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Understanding Individual Investment Decisions Through Behavioral Biases: Evidence from Morocco.

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Abstract

Investment decisions involve a series of choices that can significantly affect the performance of financial investments. Traditional financial theory generally assumes that individuals make decisions through rational analysis, whereas behavioral finance emphasizes the influence of psychological mechanisms and cognitive biases on investors' choices. Against this background, the present study examines the behavioral determinants of investment decision-making among individual investors operating in the Moroccan stock market. Empirical data were collected through a questionnaire-based survey administered directly to randomly selected retail investors. Of the 300 questionnaires distributed, 112 were fully completed and retained for analysis. The research adopts a positivist epistemological approach and relies on exploratory factor analysis (EFA) and confirmatory factor analysis (CFA) to examine the collected data. The findings reveal five underlying behavioral dimensions associated with individual investors' investment decisions. These results contribute to a better understanding of the psychological and behavioral mechanisms underlying investment choices and may help financial institutions develop investment products and services that more closely reflect the preferences and needs of individual investors.

Keywords: Retail investors; equity markets; behavioral biases; investment decisions; behavioral finance.

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Introduction

Today, the term “investment” generally refers to the allocation of funds to acquire financial or real assets with the aim of generating returns or profitability. It is closely related to saving, which represents the portion of income that is not consumed and is set aside for future use. Investment can therefore be defined as the voluntary commitment of capital intended to generate income or profits over a given period.

Investment decision-making is an essential stage of the investment process. It involves selecting, from a range of available investment opportunities, the options that best match an investor’s objectives. Given the diversity of investment alternatives, each with specific characteristics in terms of return, risk, and liquidity, identifying the most suitable investments can be challenging. Investors must also consider the composition of their investment portfolios and their investment horizons. Therefore, investment decisions must be made carefully, as inappropriate choices may result in significant financial losses.

Traditional financial theories assume that investors are rational and make decisions aimed at maximizing their wealth. However, behavioral finance challenges this assumption by arguing that investment decisions are not always entirely rational. Instead, they may be influenced by various cognitive, emotional, and psychological factors. The work of Tversky and Thaler (1990) highlights the importance of psychological mechanisms in economic and financial behavior. Consequently, investors’ decisions may be understandable in light of their perceptions and psychological characteristics without necessarily being financially optimal.

Behavioral finance is based on studies of human behavior and psychology, and it involves adjusting and revising the assumptions of standard economic models (Edward, 2014). The theoretical contributions of Richard Thaler, Amos Tversky, and Daniel Kahneman have played a central role in the development of behavioral finance.

Heuristics are rules of thumb that help investors make decisions in complex and uncertain situations (Ritter, 2003). They refer to mental shortcuts that investors use to simplify decision-making and reduce the cognitive effort required to process information. Representativeness, availability bias, anchoring, and overconfidence bias are among the most important behavioral biases affecting investment decisions (Kahneman & Tversky, 1979; Lord, Ross, & Lepper, 1979; Odean, 1998).

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This study, entitled "Understanding Individual Investment Decisions Through Behavioral Biases: Evidence from Morocco", examines the behavioral factors influencing individual investors' decisions in the Moroccan stock market, with particular reference to the Casablanca Stock Exchange. Specifically, it aims to identify the main behavioral dimensions underlying investment decision-making and assess the influence of heuristics, prospect theory, market-related factors, and herding behavior on investment decisions and investment performance. By examining these dimensions, the study seeks to provide a better understanding of how psychological mechanisms and cognitive biases shape individual investors' behavior in the Moroccan stock market.

The remainder of this paper is organized as follows. Section 1 presents the literature review, including the definition of behavioral finance, its main theories and factors, and the research hypotheses. Section 2 describes the research methodology, including the research model, sample, research instruments, and data analysis methods. Section 3 presents the empirical results, including factor analysis, reliability tests, and the assessment of behavioral factors and their impact on investment decisions and performance. Finally, the paper concludes with a summary of the main findings and their implications.

1. Literature Review

Behavioral finance emerged in the early 1970s and is associated with psychologists Amos Tversky and Daniel Kahneman, whose research examined decision-making under uncertainty. Their work challenged the traditional assumption of homo economicus, which views individuals as rational decision-makers. In 1974, these two psychologists identified three heuristics: representativeness, availability, and anchoring. One of the most influential contributions to behavioral finance was the study by Kahneman and Tversky (1979). In this study, they criticized expected utility theory (Stearns, 2000; Von Neumann and Morgenstern, 1994) as a descriptive model of decision-making under risk and developed an alternative model known as prospect theory. The psychological factors influencing investment decisions can be grouped into four categories: prospect theory, decision-making heuristics, affective factors during periods of crisis, and market factors.

1.1. Definition of Behavioral finance

Behavioral finance is a field of finance that examines the influence of cognitive biases and emotions on individuals' financial decisions. It seeks to understand how irrational behavior can affect

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financial decision-making and to develop strategies to help investors overcome these biases (Formlet, 2001).

Behavioral finance draws on the work of numerous psychologists and economists, notably Daniel Kahneman, Amos Tversky, and Richard Thaler, who have demonstrated that financial decisions can be influenced by various biases, such as fear, greed, excessive optimism, and the tendency to follow the crowd (H. Kent Baker and John R. Nofsinger, 2010).

1.2. Theories and Factors of Behavioral Finance

1.2.1. Prospect Theory

Prospect Theory, developed by Kahneman and Tversky (1979), is one of the most widely cited and well-documented theories in behavioral economics. According to this theory, individuals tend to be less willing to take risks when dealing with gains than when facing losses (Jacobsen et al., 1999). In particular, individuals tend to favor certainty, meaning that they assign greater weight to outcomes perceived as certain than to those considered merely probable. This phenomenon is known as the *certainty effect*. Human beings are not consistently risk-averse; rather, they tend to be risk-averse when dealing with gains but risk-seeking when facing losses.

In other words, traders may be more inclined to take additional risks after experiencing losses. Conversely, traders who have made profits may generally be more cautious about subsequent risks. Consequently, individuals respond differently depending on whether choices are framed in terms of gains or losses.

One of the most notable illustrations of framing effects was presented by Tversky and Thaler (1990). Expected Utility Theory (EUT) and Prospect Theory are considered two distinct approaches to decision-making. Prospect Theory focuses on subjective decision-making influenced by investors' value systems, whereas Expected Utility Theory emphasizes rational expectations and preferences (Filbeck, Hatfield, and Horvath, 2005).

Expected Utility Theory is a normative model of rational choice and has traditionally dominated the analysis of economic decision-making in market economies. Nevertheless, this theory has been criticized for its inability to fully explain why individuals are attracted to both insurance and gambling. People tend to undervalue probable outcomes relative to certain outcomes and may respond differently to similar situations depending on whether they are presented in the context of gains or losses (Kahneman and Tversky, 1979).

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Regret is an emotion that arises after people realize that they have made mistakes. Investors may attempt to avoid regret by refusing to sell stocks that have declined in value while choosing to sell stocks that have increased in value. Furthermore, investors tend to experience greater regret when they hold losing stocks for too long than when they sell winning stocks too early (Mirjam and Perttunen, 2004).

Loss aversion refers to the difference in the psychological impact of losses and gains of similar magnitude (Barberis & Huang, 2001). Research has shown that people tend to experience greater distress from potential losses than from equivalent gains (Barberis & Thaler, 2002). Moreover, some authors have found that past positive and negative returns can strengthen the negative relationship between investors' disposition to sell and their capital losses. This suggests that investors may need financial support to overcome such behavioral tendencies (Mirjam and Perttunen, 2004). Risk aversion is a common characteristic of investor behavior; however, it can sometimes lead to poor investment decisions that negatively affect investors' wealth (Odean, 1998).

Mental accounting refers to the process through which individuals organize, evaluate, and manage their financial transactions (Barberis & Huang, 2001). It allows investors to divide their portfolios into separate mental accounts rather than evaluating their investments as a whole (Barberis & Thaler, 2002; Ritter, 2003). Based on an empirical study, Rockenbach (2004) suggests that investors often fail to recognize the relationships between different investment opportunities, even when considering these relationships would be useful for determining arbitrage-free prices.

Prospect theory was introduced to provide a different framework from the expected utility model, which is based on the rationality assumptions developed by von Neumann and Morgenstern. It differs from expected utility theory in several important ways.

First, the value function used in prospect theory differs from the utility function in expected utility theory (Plous, 1993). Accordingly, prospect theory assesses outcomes as gains or losses relative to a reference point, whereas the expected utility framework evaluates outcomes based on the overall level of wealth attained.

Furthermore, the value function is generally concave for gains, convex for losses, and steeper for losses than for gains (Kahneman & Tversky, 1979). These distinctions give rise to several important implications. Plous (1993) noted that because the value function is steeper for losses than

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for gains, losses tend to have a greater psychological impact than equivalent gains. For example, losing €500 is generally perceived as more painful than gaining €500 is perceived as pleasurable.

1.2.2. Heuristic Theory

Heuristics are defined as rules of thumb that facilitate decision-making, particularly in complex and uncertain environments (Ritter, 2003). They simplify the assessment of probabilities and the prediction of values by reducing them to simpler judgments (Tversky & Kahneman, 1974). In general, heuristics are useful, especially when time is limited (Waweru, Mwangi, & Parkinson, 2014). However, they can sometimes lead to cognitive biases (Tversky & Kahneman, 1974).

Tversky and Kahneman (1974) were among the pioneering researchers to examine heuristic-based decision-making, identifying three main heuristics: representativeness, availability bias, and anchoring. Waweru, Mwangi, and Parkinson (2014) also identify two additional factors associated with heuristic theory: the gambler's fallacy and overconfidence.

Representativeness refers to the perceived similarity between an event and the population from which it originates (De Bondt & Thaler, 1995). This heuristic can lead to biases, such as placing excessive importance on recent experiences while overlooking long-term trends (Ritter, 2003).

A common example of this bias occurs when investors extrapolate high long-term growth rates from only a few quarters of strong growth (Waweru, Mwangi, & Parkinson, 2014). Representativeness can also lead to what is known as sample-size neglect, which occurs when individuals attempt to draw conclusions from an insufficient number of observations (Barberis & Thaler, 2002). In stock markets, this phenomenon may arise when investors seek out "hot" stocks rather than underperforming ones. This tendency may help explain investors' overreaction to new information (De Bondt & Thaler, 1995).

The belief that a small sample can closely resemble the larger population from which it is drawn is known as the law of small numbers (Statman, 1999). This belief can lead to the gambler's fallacy (Barberis & Thaler, 2002). More specifically, in stock markets, the gambler's fallacy occurs when investors incorrectly predict reversals in market performance, assuming that a period of good or poor returns is about to end (Waweru, Mwangi, & Parkinson, 2014).

Anchoring occurs when individuals rely on initial values as reference points when making estimates. These estimates are influenced by the initial values, as different starting points can lead to different judgments (Tversky & Kahneman, 1974). In financial markets, anchoring may occur

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when investors base their assessments on recent observations. For example, investors may continue to refer to the original purchase price when selling or evaluating a stock. Consequently, current prices are often assessed in relation to past prices. Anchoring may lead investors to establish a range for a stock's price or a company's earnings based on historical trends, resulting in underreaction to unexpected changes (Nabil & Omar, 2021).

Anchoring is related to representativeness because both can reflect a tendency to rely heavily on recent experience. As a result, investors may become more optimistic when markets are rising and more pessimistic when markets are falling (Waweru, Mwangi, & Parkinson, 2014). Such tendencies may contribute to overconfidence, which can lead investors to trade excessively (De Bondt & Thaler, 1995).

Studies have shown that financial analysts may adjust their assessments of a company slowly, even when substantial evidence indicates that their previous evaluations are incorrect. In general, investors and analysts tend to be overconfident in areas with which they are familiar (Baldwin-Evans, 2006).

Overconfidence may also have certain perceived benefits, such as greater persistence, determination, mental ease, and risk tolerance, potentially contributing to professional performance. Furthermore, it has been suggested that overconfidence may improve how others perceive an individual's abilities, potentially leading to faster promotion and longer-term investment decisions (Oberlechner, Slunecko, & Kronberger, 2004).

However, when investors overestimate their ability to generate information or identify the significance of data overlooked by others, they may underestimate their forecasting errors. They may also place excessive confidence in information they have generated themselves rather than adequately considering public signals. According to Daniel, Hirshleifer, and Subrahmanyam (1998), individuals who overestimate the precision of their private information signals relative to public information signals exhibit overconfidence. This tendency to overestimate one's own abilities is common among individuals with high self-esteem, as people often believe they perform better than they actually do (Daniel, Hirshleifer, & Subrahmanyam, 1998).

Recent psychological and financial literature describes individuals who exhibit this behavior as overconfident. Research on human behavior has identified overconfidence as a major factor contributing to excessive stock trading in financial markets.

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Availability bias occurs when individuals rely excessively on information that is readily accessible or easily recalled. In stock markets, this bias may be reflected in investors' preference for investing in local companies that they know well or about which they can easily obtain information, even when such preferences conflict with the principles of portfolio diversification.

1.2.3. Market Theory

According to De Bondt and Thaler (1995), financial markets can be influenced by investors' behavior, a phenomenon examined within the field of behavioral finance. This theory suggests that investors may overreact or underreact to price changes or new information. They may also tend to extrapolate past trends into the future while overlooking the underlying fundamentals of a stock.

Furthermore, investors may be influenced by market factors such as stock popularity and seasonal price patterns, which can, in turn, affect their investment decisions in the stock market.

Waweru, Mwangi, and Parkinson (2014) identify several market factors that influence investors' decision-making: price changes, market information, past stock trends, customer preferences, overreaction to price changes, and the underlying fundamentals of stocks.

Market efficiency theory posits that stock prices incorporate the information available to market participants, making it difficult to generate abnormal returns consistently over the long term. However, behavioral finance has challenged this assumption. Previous research has documented market anomalies that conventional financial theories struggle to explain, including abnormal returns associated with initial public offerings (IPOs), mergers, stock splits, and corporate spin-offs (Dahhou, Dib, & Kharbouch, 2021).

Throughout the 1980s and 1990s, statistical anomalies continued to emerge, suggesting that existing standard financial models might be inadequate, incomplete, or even flawed. Research has shown that investors do not always respond rationally to new information. Instead, they may exhibit overconfidence and alter their decisions when superficial changes are made to the way investment information is presented.

For example, in recent years, the media have shown considerable interest in technology stocks. In retrospect, media assessments were often positively biased, which may have encouraged investors to become more interested in these stocks. Such anomalies suggest that the rational behavior assumptions underlying the efficient market hypothesis do not fully explain market outcomes.

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Therefore, it is also necessary to consider alternative models of human behavior, as advocated by research in other social sciences (Shiller, 1998).

Fluctuations in the information available to investors, changes in a stock's fundamental value, and price movements may trigger overreaction or underreaction among investors. Empirical evidence suggests that these changes have a significant influence on investors' decision-making behavior. Researchers argue that overreaction (De Bondt & Thaler, 1995) or underreaction to news can lead investors to adopt different trading strategies, thereby influencing their investment decisions.

Waweru, Mwangi, and Parkinson (2014) conclude that market information has a substantial impact on investors' decisions, often leading them to focus on popular stocks and other attention-grabbing securities based on stock market information. Furthermore, Barber and Odean (2000) emphasize that investors are influenced by stock market events that attract their attention, even when they are uncertain whether these events will translate into favorable future investment performance.

Caparrelli, D'Arcangelis, and Cassuto (2004) argue that market participants are influenced by herd behavior and often adopt similar straegies to follow the same actions as other market participants when price changes occur. Furthermore, investors may revise their inaccurate estimates of stock returns in response to price changes, thereby affecting their investment decision-making (Waweru, Mwangi, & Parkinson, 2014).

1.2.4. Herding Theory

Herding behavior in financial markets can have significant consequences for asset prices and investor returns. Investors tend to follow the actions of others rather than rely on their own private information. This behavior can cause asset prices to deviate from their fundamental values, potentially creating investment opportunities for investors who are able to identify these price distortions.

Researchers are also interested in herding behavior in financial markets because it may influence risk and return assessments, thereby affecting investment models. Emotional biases associated with herding may lead to judgment errors and inappropriate investment decisions.

Financial professionals, such as investment professionals and financial market professionals, are often assessed in a subjective manner and periodically by comparing their performance with that of their peers. through comparisons with their peers. This evaluation process may encourage

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professionals to follow the actions of others and conform to industry norms rather than make independent investment decisions based on their own private information.

1.3. Research Hypotheses

Based on the theoretical and empirical framework, the following research hypotheses are proposed:

- **H1:** Heuristic factors significantly influence investment decisions.
- **H2:** Prospect-related factors significantly influence investment decisions.
- **H3:** Market factors significantly influence investment decisions.
- **H4:** Herding behavior significantly influences investment decisions.

2. Research Methodology

2.1. Research Method and Model

The primary purpose of this research is to investigate the behavioral elements affecting investment choices that have already been identified in the existing literature. Rather than developing a new theory through induction, a deductive approach appears to be the most appropriate choice.

The deductive approach is generally associated with quantitative research, which consists of gathering numerical data or qualitative information that can be converted into numerical form, and examining it through statistical techniques. This approach is consistent with the quantitative research strategy adopted in this study. However, the quantitative approach used in this empirical research does not necessarily allow for an in-depth analysis of the underlying constructs (Rea & Parker, 2014).

As mentioned above, behavioral factors influence investors' investment decisions in financial markets, particularly in stock markets. This study examines the extent to which behavioral variables influence individual investors' decisions in the Moroccan financial market, as illustrated in the research framework below:

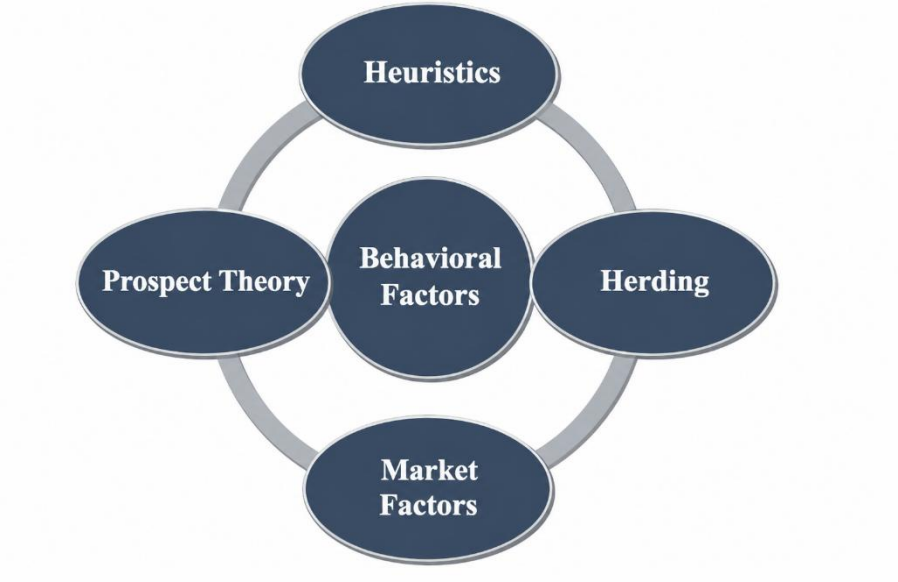
2.2. Sample

Given the aforementioned research objectives, a relatively large sample size is recommended. The larger the sample, the more representative it is likely to be and the more reliable the results may be (Beatty et al., 2004). However, sample size also depends on the researchers' available resources, particularly time, financial resources, and human resources (Saunders, Lewis, & Thornhill, 2009). The authors suggest that quantitative studies should include at least 100 respondents to enable the use of statistical data analysis techniques. In this study, questionnaires were distributed directly to

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individual investors, who were selected randomly. Of the 300 questionnaires distributed, with 112 completed responses were collected, representing a response rate of approximately 37%. This response rate was considered acceptable for a questionnaire-based survey.

Figure N°1: Research Model of the Behavioral Factors Influencing Individual Investors



Source : Authors

2.3. Research Instruments

The 37-item questionnaire was based on behavioral finance theories, including prospect theory, heuristic theory, and other theories examining the influence of behavioral factors on investors' decision-making, as discussed by Waweru, Mwangi, and Parkinson (2014).

A six-point Likert scale was used to measure respondents' opinions and attitudes. This type of rating scale is widely used in survey research (Fisher, 2010). Individual investors were asked to indicate their level of agreement with statements concerning the influence of behavioral factors on their investment decisions, as well as statements relating to investment performance.

The six-point Likert scale ranges from 1 to 6, corresponding respectively to: strongly disagree, disagree, somewhat disagree, somewhat agree, strongly agree, and extremely agree. The dimensions of the questionnaire are presented in the following table:

Table N°1: Behavioral Dimensions of Investors

Main Theme	I. Dimension	II. Questions
Heuristics	Representativeness	(11 – 12)
	Overconfidence	(13)
	Anchoring	(14 – 15)
	Gambler's fallacy	(16)
	Anchoring bias	(17 – 18)
Decision-making under risk	Sensitivity to losses	(19 – 20)
	Regret avoidance	(21 – 22)
	Psychological accouting	(23 – 24)
Market factors	Market conditions	(25 – 30)
	Price changes	
	Market information	
	Past stock trends	
	Stock fundamentals	
	Customer preferences	
	Overreaction to price changes	
Herding Effect	Follow the actions of other investors.	(31 – 34)
Investor Performance	Investor Performance	(35 – 37)

Source : Authors

The self-administered questionnaire appears to be one of the most commonly used methods in quantitative research. This method is chosen for several reasons. First, when research questions are clearly defined, questionnaires are an effective tool for collecting standardized data that are easy to process and analyze. Furthermore, since no interviewer is present while respondents complete the questionnaire, the results are less likely to be affected by interviewer bias.

In addition, this method is less expensive than other data collection methods. It also saves time, as hundreds of questionnaires can be distributed simultaneously. Since the participants are investors who may have limited time to devote to interviews, surveys may therefore be more convenient, allowing respondents to complete them at their convenience.

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Surveys are also more convenient when participant are required to disclose confidential information. Put differently, respondents may become more likely to answer honestly when completing a questionnaire than when participating in a face-to-face interview.

2.4. Data Analysis Method

In this study, the collected data were processed and analyzed using SPSS software. First, the data were cleaned by removing low-quality responses, such as those containing too many missing values or potentially biased ratings.

Next, statistical techniques, including factor analysis and Cronbach's alpha test, were applied. The reliability of each construct and its specific dimensions was assessed using Cronbach's alpha coefficients.

3. Results

3.1. Factor Analysis of Behavioral Variables

Questions items numbered 12 – 35, labelled X1 - X24, were intended to examine the extent to which behavior-related variables influence individuals investment choices. Questions 36 - 38, identified as Y 1 – Y 3, were designed to assess investors' perceptions of their personal investment results

Exploratory analysis of factors EFA was applied to the behavioral factors (X 1 – X 24) and investment outcome variables (Y 1 - Y 3) to determine their underlying factor structure.

The analysis revealed that the remaining variables were grouped into six factors: five behavioral factors and one investment performance factor. The results showed an eigenvalue of 1.007, a Kaiser–Meyer–Olkin (KMO) value of 0.728 ($p = 0.000$), and a total explained variance of 68.32%. All factor loadings exceeded 0.5.

These indicators suggest that the data are suitable for factor analysis and that the resulting factor structure is acceptable. The results are presented in Table 2.

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Table N°2: Factor Analysis

Factors	Variables	Factor loadings					
		F 1	F 2	F 3	F 4	F 5	
Herding Behavior	X 21	0,881					
	X 22	0,854					
	X 23	0,873					
	X 24	0,697					
Prospect Theory	X 10		0,662				
	X 11		0,505				
	X 13		0,726				
	X 14		0,679				
Market Factors	X 15			0,794			
	X 17			0,773			
	X 18			0,758			
Overconfidence and Gambler's Fallacy	X 3				0,655		
	X 6				0,607		
Anchoring and Aptitude Bias	X 5					0,805	
	X 7					0,671	
Investment Performance	Y 1						0,882
	Y 2						0,817
	Y 3						0,786

Source : Authors

As shown in Table 2, five behavioral factors influence individual investors. For the herding behavior factor, all three original dimensions of the questionnaire (Questions 16–18, coded X16–X18) were retained after the factor analysis. Three market-related items and three prospect theory items were also retained for the factor analysis. However, only two heuristic-related dimensions (Questions 3 and 5) were retained after the analysis. These dimensions were classified into two groups involving overconfidence, gambler's fallacy, anchoring bias, and competence bias.

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3.2. Cronbach's Alpha Test for Factor Items

Accordingly, Cronbach's alpha is employed to assess the consistency of the items associated with the identified factor. This measure is conducted to ensure that the measurement scales are consistent and suitable for subsequent analysis. Table 3 presents the results of the Cronbach's alpha reliability test.

Table N°3: Cronbach's Alpha Reliability Test Results

Factors	Variables	Cronbach's Alpha	Corrected Item–Total Correlation	Cronbach's Alpha if Item Deleted	F (Sig.)
Herding Behavior	X 21	0,86	0,77	0,79	23 (0,000)
	X 22		0,70	0,82	
	X 23		0,77	0,79	
	X 24		0,59	0,87	
Prospect Theory	X 10	0,62	0,43	0,53	20 (0,000)
	X 11		0,39	0,56	
	X 13		0,47	0,50	
	X 14		0,32	0,61	
Market Factors	X 15	0,72	0,54	0,64	2 (0,05)
	X 17		0,55	0,63	
	X 18		0,54	0,64	
Overconfidence and Gambler's Fallacy	X 3	0,62	0,39		51 (0,000)
	X 6		0,39		
Anchoring and Competence Bias	X 5	0,60	0,30		15 (0,000)
	X 7		0,30		
Investment Performance	Y 1	0,81	0,74	0,67	9 (0,000)
	Y 2		0,65	0,76	
	Y 3		0,61	0,81	

Source : Authors

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Table 3 shows the alpha coefficients for each factor exceed 0.60, as well as the adjusted item–total correlations for each item is above 0.30. Furthermore, the alpha coefficients for all factor decrease when anyof their items is removed, indicating that all items contribute to the internal consistency of their respective scales. The F-test is also statistically significant for each factor, with p-values below 0.05, supporting the suitability of applying Cronbach's alpha to the data. These results suggest that the items measuring prospect theory, herding behavior, market factors, excessive confidence and gambling fallacy, anchoring and competence distortion, as well as investment outcomes, are sufficiently suitable for further analysis, such as Structural Modeling (SEM).

3.3. Assessment of Behavioral Factors

The levels of influence of behavioral factors influencing investment choices are determined by computing the average for each variable in the sample. Similarly, investment performance variables are assessed by calculating the average of participants' ratings across all variable.

In this part of the study, the selected variables that satisfy the criteria for factorial assessment and Cronbach's alpha reliability testing, as discussed above, are retained for further assessment.

Since a six-point scale is applied to evaluate the influence of the selected variables examined, their average scores are interpreted according to the following classification:

- Mean scores below 2: Very low impact.
- Mean scores from 2 to 3: Low impact.
- Mean scores from 3 to 4: Moderate impact.
- Mean scores from 4 to 5: High impact.
- Mean scores above 5: Very high impact.

3.4. Impact of Heuristic Factors in Investment Decisions

As previously discussed, heuristic-related variables are classified into two dimensions: overconfidence and the gambler's fallacy, along with anchoring and competence bias. The impact of these variables on investment decisions is presented in the following table.

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Table N°4. Impact of Heuristic Factors in Investment Decisions

Variables	Factors	Average	SD
Excessive confidence and Gambler's Fallacy	X 3	3,52	1,13
	X 6	2,84	1,09
Anchoring and Competence Bias	X 5	3,44	1,23
	X 7	3,95	1,53

Source : Authors

Behavioral variables within the heuristic factor that influence investment choices include representativeness, overconfidence biases, gambler's fallacy, the anchoring effect, and competence bias. Nevertheless, within this study, representativeness factors were not sufficiently suitable for classification as behavioral factors affecting individual investors' decisions on the Casablanca Stock Exchange.

Excessive self-confidence X 3, anchoring bias X 5, and competence bias X 7 exhibit a moderate impact on individual investors' decision-processes, with an average of 3,52; 3,44 and 3,95; in the same order. In contrast, the gambler's fallacy has a limited influence on investment choices, with an average score of 2.84.

Within the heuristic factors, competence bias has the highest mean score, suggesting that individual investors may generally depend on well-known and readily accessible information sources when investing in stocks decisions. To illustrate, they may rely on information provided by family members or friends, as well as information from local sources rather than international sources.

3.5. Impact of Prospect Theory Variables on Investment Decisions

Table N°5. Effect of Prospect Theory Factors on Investment Decisions

Variables	Factors	Average	SD
Prospect Theory	X 10	3,71	1,26
	X 11	3,67	1,29
	X 13	4,02	1,14
	X 14	3,16	1,15

Source : Authors

Within the prospect theory dimension, three types of behavior influence investors' investment decisions: sensitivity to losses, avoidance of regret, and cognitive accounting. The corresponding

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factors affect individual investors' investment decisions. Individual investors exhibit moderate levels of loss aversion (X10), regret aversion (X11), and mental accounting (X13 and X14), with mean scores of 3.71, 3.67, 4.02, and 3.16, respectively.

In particular, Market participants show a strong Inclination to evaluate all component of their financial assets individually X 13, average = 4.02. Overall, the elements of an investment collection are interrelated and jointly influence Stock trading choices. Therefore, Considering these components independently may adversely affect Financial outcomes

3.6. Impact of Market Variables on Investment Decisions

Share market value fluctuations, financial market information and previous stock patterns are market-related facors that shap individual investors' Financial decision-making. The results are presented in Table 6.

Table N°6. Effects of Market Variables on Investors' Choices

Variables	Factors	average	SD
Financial Market Variables	X 15	4,45	1,15
	X 17	4,56	1,07
	X 18	4,39	1,10

Source : Authors

Table 6 indicates that Financial market conditions exert a strong influence on the financial decisions of retail investors decisions, as the mean scores for share price fluctuations X 15, financial Market Data X 17, and prior stock price patterns X 18 are 4.45, 4.56, and 4.39, respectively.

These results suggest that individual investors tend to consider stock market information before making investment decisions, including general market information, historical stock price trends, and current stock prices. The relatively high standard deviations indicate differences in the extent to which investors rely on market-related factors when making investment decisions.

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3.7. Impact of Herding Variables on Investment Decisions

Table N°7. Impact of Herding factors on Investment choices

Variables	Factors	Mean	Standard Deviation
Imitative Behavior	X 21	3,33	1,07
	X 22	3,44	1,16
	X 23	3,48	1,08
	X 24	2,92	1,06

Source : Authors

As shown in Table 7, individual investors in the Moroccan stock market moderately follow the trading decisions of other investors. They tend to consider other investors' behavior when selecting stocks (X21, mean = 3.33), determining trading volumes (X22, mean = 3.44), and making buying and selling decisions (X23, mean = 3.48). However, herding behavior appears to have a relatively low influence on their stock investment decisions for item X24 (mean = 2.92).

Overall, most behavioral variables associated with the heuristic dimension (divided into two subfactors), prospect theory, and herding behavior have a moderate influence on individual investors' investment decisions. Some variables, such as X6 and X24, have a low influence. Market variables (X15, X17, and X18) and one prospect theory variable (X13) have a relatively high influence on investment decisions.

These findings do not support the hypothesis that all behavioral finance factors have a high influence on individual investors' investment decisions. However, the relatively high standard deviations compared with the mean scores suggest differences among respondents in their assessments of the influence of behavioral factors affecting investment choices. For instance, stock price fluctuations X 15 have a mean score of 4.45 and a standard deviation of 1.15, indicating variation in how strongly investors perceive this factor to influence their decisions.

3.8. Investment Performance

Table N°8. Assessment of Investment Performance

Factors	Variables	Mean	Standard Deviation
Investment Performance	Y 1	2,55	1,04
	Y 2	2,72	1,10
	Y 3	2,88	1,18

Source : Authors

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Table 8 provides an overview of investment performance in relation to individual investors' expectations. Overall, the mean scores suggest that respondents' assessments of their investment performance are relatively low. A comparison of initial investment expectations (Y1, mean = 2.55) and overall market performance (Y2, mean = 2.72) reveals a difference between the two measures. This difference may reflect various factors, including unexpected market fluctuations, inappropriate investment strategies, or unforeseen macroeconomic events. However, further analysis would be required to establish the underlying causes.

Another important finding concerns investors' satisfaction with their investment decisions over the previous year. The mean score for this variable (Y3) is 2.88, suggesting that respondents' assessments of their investment decisions were relatively low. This measure may encompass several aspects of investment strategy, including stock selection, buying and selling decisions, and overall portfolio management.

These findings highlight the importance of understanding behavioral factors in investment decision-making. Individual investors may be influenced by cognitive biases and emotional reactions that affect their financial choices. A better understanding of these factors could help investors develop more disciplined and balanced investment strategies, potentially improving investment outcomes and overall satisfaction with their decisions.

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Conclusion

Stock markets are complex and unpredictable, and the Moroccan stock market is no exception. This study examined the behavior of individual investors in the Moroccan stock market through five main behavioral factors: prospect theory, herding behavior, market factors, overconfidence, and heuristic biases.

The findings indicate that individual investment decisions are influenced by a combination of behavioral factors. In particular, investors tend to be influenced by market information, including stock price fluctuations and past price trends. Loss aversion, overconfidence, anchoring, and herding behavior also play a role in investment decision-making, although their levels of influence vary across the variables examined.

These findings highlight the importance of behavioral awareness in investment decisions. Moroccan investors should consider the potential effects of cognitive biases, emotional reactions, and external influences when making financial choices. A more informed and disciplined approach may help investors make better decisions, manage risks, and improve investment outcomes. In particular, investors should avoid reacting impulsively to past losses or relying excessively on other investors' decisions.

Nevertheless, this study focuses exclusively on individual investors in the Moroccan stock market and does not examine institutional investors. Although the sample was randomly selected, further research using larger and more diverse samples is needed to strengthen the generalizability of the findings.

Further studies could examine the effects of digitalization and data technology adoption on investor behavior. In an environment where information is increasingly accessible in real time, it would be valuable to examine how digital platforms, social media, and financial applications influence investment decisions. Investors' interactions with these platforms and their responses to the growing volume of available information warrant further investigation.

Finally, the influence of individual investor behavior on marketing and brand performance represents another promising avenue for future research. As important stakeholders, individual investors may influence organizational change, corporate reputation, and organizational learning. Exploring these relationships could provide further insights into the broader implications of investor behavior for firms and financial markets.

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