤	¤2.8036	¤0.85352	neutral¤	Moderate¤
Availability¤	¤2.75	¤0.65969	neutral¤	Moderate¤
Mental:Accounting	¤3.7857	¤0.69958	Agree¤	strong¤
Illusion of Control	¤4.6429	¤0.55872	Strongly-Agree	Verystrongo
¤Total·biases	<b>2.5</b>	ш <b>0.43033</b>	Agree¤	strong¤

**Source:** Prepared by researchers, depending on the outputs of the SPSS program.

We note from the table that the gambler's fallacy and availability bias have a moderate effect, while the rest of the biases range from strong to

very strong. We also note that the illusion of control has the same effect of overconfidence, given that they share many characteristics.

## 4.3 Analysis of the strength of correlation between study variables:

In this analysis, we rely on the Pearson Correlation coefficient to measure the strength of the correlation between the study variables according to the following table:

**Table 7.** Correlation matrix between study variables

Correlations						
¤		Emotional· biases¤	cognitive· biases¤	Financial· performance¤		
Emotional·	Pearson Correlation	<b>1</b> 0	g	α		
biases¤	biases  Sig. (2-tailed)  □					
	N¤	<b>28</b> ¤				
cognitive	Pearson Correlation	,540**¤	1¤	α		
biases¶	Sig. (2-tailed)¤	,003¤	α			
¤	N¤	<b>28</b> ¤	280			
Financial·	Pearson Correlation	,730**¤	,251¤	<b>1</b> ¤		
performanc	Sig. (2-tailed)¤	,000₽	,19 <b>7</b> ¤	¤		
¤ <b>e</b>	N¤	<b>28</b> ¤	280	280		
**. Correlatio	nissignificantatthe0	.01 level (2-tai	led).¤			

**Source:** SPSS program outputs.

It is evident from Table 07 that the correlation coefficient between the two independent variables and the dependent variable was statistically significant at only 0.01 significant level between emotional biases and financial performance, and the value of the coefficient was 0.73, and this indicates the existence of a strong correlation between emotional biases and financial performance.

## **4.4 Examining Study Hypotheses:**

First Hypothesis: emotional biases influence investors' financial decisions.

 $H_{10}$ : There is no statistically significant relationship between emotional biases and investors' financial decisions.

 $H_{11}$ : There is a statistically significant relationship between emotional biases and investors' financial decisions.

**Table 8.** Results of statistical analysis of the impact of emotional biases on financial performance

	ANOVA <sup>b</sup> ¤							
Model¤		Sum·of·	df¤	Mean·	F¤	Sig.¤		
		Squares¤		Square¤				
1¤	Regression¤	7,207¤	1¤	<b>7,207</b> ¤	29,590¤	,000≗¤		
	Residual¤	6,333¤	26¤	,244¤	¤	¤		
	Total¤	13,540□	<b>27</b> ¤	¤	¤	¤		
a. Predictors: (Constant) "emotional biases¶								
b.·De	pendent·Variabl	e:::financial per	formance¤					

**Source:** SPSS program outputs.

Looking at the results of Table 08, it becomes clear that the value of (Sig = 0.000 < 0.01), and therefore we reject the null hypothesis and accept the alternative hypothesis, meaning that there is a statistically significant relationship between emotional biases and financial performance, meaning that emotional biases have an impact on the financial decisions of investors. **The second hypothesis:** cognitive biases affect investors' financial decisions.

 $H_{20}$ : There is no statistically significant relationship between cognitive biases and investors' financial decisions.

 $H_{21}$ : There is a statistically significant relationship between cognitive biases and investors' financial decisions.

**Table 9.** Results of statistical analysis of the impact of cognitive biases on financial performance

	ANOVA <sup>b</sup> ¤										
Mode	e <b>l</b> ¤	Sum·of·	df¤	Mean·	F¤	Sig.¤					
		Squares¤		Square¤							
1¤	Regression¤	,854¤	1¤	,854¤	1,751¤	,197ª¤					
	Residual¤	12,685□	26¤	,488¤	¤	¤					
	Total¤	13,540¤	<b>27</b> ¤	¤	¤	¤					
a. Predictors: (Constant) cognitive biases "											
b.∙De	pendent·Variabl	e:::financial.perf	formance¤	b. Dependent Variable: financial performance							

**Source:** SPSS program outputs.

Depending on the results of the above table, we note that the value of (Sig = 0.197 > 0.05) and therefore we reject the alternative hypothesis and accept the null hypothesis, i.e. there is no statistically significant relationship at a level of significance of 0.01 or 0.05 between cognitive biases and financial performance.

#### 5. CONCLUSION:

Through this research paper we studied the impact of emotional and cognitive biases on the financial decisions of investors (the owners of institutions or their representatives in making financial decisions) at the level of Relizane, and from the results of the study the following points can be concluded:

The study demonstrated a statistically significant relationship between emotional biases and financial decisions. There is also a strong correlation between emotional biases and financial performance at the level of 0.01 significance.

The study also demonstrated that there is no statistically significant relationship between cognitive biases and investors 'financial decisions.

The decision-making process in practical reality is complex and subject to many factors and influences. Understanding the psychological biases that affect decision-making will help investors and various practitioners improve their decisions, accept advice and consider various alternatives objectively and impartially.

Although researchers, institutional investors and investors may continue to debate investor rationality, over the past few decades behavioral finance has proven important in understanding observed behavior. Researchers should be aware that constant deviations from theoretical predictions help explain the factors that influence when people make decisions.

Behavioral finance is one of the leading areas today, especially in academic research. However, there is very little work in this field in the Arabic language. We advise researchers and academics to pay attention to this topic and to develop pedagogical programs in this field at the level of Algerian universities in particular and Arab universities in general.

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## 7. Appendices

Table 1. The questionnaire paragraphs related to the study variables

	Strongly	Agree	neutra	not	Strongly
	Agree		1	agree	Disagree
1- You believe that your skills and experience qualify you to make financial decisions that make your investments surpass what is in the market.					
2- When you are facing a definite gain,					
you avoid taking a risk.					
3- When you face a certain loss, you					
take the risk.					

4- You feel more sad about keeping	
losing investments than selling	
successful investments anytime soon.	
5- You avoid selling assets that have	
decreased in value and selling assets	
that have increased in value.	
6- You are investing in profitable	
projects with some degree of risk to	
make up for lost time or opportunity.	
7- You expect that your returns will be	
above average compared to similar	
investments.	
8- You prefer to keep your investment	
that yields an acceptable return, rather	
than give it up in favor of an	
investment in a new activity that you	
expect will have higher returns.	
9- When evaluating investments, you	
rely on similar investments in order to	
facilitate the decision-making process.	
10- You are investing in popular	
activities and moving away from	
activities that have performed poorly in	
recent times.	
11- Based on your experiences, you	
put reference points on which you rely	
when making your financial decisions.	
12- You anticipate changes in	
investment and demand based on past	
experience.	
13 - You are usually able to anticipate	
the end of the boom or bust.	
14- You are investing in familiar	
activities or within your field of	
expertise and moving away from new	
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activities.			
15- You consider the information			
received by your close friends and			
relatives as a reliable reference for			
your financial decisions.			
16- You deal with each financial			
decision separately.			
17- You ignore the interactions and			
interconnections between financial			
decisions.			
18- You invest in a specific activity			
that you manage yourself because you			
can control the results.			
19- Your rate of return on investment			
meets your expectations.			
20- The rate of return on your			
investments is equal to or higher than			
the average rate of return on similar			
investments in the market.			
21- You feel satisfied with your			
financial decisions in the past year			
(investment decisions, selling, buying,			
financing, etc).			