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IMPACT OF BEHAVIOURAL FINANCE ON RISK PERCEPTION, PSYCHOLOGICAL BEHAVIOUR, AND FINANCIAL DECISIONS OF MOROCCAN INVESTORS

ABSTRACT

The paper deals with behavioural finance as a stream of finance challenging the principles of classical finance by adding psychology to the reasons that could explain observed anomalies within financial markets and which, at the same time, are caused by real human behaviour. The aim of this paper is to explore investors' behavioural, biases and their disturbances of rationality, focusing mostly on the factors of loss aversion, cultural influences, and overconfidence, and how these elements influence investment decisions.

It is based on empirical data and behavioural experiments, which help to show how such biases deviate from efficient market theories; this work also tests some methods that can mitigate these negative effects, therefore providing insights on how to integrate the teaching of behavioural finance more effectively into the decision-making process of investors and experts within finance. Precisely, this work is aimed at attempting to provide a model of psychological behaviour for Moroccan investors, based on an investigation carried out in the field among 93 regular investors in the Casablanca Stock Exchange.

The main findings of the study underline how behavioural biases deviate from predictions by efficient market theories. This paper has only focused on the specific context of Moroccan investors, yet giving insight into how psychological factors impact investment decisions through new insights into life where these financial behaviours take place.

There is, hence, uniqueness to the research through the theoretical and practical approaches integrated therein, with the use of empirical data and behavioural experiments that sustain the discussion on behavioural finance. Presenting the case of Moroccan investors adds a significant contribution to proposing a context-specific model, which may bring important implications for financial decision-making within the region.

Keywords: market efficiency, psychology, behavioural finance, behavioural biases

JEL Classification: G4, G41, G53

INTRODUCTION

Informational efficiency is considered to be very nearly the hypothesis on which modern finance has been based. It asserts that stock prices capture all information about firms and further states that the price of any security will always tend towards its intrinsic value. This would be achieved through the use of relevant and correct information by rational investors and an equality between the value of the security and its market price. However, with irrational investors, any deviations found will be corrected by arbitrage mechanisms in order to keep the fundamental value. In the case of stocks, the fundamental value is the present value of future dividends. This necessitates the rational anticipation of future dividends, requiring thorough research, analysis, and utilization of available information as the basis for decision-making. Investors are concerned with the relevance of all public information influencing the market, their private information, their

anticipation about private information others may hold as economic agents, and the estimation of how quickly this data is integrated into the price of securities.

However, this theory cannot explain numerous anomalies observed in financial markets over the past decade, such as over/undervaluation, excessive volatility, speculative bubbles, size effects, and calendar effects. These anomalies challenge the effectiveness of the efficient market hypothesis, suggesting that financial market participants are not entirely rational. This irrationality is partly because performing analytical calculations is arduous, and sorting through relevant information can be exhausting.

Subtle contradictions in efficiency over the last three decades have caused psychologists to venture into financial studies and establish that people's choices are potentially contaminated by feelings, heuristics, emotions, and state of mind. It is a new tendency led by KAHNEMAN and TVERSKY, which links finance with psychology and emphasizes how the perceptions of investors are subject to the impact of diverse psychological factors, interfering with people's interpretations, reasoning, and choices in an automatic and instinctive way. This thus evolved into the concept of bounded rationality. The research on human behaviour, particularly psychology, has been able to provide some plausible and suitable explanations for deviations from market efficiency assumptions. It is basically this interdisciplinary connection between finance and other social sciences that marks the emergence of behavioural finance, bringing about a significant renewal to the financial landscape.

Essentially, the main impetus toward behavioural finance came from the blatant failures of traditional frameworks in explaining empirical phenomena—for example, financial bubbles that took place in different countries, such as Japan, Taiwan, or the United States. Behavioural finance offers a new avenue: a much more vigorous approach for explaining observed facts in financial markets by trying to shed light on behaviours, desires, errors, preferences, and attitudes through experiments and tests. Prospect theory, developed most strikingly by Kahneman and Tversky in 1979 and 1992, forms the basis of behavioural finance. This theory established that people do not make decisions based on expected utility principles and thus do not behave according to the theory of subjective probability, where every individual assesses probabilities objectively in an uncertain environment. It proved that people overvalue or undervalue actual probabilities and give more importance to losses than to gains of equal magnitude. It was also extended to a great extent by researchers like Richard Thaler, who was awarded the Nobel Prize in Economics in 2017. Their empirical and theoretical work has contributed to making this a resilient field of research. Experimental studies carried out for several decades now have reported the pervasive effects of cognitive biases and heuristics on individual decision-making. Challenges to expected utility theory have been provided through observations showing that it fails to describe the behaviour of individuals when dealing with situations in which there is either risk or uncertainty.

The paper focuses on investor rationality by studying the psychological behaviour and risk perception of investors. The paper will focus on a sample based on 93 regular investors in the Moroccan stock market. In this methodology, the following will be included: "Cronbach's Alpha" reliability test; highlighting the correlations; the Granger causality test; formulation and verification of a multiple regression model; and autocorrelation tests, Breusch-Pagan error normality tests, and the VIF value test to validate the completeness and robustness of the model, all based on the data gathered and refined. It belongs to the sphere of psycho-economics, which attempts to include psychological factors in investors' decision-making process. In this sense, it draws very close to the approaches of behavioural finance. The core objective of the work is to identify the key determinants of the behaviour expressed by Moroccan investors in our sample. From these results, several recommendations are proposed with the intention of assisting traders to handle, more effectively, their behaviour when faced with financial risk.

LITERATURE REVIEW

Any discussion on the market efficiency hypothesis cannot be complete without recognizing the important role Eugene Fama played in shaping this theory. Fama's use of probabilistic mathematics in the financial world during the 1950s and 1960s provided a platform for financial modelling and the immediate development of new tools of market finance.

According to Fama (1965), a market is informationally efficient if the asset's price reflects its fundamental value as derived based on available information. In the theory of efficient markets, market efficiency is defined as the ability of the market to perform its functions—prices offering good enough grounds for people to act on them. This brings out clearly the informational aspect that becomes paramount in this hypothesis. An efficient market will have prices of its listed financial assets produced and reflect all available information. There can be no regulation or reappraisal to keep the fair value of securities at any point in time in such a market. Fama cites the case of a wide market, wherein knowledge spreads instantaneously, just like in the stock exchange framework wherein operators tend to act appropriately and almost immediately to any given information if they have the cognitive capacity to interpret it correctly; the current price of any financial

asset is always the best-unbiased estimate of its true intrinsic value. Therefore, its future movements cannot be anticipated because all the information that is known or is likely to occur is already accounted for in its current price.

Informational efficiency is the keystone for the proper functioning of markets because it infuses reliability and attracts investors. Thus, it becomes paramount for the growth of financial markets. Hence, market regulatory bodies and exchanges strive to build the legal and organizational infrastructure to provide the groundwork for such an informational efficiency state. The reality of markets, however, proves that price signals do not carry useful information easily as the investor faces an absence of information. There is no true value of assets in an inefficient market and the agents are always on the lookout for all the relevant information to correctly determine the risks, gains, and opportunities that the market presents. In the first part of our article, we will relate the concept of investor rationality with market efficiency.

Another hypothesis of the market efficiency is set on the human rationality hypothesis of investor behaviour. The idea behind market efficiency is that if financial asset prices already reflect the income that is expected to be produced in the future, then the demand for these assets is efficient. Asset price efficiency is the basic assumption made because investors believe the market situation would develop in accordance with their anticipated future passive income gains. Investors not only need to properly estimate the intrinsic value of assets but also should know the basic model underneath. This is not something that can be checked easily. For this, you need a lot of data to properly analyze the trends and secure the best transaction terms. The target is to find the best estimate of security intrinsic value by the way of the financial rationality concept which sets to the principle of profit maximization for traders.

Financial research takes the same direction as that followed by economists studying the agent behaviour in a market for goods and services in an economy. In like manner, therefore, similar to the economists who assumed the rationality of the market participants to develop certain theories or model the observed behaviours on these markets, the experts in finance have assumed such rationality. Among the latter is the Efficient Market Theory which assumes the rationality of agents in both behaviours and expectations, insisting that rationality is extremely necessary for efficiency.

For ALLAIS (1953), a man is considered rational when he "pursues coherent goals and uses appropriate means for the goals pursued." More generally, "rational" designates what converges toward reason or belongs to reason, whereas "irrational" designates something which is not adequate with reason or outside of reason. To this effect, psychologists DROZDA-SENKOWSKA et al. define a rational man as a reasonable person, a sound-minded individual Ringen free from madness, and a person endowed with reason in terms of the ability to reason and judge.

Rationality in general has three meanings that tend toward a philosophical rather than a psychological concept. These three meanings, although completely different, are closely related to each other:

- rational means justified, demonstrated, approved: based on unquestionable reason, which no one can doubt;
- rational also means critical and investigative, not confined by apparent evidence and previous choices;
- rational is also understood as efficient in the sense of maximizing expected returns.

The first two senses better reflect the definitions that interest social psychologists, while the third sense is adopted by economists and financiers. From an economic standpoint, any individual capable of clearly defining their needs and optimizing the use of resources while choosing the best or most suitable service to directly meet this need is considered rational. However, there are several forms of rationality:

1. Instrumental or classical rationality: According to ALLAIS (1953), agents are distinguished based on the preferences or goals they seek to achieve, taking into account constraints that limit the scope of their possible choices. It represents the adequacy between means (income) and desired ends.
2. Cognitive rationality: The cognitive abilities of the individual have led to the development of other rational concepts based on the moderation of classical rationality. WALLISER (1982) introduced the concept of cognitive rationality to consider the correspondence between the information held by the agent and the representation (representative beliefs vary from one agent to another). Therefore, cognitive rationality emphasizes that there may be differences between the real environment and the perceived environment, reflecting whether the information held is in line with the environment.
3. Bounded or procedural rationality: This notion is mainly founded by SIMON (1987). He highlights that an individual can only have imperfect constraints and possible choices. Herbert Simon emphasized that when faced with individuals whose information is imperfect, the choices they make are not optimal but simply attempt to fulfil certain desires or requirements. Reason is no longer absolute and objective but full of subjectivity and relativity. The reason is primarily procedural, depending largely on the organization in which the individual acts.

Behavioural finance thus effectively challenges the very backbone of classical finance: the hypothesis of efficient markets. The above-mentioned theory states that the price of financial assets includes all publicly available data. It assumes a perfect world wherein the price indicates the perfect indicator of value. As Fama argues, past data has already been incorporated into the price. The past does not indicate the future, hence the notion of a "random walk," that is, the randomness of a stock price in the short run if there is no prudent data or expectation of results. In a related context, the theory of classical finance is dependent on the market participants, and through their rationality, efficiency is gained by the market. One of the immediate consequences is that the price of a stock converges to its fundamental value. The intrinsic value of the stock of a firm denotes the present value of the predicted future cash flows generated by that firm. This value of fundamentals is typically computed by the following expression:

Equation 1: Expression of fundamental value

$$\text{Fundamental Value} = \text{Cash Flow}_1 / (1+r)^1 + \text{Cash Flow}_2 / (1+r)^2 + \dots + \text{Cash Flow}_t / (1+r)^t \quad (1)$$

where: *r* is the discount rate, *Cash Flow* represents the cash flows generated by the company at a future time *t*.

Investors use the concepts of overvaluation, undervaluation, and intrinsic value to make informed decisions. Intrinsic value provides an objective estimate of an asset's true worth, while overvaluation and undervaluation compare this value to the asset's current market price.

- **Overvalued Assets:** When investors identify assets as overvalued (market price above intrinsic value), they may choose to sell them. This increase in supply can lead to a drop in prices, pushing the market price closer to the intrinsic value.
- **Undervalued Assets:** Conversely, when assets are identified as undervalued (market price below intrinsic value), investors may rush to buy them. This increases demand for these assets while supply remains constant, driving the market price up toward the intrinsic value.

By adjusting their buying and selling strategies based on these evaluations, investors can maximize their returns and minimize their risks. Theoretically, whenever overvaluation or undervaluation occurs between the market value and the fundamental value, rational agents engage in risk-free arbitrage.

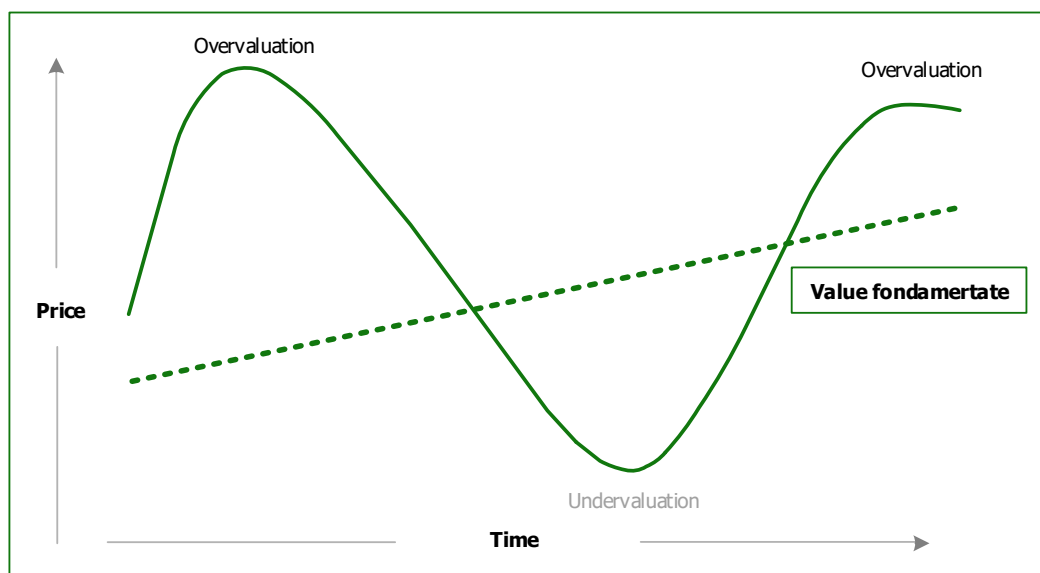


Figure 1. Over/Undervaluation and Fundamental Value. (Source: Yannick Coulon, 2015)

Unlike theoretical models dealing with just one representative investor, De Long et al. (1990) pointed out that the market hosts two kinds of investors: rational investors and irrational investors, known as "noise traders." These are the investors who act upon their mistaken beliefs, behave by the actions of other investors, and cause deviations of asset prices from their basic values. As the informational efficiency hypothesis goes, rational investors take every arbitrage opportunity to earn profits.

This view is based on psychological research that has shown the assumptions of standard theory are not interpreted in an individual's actual behaviour. In 1974, Tversky and Kahneman disclosed that individuals use shortcuts to reason out situations, and this leads to biased decisions.

In the 2000s, some of the research studies of psychologists were adapted by finance researchers, purposively taking cues from the works of Tversky and Kahneman. Behavioural finance branches off these studies to assess the rationality of people and related principles. These have been based on observations and results, such as:

- independence and transitivity axioms are often overridden by individual decisions;
- investors exhibit herding behaviour;
- investors do not follow Bayes' rule;
- investors tend to be overconfident;
- investors simplify complex choices using rules and shortcuts called heuristics.

Heuristics are the cornerstones of what efficient methods or rules are to let people make quick and a gut-level judgment. This abstract is the most important one in this chapter as it shows why people disregard rationality. These results have made scientists doubt the correctness of their predictions on actor rationalism and the efficiency of the markets.

Behavioural finance thus proposes more realistic hypotheses to understand financial behaviours, challenging the classical paradigm. Each behavioural trait is able to explain a phenomenon in the market observed at one time or another that could not be well explained previously by the classical paradigm, questioning efficiency and rejecting the substantial rationality model.

While behavioural finance is particularly focused on cognitive and psychological elements, some approaches are more oriented toward social, political, or cultural variables. Akerlof and Shiller put forward popular models in the light of the Keynesian model of animal spirits, while other authors try to explain some phenomena as being an influence of institutions and organizations.

A major criticism in the scientific realm of behavioural finance is the retention of the individualism assumption. This is a single decision maker or the fact that most behavioural finance authors have suggested microeconomic models; this is a sole concentration on the individual, which is found to be one of the major limitations observed by Fama in 1998. He expressed that empirical evidence is found against the efficiency argument, but no global model could be presented so far to explain market inefficiency.

Studies conducted in 2009 by Natapura, Kartika and Iramani in 2013, and Wulandari and Iramani in 2014, to mention a few, with respondents in Surabaya proved that investors consider neutral, accounting, and demographic information as the source of information about stock investment. Other than data, perception of risk, trust, experience, and psychological factors are deciding investment decisions.

AIMS AND OBJECTIVES

The main purpose of this study is to analyze the behavioral biases of investors and their impact on the rationality of investment decision-making, taking into account factors such as loss aversion, cultural influences, and overconfidence.

To achieve this goal, the article solves the following tasks:

- methods of mitigation of negative consequences to ensure more effective integration of behavioral finance into decision-making processes by investors and financial experts are proposed;
- a model of psychological behavior of Moroccan investors based on the study of investors on the Casablanca Stock Exchange was developed.

METHODS

The Casablanca Stock Exchange was established on the 7th of November 1929 as the official stock exchange of Morocco and was "Office de compensation des valeurs mobilières." Later on, it underwent three significant reforms in 1967, 1986, and 1993. It is a private company whose capital is, for the most part, held by Moroccan banks and the Caisse de Dépôt et de Gestion, structured as a public limited company with a Board of Directors. Key shareholders include major Moroccan

banks, the Caisse de Dépôt et de Gestion, brokerage firms, insurance companies, and the Casablanca Finance City Authority.

The Casablanca Stock Exchange, often called the Bourse de Casablanca, is Morocco's principal stock market. It involves a market system where a location for the trading of shares of listed firms is given through the issuing of listed companies so that investors may sell securities to various investors or vice versa. As a financial institution, the Casablanca Stock Exchange performs a core function in the economy of Morocco, for without it, corporate financing would not be possible. On one hand, companies can raise capital by issuing shares; on the other, it provides an opportunity for investors to share in the growth of companies by becoming shareholders. Fluctuations in stock prices in the Casablanca Stock Exchange often mirror investors' perceptions about Morocco's economic performance and international factors. It provides opportunities for diversification of portfolios of investors and is a part of the country's economic growth.

The Casablanca Stock Exchange forms a part of the legal framework laid down by the Moroccan Capital Market Authority, known as AMMC, for its governance in terms of transparency, liquidity, and the protection of investors. Intermediation in stock exchange transactions is performed through securities brokers. All in all, the Casablanca Stock Exchange is an important component of the Moroccan financial system, encouraging investment, and economic growth, and offering investors a way to share in the evolution of businesses and the economy as a whole. It is located in the economic capital of the country. The following are some of the key information related to the said entity:

1. **Stock Indices:** The Casablanca Stock Exchange uses several indices to measure market performance. The main index is the MASI (Moroccan All Shares Index), representing the overall performance of listed stocks.
2. **Listed Companies:** The Casablanca Stock Exchange hosts companies from various sectors such as finance, telecommunications, and industry. These companies issue shares to raise funds, offering investors the opportunity to become shareholders.
3. **Regulation:** The Moroccan Capital Market Authority (AMMC) regulates and oversees the activities of the Casablanca Stock Exchange, aiming to ensure transparency, integrity, and investor protection.
4. **Financial Products:** In addition to common stocks, the Casablanca Stock Exchange offers other financial products such as bonds, investment certificates, and mutual funds, providing investors with various options for portfolio diversification.
5. **Technology:** Like many global exchanges, the Casablanca Stock Exchange utilizes modern technologies to facilitate trading. Transactions are often conducted electronically, enhancing efficiency and accessibility for investors.
6. **Economic Events:** Economic and political events in Morocco, as well as on the international stage, can impact the volatility and direction of the Casablanca Stock Exchange.
7. **Foreign Participation:** The Casablanca Stock Exchange also attracts foreign investors. Rules and conditions for foreign participation are governed by relevant regulations.

The behaviour of the individual investor towards risk at the Casablanca Stock Exchange is complex and dynamic, as influenced by numerous factors. These investors respond differently to financial market uncertainties, starting from cautious savers to bold speculators.

Some are conservative, stability-oriented, and preservation-of-capital: Averse to any sort of risk, they lean toward choosing investments that are safer, even if the returns might be modest. For such, low-volatility investments—bonds or shares in established big companies—make a beeline.

On the other hand, some investors are risk-takers who believe in the promise of maximum gains. Such speculators have no issue entering into investments that are high in risk, such as shares in fledgling firms or fast-growing industries. In their view, risk is an opportunity where fluctuation in value can be accepted for a potential higher return.

Psychological and emotional factors also influence individual investor behaviour with regard to risk on the Casablanca Stock Exchange. Fears, greed, or panic can exaggerate reactions to changes in the markets. Some investors quickly start selling positions with falling prices, while others view such situations as a chance to buy.

The management of risk by individual investors has much to do with the financial education being imparted. In fact, often it is those who understand a little about the basics of investment and diversification, and the rhythm of market cycles, who are better positioned to make opposite decisions and thus go against the emotional market movements.

Some investors are very cautious about risk on the BVC, while others take bolder approaches to very high return strategies. The latter set of behaviours is shaped by psychological and educational factors related to finance, shaping a vibrant and dynamic investment environment.

Investment refers to the process of subjecting money or resources to an investment that sees them gaining extra revenue mere. It is also money set aside to be held for a predetermined period, into one or multiple assets. Hence, investment should be considered as a decision that is made to put funds or other resources that are available now with the purpose of either gaining profit from it in the future or being richer in the future.

The very definition of investment suggests it has three components: first, the expenditure or sacrifice of a resource in the present, an element of uncertainty related to risk, and finally, an anticipation of future returns. The motivations for investing also vary; some do it for meeting immediate liquidity needs, others for saving for retirement or to speculate, etc.

There basically are two primary divisions in investments: investments in real assets and investments in financial assets. The particular study concentrates on a review of financial assets like shares of stock traded on the stock exchange market. Grinblatt and Keloharju (2001) and Hui and Li (2014) have examined the three core kinds of investors, respectively:

1. **Conservative Investors:** This type of investor tends to avoid risks and prefers to engage in low-risk investment instruments.
2. **Moderate Investors:** They have a higher risk tolerance and are willing to take more significant risks, anticipating results proportionate to the risk.
3. **Aggressive Investors:** These investors display a high-risk tolerance, seeking higher returns even by taking considerable, even extreme, risks. They are often equated with speculators due to their pursuit of high returns at high, sometimes extreme, risk levels.

Our research instrument is the questionnaire which is going to be administered to investors of the stock market. In expounding the questionnaire as the instrument of research in relation to behavioural finance, it is apt and very important in this stage of data collection and analysis of financial behaviours manifested. First, the validity of the measures which is the questionnaire is approached through content validity. According to Churchill, 1979, it is important that the questionnaire should adequately cover all concepts relevant to behavioural finance. This requires the selection of questions that are most likely to reveal the underlying subject matter. On construct validity, pioneers Kahneman and Tversky underscore that the instrument ought to be designed to elicit measurements for the underlying psychological concepts of interest, including cognitive and emotional biases that characterize financial decisions. In relation to criterion validity, Thaler links a relationship between the score on the questionnaire and some external elements, like real financial behaviours. This will help in assessing the relevance of the questionnaire, but also its predictive capacity on their actual financial behaviour.

The Moroccan context presents specificities in terms of speculation and risk tolerance by stock market governance bodies. The tolerable risk margin is very narrow, and the stock market variation rate, whether up or down, cannot exceed a threshold of 6%. These elements are modelable and are not unique to our context, although the variation between our context and others may accept a more or less reduced range. The distinguishing aspect of the methodological approach within behavioural finance is its commitment to the integration of psychological concepts into financial DM analysis. This general methodological approach can express the overall purpose of the essay as follows:

- **Identification of Cognitive Biases:** The starting point is often the identification of cognitive biases, such as loss aversion, anchoring, risk aversion, and the availability heuristic. These biases are systematic distortions in how individuals process financial information.
- **Construction of Questionnaires:** Researchers in behavioural finance frequently use questionnaires to collect data on individuals' preferences, perceptions, and financial behaviours. These questionnaires are carefully designed to measure specific aspects related to identified cognitive and emotional biases.
- **Controlled Experiments:** Controlled experiments are often used to study financial behaviour in a controlled environment. For example, researchers may design scenarios where participants make financial decisions under different experimental conditions to observe behavioural responses.
- **Analysis of Behavioural Data:** The collected data are analyzed, taking into account behavioural aspects. This often involves the use of specific behavioural models to interpret financial choices, considering identified cognitive biases.

- **Field Studies and Observations:** For empirical validation, field studies are conducted by observing real financial behaviours in various contexts. Researchers examine financial transactions, investment portfolios, and other observable financial behaviours.
- **Mathematical and Econometric Modeling:** The methodological approach of behavioural finance often integrates mathematical and econometric models to formalize observed behaviours. These models can help quantify the impact of cognitive biases on financial markets and individual decisions.
- **Cultural Adaptation:** Since financial behaviours can vary across cultures, the methodological approach of behavioural finance often includes cultural adaptation. Researchers consider cultural differences in study design and questionnaire construction.
- **Integration of Results into Financial Theory:** The results obtained from these methods are then integrated into financial theory, expanding our understanding of financial markets and investment decisions beyond traditional models.
- **Data Processing Method:** To process the data, we followed the following protocol. Firstly, we chose to use Python and the Pandas Library to describe the characteristics of our sample. Then, we used Eviews 12 and IBM SPSS Statistics 27 for data processing, as they are suitable tools for econometric models and regression analysis. The objective is to analyze how these behavioural variables intervene in financial decisions, using regression models to establish quantitative relationships between these behaviours and observed investment choices. By comparing these models with the collected data, we seek to determine to what extent these behaviours play a significant role in financial decision-making, confirming or refuting the initial study hypotheses in light of specific behavioural aspects.

Through this trajectory analysis, it is established that the average investor holding common stocks for two years, like most investors, shows a strong preference for short-term investments, focusing more on expected capital gains rather than dividends. A study by Yanti in 2012 regarding Sharia-compliant stock in the Indonesian Stock Market reveals that this research found out that participants' investment strategies in Sharia-compliant stock give less weighing to fundamental information regarding price/earnings ratio and stock yield.

Those two principal factors driving in our theoretical model are: endogenous or exogenous, reflected through the variables and indicators outlined in Table 1 as follows:

Table 1. Explanatory Variables. (Source: Yuliani, Isnurhadi and Ferry Jie, 2017)

	Variables	Indicators	Sources
Exogenous	Risk Perception	Risk-averse Risk-taker	Barbier et Odéan (2000), Frensidy (2013), Bayard (2013)
	Investor Psychology	Cognitive Affective	Grinblatt et Keloharju (2001), Qawi (2010), Bayard (2013)
	Market Confidence	Financial and accounting information Media, Expert	Gumanti (2009), Kumar (2008), Bayard (2013)
Endogenous	Stock Performance	Capital gains Dividend	Bodie et al. (2013)

According to Lucey in 2005, he did research on the impact of investor sentiment on stock prices and at the same time created a theory to argue the emergence of outcomes in this field. This case looks at how health factors such as weather, biorhythms of the body, and social factors that this investor's mood affects will directly affect investments by investors and in sequence likes such as. The following are the research findings:

- investors tend to invest in a manner that aligns with their sentiments;
- there is an effect of sentiments on stock prices.

The research has shown that meteorological factors have no significant influence on the rate of inflation across markets by using nonparametric correlation analysis and autoregressive moving average models.

Research conducted by Durand and Sanghani (2008) aimed to investigate the correlation between personality traits, investment decisions and long-run portfolio performance. The number of investors that participated in the research was 18 with all of them owning shares in Australia. The fiscal year of the study came to a close at the end of the day on June 30, 2005. The study unveiled that:

- individuals who are more extroverted and exhibit less fear tend to show a stronger preference for innovation and achieve better portfolio performance;
- individuals with higher levels of negative emotions tend to take more risks and more frequently opt for a higher-risk portfolio;
- higher levels of negative emotions in individuals prone to higher risks are also linked to increased trading behaviour, while more extroverted investors exhibit a lower tendency for trading behaviour;
- the psychological gender role is more pertinent than biological sex in analyzing investor behaviour.

This behavioural finance-based approach will allow an in-depth analysis of the relationships between behaviours and financial decisions, providing valuable insights to refine study hypotheses and better understand the influence of behavioural factors on investment choices. In conclusion of this chapter, from a behavioural finance perspective, we will develop models associated with each variable: risk perception, psychological behaviour, market confidence, and market performance. We will evaluate these models using Fisher and Student p-values, as well as the coefficient of determination (R^2), highlighting the impact and importance of behavioural aspects in financial decision-making.

EViews 12 software allows the design of questionnaire variables that can later be transformed into measurable variables. To do this, we coded our various research variables as we integrated the questions, associating each variable with a code for data presentation. The list of variables and their classifications (Explained or Explanatory) is presented in the following Table 2.

Table 2. Coding of Study Variables.

Variables explained	Coding	Explanatory variables	Coding
Risk perception	V1	Political instability	V2
		Economic uncertainty	V3
		Currency fluctuations	V4
		Regulatory risk	V5
		Information risk	V6
Psychological behaviour	V7	Fear and anxiety	V8
		Cultural origins	V9
		Influence of emotions	V10
		Avoid losses rather than seek gains	V11
		Trend follower	V12
		Past experiences	V13
		Overconfidence	V14
Market confidence	V15	Accounting documents	V16
		Financial ratios	V17
		Fundamental analysis	V18
		Technical analysis	V19
		Expert advice	V20
Market performance	V22	Influence of family and friends	V21
		Stock price direction	V23
		Share price increase	V24
		Long-term objective	V25
		Dividend distribution	V26
		Dividend growth	V27

The variables used in this study are sub-grouped into exogenous and endogenous and each type of them makes their part in the study. The exogenous variables are composed of the Perception of Risks, Investors' Psychological Behaviour and confidence in stock markets, while the endogenous variables are the efficiency of ordinary shares. Understanding this stock market term, the Likert scale was used to evaluate these variables.

The Likert scale ranges from 1 to 5, encompassing:

- Strongly Disagree (Score 1);
- Disagree (Score 2);

- Neutral (Score 3);
- Agree (Score 4);
- Strongly Agree (Score 5).

The use of the Likert scale is a judicious choice for quantifying variables that are challenging to measure. This scale is widely used in many behavioural and psychological studies due to its ability to allow a gradual assessment of perceptions, attitudes, or opinions. Its format provides flexibility for collecting data on abstract or complex concepts, making it a suitable tool for measuring delicate variables in our study.

Our hypotheses are rooted in the research cited in the theoretical framework and are presented in four aspects:

- H1: There is a significant relationship between risk perception (V1) and investor psychological behaviour (V7).
- H2: There is a significant relationship between investor confidence in market information (V15) and psychological behaviour (V7).
- H3: There is a significant relationship between market performance (V22) and psychological behaviour (V7).
- H4: Investor psychological behaviour (V7) is impacted by risk perception (V1), market confidence (V15), and market performance (V22).

RESULTS

Presentation of descriptive statistics

At this stage of our study, we are trying to underline the economic parameters that are driving the trend in the participants' responses. For this purpose, we'll try to determine some statistical parameters, such as the mean, median, maximum value, minimum value, and standard deviation. With the help of these metrics, it will be possible to discover general trends and clearly evaluate the appropriateness of our research into psychological dimensions in stock markets with regard to confidence and performance.

Tables 3-7 list the variables of interest in this study, including confidence level and market performance measures, and for each compute measures of central tendency: mean, median, maximum and minimum, as well as standard deviations. All these statistics will help us to know what's behind the participants' answers according to the range and dispersion of answers, and to detect possible trends or outliers of values against trend. Additional measures of statistics can be included if relevant to our research. Results obtained at this stage will then lead to meaningful conclusions concerning the objectives of our study.

Table 3. Descriptive Variable Statistics. (Source: Personal compilation using EViews 12)

	V1	V7	V15	V22
Mean	3.4194	3.0323	2.8065	3.3226
Median	4.0000	3.0000	3.0000	3.0000
Maximum	5.0000	5.0000	5.0000	5.0000
Minimum	1.0000	1.0000	1.0000	1.0000
Std. Dev.	1.5696	1.5425	1.2875	1.3844
Skewness	-0.4098	-0.054	0.2725	-0.2214
Kurtosis	1.6153	1.5448	1.9463	1.8315
Jarque-Bera	10.033	8.2508	5.4540	6.0507
Probability	0.0066	0.0162	0.0654	0.0485
Sum	318.00	282.00	261.00	309.00
Sum Sq. Dev	226.65	218.90	152.51	176.32
Observations	93	93	93	93

Regarding the variables V1 "Perception of risk", V7 "Psychological behaviour", V15 "Market confidence", and V22 "Market performance" here are some important statistics:

1. The mean is equal to 3.42 (V1), 3.03 (V7), 2.81 (V15), 3.32 (V22). It is a measure of central tendency representing the average value of the entire dataset. To calculate the mean, all values of the sample (in this case, responses to variable Vi) are summed, and the total is divided by the number of responses (93).
2. The median is 4 (V1) and 3 for the other variables. It is another measure of central tendency, representing the value that divides the dataset into two equal parts, with half of the values below the median and the other half above.
3. The observed maximum is 5, while the minimum is 1, highlighting the divergence in responses provided by the respondents.

Additionally, examining the distribution characteristics of the variables:

1. The skewness coefficient is between -0.5 and 0, indicating a slight leftward skewness of the data distribution relative to the mean. This suggests a slight leftward asymmetry, with a longer tail on the left side of the mean.
2. The kurtosis coefficient measures how much the data distribution differs from a normal distribution. A kurtosis coefficient between 1 and 2 suggests a moderately flat distribution (leptokurtic) compared to a normal distribution. A leptokurtic distribution means that values are more concentrated around the mean, with thicker tails, implying the presence of extreme values further from the mean compared to a normal distribution.
3. It is important to note that the Jarque-Bera test is used to assess the normality of the data distribution. It compares the data distribution to a normal distribution based on kurtosis and skewness coefficients while checking if the associated probability for this test is below a predetermined threshold of 5%.

Table 4. Cronbach's Alpha Reliability Test. (Source: Personal compilation using SPSS 27)

Observation processing summary			
		N	%
Observations	Valide	93	100.0
	Exclu	0	.0
	Total	93	100.0
Reliability statistics			
Cronbach's Alpha		Number of Elements	
.756		4	

A Cronbach's Alpha coefficient of 0.756 is reasonable for internal reliability for a scale or set of questions related to psychological behaviour in the ambit of behavioural finance. This suggests that responses to items or questions that measure behaviour associated with financial decisions are fairly consistent.

Table 5. Correlation Among Variables. (Source: Personal compilation using EViews 12)

Covariance Analysis: Ordinary				
Date: 12/14/23 Time: 18:40				
Sample: 1 93				
Included observations: 93				
Correlation Probability	V1	V7	V15	V22
V1	1.0000			
V7	0.1290 0.0003	1.0000		
V15	-0.0239 0.0081	0.6445 0.0000	1.0000	
V22	0.4172 0.0000	0.1925 0.0054	-0.01841 0.0172	1.0000

We observe that the probability is below the critical threshold of 5%, indicating the presence of a correlation among all variables, namely V1, V7, V15, and V22. The strength of this relationship is represented by the correlation coefficients: for

V7 and V1, $r=0.13$ (a weak positive correlation); for V7 and V15, $r=0.64$ (a strong positive correlation); for V7 and V22, $r=0.19$ (a weak positive correlation).

It is worth mentioning that, although the correlation coefficient here looks moderate or even weak in regard to the traditional types of statistical analyses, under the conditions of a study focused on revealing the psychological processes standing behind financial behaviour, it appears truly impressive. This is especially striking against a backdrop of a lack of quantifiable psychological data, as people prefer to hide their psychological vulnerabilities, only expressing their feelings of confidence and strength. Any influence or effect should hence be considered in that light.

Table 6. Granger Causality Test. (Source: Personal compilation using EVIEWS 12)

Pairwise Granger Causality Tests			
Date: 12/14/23 Time: 19:03			
Sample: 1 93			
Lags:2			
Null Hypothesis:	Obs	F-Statistic	Prob
V7 does not Granger Cause V1	91	7.6187	0.0009
V1 does not Granger Cause V7		0.1023	0.9029
V15 does not Granger Cause V1	91	4.6750	0.0118
V1 does not Granger Cause V15		0.3548	0.7023
V22 does not Granger Cause V1	91	2.0237	0.1384
V1 does not Granger Cause V22		3.5556	0.0328
V15 does not Granger Cause V7	91	2.2083	0.1161
V7 does not Granger Cause V15		9.5365	0.0002
V22 does not Granger Cause V7	91	0.1023	0.9029
V7 does not Granger Cause V22		3.050	0.0525
V22 does not Granger Cause V15	91	1.8995	0.1559
V15 does not Granger Cause V22		1.6054	0.2068

Using the null hypothesis "H0: There is no causality between the variable V7 "psychological behaviour" and the variable Vi "i=1,15,22," we compare it with the critical threshold of 5%. The results indicate that psychological behaviour V7 causes the perception of risk V1 with a probability of 0.0009, and V7 causes market confidence V15 with a probability of 0.002. However, this causality is not direct, as it is unidirectional, meaning there is no direct causal relationship between V7 and V1, V15.

In contrast, for the relationship between V7 and market performance V22, all probabilities are above the 5% threshold, indicating the absence of causality. Thus, we confirm the null hypothesis, suggesting there is no direct causal relationship between V7 and V22. Consequently, it is essential to conclude that perception of risk V1 and market confidence V15 exert an indirect influence on V7. Therefore, we reject the null hypothesis (H0) in favour of the alternative hypothesis.

Presentation of the multiple regression model for v7

Multiple regression is a statistical technique used to quantify the relationship between a dependent variable and multiple independent variables. In our study focusing on the psychological behaviours of investors, we employed multiple regression to assess the impact of various market-related explicit variables, such as risk perception (V1), market confidence (V15), and market performance (V22), on the implicit dependent variable representing investors' psychological behaviours (V7).

$$V7 = a_1V1 + a_2V15 + a_3V22 + \varepsilon$$

In this equation, we have three regression coefficients, a_1 , a_2 , and a_3 , measuring the impact of each independent variable on the dependent variable. We also included a residual error variable (ε) to gauge the difference between the predicted values of V7 and the actual values of V7. We opted for multiple regression to account for the individual effects of each independent variable on the dependent variable, as well as interactions between different variables.

In such a way, upon adopting this model, we can quantify each explanatory variable's effect on the psychological behaviours of investors and evaluate its relative importance in predicting psychological behaviours. The results will be instrumental in understanding better the determinant factors of investment decisions and market behaviours, hence helping in making informed investment decisions.

The multiple regression model that we will build will help us examine each explanatory variable's effect on the psychological behaviours of investors and consider the interactions between variables. In this case, the regression coefficients measure the effects of each explanatory variable on the dependent variable, while a residual error variable takes into account the difference between the predicted and observed dependent variables.

Table 7. Model of Psychological Behaviour (V7). (Source: personal compilation using EViews 12)

Dependent Variable: V7 Method: Least Squares Date :12/14/23 time: 19:27 Sample: 1 93 Included observations: 93				
Variable	Coefficient	Std. Error	T-Statistic	Prob.
C	0.0759	0.5112	0.1485	0.0088
V1	0.0508	0.0922	0.5514	0.0006
V15	0.7027	0.1039	6.7620	0.0000
V22	0.2439	0.1063	2.2942	0.0241
R-squared	0.5534		Mean dependent var	3.0323
Adjusted R-squared	0.5336		S.D. dependent var	1.5425
S.E. of regression	1.2592		Akaike info criterion	3.3410
Sum squared resid	141.12		Schwarz criterion	3.4498
Log likelihood	-151.35		Hannan-Quinn criter.	3.3849
F-statistic	16.353		Durbin-Watson stat	1.8602
Prob(F-statistic)	0.0000			

Behavioural finance, a captivating branch of economics, stands out for its in-depth examination of the psychological aspects influencing financial decisions. At the core of this emerging discipline lie crucial variables such as psychological behaviour (V7), risk perception (V1), market confidence (V15), and market performance (V22). These elements are not mere data points; they represent windows into the financial soul, capturing subtle nuances that often elude traditional models.

Psychological behaviour is the foundation on which the plots of our financial decisions are hinged. It exemplifies our tendencies, cognitive biases, and emotions—intertwined in the complex tapestry of markets. On the other hand, the perception of risk shapes the line we then tread through the boundary between boldness and caution. Our perception of this risk forms our approach to investment, often subconsciously, adding special dynamics within markets.

Market confidence, much akin to a backdrop, influences our general feeling about the stability and efficiency of the financial market. It is against which our decisions rest, modulating our appetites to take on investment and tolerance for risk. Finally, market performance has a central role in being a major player in the retrospective evaluation of the rationality of our financial choices.

The paper delves into the complex world of behavioural finance through a study of how these variables interrelate dynamically. If understood, one gets not only an enlightened view of markets but also some invaluable insights for practitioners, researchers, and policymakers. We proceed to uncover, through the analysis, what trends are emerging from the relationship of psychological behaviour, risk perception, market sentiments, and market performance—thereby making pointed contributions to better decision-making in finance.

The multiple regression equation for V7 is as follows:

$$V_7 = 0.15V_1 + 0.70V_{15} - 0.24V_{22} + 0.08$$

It is important to emphasize that, according to the Student's t-test probabilities highlighted in red in the previously mentioned figure, all probabilities associated with the tests are below the significance threshold of 0.05. This suggests that all explanatory variables with a probability below the critical threshold have a significant influence, either positive or negative (depending on the slope coefficient of each variable), on the explained variable V7.

Furthermore, based on the probability of the critical values of the Fisher test highlighted in blue in the same figure, it is observed that the probability is zero, well below the significance threshold of 0.05. This indicates that the explanatory variables significantly contribute to explaining the variable V7.

Additionally, the coefficient of determination R-Squared of 0.55 means that 55% of the variability in V7 can be attributed to these explanatory variables. While this value may seem relatively moderate, it is important to note that in the context

of psychological behaviour, many variables can influence V7. Thus, this 55% proportion of explained variance is highly significant given the complexity of the relationship between these variables. Overall, these results suggest that the multiple regression model we employed is statistically significant in explaining psychological behaviour (V7) based on the selected explanatory variables (V1, V15, V22).

Table 8. Breusch-Pagan Homoscedasticity Test. (Source: personal compilation using EViews 12)

Heteroskedasticity Test: Breusch-Pagan-Godfrey			
Null hypothesis: Homoskedasticity			
F-statistic	5.6543	Prob. F(3.89)	0.0513
Obs*R-squared	14.887	Prob. Chi-Square (3)	0.0519
Scaled explained SS	12.925	Prob. Chi-Square (3)	0.0548

After specifying the regression model, it is imperative to assess the homoscedasticity of residuals to ensure the validity of the analysis results. Homoscedasticity means that the variance of residuals is constant at all levels of independent variables, a crucial condition for robust regression estimates.

In our study, we applied the Breusch-Pagan test to evaluate homoscedasticity. This test is used to determine whether the variance of residuals is significantly influenced by the independent variables included in the model. The null hypothesis (H0) of the test is: "the variance of residuals is homoscedastic".

The results of the Breusch-Pagan test will provide indications regarding the presence or absence of homoscedasticity in the model. If the p-value associated with the test is higher than a pre-defined significance level (in our case: 0.05), we would not have sufficient evidence to reject the null hypothesis and would conclude that homoscedasticity is present. In our case, the p-value of the test is 0.0513, so we retain the null hypothesis.

This step is crucial to ensure the reliability of regression results and interpret the estimated coefficients correctly. Homoscedasticity is an essential condition to ensure that prediction errors are equally distributed at all levels of independent variables, thereby enhancing the validity of the inference tests conducted on the regression model.

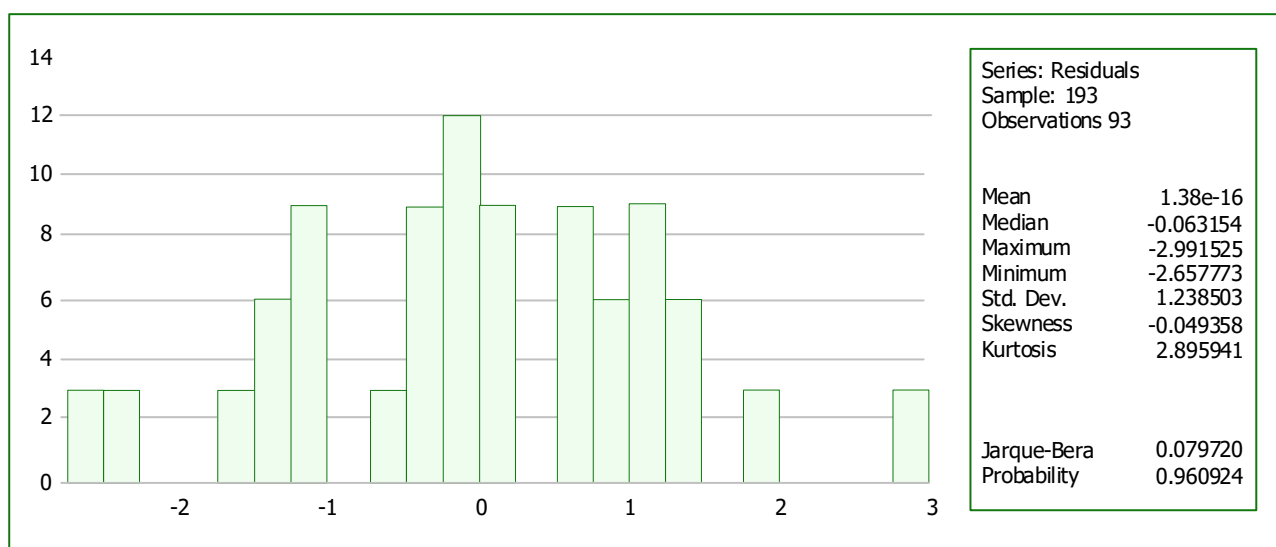


Figure 2. Jarque-Bera Residual Normality Test. (Source: personal compilation using EViews 12)

The normality assumption of residuals could be described as having implications that pertain to the regression analyses in the first place. It has a direct influence on the statistical tests' validity, associated with model coefficients. One very popular test technique for the normality of residuals is the Jarque-Bera test.

The test is based on the Jarque-Bera statistic, which is a function of the skewness and kurtosis coefficients of the residuals. The null hypothesis (H0) that the test considers is: "the residuals are normally distributed". Therefore, very small values of the p-value constitute evidence against the normality hypothesis.

We applied the Jarque-Bera test to the residuals of our regression model. We use the results of this test to be able to judge whether the residuals could be assumed to stem from a normal distribution. In our case, we obtain a high p-value of 0.96 supporting the normality hypothesis and thereby reinforcing the reliability of statistical tests based on the regression model. Hence, we accept the null hypothesis.

This becomes more crucial in a bid to ensure that the regression results arrived at are indeed valid considering that normality of residuals is one of the requirements for the confidence intervals as well as hypothesis testing related to model parameters.

Table 9. Variance Inflation Factor (VIF) Test for Multicollinearity. (Source: personal compilation using EViews 12)

Variance Inflation Factors			
Date: 12/14/23 Time: 19:57			
Sample: 1 93			
Included observations: 93			
Variable	Coefficient Variance	Uncentered VIF	Centered VIF
C	0.2613	15.3259	NA
V1	0.0085	7.0447	1.2151
V15	0.0108	6.0274	1.0387
V22	0.0113	8.5763	1.2570

Multicollinearity is a state when two or more of the independent variables in a regression model have a high correlation. The condition holds the potential to compromise the accuracy of the coefficient estimates and could confound an understanding of the results. One of the most widely used methods for multicollinearity detection is the Variance Inflation Factor (VIF) test.

The VIF estimates the expansion in the variance of a regression coefficient due to correlation with the other independent variables in a model. A high VIF, in this context, would indicate a high correlation of the variable in question with other explanatory variables, meaning multicollinearity.

VIF test was conducted on every independent variable included in the regression model. Test results assist in pointing towards any variable that might be a potential cause for multicollinearity. Badly estimated variables can have a variance factor of more than 5, which is pretty high. In our case, all the VIF values are below the threshold of 5; hence, no multicollinearity exists.

Identification of a problem of multicollinearity is very essential for some subsequent steps and mitigating measures, like the exclusion of some variables or using advanced modelling, as one intends to use. Managing multicollinearity enhances the stability of regression estimates and the validity of result interpretations.

This step will help in making the regression model robust and hence give a more reliable interpretation of relationships existing between independent and dependent variables. After having developed our model to represent variable V7 through explanatory variables V1, V15, and V22, we ran a series of important diagnostic tests. The null hypothesis of the residual normality test reveals that residuals are normally distributed, the heteroscedasticity-based test reveals the variance of residuals as constant for all levels of independent variables, and the multicollinearity test based on the Variance Inflation Factor (VIF) indicated that there were no significant correlation issues among the explanatory variables.

DISCUSSION

It is for that matter that behavioural finance has led almost a revolution, shaking the very foundations of conventional financial theory with a serious challenge to the very established idea of market efficiency. At the heart of this questioning lies a host of behavioural biases that decisively reject an assumption of pure rationality among investors. Among the major sources of these biases, counted are those stemming from loss aversion to the strong influence of individual preferences and emotions in financial choices, thereby causing anomalies in the functioning of markets.

Groundbreaking work by pioneers like Kahneman and Tversky brought the intrinsic complexity of decision-making processes under harsh light. As has been noted, investment choices cannot be reduced to questions of mere rational calculus. This important breakthrough brings home the realization that there is, therefore, a stronger need to incorporate these behavioural dimensions of portfolio management. More urgently, at least, it is considerably pressing to apply a good

understanding of behavioural mechanisms to allow finessing of the financial models and anticipate market swings so that investment strategies can be adjusted accordingly.

Regarding the verification of research hypotheses, the key findings are outlined as follows (Table 10):

Table 10. Summary Table of Verification of Key Hypotheses.

Chosen Interaction		Main Hypothesis	Results
Dependent Variable	Independent Variable		
V1	V7	H1	Accepted
V15	V7	H2	Accepted
V22	V7	H3	Accepted
V7	V1	H4	Accepted
	V15		
	V22		

Hypothesis 1 (H1): Risk perception (V1) is influenced by psychological behaviour (V7). The results confirm this hypothesis: psychological behaviour has a significant influence on how financial risk is perceived. Variations in psychological behaviour are associated with proportional changes in risk perception, highlighting the importance of psychological aspects in evaluating financial risk.

The regression coefficient of 0.13 highlights a significant linear dependence, showing that variations in psychological behaviour are associated with proportional changes in risk perception. This relationship underscores the importance of psychological factors in how individuals assess and interpret financial risk.

The indirect causality of V7 on V1 also emphasizes a bidirectional dynamic, indicating that psychological behaviour can influence risk perception and vice versa. This interconnectedness highlights the complexity of the relationship between psychological behaviour and risk perception, emphasizing their mutual influence.

Based on behavioural finance research, this acceptance highlights the importance of considering psychological aspects in understanding how individuals evaluate and respond to financial risk. Emotions, beliefs, and attitudes play a crucial role in shaping risk perception.

In conclusion, accepting this hypothesis confirms that psychological behaviour significantly influences risk perception, thereby underscoring the importance of accounting for these influences in analyzing individuals' financial decision-making.

Hypothesis 2 (H2): Market confidence (V15) is impacted by psychological behaviour (V7). This hypothesis is validated: psychological behaviour significantly influences individuals' confidence in the financial market. Variations in psychological behaviour are associated with proportional changes in market confidence, underscoring the importance of psychological factors in investor confidence.

Acceptance of the hypothesis that psychological behaviour (V7) influences market confidence (V15) is supported by significant results. The correlation of 0.54 between V7 and V15 indicates a significant positive relationship between these two variables, suggesting that psychological behaviour impacts individuals' confidence in the financial market.

The regression coefficient of 0.65 highlights a significant linear dependence, showing that variations in psychological behaviour are associated with proportional changes in market confidence. This relationship underscores the importance of psychological factors in shaping investors' confidence in the financial market.

The indirect causality of V7 on V15 also emphasizes a bidirectional dynamic, indicating that psychological behaviour can influence market confidence and vice versa. This interconnectedness highlights the complexity of the relationship between psychological behaviour and market confidence, emphasizing their mutual influence.

Based on behavioural finance research, this acceptance highlights the importance of considering psychological aspects in understanding how individuals build their confidence in the financial market. Emotions, beliefs, and attitudes play a crucial role in shaping investor confidence.

In conclusion, accepting this hypothesis confirms that psychological behaviour significantly influences market confidence, thereby underscoring the importance of accounting for these influences in analyzing individuals' financial decision-making.

Hypothesis 3 (H3): Market performance (V22) is impacted by psychological behaviour (V7). This hypothesis is accepted, indicating a significant direct impact of psychological behaviour on market performance. Therefore, this identified direct influence could explain the dynamics between the studied variables.

Acceptance of the hypothesis indicates a significant impact of market performance (V22) on psychological behaviour (V7) in your study. The significant correlation of 0.42 suggests a substantial positive relationship between these two variables, indicating that fluctuations in market performance influence how individuals perceive risk.

The regression coefficient of 0.43 highlights a significant linear dependence, showing that changes in market performance are associated with proportional changes in risk perception. This relationship underscores the direct impact of market performance on how individuals assess financial risk.

The indirect causality of V7 on V22 also indicates a bidirectional dynamic, suggesting that risk perception can also influence perceived market performance. This interconnectedness highlights the complexity of the relationship between risk perception and market performance, emphasizing their mutual influence.

Based on behavioural finance research, this acceptance underscores the importance of considering the impact of market performance in understanding individuals' psychological behaviour. Variations in market performance can influence attitudes toward financial risk, which has significant implications for financial decision-making. Accepting this hypothesis confirms that market performance has a significant impact on risk perception, highlighting the importance of considering both aspects in the analysis of financial behaviour studied.

Hypothesis 4 (H4): Investors psychological behaviour (V7) is impacted by risk perception (V1), market confidence (V15), and market performance (V22). This hypothesis is confirmed: risk perception, market confidence, and market performance are significant determinants of individuals' psychological behaviour, highlighting the importance of these variables in financial decision-making.

This hypothesis is confirmed by the analysis results, which examined the impact of V1, V15, and V22 on the psychological behaviour variable (V7). Using a model incorporating these explanatory variables, several tests were conducted to assess the model's validity.

The Fisher test, with a value close to 0, indicates that the explanatory variables (V1, V15, V22) significantly contribute to explaining the dependent variable V7. The Student's probability being zero confirms a significant relationship between the variables. Additionally, the R^2 value of 0.55 shows that 55% of the variability in V7 can be attributed to the explanatory variables.

In terms of behavioural finance, these results suggest that risk perception (V1), market confidence (V15), and market performance (V22) are significant determinants of psychological behaviour (V7). Individuals react and adjust their psychological behaviour based on their perception of financial risk, their confidence in the market, and observable market performance.

These results highlight the importance of considering emotional, cognitive, and social aspects in understanding financial behaviour, emphasizing the influence of subjective perceptions and market factors on individual decisions. This confirms the relevance of behavioural finance in analyzing complex financial behaviours.

CONCLUSIONS

The efficiency hypothesis has been the subject of intense various debates, speculative bubbles, and changes in the observed efficiency. The debatable issues in question impact the basics of absolute efficiency by the fact that there are potential gaps uncovered in different contexts and markets. These discussions challenge the perception of absolute efficiency, thus casting a light on some cases where issues like vagueness appear in markets. This ongoing scrutiny by researchers is what brings about a never-ending and dynamic dialogue in the world of finance.

The article at hand walks through the change from classical models to the behavioural finance trend as a way to deal with the shortcomings of traditional theories. Such a move is strengthened by the fact that there is an ever-growing appreciation of the omissions that conventional theories do not embrace the individual peculiarities of decision-making and the human mental traits that are involved in the process. This novel method of inexpugnable mechanisms of finance causes a radical change in the traditional stock markets perspective.

Being a more developed junction where the behavioural finance construct is utilized, this transitional idea becomes an eclectic audience that mixes the straightforward theories of classic economics with irrationalities that on the other hand

are the human element. Therefore, the amalgamation of these different ideals marks a real milestone in scientists' and students' march towards a deeper and more comprehensive grasp of the modalities that drive the modern financial arena. Narratives and discussions about the complex investment environment in Morocco show that behavioural finance is not only indispensable but it is among the main tools through which markets, industries, companies and investors get to be analyzed, understood, and even improved.

The integration of behavioural finance offers several significant advantages for regulating and understanding anomalies in financial markets:

- **Understanding Irrational Behaviours:** It provides a better understanding of the irrational behaviours of market participants, taking into account cognitive and emotional biases that can influence their decisions. This helps explain anomalies and unexpected market movements.
- **Trend Prediction:** By recognizing recurring behavioural patterns, behavioural finance can help anticipate certain market trends that cannot be explained by traditional efficient market models.
- **Regulation Improvement:** It offers perspectives to develop more tailored regulatory policies. By understanding investor behaviours and biases, regulators can implement measures to mitigate the adverse effects of excessively irrational or speculative behaviours.
- **Risk Management:** By considering the emotional reactions and behavioural biases of investors, finance professionals can better assess and manage risks related to irrational decisions in the markets.
- **Enhancement of Financial Models:** The integration of behavioural aspects improves existing financial models by accounting for human psychology. This provides better accuracy in predicting market movements.

In summary, the integration of behavioural finance offers a more comprehensive approach to understanding financial markets by considering the psychological and behavioural aspects of market participants. This can lead to more informed regulatory decisions and better risk management.

ADDITIONAL INFORMATION

AUTHOR CONTRIBUTIONS

Author's contributions are equivalent.

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CONFLICT OF INTEREST

The Authors declare that there is no conflict of interest.

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ВПЛИВ ПОВЕДІНКОВИХ ФІНАНСІВ НА СПРИЙНЯТТЯ РИЗИКУ ТА УХВАЛЕННЯ ФІНАНСОВИХ РІШЕНЬ: РОЗРОБКА ОСНОВИ ПСИХОЛОГІЧНОЇ ПОВЕДІНКИ МАРОККАНСЬКИХ ІНВЕСТИВІВ

Ця стаття заглиблюється в поведінкові фінанси, дисципліну, яка кидає виклик класичним принципам фінансів, включаючи психологію для пояснення аномалій, що спостерігаються на фінансових ринках та виникають через реальну поведінку людини. Мета полягає в тому, щоб проаналізувати поведінкові упередження інвесторів і їхній вплив на раціональність, особливо зосередившись на таких факторах, як неприйняття втрат, культурні впливи та надмірна самовпевненість, а також на тому, як ці елементи впливають на інвестиційні рішення.

Дослідження спирається на емпіричні дані та поведінкові експерименти, щоб підкреслити, як ці упередження можуть відхилитися від ефективних ринкових теорій. Також розглянуто методи пом'якшення цих негативних наслідків, надаючи уявлення про більш ефективну інтеграцію вчень про поведінкові фінанси в процеси ухвалення рішень інвесторами та фінансовими експертами. Зокрема в статті запропоновано розробку моделі психологічної поведінки марокканських інвесторів на основі дослідження за участю 93 постійних інвесторів на фондовій біржі Касабланки.

Результати дослідження підкреслюють, як поведінкові упередження можуть відрізнитися від прогнозів ефективних ринкових теорій. Зосереджуючись на конкретному контексті марокканських інвесторів, стаття пропонує уявлення про те, як ці психологічні фактори можуть впливати на інвестиційні рішення, сприяючи більш тонкому розумінню фінансової поведінки в цьому конкретному контексті.

Унікальність цього дослідження полягає в його теоретичному та практичному підході, що об'єднує емпіричні дані й поведінкові експерименти для підтримки дискусії про поведінкові фінанси. Зосереджуючись на конкретному випадку марокканських інвесторів, стаття робить значний внесок, пропонуючи контекстно залежну модель, яка може мати важливі наслідки для ухвалення фінансових рішень у регіоні.

Ключові слова: ринкова ефективність, психологія, поведінкові фінанси, поведінкові упередження

JEL Класифікація: G4, G41, G53