

**REPUBLIC OF TURKIYE
ISTANBUL GELISIM UNIVERSITY
INSTITUTE OF GRADUATE STUDIES**

Department of Economics and Finance

**THE EFFECT OF COGNITIVE FACTORS ON
DECISION-MAKING BEHAVIOR WITH THE
MODERATING ROLE OF CRYPTOCURRENCY
INVESTMENT**

Master Thesis

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Turkish Abstract

Bu tez çalışmasının temel amacı, bilişsel faktörlerin yatırımcı kararlarını ve davranışlarını etkileyip etkilemediği ve etki düzeylerinin incelenmesidir. Bilişsel faktörler ise yapılan literatür taraması sonucunda temsiliyet yanlılığı, sürü yanlılığı, çapa ve kullanılabilirlik yanlılığı şeklinde belirlenmiştir. Tez çalışmasının literatür bölümünde bilişsel önyargılar, bu konuda daha önce yapılan çalışmalar ve kripto varlıklara yer verilmiştir. Metodoloji bölümünde, bahsi geçen bağımlı ve bağımsız değişkenler tanımlanmıştır.

Araştırmada veri toplama yöntemi olarak anket kullanılmış ve online bir şekilde verilere ulaşılmıştır. Çalışmanın örneklemini Libya'daki kripto para yatırımcıları oluşturmuştur. Araştırmada verilerin analiz edilmesi amacıyla SPSS programı kullanılmıştır. Analiz yöntemi olarak faktör analiz yöntemi yapılmıştır. Verilerin faktör analizine uygunluğunun ardından boyutlar belirlenmiştir. Bağımlı ve bağımsız değişkenler şeklinde oluşturulan boyutların arasındaki ilişkinin tespit edilmesi amacıyla Regresyon Analiz yöntemi uygulanmış ve yöntemin tüm varsayımları test edilerek ilişkiler değerlendirilmiştir.

Elde edilen sonuçlara göre Libya'daki kripto para yatırımcıların aldıkları kararların temsiliyet yanlılığı, sürü yanlılığı, çapa ve kullanılabilirlik yanlılığı gibi bilişsel faktörlerden etkilendiği ve tüm bilişsel faktörler ile istatistiksel olarak anlamlı ve yüksek bir ilişkilerinin olduğu sonucuna varılmıştır.

Özetle, bu tez çalışması Libya'daki kripto para yatırımcıların kripto varlık yatırımlarında duygusal ve bilişsel faktörlerden önemli düzeyde etkilendikleri, yatırım kararlarını rasyonellikten uzak bir şekilde verdikleri

gözlemlenmiştir. Bu araştırmada aynı zamanda, kripto para yatırımcıların finansal okuryazarlık düzeylerinin artırılması ile daha rasyonel kararlar verilebilecekleri şeklinde öneriler sunulmuştur.

Anahtar kelimeler: Bilişsel faktörler, kripto varlık yatırımı, yatırımcı davranışlar

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I affirm that throughout the writing of this thesis, I have stuck to the scientific ethical guidelines. Whenever I used other people's work, proper citations were provided according to the scientific norms. I can assure you, no data was falsified in this thesis, and no part of this thesis has been submitted to this university or other universities as a separate thesis.

Ahmed Salah Amer ZWILIMA



TO ISTANBUL GELISIM UNIVERSITY
THE DIRECTORATE OF SOCIAL SCIENCES INSTITUTE

The thesis study of Ahmed Salah Amer Zwilima, titled The Effect of Cognitive Factors on Investment Decision-Making Behavior with the Moderate Role of Cryptocurrency Investment in Libya: An Application, has been accepted as a Master's Thesis in the Department of Economics and Finance by our jury.

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Prof. Dr. İzzet GÜMÜŞ

Director of the Institute

SUMMARY

The main objective of this thesis is to examine whether cognitive factors affect investor decisions and behaviours and their impact levels. As a result of the literature review, cognitive factors are identified as representativeness bias, herd bias, anchor bias, and availability bias. In the literature section of the thesis, cognitive biases, previous studies on this subject, and crypto assets are included. In the methodology section, the aforementioned dependent and independent variables are defined. In the research, a questionnaire was used as a data collection method, and the data were accessed online.

The sample of the study consisted of cryptocurrency investors in Libya. SPSS software was used to analyse the data in the study. The factor analysis method was used as the analysis method. Following the suitability of the data for factor analysis, the dimensions were determined. The regression analysis method was applied to determine the relationship between the dimensions formed as dependent and independent variables, and the relationships were evaluated by testing all assumptions of the method. According to the results obtained, it was concluded that the decisions made by investors in crypto asset investments in Libya are affected by cognitive factors such as representativeness bias, herd bias, anchor and availability bias, and that there is a statistically significant and high relationship with all cognitive factors.

In summary, this thesis study shows that the financial investors in Libya are significantly affected by emotional and cognitive factors in cryptoasset investments and make investment decisions in a non-rational manner. At the same time, this research also suggests that even cryptocurrency investors can make more rational decisions by increasing their financial literacy levels.

Keywords: cognitive actors, crypto asset investment, investor behaviour

ÖZET

Bu tez çalışmasının temel amacı, bilişsel faktörlerin yatırımcı kararlarını ve davranışlarını etkileyip etkilemediği ve etki düzeylerinin incelenmesidir. Bilişsel faktörler ise yapılan literatür taraması sonucunda temsiliyet yanlılığı, sürü yanlılığı, çapa ve kullanılabilirlik yanlılığı şeklinde belirlenmiştir. Tez çalışmasının literatür bölümünde bilişsel önyargılar, bu konuda daha önce yapılan çalışmalar ve kripto varlıklara yer verilmiştir. Metodoloji bölümünde, bahsi geçen bağımlı ve bağımsız değişkenler tanımlanmıştır. Araştırmada veri toplama yöntemi olarak anket kullanılmış ve online bir şekilde verilere ulaşılmıştır.

Çalışmanın örneklemini Libya'daki kripto para yatırımcıları oluşturmuştur. Araştırmada verilerin analiz edilmesi amacıyla SPSS programı kullanılmıştır. Analiz yöntemi olarak faktör analiz yöntemi yapılmıştır. Verilerin faktör analizine uygunluğunun ardından boyutlar belirlenmiştir. Bağımlı ve bağımsız değişkenler şeklinde oluşturulan boyutların arasındaki ilişkinin tespit edilmesi amacıyla Regresyon Analiz yöntemi uygulanmış ve yöntemin tüm varsayımları test edilerek ilişkiler değerlendirilmiştir. Elde edilen sonuçlara göre Libya'da kripto varlık yatırımlarında yatırımcıların aldıkları kararların temsiliyet yanlılığı, sürü yanlılığı, çapa ve kullanılabilirlik yanlılığı gibi bilişsel faktörlerden etkilendiği ve tüm bilişsel faktörler ile istatistiksel olarak anlamlı ve yüksek bir ilişkilerinin olduğu sonucuna varılmıştır.

Özetle, bu tez çalışması Libya'da üst düzey yöneticilerin kripto varlık yatırımlarında duygusal ve bilişsel faktörlerden önemli düzeyde etkilendikleri, yatırım kararlarını rasyonellikten uzak bir şekilde verdikleri gözlemlenmiştir. Bu araştırmada aynı zamanda, üst düzey yöneticilerin dahi finansal okuryazarlık düzeylerinin artırılması ile daha rasyonel kararlar verilebilecekleri şeklinde öneriler sunulmuştur.

Anahtar kelimeler: Bilişsel faktörler, kripto varlık yatırımı, yatırımcı davranışları

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ABBREVIATIONS

CBL	:	The Central Bank of Libya
LAFB	:	Libya Arab Foreign Bank
NCB	:	National Commercial Bank
RB	:	Republic Bank
TSH	:	The Sahara Bank
AGB	:	Agriculture Bank
UB	:	Ummu Bank
SREIB	:	Saving and Real Estate Investment Bank
UB	:	Unity Bank
ETH	:	Ethereum
XRP	:	Adecentralized blockchain designed to facilitate fast, affordable transactions across borders.
USD	:	United States Dollar
OLS	:	Ordinary Least Squares
EOS	:	Is the layer in blockchain that has been built on the antelope protocols of the network
ANOVA	:	Analysis Of Variance

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PREFACE

My sincere appreciation goes to the Assistant. prof. Dr. Aysegul for her brilliant efforts. Despite her busy schedule and commitment, she gave me so much assistance, which was vital to completing this research work. My gratitude also goes to my family members, words will not be enough to show how much I value them. I want to say a big thank you to all the teachers at the institute, from whom I have learned so much. Last but not least, I want to thank everyone for their encouragement during my master's program. I appreciate the effort from everyone close



INTRODUCTION

Throughout life, individuals make decisions for various reasons. And the decisions made by individuals influence the individual the investment strategic planning. Therefore, for this research, the decisions have been examined in the context of cognitive factors as well as cryptocurrency investment.

Therefore, decision-making can be well described as the part of decision-making behavior that an individual reaches by thinking about an issue or problem. Bryson (2018) either thinks that decision-making behavior is the choice made by individuals, groups, or organizations among possible actions (Bryson, 2018). Despite individuals, groups, or organizations being faced with various choices integrated with behavior changes, the decisions should be made to achieve the general objective. In this context, the concept of decision-making can be presented as a broader term that is associated with the process of choosing one of the alternatives in line with the choices of individuals in the decision-making (Dohmen and Wagner, 2011).

In decision-making, individuals choose an option from a set of alternatives or put an action plan into effect, which is based on the criteria that pertain to the set and strategies for the behavior. In other words, individuals make decisions among alternatives by adhering to the criteria of adopting a certain behavior to achieve strategic objectives. Some significant instruments for the existence of integrated decision-making as focusing on solving the problems experienced by individuals, groups, or organizations. decision-making behavior is not only an evaluation process but also the first step of new events or situations; decision-making behavior brings opportunity costs (Gillbert, 2024). planning and programming activity that takes place during the decision-making process, decision-making behavior affects the future of individuals, groups, or organizations, it is a forward-looking form of behavior (Amiru, 2020).

CHAPTER ONE

BACKGROUND OF STUDY

1.1. Background of the Study

1.1.1. Investment decision-making behavior

Throughout life, individuals make decisions for reasons, and behavior continues for whole lives. Definitive judgment is the part of decision-making behavior individual reaches by thinking about an issue or problem. Byson (2018) either gives the thought that decision-making behavior is the choice that has been made by individuals, groups, or organizations among possible actions (Bryson, 2018). Despite individuals, groups, or organizations being faced with various choices integrated with behavior changes, the decisions should be made to achieve the general objective. In this context, the concept of decision-making can be presented as a broader term that is associated with the process of choosing one of the alternatives in line with the choices of individuals in the decision-making (Dohmen and Wagner, 2011).

In decision-making, individuals choose an option from a set of alternatives or put an action plan into effect, which is based on the criteria that pertain to the set and strategies for the behavior. In other words, individuals make decisions among alternatives by adhering to the criteria of adopting a certain behavior to achieve strategic objectives. Some significant instruments for the existence of integrated decision-making as focusing on solving the problems experienced by individuals, groups, or organizations. decision-making behavior is not only an evaluation process but also the first step of new events or situations; decision-making behavior brings opportunity costs (Gillbert, 2024). planning and programming activity that takes place during the decision-making process, decision-making behavior affects the future of individuals, groups, or organizations, it is a forward-looking form of behavior (Amiru, 2024).

Since there is a new situation after the decision-making behavior occurs, it is also a cost element for organizations or individuals, however, decision-making behavior varies depending on the nature of the decision made, including a certain period and the actions that will occur in that period (Bryson, 2018). Decision-making behavior includes different components, in addition to individuals or groups in decision-making positions. In this respect, it consists of individuals, goals, decision conditions, options, events, and results. Explanations regarding the decision components in question are as follows (Dwirandra and Astika, 2020).

Individuals or groups who choose among available alternatives are called "decision makers". "Target" is the point that individuals or groups in decision-making positions want to achieve in line with their actions. "Decision conditions", are the system of values used by individuals or groups in decision-making positions when determining their preferences. Different alternative "options" that individuals or groups in decision-making positions can choose.

Elements that occur independently of individuals or groups in decision-making positions are "events". The values that arise from choices and events are defined as "results". The process of decision-making behavior of decision-making individuals includes many stages. The process in question starts with the decision-making to determine the goals or define the problem and ends with examining the goals and problems, respectively, determining the options, examining and evaluating the options, determining the choice condition, and choosing the appropriate one among the options (Li et al., 2024).

At the stage of setting goals and defining the problem, individuals in the decision-making position are aware of the situation, problem, or event that leads to decision-making behavior. In this regard, individuals who are decision-makers determine the goals they want to achieve in the future and identify the factors that prevent them from reaching the goal (Shahvaroughi et al, 2024).

The examination of goals and problems phase includes a detailed analysis of the reasons for setting the goals, the reasons that lead to the problem, the

characteristics of the goals or problems, the difficulties, the situations, and priorities that may be encountered in case the goals cannot be achieved or the problems cannot be solved (Xu et al., 2023). Individuals' unique evaluation elements come to the fore when determining options. In line with the goals determined at this stage, individuals develop different ways and ideas for the situation, event, or problem they define. Failure to correctly understand the situation, event, or problem by individuals in the previous stages may cause individuals to encounter difficulties in determining the options (Kenigsberg et al., 2025).

The examination and evaluation phase of options includes examining how effective the options determined by individuals for the situation, event, or problem can be in the face of the situation, event, or problem in question. In addition, at this stage, the costs that the options will impose on individuals, and the feasibility, reliability, and timing of the options are evaluated (Clack et al., 2017). The stage of determining the selection condition and choosing the appropriate one among the options involves deciding by choosing the option that best suits the criteria determined by the individuals in the decision-making position. However, after the decision turns into a behavior, it is evaluated how much of the goals determined for the event, situation, or problem in question have been achieved. In other words, the effect of decision-making behavior in achieving the determined goals is measured (Bavolar et al., 2024).

The act of decision-making indicates choosing a choice or choosing one of the options over the other. At this selection stage, the combination of many complex cognitive, psychological, and physiological conditions, such as the person's innate characteristics and habits shaped by the environment, is effective (Sedigheh, 2023). Since the manifestation of will constitutes the prerequisite for decision-making, it is useful to emphasize the concept of "free will" when talking about decision-making. Koçel (2007) stated that the concepts of good and right-wrong are always equivalent to the one choosing the decision-making phase and defined the concept of indecision as not choosing any option. The behavior that reveals one of the most important and complex functions of a person is decision-making behavior.

Health discussion based on decision-making environments. What is meant by a healthy environment is a condition free from anxiety and stress, where free will prevails. Research shows that anxiety and stress negatively affect decision-making and cause individuals to make wrong decisions. Individuals who can make the right decisions achieve more positive results in both their private and business lives and encounter relatively less stressful situations (Bayram and Aydemir, 2017). On the other hand, it has been observed that individuals whose decision-making skills are not developed and who make decisions while feeling the effects of negative factors such as anxiety and stress make wrong decisions, and the decisions they make cause them to face negative consequences that may cause them to be unhappy for the rest of their lives (Sedigheh, 2023).

Decision science is one of the well-developed disciplines that “capture the dynamic nature of decision processes by prescribing a decision strategy that determines what action should be chosen initially and what actions should be chosen for each subsequent event.” Understanding decision-making means analyzing subsequent actions to evaluate the consequences of alternatives leading to a choice (Dewulf and Biesbroek, 2018). Decision analysis depends not only on evaluating the consequences of each alternative but also on the decision-maker's preferences regarding those consequences. Due to the important role of decision-makers, this analysis requires subjective judgments. Although technical knowledge can calculate the probabilities and benefits of alternatives, taking into account the judgments and values of decision-makers is the most crucial point of the issue. Philosophers believe that our decisions say a lot “about ourselves and our values” (Neuhoff, 2024).

Decision-making processes are an important part of the decision science literature and have emerged in three different fields: cognitive psychology on individual decision-making, social psychology on group decision-making, and management and political science on organizational decision-making. However, this research examines the cognitive factors as the main measures influencing investment decision-making behavior. Ultimately, the proxies are associated with

cognitive factors such as availability bias, representativeness bias, herding bias, and anchoring bias.

At a time when central currencies felt pressure under the influence of the 2007-2008 global financial crisis and the subsequent debt crisis, the calls for central and alternative currencies intensified by shaking their confidence in central financial institutions. This encouraged the birth of the age of decentralized digital currencies based on interspousal networks and cryptographic mechanisms (Hossain, 2020).

Cryptocurrency users can sell or buy goods and services from other users with this virtual currency. Cryptocurrencies are praised for low trading costs on the one hand, while on the other hand, it is highlighted as an alternative to banks and credit cards. However, some warn that cryptocurrencies can be used as a potential tool for illegal transactions, such as a potential tool for money laundering and drug trafficking (Hameed & Farooq, 2016).

Money comes in many different forms and features. This distinction has always existed since ancient times. The notion of money and the financial system has changed with the development of technology. Today, we have electronic money, a currency that is not discovered by the older generation of money. Cryptocurrency is the representative of currencies in the new generation. In this context, when we look at what cryptocurrency is, cryptocurrency adopts a cryptographic approach and thus conceals operations, but provides management of deposits (Laçin, Gül Cennet, 2019).

Cryptocurrencies are digital assets that create additional digital currencies using safe encryption and cryptographic processes. They are separated from traditional electronic banking and money systems with their decentralized structures. This decentralized mechanism is carried out by a blockchain process database. Cryptocurrencies are alternative currencies that are accepted as digital and virtual currencies. Usually, cryptocurrencies and virtual currencies, Bitcoin, and similar subcoins are mixed (Hameed and Farooq, 2016).

However, cryptocurrencies and virtual currencies are not independent currencies. They are based on the national currencies of the countries representing themselves and can be regulated and controlled by the central authorities of that country. On the other hand, Bitcoin is a currency that exists on its own rather than a currency controlled or managed by a central authority (Hossain, 2020).

The term "crypto money" consists of a combination of the words "crypto" and "money" and refers to virtual currencies used on the internet that are not connected to a central authority or intermediary. Cryptocurrencies provide the opportunity to pay and accept individuals or organizations such as normal money. These currencies similarly use cryptography to the currencies known as the Turkish Lira, USD, and EUR, but they aim to supervise the creation of new units by securing the currency transactions (Hossain, 2020).

Cryptocurrency is a virtual currency designed using cryptographic (encryption science) methods. Cryptography is used as part of creating currency and reliability of transactions. The theoretical foundations of cryptocurrencies were laid by Wei Dai in 1998, and in 2008, the technical infrastructure of all cryptocurrencies existing by Satoshi Nakamoto or his team was created (Fung, and Lee, 2018).

Considering it as a system, cryptocurrency is distributed and refers to the central authority-independent systems. The common feature of all cryptocurrency systems is that they use cryptography to control operations, control the supply, and prevent fraud. Operations are stored in a digital environment after approved and function as a kind of accounting system. All operations are collected in an open and accessible structure called a blockchain. These transactions are verified by network nodes during payments (Hameed and Farooq, 2016).

The most prominent feature of blockchain technology is that it has a decentralized authentication system. Therefore, it has been accepted to be an important tool for digital transformation. The blockchain acts as a digital recording store and can be used in a number of different applications, from the proven and

saving of documents and valuable items, to the collection of birth, marriage, and death documents (Sami and Abdallah, 2020).

In addition, blockchain technology allows digital users to control their data at an unprecedented level. Therefore, the blockchain is used not only in the production of cryptocurrencies but also in many different fields such as storage and management. The ability to authenticate digital identity makes it a key to the economy of trust. It may be difficult to determine all its properties in a short time when cryptocurrencies appear, but it has some basic properties. In this context, the general features of all known and important cryptocurrencies can be revealed in a certain way (Sami and Abdallah, 2020).

Open-source coding: Almost all electronic monetary systems are open-source software. Bitcoin is an open-source software system without any commercial initiative, but it is made of open-source software developed to support a business. Any person or group that wants to download the source code of this software to their computer and create their own cryptocurrency. It is not wrong to say that the main purpose of cryptocurrencies with an Open-source structure is to gain from being open-source software (Vijayalakshmi and Murugan, 2017).

Cryptography: The most prominent feature of the cryptographic structure is the common use of cryptographic techniques. These cryptographic techniques are used in the production of currency, in the movement of user accounts, and in the security of a data structure known as a blockchain or notebook in which all these transactions are recorded and available. Encryption, which is the most commonly used technique in cryptography, is usually divided into four classes. Hash functions can be listed as symmetrical key encryption, open key encryption, and numerical signature techniques with their application (Hameed and Farooq, 2016).

Hash function: A hash function is an algorithm that produces random data as input and gives a mixed value with a fixed length bit sequence. In other words, a mixture, with the same input, always rotates the same mixture value. Regular Hash functions can produce the same Hash for different inputs, but Hash functions must

show a regular distribution. These functions follow stricter requirements than normal mixed functions, so cryptographic or safe mixed functions do not produce the same summary value for different inputs (Sami and Abdallah, 2020).

Symmetry Key encryption: The encryption switch is used to encrypt the plaintext or to decrypt the ciphertext. Password-solving switches and encryption may be slightly different. The symmetric switch acts as a clear hidden key for parties who want to communicate, shared by a secure channel before communication. However, this safe channel is not always available in internet e-commerce (Fung and Lee, 2018).

Indicator Key encryption: Asymmetric switch encryption or open switch encryption appeared to relieve the flaws of symmetrical key encryption in the 1970s. In this method, instead of a unique password, the special switch used to decipher the message is hidden and unique. When using this technology, only the special key must be kept secret. In the case of every communication, the symmetric switch created with general key encryption and general key encryption is not used. This is due to a several times slower and wider message size than the symmetrical switch encryption of open switch encryption (Sami and Abdallah, 2020).

Digital Signature: Digital signature is a further of the open key encryption. Electronic signatures perform three functions. These: (1) Checking whether the relevant message belongs to the sign (2) ensuring the integrity of the message, in other words, ensuring that the message is not falsified, (3) refuting the claim that the message is not sent by the signature (Fung, and Lee, 2018).

1.1.2. Cognitive factors

Cognitive factors play a significant role in determining appropriate investment decision-making in the financial market (Sachdeva et al., 2023). The cognitive factor uses its proxies, such as availability bias, representativeness bias, herding bias, and anchoring bias, to measure the precise strategic planning for investment (Khare and Kapoor, 2024).

In the modern world, knowledge of the cognitive factors of investment decision-making has increased every year, this demonstrates that during investment, investors use these instruments for creating significant results on their investments (Rahman and Gan, 2020).

Notably, the cognitive factors analyze both the positive and negative effects of the investment during huge investments, the investors are so curious and serious about investment and its consequences, which means the cognitive factors return the market values as well as provide a wide range for the risks averse (Xia and Madni, 2024).

In fact, the cognitive factors test the recent and previous information in the context of providing information that helps the investors to have the information in the investment strategies. Economics and finance make an assumption based on human beings, and we call the rational, even people, sometimes the mistakes without following the modern portfolio (Vuong and Nguyen, 2024).

In this case, the cognitive factors using its proxies tend to validate the investment decision-making to have significant progress on investment. Several studies demonstrate that investors are mostly spectacle, resilient to psychological factors, and not always rational; that is the case people always become irrational in a very systematic manner (Raut, 2020).

That is the case, the investors generate different theories based on the availability of the market strategies, and mostly have been affected by psychological and social norms in the financial market. Therefore, cognitive factors constrain investors from evaluating and organizing to create proper investments, specifically in the financial market. Therefore, the cognitive factors based on the investment intend to strengthen the digital market by enhancing cryptocurrency investment (Gouveia, 2024).

1.1.3. Cryptocurrency investment

According to Davenport et al, (2019), investment decisions are crucial in creating value as they involve allocating capital to investment proposals whose

benefits will be realized in the future. Since future benefits are uncertain, investment proposals inherently involve risk and should be evaluated based on their expected return and risk. On the other hand, Exton (2018), defines investment as the process of committing funds to assets, with a focus on financial assets, marketable securities, and real assets. It is important to note that foreign financial assets should not be overlooked in this context. Hobbs and Jonathan (2018) further elaborate that investment involves the expenditure or placement of funds in the present to secure profits or other benefits in the future.

When investing, factors such as rate of return, rate of risk, and availability of funds must be taken into consideration. Return refers to the profit level of the invested funds, which can be expected or realized. Risk, on the other hand, represents the possibility of returns differing from expectations. Investors often consider risk when selecting investment opportunities, as higher investment risk typically correlates with higher expected returns.

In addition to the aforementioned risks, investors also encounter various challenges in investment, including fraudulent investments. This refers to illegal investments lacking clear legality, yet some individuals still believe in and pursue such investments due to the promising returns they offer. When considering an investment, attention should be given to five aspects: the legality of the investment, the mechanism of the investment institution, the track record and achievements of the investment institution, and the promise of high profits in a short time. Illegal investment institutions typically entice potential investors with high and stable returns to convince them (Bintarto et al, 2023).

The emergence of cryptocurrencies in the financial sector has been recognized as a legitimate investment vehicle. However, cryptocurrencies are characterized by high volatility, presenting both high risk and high returns. Therefore, investing in cryptocurrencies must be carefully considered in real time. Short-term investments in cryptocurrencies can yield substantial returns, but also come with substantial risk. In the long term, investing in cryptocurrencies can also

result in high returns, contingent upon regulatory developments and the dynamics of the cryptocurrency market (Bintarto et al., 2023).

Cryptocurrencies are considered a diversified investment, and many researchers have focused on the advantages of diversifying investments and analyzing asset combinations to maximize profits and minimize volatility. Cryptocurrencies are currently attracting investors to include them in their portfolios (Susilo et al., 2020). Some researchers have examined whether cryptocurrencies share similarities with other instruments such as gold (Gates, 2017).

Various scholars have analyzed to determine whether cryptocurrencies share similarities with other assets like gold. Nikolaos (2020) asserts in his study that, on the whole, cryptocurrencies exhibit comparable global safe-haven characteristics to gold. There are multiple rationales behind selecting cryptocurrency as an investment vehicle, such as: 1. Investors or traders with a well-developed strategy stand to gain higher potential returns. 2. Cryptocurrency investment can be initiated with a minimal amount of capital. 3. Investors or traders contribute to the advancement and acceptance of new technologies that support a decentralized economy (Hobbs, Jonathan, 2018).

1.1.4. Cryptocurrency information

Cryptocurrencies, which are reserved for the fact that they are not connected to a central authority from digital coins, do not have a very long date. It is obvious that cryptocurrencies, which are revealed as an alternative to traditional payment and investment instruments, accelerate the growth and development of money and capital markets. Although e-money, such as digital coins and cards, has been widely used and has a relatively longer history, the cryptocurrency system was first revealed by Satoshi Nakamoto in 2008 with the article “Bitcoin: Spouses Electronic Cash System”. After the emergence of Bitcoin, many cryptocurrencies called Altcoin began to be traded on cryptocurrency exchanges (Smith, 2022).

Satoshi Nakamoto has introduced Bitcoin and Blockchain technology to the world by delivering the article he wrote to many software developers and developers through e-mail. The decentralized structure of Bitcoin has enabled many people to be accepted by many people. In 2008, Satoshi Nakamoto created the first blockchain for Bitcoin and produced 50 Bitcoin. The use of these Bitcoins as a payment tool was used in 2009 to get pizza in 2009. In the ongoing process, Bitcoin has started to be used in illegal jobs because it has a decentralized structure. Satoshi Nakamoto, the founder of Bitcoin, limited the supply of cryptocurrency by saying that the production of Bitcoin is limited to 21 million units and that the entire production process will end on a predetermined date. Bitcoin, which has produced 21 million units, is in circulation as of April 2022 (Smith, 2022).

After Bitcoin, the first cryptocurrency, many software developers created non-decentralized cryptocurrencies and inserted them into the cryptocurrency exchange. Litecoin, the second cryptocurrency in the cryptocurrency market, was released by Charlie Lee, who had worked at Google. The difference between this money from Bitcoin is that its commercial costs are close to zero, and that it makes payments four times faster than Bitcoin. Ripple, which was later revealed, reduced the approval time of the operations and the blockchain creation process to a few seconds, as well as making it more easily translated into common currencies such as the dollar, yen, and euro (Smith, 2022).

In addition to crypto coins such as Bitcoin, Litecoin, and Ripple, there are many popular and widely used cryptocurrencies such as Ethereum, BNB, Dash, and Monero. Today, there are over 20,000 cryptocurrencies, and this number is increasing day by day. As a result of technological developments, the interest in cryptocurrencies is increasing. It is because Bitcoin has a decentralized structure under the vision of significant rises and decreases in the value of the value and is suitable for speculative movements (Brown and Johnson, 2023).

1.1.5. Uses of cryptocurrency

The biggest advantage of cryptocurrencies compared to traditional currencies is that they make transfers abroad in a very fast, practical, and appropriate way. In

addition, cryptocurrencies can be used as a payment tool for legal transactions such as transfers, salary payments, and trade, as with traditional currencies. Although the adoption of payments with cryptocurrency became widespread every day, it was the first time in 2012 with WordPress Bitcoin. Then, software companies such as Expedia and Microsoft accepted payments with Bitcoin. As of 2013, the website of Cheapir.com, a hotel and car rental, and ship tour ticket sales have accepted payments made with Bitcoin (Sami and Abdallah, 2020).

Similarly, the site, which operates in the real estate sector, accepts payments made with cryptocurrency during real estate sales (Vijayalakshmi and Muruhan, 2017). In 2013, Tesla sold the Tesla S model for 91.4 Bitcoins. Similarly, the Lamborghini company sold the Gallardo LP 550-2 Coupe model for 218.7 Bitcoin. In 2022, he explained that Elon Musk's Bitcoin and Tesla vehicles can be sold. Amazon, Apple App Store, Victoria's Secret, and Dell in international companies with cryptocurrencies that accept payment (Sami and Abdallah, 2020).

As can be understood from the examples given, cryptocurrencies are accepted as a means of payment. In addition to these areas of use, it is widely used in the online gaming sector. Even if they do not accept payment directly with cryptocurrencies, some institutions sell gift vouchers for cryptocurrency. In Turkey, Royal Motors McLaren, Tesla, Bugatti, Ferrari, and Bentley, which enable automobile trade by using cryptocurrency, have approved the use of cryptocurrency in the sale of luxury cars such as Crypto money in the sale of cars such as maintenance and repair (Sami and Abdallah, 2020).

However, after this initiative of Royal Motors, the regulation published in the Official Gazette prevented the realization of commercial transactions with cryptocurrency. Cryptocurrencies can be used as an investment or value storage tool as well as being used in daily transactions. Cryptocurrency markets show more harsh movements than traditional markets, but are the market preferred by risk-loving investors (Brown and Johnson, 2023).

1.1.6. Cryptocurrency features

Cryptocurrencies have 6 basic features such as decentralization, money, and owner records, procedures of money supply or printing, proven cryptocurrency, hand-changing rules, and multiple orders (Wikipedia, 2023). The decentralization feature is the most basic point that distinguishes cryptocurrencies from other currencies. This feature distinguishes cryptocurrencies from all other national currencies, shows that it is not connected to the financial institution or intermediary institutions, and have a completely independent structure. With its decentralization feature, it shows that cryptocurrencies act independently of the monetary policies and manipulations carried out by countries. The records of the money and owners, which are the second feature of cryptocurrencies, are the records of the people who produce money only with cryptography techniques. and states that it has an element of privacy in terms of reaching cryptocurrencies (Smith, 2022).

The money printing rules feature mentions that cryptocurrencies are not affected by cases such as inflation and interest in traditional currencies. Since the pricing system of cryptocurrencies is completely based on the supply and demand relationship, the monetary policies of countries do not directly affect the values of cryptocurrencies. The fourth feature of cryptocurrencies means that the people and institutions producing any cryptocurrencies are proven through cryptography techniques. Data emerges through the passwords produced by people and institutions that produce cryptocurrency with cryptography techniques. No manufacturer or user can solve this password (Smith, 2022).

This is an indication that it is only the manufacturer's authority on the cryptocurrencies produced, and can only be hidden by the manufacturer. The fifth feature, which can change hands on the instruction of the people or institutions producing crypto money, refers to the fact that cryptocurrencies can only act through manufacturers and in line with their manufacturers. When any cryptocurrency produced is given more than one order at the same time, only one of the orders is the sixth feature of cryptocurrencies (Smith, 2022).

Bulut (2019: 12) divided the characteristics of cryptocurrencies into three. The first of these features is that cryptocurrencies are written to the bearer. The person with crypto money has the right to save in cryptocurrency. It is a tool of exchange in which the price increases of the relevant cryptocurrency in the future can benefit and have the right to return. Secondly, all transactions caused by the technological infrastructure have the possibility of doing low-cost and safe transactions anywhere and at any time and at any time (Brown and Johnson, 2023).

It is the integrated payment network feature that expresses its provision. The third feature of cryptocurrencies is that they allow non-financial use. It can be used except for money and similar assets, caused to the decentralized structure expressed from non-financial use. In addition to all these explanations, the characteristics of cryptocurrencies can be listed as follows (Brown & Johnson, 2023): Although they have digital currencies, they do not have any financial value. Cryptocurrencies are virtual coins with a unique digital structure of private individuals. It has a structure where the transaction costs are very low through the technological infrastructure it uses, and allows instant transactions. It uses the inter-spousal (P2P-Peer-to-Peer Peer system to avoid being connected to a central structure or authority. The reliability of the transactions performed with cryptocurrencies is guaranteed by an encryption method called cryptography. Cryptocurrencies are basic components.

- i. They have a centralized structure.
- ii. It does not require an intermediary, broker, or a 3rd party during money transfers.
- iii. It works on the internet infrastructure, and transfers are made over the internet.
- iv. All users have a transparent structure and do not have restrictive rules of use.
- v. It can be used anywhere and anytime where internet access can be provided.
- vi. There are digital wallets of users, and these wallets cannot be

- interfered with
- vii. outside.
- viii. The amount of supply is determined during their production.
- ix. In case of use in trade, the cryptocurrency is transferred directly to the personal
- x. wallets of the parties.
- xi. Cryptocurrencies can be converted into many traditional currencies.
- xii. Crypto is not a means of financial, legal, or legal payment.
- xiii. There is no guarantee from any institution or organization regarding the repayment

These components are encryption, economy, and computer data systems. All transactions in the cryptocurrency market can be controlled and monitored by everyone. It is not possible to obtain the real information of the individuals because the wallets of people have their passwords. All commercial activities are similarly performed through passwords (Brown and Johnson, 2023). In this way, the passwords in the hands of people who produce cryptocurrencies perform money, and the new user of the cryptocurrency determines its password while having its currency. To talk about the functioning mechanism of cryptocurrencies, blockchain technology should also be mentioned. Blockchain technology was used in many financial transactions before cryptocurrencies appeared. Blockchain technology, which is based on smart contracts, is preferred not only in financial applications but also in non-financial applications (Georgiou, 2021).

Blockchain can be likened to the blockchain where traditional enterprises use and all transactions are recorded. All movements and operations performed with Blockchain technology are recorded, and each process is added to the other and blocks. All transactions performed in the cryptocurrency system are recorded in the blocks. Each block is a chronologically connected chain to form a chain (Blau, 2020). The encryption mechanism using digital signatures is used to verify each process using Blockchain technology. Blockchain technologies have an

unforgettable structure and therefore do not need an intermediary institution to perform transactions. In addition, all operations are permanent since it is not possible to take back or delete any operation recorded in any block in this technology. In addition, in all recorded transactions, they can hide the user and identity information of the parties of the transaction (Blau, 2020).

The creation of cryptocurrencies operating with the P2P system is a result of the mining process. In the Blockchain system, miners intervene in the determination and approval of each process to be added to the block. Miners who intervene in such transactions and make blocks earn any cryptocurrency. The formation of each block takes approximately 10 minutes due to its complex and challenging structure. The fact that the amount of Bitcoin is limited to 21 million makes the mining of the relevant asset difficult every day, and this difficulty has an impact on the value of Bitcoin. The continuous use of cryptocurrency markets has led to a change in the mining process. As the number of users increases, the number of mines increases, so the number of cryptocurrencies per miner decreases (Delfabbro et al, 2021).

One of the basic criticisms of crypto coins or mining is the high energy consumption during cryptocurrency production. As a result of these high costs that affect the income of miners negatively, people who make mining in different regions work together in mining pools. Due to the low transfer and transaction costs, its decentralized structure, and other financial facilities, it is thought that the use of cryptocurrency will increase in the future and even traditional currencies (Hong, and Lee, 2018). Unlike traditional currencies, it is influenced by inflationary influences in the economy due to the limited supply of cryptocurrencies. In addition, the market collapse encountered as a result of inflationary effects due to their decentralized structure is not found in crypto money markets. Another advantage is that it can be carried out directly without the need for a vehicle institution in transactions such as cryptocurrencies, and the low costs and high transaction speed are too high. In addition, it can be carried out with memory cards or a virtual environment for transporting or transmitting anywhere, easily, reliably, and practically. Cryptocurrencies are not affected by administrative

sanctions such as any tax or foreclosure because they are not subject to any inspection, the confidentiality of user information, and not allow access (Blau, 2020).

Although there is user privacy in cryptocurrencies, every process is performed in a public and transparent way. Another advantage of cryptocurrencies is transferring operations without space and limit limitations (Bunjaku, 2017).

In addition to the advantages of cryptocurrencies, there are some disadvantages. The most criticized or prejudiced disadvantage is that it facilitates the realization of illegal procedures by escaping from illegal organizations by illegal organizations. In addition, due to the decentralized structure of cryptocurrencies in case of stolen or disappearance, the lack of authority to be applied is another disadvantage (Baur, Hong, and Lee, 2018). Today, the high level of volatility of cryptocurrency prices, which almost all cryptocurrency users know well, is another disadvantage (Bunjaku, 2017).

The main reason for this volatility is that cryptocurrency prices have a very open structure to manipulative actions as a result of the fact that the prices of money are completely active and in demand. As mentioned in the functioning mechanism of cryptocurrencies, the high amount of electricity used in the production or mining stage is one of the most important disadvantages (Baur and Lee, 2018)

1.1.7. Cryptocurrency elements,

Cryptocurrencies, which started to play a role in global markets with Bitcoin's production in 2009, have reached about ten thousand today. Although this figure has increased to more than 10,000, there were 9257 cryptocurrencies on the date of the study (CoinMarketCap, 2023a). However, information will be given about cryptocurrencies with significant volumes in the cryptocurrency market to be used in the study under this title. This Crypto Currency is Bitcoin (BTC), Litecoin (LTC), Ripple (XRP), Ethereum (ETH), and Binance Coin (BNB) (Brown & Johnson, 2023).

1.1.7.1. Bitcoin

In 2008, Nakamoto, the article 'Bitcoin: Electronic Cash System' is mentioned 2008, what Bitcoin is, how it emerged, and what its features are. According to the article, the features of Bitcoin eliminate the intermediary institutions and organizations between the buyers and sellers in commercial transactions. A procedure cannot be taken back. Transaction costs are low compared to traditional payment tools. It prevents commercial transactions that will cause double expenditure. With this article published by Nakamoto, the foundation of cryptocurrencies and blockchain technology was laid (Bunjaku, 2017).

Bitcoin's first block was held in 2009, and the same year it was presented on the New Liberty Standard market. The first trade through Bitcoin was realized in 2009 with 2 pizzas for 10 thousand Bitcoin. By 2011, the value of 1 bitcoin became equal to \$ 1. In 2013, the value of Bitcoin in the market exceeded \$ 1 billion. In 2017, NASDAQ made statements that they would carry out futures with BBOE 1 and the Tokyo Stock Exchange Bitcoin. In 2018, approximately 17 million Bitcoin was released, and 80 %of the total supply was released. By 2020, the value of 1 Bitcoin increased to over 20,000 and increased to \$ 68,000 in 2021. He also accepted El Salvador Bitcoin as an official currency in 2021(Brown, and Johnson, 2023).



Figure 1. Bitcoin Market Price

Source: CoinMarketCap (2023e)

1.1.7.2. *Litecoin*

It was produced in 2011 by Charlie Lee, who worked as a computer expert at Google, to eliminate some errors in the Bitcoin system. Litecoin is traded on the open-source blockchain system with an unforgettable structure. Money has emerged to reduce transfer costs. In addition, Litecoin, which has a different algorithm than Bitcoin, can create a faster block than Bitcoin's Blockchain network. One of the main differences from Bitcoin is that the mining operations can be performed from personal computers, although the mining processes reduce the profit rates (Brown & Johnson, 2023).



Figure 2. Litecoin Market Price

Source: CoinMarketCap (2023c)

1.1.7.3. *Ripple*

Ripple is a Ripple payment platform developed in 2011 by David Schwartz, Jed McCaleb, and Arthur Britto, founded by Ryan Fugger in 2004. Ripple will be used in financial transactions to be performed. It is the name of the Blockchain where the digital payment network is created, but it is the name of the company. The cryptocurrency produced by the Ripple Company is offered to the cryptocurrency exchange called XRP. The main difference between Ripple from other crypto coins is that it has a central structure. In other words, all the account books traded are managed by the company (Hairudin et al, 2020).

The XRP, on the other hand, does not require a multiple approval mechanism, and it provides faster and more efficient processing than Bitcoin and other cryptocurrencies. While 7 operations can be performed per second in the Bitcoin network, 1,500 operations per second can be performed in the Ripple network. The supply of XRP is announced as 100 billion units by the company owners. However, it is ensured that the supply has a deflationary structure by burning 0.000001 XRP as a result of each XRP transaction in the market. Nowadays, there are close to 100 banks in Turkey that perform transactions using the Ripple network, only Akbank. The company uses XRP, 15 of the 50 largest banks in the world, because the transfer transactions are fast and low cost (Hairudin et al 2020).

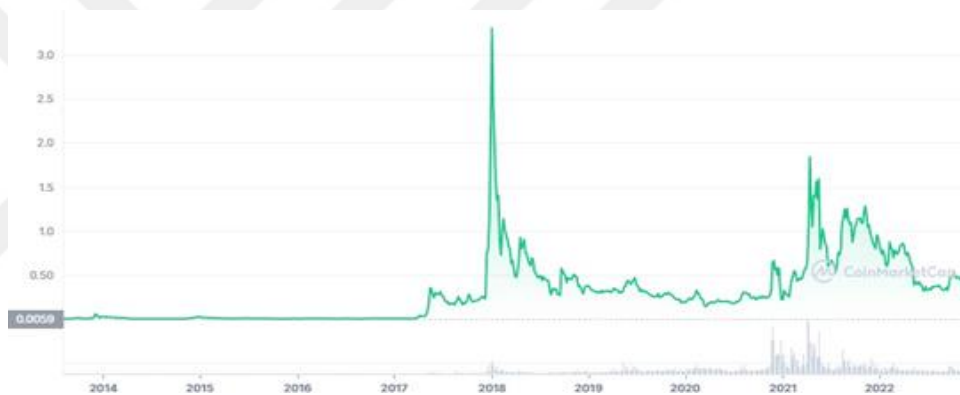


Figure 3. XRP Market Price

Source: Coin Market Cap (2023d)

1.1.7.4. *Ethereum*

Ethereum, developed by Vitalik Botter in 2014, is a blockchain project with its infrastructure, which allows a smart contract on the Blockchain. It has allowed many tokens and coins to emerge through its infrastructure. ETH is the local cryptocurrency that the Ethereum blockchain offers to the cryptocurrency exchange. The main purpose is to create a more scalable infrastructure to enable their users to perform faster and cheaper transactions. Unlike other cryptocurrencies, it tries to create the infrastructure without decentralization (Benlagha, and Maouchi, 2020).

The main difference from Bitcoin uses a central server, while the Ethereum Node works globally through the so-called nodes. In this way, the block network is decentralized and resistant to cyberattacks and interventions. All operations on the network are recorded and stored in a transparent manner that can be monitored by third parties. Although ETH does not have a limited supply, it has a deflationary structure because the burning process occurs when certain conditions occur as in XRP. The main advantages of Ethereum compared to other cryptocurrencies are that smart contracts can be developed on the blockchain and that it has a strong developer community and an infrastructure with an ecosystem. However, in addition to these advantages, the high transaction fees and the fact that they experience scalability problems are the main disadvantages of ETH(Charfeddine, Benlagha, and Maouchi, 2020).



Figure 4. ETH Market Price

Source: CoinMarketCap (2023c)

Investment is a common practice among individuals and corporate entities, involving the allocation of capital with the expectation of future benefits. This commitment of funds or resources is aimed at improving the standard of living for investors. The current era of globalization has seen a surge in financial investment, particularly in stocks, bonds, and various derivative instruments. The emergence of cryptocurrencies based on blockchain technology has further expanded the landscape of investment, offering new opportunities for hedging and speculation.

These digital assets, which operate on decentralized networks, present a unique form of currency that is distinct from traditional money (Kyriazis, 2020).

Cryptocurrency made its debut in 2008 with the release of a white paper authored by the mysterious "Satoshi Nakamoto," followed by its official launch in 2009. Bitcoin stands out as the most widely recognized and actively traded cryptocurrency among the various options available. Its rapid, secure, and seamless innovation, stemming from decentralized core technology, trust, and transparency, makes it an ideal form of digital currency for online transactions. The allure of cryptocurrencies lies in their tendency to consistently appreciate over time, with Bitcoin exemplifying this trend by skyrocketing from being valued at less than 0.01 USD in 2010 to exceeding 10,000 USD per unit in 2019. The proliferation of over 1000 alternative coins and crypto tokens alongside Bitcoin has given rise to numerous investment myths, fueled by the innovative potential of blockchain technology (Yoo, 2021).

Nonetheless, Bitcoin is not without its vulnerabilities, notably its lack of oversight from any centralized institution or government body. Operating on a blockchain database that remains beyond the control of any single entity, Bitcoin ensures transparency by allowing public access to its transaction records, thereby preventing fraudulent activities on the blockchain (Kim et al, 2020). Facilitated by a peer-to-peer network structure, Bitcoin transactions can be conducted directly between users without the need for intermediaries, preserving the anonymity of the parties involved. The implementation of anti-double-spending measures further safeguards the integrity of Bitcoin transactions, preventing unauthorized claims on the cryptocurrency (Kim et al, 2020).

There are various alternative cryptocurrencies, known as Altcoins that have emerged as alternatives to Bitcoin. Altcoins operate on a peer-to-peer system similar to Bitcoin, using a process called mining to validate transactions and add them to the blockchain. The main difference lies in the technology used, particularly the algorithm. Some examples of Altcoins include Ethereum, Litecoin, Ripple, Dash, Monero, Tether, EOS, and Stellar. Ethereum, in particular, has gained

significant attention and is the second most mined Altcoin after Bitcoin (Kim et al, 2020).

Ethereum is known for its ability to run software on computer networks, ensuring the data and small programs within it, known as smart contracts, are applied and processed automatically across all computer networks without a central coordinator. Like Bitcoin and other cryptocurrencies, Ethereum can be used as digital money and operates on a decentralized system, meaning it cannot be controlled by any individual or company, and its supply is unlimited. Additionally, there has been a surge in cryptocurrencies, with the mass media playing a significant role. For instance, Elon Musk, the richest person in the world, made a statement about the digital currency Dogecoin via Twitter in February 2021, and Tesla Inc. invested 1.5 billion USD in Bitcoin. Furthermore, Tesla Inc. hinted at its intention to start accepting cryptocurrencies as a form of payment (Yoo, 2021).

The concept of economic fragmentation is promoted by Bitcoin. Cryptocurrencies possess social-demographic characteristics and other attributes that can impact the ability of individuals and corporate retirees to engage and invest in the market. This disparity in determinants between Australian and Chinese cryptocurrencies highlights significant factors such as age, gender, education, occupation, and investment experience, all of which align with existing behavioral literature. These findings may offer a plausible explanation, especially considering the cryptocurrency market's notable fluctuations and the evolving trends in pricing and regulation. Furthermore, aside from the potential for increased income, investing in cryptocurrencies can provide an opportunity for individuals who may not typically venture beyond their usual investment habits (Hairudin et al, 2020).

Demographic factors like age, gender, and education level can also have a positive influence on investment decisions within the Egyptian capital market. Behavioral aspects such as investor sentiment, over/under reaction, overconfidence, and herd behavior can similarly impact investment choices. Nevertheless, as investors gain more experience in the investment realm, they are

more likely to disregard the emotional impacts of sentiment, over/under reaction, overconfidence, and herd behavior (Hairudin et al, 2020).

The essential impact of the technical nature of cryptocurrencies on trust, technology awareness, and satisfaction has a positive effect on the attitudes of cryptocurrency investors. Moreover, the necessity for technology awareness also indicates strong support for the difficulty in marketing this type of currency to the older generation, who are not adept at using new technology. This research incorporates behavioral factors and social demography as cryptocurrency investors are still influenced by emotional factors and external information when making investment decisions, such as price movements, expert opinions, and internet sources (Yoo, 2021).

1.2. Research Statement Problem

Despite the increases in cognitive factors that pertain to decision-making behavior associated with the moderating role of cryptocurrency investment, the need for investors to be unbiased, conscious, careful, and deeply considered before making any investment should be considered proper decision-making. The biases of an investor, either deliberate or unconscious, must be effectively considered before making an investment decision. Thus, investors should make the right decisions that do not allow behavioral biases to influence investment decisions.

1.3. Objective of the Research

The specific objective of the study is to investigate the effect of cognitive factors related to the decision-making behavior associated with the moderating role of cryptocurrency in investment, however, there are some important objectives as follows: -

- i. To evaluate the change that exists in the decision-making behavior of Libyan investors due to the existence of cognitive factors
- ii. To determine how herd biases significantly affect decision-making behavior, particularly for Libyan decision investors
- iii. How the representation of biases could affect the investment

decision from an individual perspective

- iv. To determine how the significance of investment in cryptocurrencies plays a significant role between cognitive factors and the decision-making behavior of Libyan investors
- v. To demonstrate the risk of investing in cryptocurrencies that could be incurred due to irrational decision-making

Due to the presentation of both General and specific research objectives,

Thus, this research intends to ask the following research questions

1.4. Research Questions

As the scientific investigation, therefore, the research should be constructed with the research questions, and the research questions must originate from the research problem statement and the objectives of the research. Therefore, the research questions of this research are as follows; -

1. To what extent do the cognitive factors affect the component of decision-making behavior in Libyan investors
2. Does the bias for Libyan investors have a significant negative effect on decision-making behavior
3. Is there any risk of investing in cryptocurrencies due to irrational decision-making
4. What is the relationship between the cognitive factors and decision-making behavior on investing cryptocurrencies in Libya investors

Therefore, to demonstrate the objectives and to respond to the research questions, this research should create its research hypotheses as a means to validate the research questions as well as the research objectivity. Thus, the following are the research hypotheses

1.5. Research Hypotheses

The hypotheses of the research have been applied to validate the research questions and objectivity. The research hypotheses use both the null hypothesis and

the Alternative hypothesis. In this context, the following are the research hypotheses

- i. H_0 : The cognitive factors on decision-making behavior have less effect on cryptocurrency investment for Libyan investors
- ii. H_1 The cognitive factors on decision-making have an impact on cryptocurrency investment for Libyan investors

Thus, the following hypothesis uses the 5% to justify the validity of the hypothesis; that is, if the calculated value is less than 5% or the critical value is 1.96, then we can accept the alternative hypothesis, otherwise, we can reject the null hypothesis.

1.6. Research Contribution

The contribution of the research is obtained due to the significant output results, as has been highlighted from the empirical analysis that depicts the effect of the cognitive factors on the role of moderating the decision-making of Libyan investors. The study contributes by describing the information related to cryptocurrencies on the investment decision-making in the Libyan market equilibrium. The policymakers will use the findings from the study to create financial and business policies related to cryptocurrencies and investment decision-making, especially in the Libyan market equilibrium.

Therefore, the stakeholders related to the market of cryptocurrencies and the decision-making related to the output results will benefit by cooperating with different sectors in Libya including, financing sectors, investment sectors, trade and investment sectors, financial institutions, and academic scholars to create effective policy that enhances the relationship between the cognitive factors including the component of the cryptocurrencies on investment decision-making especially on the Libyan market strategies.

Apart from that, the study uses an Ordinary Least Squares (OLS) regression model as an empirical analysis for obtaining the outcome results, therefore, the methodology is rigorous and valid for finding the outcome of the results.

1.7. Scope of the Research

The scope of research covers all the cities in Libya, including the Libyan investors of cryptocurrency in the Libyan financial market. The investors for the scope of the research have been selected regarding the above two years of experience in the financial cryptocurrency market. To make the data collection for the cryptocurrency, about 250 Google questionnaires have been distributed to the cities related to cryptocurrency in Libya. Further, non-random sampling for data collection has been implemented to collect the data from the investors of the cryptocurrency.

1.8. Limitation of the Research

The cognitive factors and decision-making in cryptocurrency in Libya, especially in the financial market, increase further as time increases. The growth of cryptocurrency goes parallel with the growth of financial technological advancements, such as AI technology. Apart from that, the cognitive factors that are associated with decision-making in the financial market play a key role in providing efficiency in the growing cryptocurrency market in Libya. Therefore, cryptocurrency investors should be unbiased and consistent in making the right decision regarding the widening of cryptocurrencies in Libya. Apart from the research investigating the effect of cognitive factors on decision-making behavior for moderating the role of cryptocurrency investment further, the research extends the investigation about the limit of the expansion of the Crypton market in Libya associated with widening the application of artificial intelligence (AI) in the financial market.

The output results from the empirical analysis are disseminated and shared with the respected authority of financial institutions in Libya to strengthen the market growth of cryptocurrency, which examines the effect of cognitive effects and cryptocurrency investment in the Libyan financial market. Therefore, the cryptocurrency investors will benefit from the outcome of this research.

1.9. Research Organization

The research is structured as follows chapter two is related to the literature review that depicts different thoughts and arguments from the different scholars related to the field of the effect of cognitive factors, and decision-making behavior in cryptocurrency investment, also the chapter will describe the conceptual framework of the research as well as the gap analysis of the research. In Chapter Three, the research will describe the data collection, data analysis, and methodology that have been implemented to analyze the output results of the research. In chapter four, the research presents the estimated results and a discussion of the results. In this phase, the outcome of the results is presented and discussed according to the thoughts and arguments of other scholars about the case of cognitive factors and decision-making behavior on cryptocurrency investment in Libya. The last chapter is concerned with the conclusion and policy recommendations of the research.

CHAPTER TWO

LITERATURE REVIEW

2.1. Introduction

This chapter discusses different thoughts and arguments from different academic scholars. The chapter discusses the cognitive factors and the decision-making behavior on the moderate roles of cryptocurrency investment, specifically in Libya. Therefore, the section reviews similar studies that have been investigating these effects. Thus, the section is divided into a theoretical literature review, an empirical literature review, a conceptual framework, and lastly is about, the gap analysis from the literature reviews.

2.2. Theoretical Literature Review

Different academic scholars discussed the effect of the cognitive factors of decision-making behavior on cryptocurrency investment. The thought and argument have been put forward for discussion, and revealed that the effect of cognitive factors and cryptocurrency investment on investment decision-making behavior has no consensus. Therefore, the reviews from this section include sub-sections pertaining to the specific factors of cognitive factor behaviors, cryptocurrency investment, and investment decision-making.

2.2.1. Cognitive factors and investment decision-making behaviors

In the context of cognitive factors on investment decision-making behavior, the debate has started as follows;

Nofsing (2018) states that the functions of cognitive factors can be explained in the form of processing input with sensory organs, perceiving, and understanding the functionalities of the cryptocurrency in the financial market are expressed through the cognitive concept. Therefore, the cognitive function of the decision-making behavior operating in the context of cognition that seeks answers to questions informed by the brain, executes instructions informed of neuroscience, assists computer software to deliver the output for the cryptocurrency, and provides incentive decision behavior for the investors to invest (Nofsinger, 2018).

Bihari and Luthra (2023) argue that; thinking in cognitive science involves processing internal representations of external requests, on that concept the cognitive factor of decision-making behavior is the part of applied science concerns sensation, perception, attention, awareness, learning, memory, perception, thinking, activation, language, intelligence, that facilitates to have better investment decision-making behaviors.

According to Arkonaç (1998: 80-81). The cognitive factors in investment decision-making behaviors are well integrated to perceive various information intensities as acquisition. Therefore, the perception, acquisition, storage, transformation, emphasis on the use of knowledge, as well as the process, perception, memory, and expansion of processing. With the help of programming, sorts, simplifies, and expands the information to obtain an unbiased decision, which helps to make it very clear for investment (Sak, and Dalgar, 2020).

Sak and Dalgar (2020), in today's cognitive investment decision-making, refer to the models and theories that have been put forward to explain these cognitive processes. However, the cognitive system is not a system that allows stimuli to be prepared, visualized, and recalled, when necessary, through machine learning, and committed to memory. An effective cognitive system must be able to protect, change, and edit schemas and combinations, when necessary, to construct and resist the effects of digital currency interference. Also, to integrate events in time and space (integration), to clear memory, to work over memory marks, and to create and change strategies. In short, it must be able to manage digitalized activities

Shah et al. (2018) discussed that the role of cognition factors in investment decision-making behavior about investment accordance with organizational and management theories is very important.

However, the cognitive factors on investment decision-making behavior are based on the unbiased structural management organization that fulfills the enhancement of investment decision-making. The structural enhancement for

cognitive factors for the investment is formed about the movements of others' investment decision-making that is linked to the financial organization development. Thus, the cognitive factors on investment decision-making behaviors are expressed via digital transmission; on that point, the process becomes vital as the primary center of cognitive factors and digital organization in investment decision-making. Therefore, unbiased cognitive factors strengthen the right investment decision-making behavior in the digitalization world to making it more uncertain.

Thus, unbiased cognitive factors on investment decision-making behaviors have been achieved at the advanced level, in a way that the decision investment reduces complexity during the business investment, increases the knowledge of digitalization, in a way that the investors can be assured to have effective investment. Konstantinidis and Maria (2012). Argued that an important factor in financial markets, investor and investment behaviors in general, is taken into account. Investors leverage not only financial data in investment decisions, but also their emotional and cognitive worlds. For this reason, investors who are far from rational attribute their decisions to binary thinking (Maria, 2012).

Brock (2014) states that, while most of the studies conducted in the financial discipline, most of the market anomalies theories, such as the efficient market hypothesis, random walk, and expected price theory, are beginning to change. In this regard, cognitive factors in investment decision-making in behavioral finance have a significant contribution to changes. The cognitive factors on investment decision-making aim to prove that unbiased decisions compared to emotional ones are important in addition to investment data, and not the inaccuracy or lack of other methods. thus, proving that the decision-making process becomes more appropriate.

In this context, behavioral finance can be defined as a discipline that attempts to explain the reasons for mistakes made by investors. Also, the elements of cognitive factors, including availability bias, representativeness bias, herding bias,

and anchoring bias, have a significant contribution to investment decision-making behaviors in Libya.

2.2.2. Cryptocurrency investment and investment decision-making behavior

Cryptocurrency investment in investment decision-making behaviors refers to the process of investing the cryptocurrency in the financial markets regarding the proper decision for investing. In investing the cryptocurrency as a digitalization finance market, the right decision-making is needed, specifically in the context of averting biases are important factors that cause unpatriotic attitudes and behaviors in individuals.

Jacobsen and Zhang (2014) argued that the structure and components of cryptocurrency investment, which are among the key elements, addressed the roles of cryptocurrency changes in investment decision-making behaviors. The structure and components examine how investors create different ideas about cryptocurrency investments, as decision-making that is expressed in different forms. An investor focused on investment can develop negative information that appears as a result of analysis. Ultimately, once the right decisions have been invested increases the significant results. in the future (Nofsinger, 2018).

Creo (2024) states that one of the most consistent findings of cryptocurrency investment is one of the main elements of tendencies that are concerned with games of chance, which are described as investing in cryptocurrency. Cryptocurrency investment is attributed to the tendency to believe in the fact that events can be predicted before, with good consequences, and bad consequences on investment decision-making.

Ackert and Richard (2010), conducted a questionnaire to test individual investors who invest in cryptocurrency through factors of investment in decision-making behaviors. The data obtained were analyzed by the chi-squared test. The output results indicate that efficient decision-making behavior leads to enhanced cryptocurrency investment in the financial market. As a result of the analysis, it was

concluded that cryptocurrency investment affects the investors, and investors have an attitude to make decisions on cryptocurrency decisions; if they know how to solve problems.

2.2.3. General discussion on investment decision-making behaviors

Babalhavaeji et al., (2016) conducted a questionnaire to study the accuracy and validity of behavioral finance. The survey sample consists of female investors who invest in ISEs. The Ki-Square test was used in data analysis. As a result of the analysis, it was determined that investors displaying unconventional tendencies and herd psychology are a priority. Jacobsen and Zhang (2014) surveyed to determine whether psychological and social factors are effective in investors' investment ideas. The data obtained was analyzed with several tables and percentages. As a result of the analysis, it was concluded that behavioral finance was effective in influencing investors' thoughts in the province where the survey was conducted.

Naktiyok (2015) conducted his study using a questionnaire to test the validity of investors' behavioral financial tendencies. The data obtained were analyzed by the Pearson Chi-Square test. As a result of the analyses, it was concluded that individual investors living in Balıkesir show their behavioral financial tendencies.

Satish (2016), in his study, applied a questionnaire to determine the investment instruments they chose and how the employees working in the unit made their investment decisions. The survey data obtained were analyzed by the Pearson Chi-Square test of independence. As a result of the research, an idea emerged that was less acceptable in society with fewer risks. Factors that influence investment decisions are external and environmental.

Kabapelit's (2018) study aimed to examine individual investors who participate in capital markets in terms of emotional and cognitive tendencies and determine whether there is a difference between investors' tendencies. The results of the study were analyzed through factor analysis through RMSEA and X2/DFA models. As a result of the analysis, it was concluded that individual investors were

influenced by emotional, social, and communication tendencies linked to risk levels influenced by behavioral tendencies.

Palmer (2014) conducted an individual investor questionnaire to reveal the choice of investment vehicles for investors with behavioral financial tendencies. The Ki-Square test was used in the analysis. Through the analysis, it was concluded that investors invest more in gold and foreign currency than in investment instruments, and married people invest more than single people.

Shah et al. (2018) studied individual investors under the influence of behavioral financial tendencies to determine whether they completed a questionnaire. The data obtained from applying the questionnaire were analyzed by the Pearson Chi-Square test. As a result of the analysis, some investors' decisions are found to be effective across income, education level, marital status, age, and gender.

In their study by Çetiner. Guo et al. (2017) conducted a facial scan with jewelry to examine the behavioral finance perspective of gold investors. Data obtained from Kolmogorov-Smirnov surveys and ANOVA tests were applied. As a result of the analysis, it was found that there is a change in investor behavior according to issues such as education and professional experience

Nofsinger (2018) in his study, a questionnaire of investors living in Istanbul to reveal the psychological tendencies of the questionnaire. In his study, in the analysis results, the tendencies grouped under the name of self-skew have greater effects on investors, that men have more tendency than women, and at the same time, mental accounting and cognitive discrepancy, such as tendencies such as education, increase.

Mishra and Metilda (2015) conducted a questionnaire study to determine the relationship between investors' psychological biases, the levels of risk they can take, and personal and mechanical characteristics. According to the data obtained, the risk level of investors was low. Investors concluded that they have compliance personality characteristics as personality traits of acting propensity.

Tekrek and Table (2008), aim to understand and explain the psychological attitudes of individuals during periods of crisis. For this purpose, they examined psychological and emotional factors and tried to reveal the relationship of these factors with crises. As a result of the study, not only economic indicators, but also investors' trend factors should be taken into account. Haita, (2014) wanted to reveal the influence of psychological factors on investment decisions in detail in a study of individual investors in a study of individual investors.

Konstantinidis and Maria (2012) conducted a study to investigate whether individual investors have a framing effect on investment decisions. For this purpose, the survey was conducted, and data correlation, normality test, independent T-test, and chi-square test were analyzed. As a result of the analysis, it was understood that there was no risk in the final gains, and in the event of a specific loss, they wanted to get high profits.

Bodur (2016) aims to determine the influence of the overconfidence factor on investment decisions. For this purpose, he conducted a questionnaire. In applying the questionnaire that uses a random sample, the chi-square test and ANOVA test were used. As a result of the analysis, it was found that the overconfidence factor tends to increase in investors with experience in the high market.

Germer et al., (2016), compared traditional finance theory and behavioral finance theory in the study and discussed the factors of behavioral finance discipline that influence individuals' investments effectively. As a result of the study, it was found that traditional financial theories have lost their influence on individuals, and behavioral financial theory has no influence on individuals. This procedure aims to support new studies by focusing on the effects of unpatriotic investor behaviors within the framework of emotional factors in its study. For this purpose, the literature was examined. As a result of the research, it is believed that the emotional factors that influence investment decisions will be useful for other studies.

Bihari and Luthra (2023), in the study of individual investors in investment decisions of emotional and cognitive factors, effectively show a significant difference in investment preferences in a test questionnaire. These managers were selected from travel agencies, boutique hotels, and large hotels in Muğla. Data obtained from the surveys were analyzed using an independent samples t-test. As a result of the analysis, it was found that behavioral financial factors showed significant differences in investment decisions.

2.3.Gap Analysis

The research investigates the influence of cognitive factors on the decision-making behavior of moderate roles in cryptocurrency investment in Libya. Most of the literature reviews discuss the effect of cognitive factors in the concept of psychology and social activity decisions, but fewer studies discuss this effect in the context of cryptocurrency investment. In the concept of cryptocurrency, but no studies in Libya that discuss the effect of the cognitive factors in the digital financial marketing in Libya that have influenced the investment of cryptocurrency in Libya.

Almansour et al., (2023) investigate the case of complexities of cryptocurrency investment decisions, however, the case study pertains to the financial behavior in Gulf countries. Plilatin and Dilek (2024) investigated the case of investor intention and investor behavior, however, the case study assesses the currently planned behavior. Syarkani and Tristante (2022) examined the issue of predictors of crypto investor decisions. The study is related to financial literacy and attitude.

CHAPTER THREE

RESEARCH METHODOLOGY

3. Introduction

This section describes the methodology chapter in relation to the effect of cognitive factors and decision-making on the moderate roles of cryptocurrency investment in Libya. The section includes the research tools for data collection and econometric methods that have been used to estimate the output results from the collected data. Furthermore, using the Likert scale, the data have been collected and analyzed in a table format. Apart from that, in this context, the research employs the ordinary least squares method to obtain the output results.

Thus, this research was conducted to investigate the effect of cognitive factors of decision-making on the moderating roles in cryptocurrency investment in Libya. The research is based on the cognitive factors of decision-making, such as availability bias, representativeness bias, herding bias, anchoring bias, and cryptocurrency investment on investment decision-making behaviors. The studies were conducted on all cities in Libya that possess cryptocurrency investment, and the Libyan people who have the knowledge and experience of using cryptocurrency in the financial market.

Therefore, about 209 as a sample size has been collected to investigate the effect of the cognitive factor behavior of decision-making on the moderate roles of cryptocurrency investment in Libya. Thus, 209 participants agreed to be interviewed from the questionnaires, and about 9 members refused to be interviewed. Therefore, the total sample size of sample size that has been accepted to be interviewed is 200. The research includes major financial institutions like CBL, LAFB, NCB, RB, TSB, AGB, UB, SREIB, UB Libyan Financial Institutions, and Libyan Private Investors' Business Associations, for further data inclusion.

According to the Libyan National Statistical Research shows that about 7.306 million people live in various cities in Libya.

3.2. Study Design

The study is designed to be conducted for the rest of the Libyan people, specifically the investors, and well knowledged in cryptocurrency. The study is descriptive, cross-sectional, data-oriented, oriented that involves various institutions related to cryptocurrency investors, based on the cognitive aspects of decision-making.

3.3. Study Duration

The study was conducted for nearly six months,+6 including two months for data collection from the financial institutions, and private institutions in Libya. In fact, the duration started in 2024.

3.4. Study Population

The target population of this research includes all the community investors, company owners, and financial institutions that emerging in cryptocurrency and the members who have experience with the cryptocurrency application that is a digital cryptocurrency. Therefore, about 209 questionnaires, a sample size, were distributed as the primary data sources for collecting data sources. Thus, about 200 were accepted to participate, while 9 members did not accept to participate in the investigation. The data were collected from 7:00 am to 5:00 pm during the collecting data all the rules and regulations were applied.

3.5. Sampling Method

All citizens who are living in and outside of Libya, specifically, those who have the knowledge and experience of using cryptocurrency in the digital financial market in Libya. A simple random sampling method was used to collect the data in the different regions in Libya. Further, the two regions were considered as the strata during the data collection.

3.6. Sample Size Estimation.

The sample size of the data for estimation was obtained by using Fisher's formula

$$n = \frac{Z^2 \rho (100 - \rho)}{\varepsilon^2} \quad (1)$$

where

n = Estimated sample size,

p = the proportions of the existence of cryptocurrency investment in Libya,
where p is(2024)

ε = Marginal Error of 5% which is 0.005

Z = Level of confidence

Therefore, the estimated sample size can be found as follows:

$$n = \frac{Z^2 \rho (100 - \rho)}{\varepsilon^2} \quad (2)$$

formula that

For possible participants that were not found during the data collection time, an additional 10% was added, or the minimum sample size of the effect of cognitive factors making decisions on the moderate role of cryptocurrency investment in Libya. The investors, and the citizens who have knowledge and experience of the cryptocurrency inside and outside Libya have been included. Further, the experts and academicians who have knowledge of cryptocurrency have also been included.

3.6.1. Sampling procedures

The questionnaires have been distributed to the different regions of Libya, and in addition to that, the stratified technique was used to obtain participants from the different areas in the cities of Libya. Therefore, about 200 from the stratified procedures have been collected and computed to get exact results. Further, the consent notes were distributed and made readable to the participating members to obtain their willingness to participate in the investigation. Thus, the distribution of the participants' members in the sample size has been represented as follows: -

3.6.2. Inclusion research data criteria

The research includes all Libyan citizens aged from 20 to 70, and above, government and private digital financial institutions, cryptocurrency investors, and citizens who have knowledge and experience about cryptocurrency investments, and cognitive factors that bias are associated with decision-making behaviors. Also, the investigation includes the expertise of cryptocurrency investment, and the interviews for the data collection were conducted from 9:30 am to 4:00 pm. The data was collected during working days at working hours; this has been done purposely to avoid inconsistency in the data collection.

3.6.3. Exclusion research data criteria

Overgeneralization and exaggeration during the data collection were avoided intentionally to obtain clean data for the data analysis. Therefore, the data collection was focused on what was presented in the questionnaires, as a means of avoiding data inconsistency. In addition to that, all Libyan Citizens below 18 years of age were excluded from the investigation, therefore, the research included all the participants above 18 years.

3.7. Research Variables

The main objective of this research is to investigate the effect of cognitive factors of decision-making behavior on the moderating roles of cryptocurrency in Libya. In order to facilitate the effect, this research uses variables such as the proxies of cognitive factors, the proxies of decision-making behaviors, as well as the proxies of cryptocurrency investment. In the regression analysis, the cognitive factors and decision-making behavior stand as the independent variables, while cryptocurrency investment is used as the dependent variable.

3.7.1. Dependent variable

The dependent variables have been well documented and observed to provide efficient results in the empirical analysis. Thus, the dependent variables determine the output results of the investigated effects, and help the output results to create effective policy recommendations that will improve cryptocurrency investment in Libya. The dependent variable of this research is represented as follows: -

3.7.1.1. *Investment Decision-Making Behaviors*

The decision-making behavior is used to examine the effect of cognitive factors and cryptocurrency investment in digital financial marketing in Libya. The effect of the dependent variable against the independent variable can be well presented in the linear regression model that has been presented in Equation 1 below. The following is a linear regression equation model that shows the relationship between the dependent and independent variables in the context of the making-decision effect

$$Y_t = C + B_1 \Sigma X_t + \varepsilon_t \quad (3)$$

Where

Y_t = represents the dependent variable, which is Decision-making, and

ΣX_t = represents the sum of the independent variables of cognitive factors, and cryptocurrency investment

t = represents the current time within the respective investigation.

ε = represents the error term that leads to the sum of the squared residuals of the respective investigation.

3.7.2. **Independent variable**

Also, the error term stands for correcting the errors during the investigation. All the variables are well documented and observed to investigate the effect of the cognitive factors of the decision-making behavior on cryptocurrency investment.

3.7.2.1. *Cognitive factor behaviors bias*

In this section, different proxies of the cognitive factor behaviors have been presented. The cognitive factor behaviors include; - availability bias, representativeness bias, herding bias, and anchoring bias. All these factors determine the effect of the cognitive factors on the behavior of decision-making regarding cryptocurrency.

3.7.2.1.1. Availability bias

Availability bias is the condition that human beings tend to rely on the information that comes readily to mind when evaluating conditions or making decisions. Due to this reason, most people believe that the readily available information is more representative of the making decision than the case. Sometimes, the availability bias can be recognized as the availability heuristic, and it can be well described as one of the numbers of cognitive biases that humper critical thinking that leads to the validity of our decision. The availability bias is accounted as the cognitive bias that relies on what immediately comes to mind to make rapid decisions and judgments. The information through the availability bias might be released from the recent past, according to vivid memories. The information might be based on personal experience, or fueled by outside sources such as the internet or news. Through on this information helps people avoid laborious fact-checking and analysis, but it increases the likelihood of decisions.

3.7.2.1.2. Representativeness bias

The representativeness bias exists when similar objects or events confuse people's thinking regarding the existence or probability of an outcome. People make mistakes by considering that two similar things are correlated or more closely than they are. The representativeness bias is a common information processing error in the digital financial market. The representativeness bias might occur in the context that people confirm that a good company comes from a good investment, however, this is not the fact. The company might be good at its production, but less effective at judging other businesses. In addition, evaluating the performance of the future performance based on the historical data just because of the high growth performance years, does not mean that the trend will grow indefinitely in the future.

3.7.2.1.3. Herd bias

The term herd refers to the phenomenon that people join or create groups and follow other actions under the assumption that other groups have done their research. Herd bias is common in financial sectors where investors follow the decision as what has been perceived by the other investors rather than relying on

their analysis. In addition to that, the investors who practice the herd bias ordinarily gravitate to the same or similar investments as others do. Therefore, herd bias is the behavior in which investors join groups and follow the actions of others. It exists in the finance sector specifically, when the investors follow the crowd instead of his /her analysis. Herd bias is comforting to the conditions that direct others to multiple decisions, from the way we shop to the way we invest. The fear of missing out on a profitable investment is the driving force behind the herding bias, especially in the good news or after-release analysis investigation, however, it might be a mistake.

3.7.2.1.4. Anchoring bias

This refers to the tendency that people to rely to heavenly on the first piece of information that they receive, regardless of the accuracy of that information, in a way that people for sure to use that information as a reference point, or anchor to make certain judgments. Due to this tendency, the anchoring bias might cause a poor discussion in various contexts, specifically in the making of investments, medical diagnoses, negotiations, and the purchasing of various products. In general, anchor bias causes people to favor information that they have received pre in the decision-making process, in a way that people hold this information as the reference point, and fail to correct or adjust the initial impression even though they receive extra information.

3.7.2.2. Cryptocurrency investment

The cryptocurrency investment is the dependent variable that examines the relationship between cryptocurrency investment and investment decision-making behavior. The existence of significant factors at a certain level of probability will determine the magnitude of cryptocurrency on investment decision-making behavior in Libya.

3.8. Data Management

Data collection was done through questionnaires, and an observed checklist was managed and controlled. The questionnaire was included in the research for the data collection based on the effect of cognitive factors and decision-making on the moderate roles of cryptocurrency investment in Libya. The interviews were conducted at the end of the data collection, in a way that the questionnaire contained open-ended questions. The digital financial institutions and participating members participated according to the standard and protocol of the data integrity collections. The procedure for the data collection was followed appropriately and adhered to during the data collection. The permission was obtained from the authorities and managers for the data collection. To ensure the quality of data. The data was coded and entered into SPSS version 20.0 statistical software for data management; data cleaning was also involved.

3.9. Data Analysis Plan

Demographic information was obtained using Likert questionnaires after the data collection, and then entered, and analysis was done using a statistical package for scales. Tables were used to summarize and present the core findings from the empirical analysis.

3.10. Study Tools

To investigate the effect of cognitive factors and cryptocurrency investment on decision-making behavior in Libya, a questionnaire was designed as the source of the data collection for collecting data from the primary sources. The questionnaire was classified into four sections, whereby the first section relates to the demographic data of the investors, the second section relates to the cognitive factors' biases, the third section relates to the cryptocurrency investment, and lastly relates to the decision-making behaviors. The measurement of the questionnaire was designed according to the Likert scale, consisting of 5 scale measurements (degrees) such as SA% means Strongly Agree, A% means Agree, N% means neutral, SWD% means somewhat disagree, and D% means Disagree (Jebb and Tay, 2021).

All the scales are presented in percentage values to be translated easily. All the entities provide information that has been requested to be provided by the reviewers. It started with the proxy variable of the cognitive factors, decision-making, and cryptocurrency investment. All the information on the applied variables has been represented in the table form (Moon and Han, 2017).

3.10.1. Research validity

The researcher reviewed the questionnaire with a group of faculty members to verify the apparent validity of the tool, and to express their observations, suggestions, and modifications regarding the paragraphs of the tool in terms of the suitability of the linguistic formulation, and the suitability of the paragraphs to the study sample. According to the arbitrators' observations and suggestions, the researcher made the necessary modifications to the questionnaire, as some paragraphs remained unmodified. In contrast, others were modified, simplified, and replaced with unclear words in terms of meaning with other, clearer words.

CHAPTER FOUR

DATA ANALYSIS AND RESULTS

4.1. Introduction

This section represents the data collection and data evaluation in relation to the effect of cognitive factors and decision-making of the moderate roles of cryptocurrency investment in Libya. The proxy variables of the cognitive factors, such as availability bias, representativeness bias, herd bias, and anchoring bias, have been digested and interpreted. Also, the relationship between the cognitive factor of cryptocurrency investment on decision-making investment has been examined. The section begins with the demographic characteristics and ends with the Ordinary Least Squares (OLS) regression model.

4.1.1. Demographic Participants Information

This part describes the characteristics of the members who participate in this research. The section describes the behavior of participating members in terms of gender, age, marital status, educational qualification, and working status.

Table 1. Distribution Participated Sample by Gender

	Research Participants	Participant Ratio
Male	137	68.5
Female	63	31.5
Total	200	

Sources: Calculated from the Questionnaires

The number of males is equivalent to the number of females in participation, which demonstrates that there is a high rate of understanding of the significance of research and development, as well as the participants acquiring knowledge of the cognitive factors regarding cryptocurrency investment in Libya. Further, the output results demonstrate that the citizens in Libya are more influenced by research and development.

Table 2. Distribution sample by Age

Interval	# of Participants	Percentage
20 – 29	50	13.30
30 – 39	99	26.33
40 – 49	110	29.26
50 – 59	47	12.5
60 – 69	60	15.96
70 – 79	10	2.66

Source: Calculated from the Questionnaire

Table 2 illustrates the participation of members in relation to their ages. The table shows that the ages of 40 and 50, followed by 30 to 40, have a participation ratio of 29.26 and 26.33, respectively. This demonstrates that the ages of 40 to 50 have the highest ratio of participation compared to the rest ages. In addition, the ages of 70 to 80 have less participation compared to other age groups. Generally, the information from the data sources has been contributed by all targeted ages; however, the ages of 30 to 50 show effective participation compared to the rest. This demonstrates that the Libyan citizen's majority have the knowledge of cryptocurrency investment, but mostly practice by the age of 30 to 50. Further, the knowledge of the investment decision-making in Libya specifically, for the cryptocurrency is very high because the Libyan government does not ban the uses of cryptocurrency in normal consumption. This is the case, the majority of the people in Libya transform to the digitalization currency compared to the normal uses of the currency (Legality Lens, 2025).

Table 3. Sample Distribution by Marital Status

	Research Participants	Percentage
Single	97	48.5
Married	103	51.5

Source: Calculated from the Questionnaire

Table 3 indicates that participants who have a married status have a greater influence on participation in the cognitive factors of decision-making behaviors on

cryptocurrency investment compared to the single. The output results influence the determination of the cognitive factors of decision-making behaviors on cryptocurrency investment in married status, compared to the single. The analysis from this table revealed that citizens in Libya participated in this investigation of decision-making behavior based on cryptocurrency investment. The output from the investigation indicates that the families are influenced to be aware of decision-making behavior bias in cryptocurrency investment.

Table 4. Distribution Sample by Educational Status

	# of Participants	Percentage
High School	64	17.02
Bachelor' Degree	176	46.81
Masters	102	27.13
Doctorates	34	9.04

Source: Calculated from the Questionnaire

Table 4 illustrates that all educational levels from high school to university have participated in this research. The participants who hold bachelor's degrees have the highest number of participants compared to the rest levels. However, there is a smaller number of PhD holders who have participated in this research. The inclusion of this section is just to determine the number of skilled and expert individuals who are involved in the research. Further, it helps the policymaker to construct effective policy recommendations on how to strengthen the cognitive factors of decision-making on cryptocurrency investment.

Table 5. Distribution Sample by Occupation

Participants	# of Participant	Percentage
Student	35	9.31
Government Employees	67	17.82
Un employed	57	15.16
Self-employed	189	50.27
Retired	28	7.45

Source: Calculated from the Questionnaires

Table 5 illustrates different sectors of participants in connection with the working department. The table shows that the rate of self-employment is higher

compared to the other sectors. The output results demonstrate that most of the self-employed sector has invested in cryptocurrency compared to the other sectors in Libya. Therefore, the rate of cognitive factors of decision-making behavior is well established in the self-employed sectors. However, the unemployed have knowledge about cryptocurrency investment in Libya. Furthermore, the Civil servants have become second to support the investment of cryptocurrency in Libya. The government supports strengthening digital financial institutions as a means of increasing the rate of practicing cryptocurrency in Libya.

4.2. Empirical Analysis

The questionnaire data are estimated using the SPSS software and transformed from the theoretical phase to the empirical evaluations. Therefore, this section uses the developed questions from the questionnaires and integrates them into the real world. The results from the empirical analysis are presented in the form of a table and graph, and the numbers are presented in percentage form. This is because, if the output results of the proxies from the investigation are presented in the percentage form, it creates significant meaning. This is the case where all the output results from the empirical analysis have been expressed in the form of percentages in order to be well-identified and understandable. Thus, this section has started with the variable of cognitive factors in relation to its proxies.

Further, the scale measures have been represented in the first row of each table in a way that the D% represents the percentage of the participants who disagree about the descriptive statements, N% represents the percentage number of the people who stands for not knowing anything, that means they don't have any idea according to the description statement, SWA% represents the percentage number of the participants who somehow agree with the descriptive statements, and A% represents the percentage number of the people who agree, that means those who have ideas about the descriptive statement. The type of Likert Scale is supported by the study of Fahlevi et al., (2024), which investigates the effect of digital finance literacy based on savings, spending, and prospective financial behavior (Fahlevi et al., 2024).

Table 6. Description Table of Measurement Scales

s/Number	Likert Scale	Altetnative	The Effect
1	%D	1	Percentage of Disagree
2	%SWD	2	Percentage of Somehow Disagree
3	%N	3	A Percentage do not have an idea
4	%A	4	Percentage of Agree
5	%SA	5	The Percentage of Strongly agree

Table 6 above represents the scales that have been used to measure the effect of the descriptions of the statement's variables during the interviews. The scales are represented as follows: the %d represents the percentage of disagreement with the statement. Inthi scales are normally used to measure the facts about the number of participants who disagree with the statements. According to the interviews that have been conducted, the scales just show the percentage of people who disagree in according to the statements that have been represented. The scale has also been used in different investigations, for instance, the study conducted by Barret et al. (2025) for the investigation about the beliefs of intrinsic and extrinsic determinants for decision-making behavior (Barret et al., 2025).

Further, the %SWD represents the percentage of the participants who described that the statements have been somewhat disagree. This scale measures the participants who respond that they somehow disagree with the described statements. Such a kind scale in the Likert scales has been used in the study investigated by Chen et al. (2022), which investigates the effect of decision-making behavior on the case of antecedents, process, and outcomes for shared decision making across-sectional survey of patients with number of degebnerative diseases (Chen et al., 2022).

Apart from that, the measurement scales such as %N, means neutral, that indicates those participants who do not have any ideas about the requested description, %A means agree, it repsents the number of the participants f the people who agree or who haveideas about the asked description, as well as %SA means the storng agree, it means have completely have the knowledge or full equipped

with knowledge that have been represented in accordance to the requested description. Therefore, all these measurements of the scales have been presented to measure the facts about the knowledge of the participants during the interview phase. These scales have also been used in the investigation of the study by Ma et al. (2025).

Table 7. Availability bias

#	Perception	D%	SWD%	N%	A%	SA%
1	I prefer to sell stocks when the composite index is on a downward trend	13.5	5.5	8	34	39
2	I prefer to buy stocks when the composite index is upward trend	15.5	4.5	12.5	33	32.5
3	I prefer to purchase local stocks rather than international stocks due to local stocks are more widely available	15.5	13.5	12.5	24	34.5
4	I prefer to buy stocks that are recommended by close friends or relatives	21.5	17.5	14	22.5	28.5
5	I prefer to buy local stocks rather than trading international stocks	19	10.5	10	27.5	33
6	I prefer to buy stocks that are recommended by financial experts or stock experts	16	12.5	14	34	23.5

Source: Computed from the Questionnaires

Table 7 demonstrates that all the questionnaire statements show some incidence of availability bias. The descriptive statement indicates that the rate of strongly agree, somewhat agree, and agree dominates the results. It shows that most of the interviewers tend to rely on the information that comes readily to mind, evaluate, and make decisions. From this investigation, the interviewers care about the available information and make decisions rapidly. Sometimes, deciding to make decisions due to the availability of information hampers critical thinking. Because the decision is being made immediately comes to make rapid decisions, and judgments.

The result is supported by the investigation conducted by Nizar and Daljono (2024) about the impact of availability bias and representative bias on investment decision performance. Furthermore, Salaman et al., (2021) investigate the case study of the effect of availability bias on decision making. The outcome results from the investigations revealed that the availability bias has a significant impact on the moderate role of decision-making (Salaman et al., 2021).

Mardina et al., (2025) investigated cognitive factors on decision-making behavior, and the output results found a statistically significant positive on decision-making behaviors. Therefore, there is a significant impact of the availability bias on investment decision-making. Here is the case where most investors focus on the availability of information for making decisions in investment strategies instead of concentrating on previous analytical information. Adding to that, Sumantri et al. (2024) investigated the case of the availability bias, and representative bias, as well as the anchoring bias, and herding bias. In the study, the output results found the positive and significant effects of both availability bias and representative bias, and non for the remaining. Understanding the availability bias leads to effective decision-making making specifically in the investment decision.

The fact that similar results have been demonstrated by the previous scholars indicates that the availability bias significantly the investment decision-making in the financial market. The availability bias has a significant influence on the corresponding decision-making investment behavior. Therefore, for effective decision making, the entrepreneurs in Libya should make consideration in the making the proper decision regarding the perception of the availability bias. As most scholars revealed that the availability bia has significance or influence the decision decision-making in investment, especially in the financial market.

Table 8. Representativeness bias

#	Perception	D%	SWD%	N%	A%	SA%
1	I avoid buying stocks that have performed poorly in the past	16	17	10	17.5	38.8
2	I prefer to buy stocks that have performed well in the past because I believe that good performance will continue in the future	17.5	15.5	12	20	36
3	I prefer to buy stocks that have good fundamentals (consistent earnings growth in the past)	22.5	16	10.5	23.5	27.5
4	I prefer to buy stocks that are doing well in the local composite index rather than stocks that will perform poorly in the near future.	18	12	5.5	32.5	32
5	I definitely check the past performance of a stock before deciding to buy it	18	10	17	21.5	33.5
6	I use trend analysis before deciding to buy stocks.	15.5	10.5	4.5	34.5	35

Source: Computed from the Questionnaires

Table 8 includes statements related to the representativeness bias, which are represented among the investors, and most of the interviewers agreed that the representativeness bias impacts the decision-making. The output of this table is supported by prominent studies (Sohari, 2012; Hirshleifer, 20001; Merikas, 2004).

The output results indicate that most investors make decisions too quickly without deep analysis, in a way that the investors make the decisions according to previous experience that is considered as the reference for the current investment (Moosa and Ramah, 2017). The representativeness bias is that investors constantly

make decisions by judging more previous events to be likely, whether it is or not (Tversky and Kahneman, 1972).

The representativeness bias helps us to understand the events' insight due to the overreaction that has been exported to several previous events, plus the final trigger. The statements are supported by the line with a number of the investigated research, such as Waweru et al., (2014), Sohani (2013), and Badshah et al., (2016) argued that the representativeness bias has an impact on the investment-decision making.

Table 9. Herding bias

#	Perception	D%	SWD%	N%	A%	SA%
1	Other investors' decisions on the stock volume have an impact on your investment decision	16.5	7.5	4.5	26	43.5
2	Other investors' decisions to buy and sell stocks have an impact on your investment decisions	15.5	12	6	28	38.5
3	You usually react quickly to the changes in other investors' decisions in the stock market.	16.5	13	13	33.5	28

Source: Computed from the Questionnaires

The results from Table 9 indicate that the herding bias impacts decision-making in the investment because most of the statements show that the participants of this questionnaire strongly agreed. The outcome of the results shows that the majority of the investors join the group and follow the decisions or actions that have been made by others through the assumption that individuals have already done their investigation. The results are supported by the study conducted by Robin and Angelina (2020).

Thus, the investors follow what has been perceived rather than the case the investors are doing rather than relying on their investigation. Investors are prone to a herd bias due to the comforting investment activities, and direction of others in different ways, from the ways we invest, and the way to shop (Wijay et al., 2024; Zafar et al., 2024; Ali et al., 2024). Fear of missing out on profitable investments seldom acts as the driving force behind herd bias, especially in cryptocurrency investment, however, this can be a mistake for decision-making. Sometimes herd bias can well be described as the unfounded market that relies on a sell-off that is based on a lack of fundamental support justifying either, though it is a significant element of asset bubbles in cryptocurrency.

Further, the study investigated by Qasim et al., (2019) examined the effect of herding behavior and overconfidence on investment decision-making in Pakistan. The results from this investigation revealed that there is a significant positive effect of herding and overconfidence of Pakistani investors, especially in the context of investment decisions. Therefore, most of the Pakistani investors are haggling towards the herding bias. The output results indicate that the herding bias has a significant influence on investors' decisions (Qasim, 2019).

Furthermore, Rabinovic et al. (2025) investigated the effect of the hedging effect on decision-making behavior regarding the case of understanding the disability benefits decision-making on the cryptocurrency issues. The output results from the investigations found that higher transactions of the disability applications, coupled with the widespread perception of the people. Further, more structure in the investment decision should consider that people have disabilities in financial marketing (Rabnovic et al., 2025).

Table 10. Anchoring bias

#	Perception	D%	SWD%	N%	A%	SA%
1	I usually rely on past experience in the market for my next investment	13	10.5	15	36	25
2	I fix a target price for buying and selling the security in advance.	10	15.5	12.5	13.5	31
3	The purchase price of a security is a not big factor to be considered while selling it.	15.5	13.5	15	23	27.5

Source: Computed from the Questionnaires

Table 10 represents the anchoring bias that shows the majority of the participants from this research agreed and found that the anchoring bias has an impact on decision investment. The output results indicate that all the participants are driven to be influenced by the anchoring bias. The results show that most of the participants are susceptible and well knowledgeable about anchors by preferring strongly agree. The results are supported by Tversky and Kahneman (1979).

The anchoring bias refers to the decision investment that investors make decision investment by beginning from an initial value that might be suggested by the creation of the problem, or due to the results of the computation (Murith, 2014). The anchor bias refers to the investors relying on previous experience compared to recent information.

Also, the study conducted by Khalleefah et al (2025) investigates the effect of anchoring of investment decision-making behavior in Libya. The findings from the investigation revealed that the anchoring behavior has a significant positive effect on investment decision-making behavior in Libya (Khalleefah et al., 2025).

Table 11. Investment Decision Making-Behavior

#	Perception	D%	SWD%	N%	A%	SA%
1	I know about the interest rate, financial charges, and credit	21	13	10.5	25.5	35
2	Money is the most important goal of my life	18.5	15	13	30.5	25.5
3	I know how to manage the finances	17	17.5	10	19.5	31
4	I know how to invest my money	18	16	5	32.5	27.5
5	It is more satisfying to save than invest money	17.5	13	23.5	20.5	30.5
6	I would invest a large sum of money in stock	20	17.5	4.5	21.5	35

Source: Computed from the Questionnaire

Table 11 contains the statements that relate to the investment decision-making behavior. The table indicates that most of the statements are strongly agreed upon by the participants. This indicates that decision-making behaviors have an impact on cryptocurrency investment. The decision-making behavior bias has a diverse range of investments, from financial investments to digital currency investments. However, with any investment, there is complexity and volatility that bring some challenges that result in irrational decision-making.

Thus, the behavior attitude examines the psychological influence on decisions that the investors provide regarding highlighting the implication of dynamic marketing and investors' outcomes. Therefore, investors who correlate with a higher awareness of behavioral biases lead to making more rational decisions, in such a way that knowledge and skills lead to reducing the negative effects of less effective decision-making behavior.

Table 12. Investment in Cryptocurrency

#	Perception	D%	SWD%	N%	A%	SA%
1	I am prepared to invest in cryptocurrency	12	15.5	11.5	24.5	36.5
2	I will make every effort to start to investing in cryptocurrency	18.5	23	18.5	10	35
3	I will seriously consider investing in cryptocurrency	16.5	20.5	7.5	24.5	31
4	I have decided that I will invest in cryptocurrency in future	13.5	16.5	6	30.5	33.5
5	I firmly believe that one day in the future I will definitely invest in cryptocurrency	17	11	17	25.5	29.5

Source: Computed from the Questionnaires

Table 12 represents the statements that show that the participants are willing to invest in cryptocurrency. All the output from Table 12 indicates that the majority strongly agree with the recommendation. Therefore, cognitive factors and decision-making behaviors are crucial in shaping investors to invest in the cryptocurrency market.

Despite the awareness of cryptocurrency investment, there is a need to empower Libyans to invest more in cryptocurrency. The empowerment of cryptocurrency investment for investors should provide the room that follow a logical relationship between risk and profitability in the foreign market. Investors should reconsider regular rebalancing of cryptocurrency investments, which leads to an increase in profitability in the financial market.

However, future research should consider developing cryptocurrency programs aimed at enhancing investor awareness and understanding the behavior of the decision-making and cognitive factors on cryptocurrency investment. Ultimately, promoting effective investment practices in cryptocurrency investment.

Table 13. Correlation Matrix

	AB	RB	HB	ANB	IDMB	IC
AB	1					
RB	0.963**	1				
HB	0.935*	0.985***	1			
ANB	0.878**	-0.988	0.975**	1		
IDMB	0.948**	0.996**	0.585**	0.979	1	
IC	0.729**	0.971***	0.973**	0.949**	0.870**	1

* %10 indicates that there is co-integration at a significant level.

** %5 indicates that there is co-integration at a significant level.

*** %1 indicates that there is co-integration at a significant level.

Source: Prepared by a Researcher based on the Statistical program SPSS

AB represents Availability bias

RB represents Representativeness Bias

HB represents Herding Bias

ANB represents Anchoring Bias

IDMB represents Investment Decision-Making Behavior

IC represents Investment Cryptocurrency

From Table 13, it is clear that the degree of correlation between Availability Bias and Decision-making Behavior is very strong, as the value of the correlation coefficient was 0.948, which is statistically significant at a significance level of 1%. The relationship between Representation bias and decision-making behavior was very strong, as the value of the correlation coefficient was 0.996, which is statistically significant at a significance level of 1%. The relationship between Herding bias and Decision-making Behavior was very strong, as the value of the correlation coefficient was 0.985, which is statistically significant at a significance level of 1%.

The relationship between Anchoring bias and Decision-making Behavior was very strong, as the value of the correlation coefficient was 0.979. Therefore, it can be said that the relationship between behavioral biases (availability bias, representation bias, herd bias, anchoring bias) and decision-making behavior is strong and statistically significant at a significance level of 1%. As shown in Table

12, the relationship between investment in cryptocurrencies and decision-making behavior is strong and significant, with the Pearson correlation coefficient value being 0.970.

4.3. Factor of Analysis (Research Stability)

In this section, the research examines the factor of analysis through usable variable data, specifically in the data integrity, consistency, and stability of the research, which has been utilized during the analysis phase. Therefore, the phase starts with internal consistency. The factor analysis starts with KMO and Bartlett's Test.

4.3.1. KMO and Bartlett's test

Table 14 below illustrates the Kaiser-Meyer Olkin Measure of Sampling Adequacy. The KMO is used to validate the suitability of the data for further empirical analysis works in a way that high values or closely to 1.0 indicates that the data of the variables that, for factor analysis, can be applied for analysis, and less than 0.005, the results of the factor analysis probability cannot be applied. Furthermore, Bartlett's test uses the hypothesis that the correlation matrix of the data is an identity matrix, in a way that the variables indicated are unrelated, and therefore unsuitable for data analysis.

The test is used to indicate the variation of proportionality of the data that is used to be applied for data analysis, which might be caused by underlying factors.

Being tested by KMO and Bartlett test, the data inspection reached the data of the standard factor analysis with KMO statistical values of 0.878, and Bartlett test with the significant values of $0.000 < 0.005$. The probability values of less than 5% indicate that the sample is suitable for analysis, and it can be applied for analysis.

Table 14. KMO and Bartlett's Test

Keyser-Mayer- Olkin Measure of Sampling Adequacy	0.878	0.878
Bartlett's Test of Sphericity		548.903
Df		46
Probability value (significance)		0.000

Source: Source: Prepared by a Researcher based on the Statistical program SPSS

4.3.2. Rotated matrix

Rotated Matrix represents the idea of reducing the number of factors through which the variables under estimation have high loadings. The Rotation matrix does not change anything except make the interpretation of the empirical analysis easier and well understood.

Table 15. Rotation Matrix

Applied variables	Component		
	1	2	3
Availability bias			0.8456
Representativeness bias	0.8372		
Herding bias		0.8763	
Anchoring bias		0.8651	
Cryptocurrency Investment bias	0.8972		0.8997
Investment Decision-Making Behavior	0.8892		

Source: Source: Prepared by Researcher based on the Statistical program SPSS

Table 15 illustrates the rotation matrix where the availability bias is substantially loaded on factor/ Component 3, while harding bias and Anchoring bias are substantially loaded in factor 2/ component 2, Representativeness bias, and Investment Decision-Making are substantially loaded on factor 1/component 1.

4.4. Internal Consistency

The internal consistency of the questionnaire axes is verified by calculating the Pearson correlation coefficient between the dimensions of each variable. Table 16 shows the correlation between the dimensions of the behavioral bias variable

Table 16. Internal consistency of the behavioral bias variable

Behavior Bias	Significant Level
Availability Bias	0.980***
Representativeness Bias	0.995**
Herding Bias	0.985**
Anchoring Bias	0.996***
Investment Decision-Making Behavior	0.985**

* %1 indicates that there is co-integration at a significant level.

** %5 indicates that there is co-integration at a significant level.

*** %10 indicates that there is co-integration at a significant level.

Source: Prepared by a Researcher based on the Statistical program SPSS

From Table 16, there is a strong correlation between the statements of availability bias and behavioral biases, as the value of the correlation coefficient was 0.980, which is very strong, while the correlation between the statements of representation bias and behavioral biases was 0.995, which is very strong, while the correlation between the statements of herd bias and behavioral biases was 0.985, which is a robust, and significant correlation, while the correlation between the statements of anchoring bias and the statements of behavioral biases was 0.996, which is very strong and significant. Accordingly, there is internal consistency between the statements of the independent variable, behavioral biases.

4.5. Cronbach's Alpha Coefficients

Cronbach's alpha coefficient is used to measure the stability of the study questionnaire, and Table 16 shows the results of the Cronbach's alpha coefficient test.

Table 17. Cronbach's alpha coefficient values for the statements of the study

	Cronbach's Alpha	N of Items
Availability Bias	0.991	6
Representation Bias	0.991	6
Herding Bias	0.985	3
Anchoring Bias	0.987	3
Investment Decision-Making Behavior	0.995	6
Investment in Cryptocurrency	0.994	5

Source: Prepared by Researcher based on the Statistical program SPSS

From Table 17, it is clear that Cronbach's alpha (CA) value for the Availability Bias statements was 0.995, which indicates that the statements are stable. The Cronbach's alpha value for the Representation bias statements was 0.991, which indicates that the statements of the representation bias variable are stable. The Cronbach's alpha coefficient value for the Herding bias variable was 0.985, which indicates that the statements of the Herding bias are stable. The Cronbach's alpha value for the Anchoring bias statements was 0.987, which indicates that the statements of the Anchoring bias variable are stable. The Cronbach's alpha coefficient value for the Decision-Making Behavior variable was 0.995, which indicates that the statements of the Decision-Making Behavior variable are stable. The value of Cronbach's alpha for the variable Investing in CryptoCurrencies was equal to 0.994, which indicates that the expressions of the variable Investing in CryptoCurrencies are stable. Our results for CA are supported by (Peterson, 1994; Mahmoud et al., 2018).

4.6. Regression Analysis Approach

The research considers the development of strategic planning for developing the future investment of cryptocurrency by employing an effective potential analysis. Therefore, to have the scientific output results, this research creates a scientific hypothesis in connection with the objective of the research, as well as the questions of the research. The research hypotheses are related to the investigation of the cognitive factors and the decision-making on the moderate role of cryptocurrency investment in Libya.

In fact, this research develops the main hypothesis, which focuses on a measure or justifies the main objective or general objective of this research, as well as the sub-hypotheses, which imply the sub-hypotheses regarding the proxies of the cognitive factors and cryptocurrency investment. The program of SPSS through the primary data that have been collected using the Likert Scale questionnaires has been tested and produced significant results. Therefore, the following are the procedures for the testing of the respective hypotheses in this research.

4.6.1. Main hypothesis

H1: The cognitive factors cannot affect the Investment Decision

Table 18 (A). The cognitive factors on Decision-Making Behavior

	coeff	Std.Error	t Statistic	Sig (Pro)
Constant	0.016	0.051	4.32	0.052
Cognitive Factors	0.997	0.011	86.917	0.000
Std.Coeff (Beta)				
R. Square	0.976			
Adj R. Square	0.988			
Sum of Square	48.473	8.373	7554.505	0.000

Source: Source: Prepared by a Researcher based on the Statistical program SPS

Table 18 (A) above demonstrates that the cognitive factors as parameters have a statistically significant positive effect on Decision-making behavior. The table shows that a 1 percent increase in cognitive factors led to an increase of 99.7 percent in investment decision-making behavior. Further, the coefficient of cognitive factor is significant at a 1% level, with the t-statistic value of 86.917,

which is greater than 1.96 of the critical values. That means we can reject the null hypothesis and accept the alternative. Therefore, the output from the results shows that cognitive factors affect the investment decisions of individuals. Ultimately, the regression of ordinary least squares can be presented as follows; -

$$\log IDMB_t = C + \beta_1 \log CF_t + \varepsilon_t \dots\dots\dots(4)$$

Where log represents the log form of synchronizing data, “t” represents the current time, and C stands for the constant value of the regression analysis.

IDMB represents the Investment Decision-Making Behavior

CF represents the proxies of Cognitive Factors Behaviors

IC represents the Investment in Cryptocurrency

Thus, the General Statistical Representation can be well found as

$$IDMB = \frac{0.016C}{(0.051)[0.05]} + \frac{0.997 CF}{(0.011)[0.000]} \dots\dots\dots(5)$$

Where (), [] represent the coefficients, and the probability value of the respective variable.

4.6.2. Sub-hypotheses

The proxies of cognitive factors, cryptocurrency investment, on investment decision-making have been tested as follows; -

1. H_{1a} : Availability bias does not affect investment decision-making
 H_{2a} : Availability bias affects investment decision-making behavior
2. H_{1b} : Representativeness bias does not affect investment decision-making
 H_{2b} : Representativeness bias affects investment decision-making
3. H_{1c} : Herding bias does not affect investment decision-making
 H_{2c} : Herding bias affects investment decision-making
4. H_{1d} : Anchoring does not affect investment decision-making

H_{2d}: Anchoring affects investment decision-making

The above hypotheses are categorized into two systems that are the null hypothesis and the alternative hypothesis. If the probability value is greater than 5% of the critical value is less than 1.96, we can reject the null hypothesis and accept the alternative.

Thus, Tables include the sub-hypothesis values that should be tested to give the scientific output results. The table tested the proxies of cognitive factors such as availability bias, representativeness bias, herding bias, and anchoring bias. The coefficients, Std. Err, t-statistics, and probabilities are included for determining the significance of the output results. Therefore, the testing of the hypotheses of the research is presented as follows:

Table 18 (B). The Proxies of Cognitive Factors (Availability bias) on Investment Decision-Making Behaviors

	coeff	Std.Error	t_Statistic	Sign (Prob)
Availability bias				
Constant	0.254	0.104	2.439	0.016
Availability bias	0.944	0.023	40.526	0.000
R. Square	0.863			
Adj. R-Square	0.899			
Sum of Squares	44.651			
Residual	5.002			

The regressional Model can be represented as

$$\log IDMB_t = C + \beta_1 \log AB_t + \varepsilon_t \quad (6)$$

where IDMB represents the Investment Decision-Making Behavior, and AB represents the Availability Bias Hypothesis

$$IDMB = \frac{0.254}{(0.104)[0.016]} + \frac{0.997 AB}{(0.944)[0.000]} \dots\dots\dots(7)$$

And (), [] represent standard error and probability values, respectively

Availability bias: From Table 18 (B) it is clear that the value of Adjusted R Square was 0.899, which explains that 89.9% of the changes that occur in decision-making behavior are due to availability bias. This change is significant as the value of Sig. was less than 5%. Accordingly, the hypothesis that states that "Availability Bias has an effect on the investment decisions of individuals" can be accepted.

Table 18 (C). The Proxies of Cognitive Factors (Representativeness bias) on Investment Decision-Making Behaviors

Representativeness bias

Constant	-0.10	0.029	-0.353	0.724
Representativeness bias	1.002	0.007	152.828	0.000
R. Square	0.952			
Sum of Square	0.983			
Std.Error-Estimate	0.045			
Residual	0.388			

The regressional Model can be represented as

$$\log IDMB_t = C + \beta_1 \log RB_t + \epsilon_t \quad 8$$

where IDMB represents the Investment Decision-Making Behavior, and RB represents the Representativeness Bias Hypothesis

$$IDMB = \frac{-0.10}{(0.029)[0.724]} + \frac{1.002 RB}{(0.007)[0.000]} \dots\dots\dots(9)$$

And (), [] represent standard error, and probability values, respectively

Representativeness bias; From Table 18 (C), it is clear that the value of Adjusted R Square was 0.992, which explains 99.9% of the changes that occur in decision-making behavior that are due to representativeness bias. This change is significant as the value of Sig. was less than 5%. Accordingly, the hypothesis that states that "Representativeness Bias affects the investment decisions of individuals" can be accepted.

Table 18 (D). The Proxies of Cognitive Factors (Herding bias) on Investment Decision-Making Behaviors

Herding bias				
Constant	1.101	0.056	1.808	0.052
Herding	0.980	0.012	78.682	0.000
R. Square	0.973			
Sum of Square	0.991			
Std.Error-Estimate	0.08825			
Residual	1.433			

The regressional Model can be represented as

$$\log IDMB_t = C + \beta_1 \log HB_t + \varepsilon_t \quad 10$$

where IDMB represents the Investment Decision-Making Behavior, and RB represents the Herding Bias Hypothesis

$$IDMB = \frac{1.101}{(0.0056)[0.05]} + \frac{0.980 RB}{(0.012)[0.000]} \dots\dots\dots(11)$$

And (), [] represent standard error, and probability values, respectively

Herding bias: - From Table 18 (D) it is clear that the value of Adjusted R Square was 0.992, which explains 97.1% of the changes that occur in decision-making behavior are due to herd bias. This change is significant as the value of Sig. was less than 5%. Accordingly, the hypothesis states that: "Herding Bias has effects on the investment decisions of individuals" can be accepted. Accordingly, the regression equation can be justified that herding bias has effects on the investment decisions of individuals.

Table 18 (E). The Proxies of Cognitive Factors (Anchoring bias) on Investment Decision-Making Behaviors

Anchoring bias				
Constant	0.111	0.068	1.642	0.102
Anchoring	975	0.015	64.423	0.000
R. Square	0.934			
Adj. R-Suare	0.957			
Std.Error-Estimated	0.10703			
Residual	2.108			
The regressional Model can be represented as				

$$\log \text{IDMB}_t = C + \beta_1 \log \text{ANB}_t + \varepsilon_t \quad 12$$

where IDMB represents the Investment Decision-Making Behavior, and ANB Anchoring Bias Hypothesis

And (), [] represent standard error, and probability values, respectivel

Anchoring bias: From Table 18 (E) it is clear that the value of Adjusted R Square was 0.958, which explains 95.8% of the changes that occur in decision-making behavior are due to anchoring bias. This change is significant as the value of Sig. was less than 5%. Accordingly, the hypothesis that states that "Anchoring Bias has effects on the investment decisions of individuals" can be accepted.

Table 19. Cognitive Factors and Cryptocurrency Investment on Investment Decision-Making Behavior

	coeff	Std.Erroe	t_Statistic	Probabi
Constant	-0.11	0.048	-0.227	0.821
Cognitive_factors	0.770	0.041	18.822	0.000
Cryptocurrency investment	0.234	0.042	5.545	0.000
R. Square	0.934			
Adj.R-Square	0.980			
Std.Error-Estimated	0.07395			
Residual	1.000			

The regressional Model can be represented as

$$\log IDMB_t = C + \beta_1 \log CF_t + \beta_2 \log CI_t + \varepsilon_t \quad 12$$

where IDMB represents the Investment Decision-Making Behavior, and CB, and CI cognitive factors and cryptocurrency Investment Bias Hypothesis, respectively

$$IDMB = \frac{-0.11}{(0.048)[0.821]} + \frac{0.770 CF}{(0.041)[0.000]} + \frac{0.234 CI}{(0.042)[0.000]} \quad (13)$$

And (), [] represent standard error and probability values, respectively

Source: Source: Prepared by a Researcher based on the Statistical program SPSS

Table 19 illustrates the ordinary least squares that consists of the exogenous variables of cognitive factors, and investment cryptocurrency on the endogenous variable of investment decision-making in Libya. The output results from the empirical analysis find that both cognitive factors, and cryptocurrency investment are statistically significant at a 1% level, and positively impact investment decision-making. The empirical analysis shows that a 1% increase in cognitive factors leads to a 77% increase in investment decision-making in Libya. We document the output results from the empirical analysis to support the results from the study conducted by Abideen et al., (2023), who investigated the case of behavior bias affecting investors.

Therefore, the cognitive factors and investment decision-making anomalies are closely related, and the cognitive factors influence the investors to make investment decision-making behavior (Weixiang et al., 2022; Ishfaq et al., 2020; Shah et al., 2018).

On the other hand, a 1% increase in cryptocurrency investment led to a 23.4% increase in investment decision-making in Libya. The output result is similar to the study conducted by Dung et al., (2024) that investigates the factors that affect the bitcoins investment of investors (Wang., 2024; Arriqoh and Zoraya, 2024; Le., 2023).

Adding to that, the table indicates that the value of Adjusted R Square was 0.980, which explains 98.0% of the changes that occur in decision-making behavior resulting from behavioral factors and investment in cryptocurrencies. This change is significant as the value of Sig. was less than 5%. Therefore, the hypothesis that states that "Cryptocurrency investment mediates the relationship between the cognitive factors of the individuals on the decision-making behavior.

Table 20. The results of the normal distribution test for the study variables

	Tests of Normality					
	Kolmogorov-Smirnov ^a			Shapiro-Wilk		
	Statistic	Df	Sig.	Statistic	Df	Sig.
Availability Bias	.345	186	.000	.684	186	.000
Representation bias	.336	186	.000	.687	186	.000
Herding bias	.338	186	.000	.693	186	.000
Anchoring bias	.338	186	.000	.687	186	.000
Ineves Decision making	.345	186	.000	.678	186	.000
Cryptocurrencies invest	.338	186	.000	.693	186	.000

Source: Prepared by a Researcher based on the Statistical program SPSS

From Table 20, it is clear that the value of Sig. was 0.00, which is less than 5%, and this indicates that the study variables are not subject to normal distribution, and this condition can be abandoned according to the central limit theory when the study sample size is greater than 30 observations.

CONCLUSION AND RECOMMENDATION

Conclusion

Despite the increases in cognitive factors that pertain to the decision-making behavior associated with the moderating role of cryptocurrency investment, the need for investors to be unbiased, conscious, careful, and deeply considered before making any investment in Libya should consider proper investment decision-making. The bias of the investors in Libya, either deliberate or unconscious, must be effectively considered before the investment decision. Therefore, Investors should make the right decisions that do not constrain the cognitive behaviors to influence the investment decisions.

Owing to that, the research aims to investigate the effect of the proxy of cognitive factors on decision-making behavior in the moderate role of cryptocurrency investment in Libya. It is a mixed approach methodology that the outcome of the results has been achieved by using both strategies, that is, quantitative and qualitative methodologies, to reveal the outcome results. The research uses the proxies of cognitive factors such as availability bias, representativeness bias, herding bias, and anchoring bias, furthermore, the research uses cryptocurrency investment and the investment decision-making behavior in the Libyan cryptocurrency investment.

From the empirical analysis, the research revealed the existence of a proxy of cognitive factors that have a statistically significant and positive effect on investment decision-making, in a way that there is a strong influence of cognitive factors such as availability bias, representativeness bias, herding bias, and anchoring bias on investment decision-making behavior. Furthermore, cryptocurrency investment has a significant positive impact on investment decision-making behavior in the Libyan financial market. The research demonstrates that the risk of investing the cryptocurrency in Libya should be avoided once the investors implement the right and significant investment decision-making behavior.

Ultimately, the research finds that an increase a1% in cognitive factors led to a 77% increase in investment decision-making behavior. Therefore, in the moderate role of cryptocurrency investment, the government of Libya should maintain the bias in the cognitive factors proxies to minimize the risk of holding 77% during the investment decision-making. Similarly, a 1% increase in increases of cryptocurrency investment led to an increase of about 23.4% increase in investment decision-making behavior. Therefore, the unbiased investment decision-making of the cryptocurrency investors led to minimizing the effect of the 23.4% bias in the cryptocurrency investment. Therefore, proper investment decision-making leads to a positive and significant effect on cryptocurrency investment. Adhere, the unbiasedness of both proxies of cognitive factors, and cryptocurrency investment mitigates the risk of the bias to investors.

The output results indicate that all the null hypotheses are less than 5% at a significant level, therefore, the research rejects the null hypothesis and accepts the alternative. it means that the cognitive factors and cryptocurrency investment have a significant effect or influence on investment decision-making behavior in the Libyan digital financial market.

The research contributes by describing the information related to cognitive factors and cryptocurrency behavior on the investment decision-making in the Libyan market equilibrium. The policymakers will use the findings from the study to create financial and business policies related to cryptocurrencies and investment decision-making, especially in the Libyan market equilibrium. Therefore, the stakeholders related to the market of cryptocurrencies and the decision-making related to the output results will benefit by cooperating with different sectors in Libya including, financing sectors, investment sectors, trade and investment sectors, financial institutions, and academic scholars to create effective policy that enhances the relationship between the cognitive factors including the component of the cryptocurrencies on investment decision-making especially on the Libyan market strategies. Apart from that, the empirical analysis for obtaining the outcome results, therefore, the methodology is rigorous and valid for finding the outcome as

the results will provide to the succession the new research which is related to cryptocurrency investment and cognitive factors on investment decision-making in Libya.

Policy Recommendation

Based on the results of the study, the study recommends the following:

1. More research should be conducted on investing in cryptocurrencies and identifying their nature and risks.
2. The decision to invest in cryptocurrencies should be based on financial analysis in addition to the opinion of financial experts.
3. Some investors may make mistakes in their investment decisions without relying on financial data, and therefore, it is not sufficient to rely only on the opinions of investors.
4. Future studies can conduct the same research on other communities and other samples, or study the relationship between cognitive factors and investing in stocks.

Research Limitation

The cognitive factors and decision-making in cryptocurrency in Libya, especially in the financial market, increase further as time increases. The growth of cryptocurrency goes parallel with the growth of financial technological advancements, such as AI technology. Apart from that, the cognitive factors that are associated with decision-making in the financial market play a key role in providing efficiency in the growing cryptocurrency market in Libya.

Therefore, cryptocurrency investors should be unbiased and consistent in making the right decision regarding the widening of cryptocurrencies in Libya. Apart from the research investigating the effect of cognitive factors on decision-making behavior for moderating the role of cryptocurrency investment further, the research extends the investigation about the limit of the expansion of the Crypton market in Libya associated with widening the application of artificial intelligence

(AI) in the financial market. The output results from the empirical analysis are disseminated and shared with the respected authority of financial institutions in Libya to strengthen the market growth of cryptocurrency, which examines the effect of cognitive effect, and cryptocurrency investment in the Libyan financial market. Therefore, the cryptocurrency investors will benefit from the outcome of this research.



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APPENDIX

Residuals Statistics ^a					
	Minimum	Maximum	Mean	Std. Deviation	N
Predicted Value	3.0081	5.0025	4.4489	.51188	186
Std. Predicted Value	-2.815-	1.081	.000	1.000	186
Standard Error of Predicted Value	.006	.018	.008	.001	186
Adjusted Predicted Value	3.0085	5.0025	4.4489	.51187	186
Residual	-.71163-	.57922	.00000	.07989	186
Std. Residual	-8.884-	7.231	.000	.997	186
Stud. Residual	-8.914-	7.251	.000	1.000	186
Deleted Residual	-.71650-	.58236	-.00002-	.08038	186
Stud. Deleted Residual	-11.795-	8.556	-.004-	1.221	186
Mahal. Distance	.003	7.924	.995	.764	186
Cook's Distance	.000	.272	.003	.024	186
Centered Leverage Value	.000	.043	.005	.004	186
a. Dependent Variable: decision-making					

Residuals Statistics ^a					
	Minimum	Maximum	Mean	Std. Deviation	N
Predicted Value	3.0873	4.9761	4.4489	.49128	186
Std. Predicted Value	-2.772-	1.073	.000	1.000	186
Standard Error of Predicted Value	.012	.036	.017	.002	186
Adjusted Predicted Value	3.0916	4.9876	4.4489	.49126	186
Residual	-.97613-	1.28307	.00000	.16444	186
Std. Residual	-5.920-	7.782	.000	.997	186
Stud. Residual	-5.955-	7.850	.000	1.004	186
Deleted Residual	-.98759-	1.30576	.00004	.16650	186
Stud. Deleted Residual	-6.609-	9.600	.012	1.142	186
Mahal. Distance	.013	7.681	.995	.740	186
Cook's Distance	.000	.545	.006	.046	186
Centered Leverage Value	.000	.042	.005	.004	186
a. Dependent Variable: decision-making					

Residuals Statistics ^a					
	Minimum	Maximum	Mean	Std. Deviation	N
Predicted Value	2.9954	4.9993	4.4489	.51604	186
Std. Predicted Value	-2.817-	1.066	.000	1.000	186
Standard Error of Predicted Value	.003	.010	.005	.001	186
Adjusted Predicted Value	2.9952	4.9993	4.4489	.51605	186
Residual	-.49830-	.33471	.00000	.04580	186
Std. Residual	-10.850-	7.288	.000	.997	186
Stud. Residual	-10.879-	7.311	.000	1.000	186
Deleted Residual	-.50102-	.33684	.00001	.04607	186
Stud. Deleted Residual	-18.166-	8.656	-.033-	1.505	186
Mahal. Distance	.009	7.934	.995	.757	186
Cook's Distance	.000	.323	.003	.027	186
Centered Leverage Value	.000	.043	.005	.004	186
a. Dependent Variable: decision-making					

Residuals Statistics ^a					
	Minimum	Maximum	Mean	Std. Deviation	N
Predicted Value	3.0393	4.9984	4.4489	.51054	186
Std. Predicted Value	-2.761-	1.076	.000	1.000	186
Standard Error of Predicted Value	.007	.019	.009	.001	186
Adjusted Predicted Value	3.0412	4.9984	4.4489	.51065	186
Residual	-.34535-	.81450	.00000	.08802	186
Std. Residual	-3.913-	9.229	.000	.997	186
Stud. Residual	-3.924-	9.272	.000	1.005	186
Deleted Residual	-.34730-	.82208	.00005	.08930	186
Stud. Deleted Residual	-4.088-	12.668	.027	1.243	186
Mahal. Distance	.041	7.624	.995	.781	186
Cook's Distance	.000	.815	.007	.067	186
Centered Leverage Value	.000	.041	.005	.004	186
a. Dependent Variable: decision-making					

Residuals Statistics ^a					
	Minimum	Maximum	Mean	Std. Deviation	N
Predicted Value	3.0368	4.9872	4.4489	.50696	186
Std. Predicted Value	-2.785-	1.062	.000	1.000	186
Standard Error of Predicted Value	.008	.023	.011	.001	186
Adjusted Predicted Value	3.0387	4.9986	4.4490	.50693	186
Residual	-.98719-	.66292	.00000	.10674	186
Std. Residual	-9.223-	6.194	.000	.997	186
Stud. Residual	-9.277-	6.211	.000	1.002	186
Deleted Residual	-.99865-	.66668	-.00003-	.10775	186
Stud. Deleted Residual	-12.680-	6.968	-.010-	1.233	186
Mahal. Distance	.049	7.758	.995	.744	186
Cook's Distance	.000	.499	.005	.039	186
Centered Leverage Value	.000	.042	.005	.004	186
a. Dependent Variable: decision-making					

Residuals Statistics ^a					
	Minimum	Maximum	Mean	Std. Deviation	N
Predicted Value	3.0007	5.0084	4.4489	.51283	186
Std. Predicted Value	-2.824-	1.091	.000	1.000	186
Standard Error of Predicted Value	.007	.048	.008	.004	186
Adjusted Predicted Value	3.0007	5.0085	4.4473	.51249	186
Residual	-.59679-	.48763	.00000	.07353	186
Std. Residual	-8.072-	6.596	.000	.995	186
Stud. Residual	-8.415-	6.774	.010	1.063	186
Deleted Residual	-.64862-	.51432	.00160	.08523	186
Stud. Deleted Residual	-10.719-	7.804	.010	1.238	186
Mahal. Distance	.752	78.470	1.989	6.774	186
Cook's Distance	.000	5.958	.066	.510	186
Centered Leverage Value	.004	.424	.011	.037	186
a. Dependent Variable: decision-making					

Questionnaire

Dear Investor/ Participants

Greetings

The student is conducting a master's thesis at İSTANBUL GELİŞİM. UNİVERSİTESİ entitled "Cognitive Factors and Their Impact of Cognitive Factor Behaviors on Investment Decision-Making Behavior, and the Moderating Role of Investing in Crypto Currencies in Libya".

I appreciate your participation in my study and assure you that your responses will be kept confidential and will be used only for educational purposes. Please put a checkmark (✓) in the appropriate column to indicate whether you agree or disagree with each of the following statements; We hope you will answer all paragraphs of the questionnaire, thanking you in advance for your cooperation.

With great appreciation

Section One: Personal Information

1. Gender

Male (.....) Female (.....)

2. Age

20-29 (.....) 30-39 (.....)

40-49 (.....) 50-59 (.....)

Over 60 (.....)

3. Marital Status

Single (.....) Married (.....)

4. Educational Qualification

High School (.....) University (.....)

Master's (.....) Doctorate (.....)

5. Occupation

Government Employee (.....)

Unemployed (.....)

I work as a freelancer (.....)

Freelance (.....)

Section Two

Behavioral biases: include availability bias, representativeness bias, herd bias, and anchoring bias

	Statement	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
First: Availability Bias (Nizar & Daljono, 2024)						
1	I prefer to sell stocks when the composite index is downward trend					
2	I prefer to buy stocks when the composite index is upward trend					
2	I prefer to buy local stocks rather than international stocks because local stock information is more widely available					
3	I prefer to buy stocks that are recommended by close friends or relatives					
4	I prefer to buy local stocks rather than trading international stocks					
6	I prefer to buy stocks that are recommended by financial experts or stock experts					
Second: Representation bias (Nizar & Daljono, 2024)						

7	I avoid buying stocks that have performed poorly in the past					
8	I prefer to buy stocks that have performed well in the past because I believe that good performance will continue in the future					
9	I prefer to buy stocks that have good fundamentals (consistent earnings growth in the past)					
10	I prefer to buy stocks that are doing well in the local composite index rather than stocks that will perform poorly in the near future					
11	I definitely check the past performance of a stock before deciding to buy it					
12	I use trend analysis before deciding to buy stocks					
Third: Herding bias (Ngoc, 2014)						
13	Other investors' decisions of the stock volume have impact on your investment Decisions					
14	Other investors' decisions of buying and selling stocks have impact on your investment decisions					
15	You usually react quickly to the changes of other investors' decisions and follow their reactions to the stock market					
Fourth: Anchoring bias (Shusha & Touny ,2016)						
16	I usually rely on past experience in the market for my next investment.					
17	I fix a target price for buying and selling the security in advance					
18	The purchase price of a security is a not big factor to be considered while selling it					

Section Three: Decision-Making Behavior

	Statement	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1	I know about interest rates, Finance charges, And credit terms					
2	Money is most important goal of my life .					
3	I know how to manage the finances.					
4	I know how to invest my money.					
5	It is more satisfying to save than invest money.					
6	I would invest a large sum of money in stock					

Section Four: Investing in Cryptocurrencies (Wang, Duong, & Ying , 2024)

	statement	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
BI1	I am already prepared to start investing in cryptocurrency.					
BI2	I will make every effort to start investing in cryptocurrency.					
BI3	I will seriously consider investing in cryptocurrency.					
BI4	I have decided that I will invest in cryptocurrency in the future.					
BI5	I firmly believe that one day in the future, I will definitely invest in cryptocurrency.					

RESUME

Personal Information

Surname, name : Ahmed Salah Amer ZWILIMA

Nationality : Libyan

Education

Degree	Education Unit	Graduation Date
Master	Masters	
Bachelor		
High School		

Work Experience

Year	Place	Title
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Foreign Language : English

Publications

Hobbies : Reading books