

THE EFFECT OF FINANCIAL LITERACY ON BEHAVIORAL BIASES OF INDIVIDUAL INVESTORS IN THE EGYPTIAN STOCK EXCHANGE

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Abstract

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The purpose of this paper is to examine how the dimensions of financial literacy could affect the behavioral biases of individual investors in the Egyptian stock exchange. The study examines the data collected from 403 individual investors in Egypt. The findings revealed the presence of some kinds of behavioral biases among individual investors in the Egyptian stock exchange, which could be categorized into three main categories: belief perseverance biases, information processing biases, and emotional biases (Pompian, 2012). This supports the view that individual investors do not necessarily act rationally. The findings also support the general view that financial literacy has a negative effect on behavioral biases; however, the effect differs between the categories of the behavioral biases, with the most effect on information processing biases, moderate effect on belief perseverance biases, and low effect on emotional biases. Also, this study indicated that the impact of financial literacy on behavioral biases is greater on females than males (Baker, Kumar, Goyal, & Gaur, 2019). Financial intermediaries and consultants can possibly become more effective by understanding the decision-making processes of individual investors. This study adds to the limited academic research that attempted to tackle the impact of financial literacy on the categories of behavioral biases.

Keywords: Financial Literacy, Behavioral Biases, Egyptian Stock Exchange, Gender

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1. INTRODUCTION

The investment could be defined as the process of flow of capital that is utilized for productive purposes. Moreover, it is also considered as the basic tool for the economic growth and development of a country. The capital market in developed and

developing countries has significantly assisted in transferring savings and consumable income of people into investments, which is realized through initial public offer or new issue of securities through primary market and the trading of the existed issued securities through the secondary market.

Classical investment theories adopted the assumption that investors always act in a manner that maximizes their return. Recent studies have revealed that investors are not always logical when making decisions, as they are inclined to make decisions based on emotions rather than logic. Additionally, markets are not always efficient. Uncertainty surrounding an investment decision causes humans to become confused. Behavioral finance discusses the reasons beyond why individuals do not necessarily make the decisions they are anticipated to make, and why markets do not consistently perform as they are anticipated to behave.

Researchers provide an extended list of some explicit biases and have applied a large number of these biases to individual investor behaviors in recent studies. Some researchers refer to biases as heuristics as they are more related to practical experiences, while others call them beliefs, judgments, or preferences. Various studies have attempted to classify these biases using some distinguished frameworks. Pompian (2012) had categorized the behavioral biases into the main three groups of biases: the first group includes biases that are related to belief perseverance of the individual investors, the second group is related to information processing, and the third group is related to emotions.

Financial literacy is a vital instrument that permits individuals to be educated about a substantial number of financial matters and how to make accurate decisions regarding them. Investors' saving, investment, and borrowing activities have all been shown to be influenced by their financial literacy, and that conforms with the view of Lusardi and Mitchell (2014), people who are financially literate are more expected to build up wealth.

Rational expectation theories explain events that occur in stock markets and are considered in the literature as standard (traditional) finance theories, and these events are explained by developing a model that makes some assumptions, the first of which is that all investors are rational and that the available information reflects stock prices, knowing that these ideal conditions are not met in the real stock markets. Based on this, it becomes clear that there is a literature gap regarding the doubts about the efficiency of the financial markets, and this is due to the anomalies in the stock market. Behavioral finance has explained many of the causes of consumer behavioral deviations, which in turn affect rational decision-making processes. Researches have nominated those changes as "behavioral biases", and some of them try to categorize and group them according to their common dominant characteristics. In addition to the increasing significance of financial literacy level due to the engagement of a broad base of customers to the several financial products. The research aimed to provide consistent and clear answers to the following research questions:

RQ1: Could financial literacy reduce the effect of behavioral biases on investment decisions conducted by individual investors in the Egyptian stock exchange?

RQ2: To what extent the categories of behavioral biases are affected by the different dimensions of behavioral finance?

RQ3: Do the differences in gender make any difference in these relationships?

This research aims to explore the impact of each dimension of financial literacy, which consists of financial knowledge, financial abilities, and skills and financial awareness on each category of the behavioral biases which include belief perseverance biases, information processing biases, and emotional biases, in addition to the effect of the gender on all of these relationships.

Results of this research provide empirical evidence on the levels of financial literacy and the extent of their effect on different categories of behavioral biases in the financial markets, including understanding market dynamics and looking closely to take into account other factors other than the price as it affects the performance of the Egyptian securities. Moreover, reducing the impact of behavioral biases on the decisions of individual investors in the Egyptian stock exchange.

The findings of this research can provide the following practical contributions:

Firstly, investors in the Egyptian stock exchange, where this study was conducted to provide insights to the existing and probable investors, can present and make practical decisions without counting on wrong information or having to keep unsuccessful projects and this happens at the moment when shares of the new and diverse companies are offered in the market.

Secondly, advisors, financial advisors, and brokers, this research is considered as a guide for them about the impact of behavioral biases on trading activities in the financial markets and understanding market dynamics, and looking at other factors that impact the performance of securities in the markets other than the price and how to treat the newly traded securities. Therefore, they can develop training programs and tools for current and potential investors which will result in rectifying any distortions or anomalies that are in the stock exchange market and which investors face while making investment decisions.

Thirdly, governments, as the research will develop strategies for the effective operations and management of the Egyptian stock market, and this, in turn, will highlight the behavioral perspective in securities trading decisions. Also, applying policies and regulations by the Egyptian stock exchange to encourage investors to improve their financial literacy through different programs before conducting any investment transactions.

The results of this research will offer more insights into theories and practices of financial literacy and how it could impact the behavioral biases of the individual investors, and the role of differences in gender in this relationship, for the teaching bodies that will extend this research into further areas of study.

The structure of this article is as follows. Section 2 is a literature review that introduces the stock markets and their impact on the country's economy and discusses different aspects and dimensions of financial literacy. It also introduces behavioral finance and navigates through the different categories of behavioral biases and differences related to gender. Section 3 analyses the methodology that has been used to conduct this empirical research, to tackle the previously mentioned objectives, and also explains the chosen variables, draws the conceptual models. Also,

it describes the questionnaire design and the conduction of the pilot study, in addition to highlighting the sampling technique used and the data collection phase. Section 4 explains the analysis of the data and the findings of the study. Finally, Section 5 demonstrates the conclusion of the results, recommendations, implications for practice, and limitations of the study and makes certain recommendations for future research.

2. LITERATURE REVIEW

2.1. Egyptian stock exchange

The growth of both the stock market and economy are significantly related to each other, as the stock market represents a barometer, which explains the health of the economy inside the country (Boubakari & Jin, 2010). The prices of stock have a great influence on the confidence of customer and business, which in turn impact the overall economy. The appearance of stability signs of business and economy leads to stability and the rise of prices. Therefore, the movement of the stock market could be considered as a reliable sign of the general direction of the economy. Additionally, it is noticed that the stock market liquidity supports the evolution and development of the economy. Thus, countries, which are characterized by their high performance of stock markets, generally have better performance in the economies too. Investors, industry, government, and other stakeholders are closely monitoring the movements in the stock market.

The Egyptian Exchange (EGX) was considered one of the oldest stock exchanges markets in the world in the 1800s. Initially, it was established in 1883 in Alexandria as the Alexandria Stock Exchange. In 1903, and after twenty years, the Cairo Stock Exchange was established. Later, and relatively more recently, they both joined and form the Cairo and Alexandria Stock Exchange (CASE).

Nowadays, the EGX is considered one of the pillars of the Egyptian economy and its development. As a global stock exchange, the Egyptian stock exchange truly believes in the importance of international cooperation to create substantial value for its stakeholders. It always seeks interaction and exposure to other member institutions' experiences to maximize the role of the Egyptian capital market regionally and internationally and that is in line with its mission to furnish its Egyptian and international clients with exclusive services. Egyptian stock exchange affects and contributes to the domestic economy through the following:

- Stock markets assemble the savings of individuals to the corporations then corporations are aggregated to the level of the GDP of the economy.
- Businesses are expected to make capital investments when they expect that these investments will lead to increased market values, such as during growing or bull markets.
- The stock market enhances the reduction of large disparities of income, that is because the stock market gives the opportunity to many people to mobilize savings from traditional bank accounts that have fixed returns and invest in stocks instead and

by that participates in the profits of the business that were set up by others.

- Companies always work on improving their management standards and efficiency in pursuit of satisfying the shareholders' demands and because of the diversity of those owners.

- It is possible that the government or even local authorities may choose to borrow funds by issuing bonds — a type of financial instrument — to finance development projects such as water treatment and sanitation projects and housing estates. This source of funds has an advantage to people because the government is no longer needs to impose more taxes to finance this type of development project.

2.2. Financial literacy

Financial literacy could be introduced as the ability to manage financial resources effectively depending on using knowledge and skills, aiming to reach permanent financial health (President's Advisory Council on Financial Literacy, 2008). Financial literacy could also be defined as the knowledge of the main concepts and definitions of economy and finance and the ability to use that knowledge in order to efficiently succeed in financial resources management for lifelong financial health. Specifically, this definition emphasizes the ability to apply the knowledge and skills necessary to realize financial well-being, and is considered to be a behaviorally-based definition (Hung, Parker, & Yoong, 2009). Financial literacy can be understood as a measure of the degree of one's understanding of fundamental financial concepts, in addition to the capability and assurance of the management of an individual's personal finances by using the suitable, short-term decision-making and rigorous, long-range financial planning, while taking into consideration the changing nature of life's events and economic circumstances (Remund, 2010).

Financial literacy literature did not agree on a common tool of measurement; therefore, financial literacy degrees found in these researches are different and cannot be compared. The main characteristic that was common in different prior researches is that they did not categorize financial literacy into the three main categories followed in the current research. This hinders the authors' ability to compare the current research findings with other researches.

The OECD/International Network on Financial Education (INFE) developed a survey (OECD, 2020) designed to obtain an inclusive measurement of financial literacy of people with different backgrounds from different nations. In order to assess financial literacy, Hilgert, Hogarth, and Beverly (2003) used 28 true/false questions covering the financial knowledge on issues, for example, investment, saving, cash flow, and so on. Lusardi and Mitchell (2007) used a number of multiple-choice questions, 5 questions are simple questions primarily associated with the time value of money and 8 questions are advanced questions on more complicated topics, such as the difference between stocks and bonds, and the mechanism of stock markets.

The increasing involvement of individuals in the stock market requires an improved understanding of investment behavior and its determinants. Studies

assured that characteristics of individual investment behavior, such as social preferences and financial literacy, represent key determinants that play a significant role (van Rooij, Lusardi, & Alessie, 2012). The relation between investment behavior and financial literacy is still not clear; however, Hilgert et al. (2003) indicated that the higher the level of individuals' financial literacy, the more successful practices level, such as credit management, cash flow management, saving and investment. In addition, van Rooij et al. (2012) showed that people with lower financial literacy are much less likely to invest in stocks.

Financial literacy is the primary determinant of retirement planning (Lusardi & Mitchell, 2007). Several countries have developed strategies for financial learning and financial literacy, with the goal of empowering consumers in their interactions with the financial markets (Grifoni & Messy, 2012). Knowledgeable individuals are obviously more expected to invest in shares (Guiso, Sapienza, & Zingales, 2008). Thus, this may influence the investment behavior in the stock market.

Several empirical studies that targeted different groups of the population all over the world have found that investors who have poor financial literacy are linked with poor and inefficient portfolio diversification. Their findings have revealed that the majority of investors or consumers are unaware of even the most fundamental economic concepts (Agnew & Szykman, 2005; Bernheim, 1994). According to Lodhi (2014), improving financial literacy is thought to be important in reducing information asymmetry and allowing investors to take on more risk by investing in high-risk securities. Males, on the other hand, are considered to be more financially literate than their female counterparts (Lusardi & Mitchell, 2007), that is because of the low rates of females' participation in financial issues. As a result, females are less likely to plan for retirement, as well as they usually borrow at a higher rate. According to Koh, Mitchell, and Fong (2021), in Singapore, the more financially literate people have relatively more diversified investment portfolios on average when it is compared to the less financially literate ones. Researchers realized that for the people aged between 50 and 70 years, who are considered more financially literate, they are more likely to have a lifetime health insurance care that works in improving their retirement status through handling potential emergencies.

In general, Mitchell, Lusardi, and Curto (2009) identified the key economic terms that every human should know. The financially literate person in their opinion should know about the accumulation of interest, the difference between the face value and real value, as well as a well amount of knowledge about risk diversification. This subsection discusses three dimensions of financial literacy, which are financial knowledge, financial abilities and skills, and financial awareness.

2.2.1. Financial knowledge

Knowledge is one of the famous aspects of the descriptions of financial literacy. Hilgert et al. (2003) defined financial literacy as financial knowledge. They highlighted that financial knowledge is statistically related to financial practices.

People who were aware more are more capable to participate in the available financial practices. Moreover, the Financial Industry Regulatory Authority (FINRA) had identified a definition of financial literacy concept in 2003, which was the understanding and awareness of ordinary investors to the principles of market, instruments, organizations and regulations (as cited in Kimiyaghalam and Safari, 2015). While financial knowledge is usually considered to be the core of financial literacy, it must be distinguished from general knowledge. For instance, Parker, Yoong, de Bruin, and Willis (2008) assured that the particular knowledge of the area of finance has relatively more impact for anticipating financial performance on a theoretical investment task than general knowledge has. According to that, the National Foundation for Credit Counseling (NFCC, 2008) stated that financial literacy is knowing the fundamental economic bases, having information about the economy, and understanding some basic economic terminologies. Most of the explanations provided regarding financial literacy have highlighted that the knowledge of a person is only related to the finance area and does not include financial skills and abilities. Furthermore, Clark, Lusardi, and Mitchell (2017) empirically assessed financial knowledge from three questions on portfolio diversification, real and nominal interest rates, and the time value of money.

2.2.2. Financial abilities and skills

Researchers have also identified new views of defining financial literacy. For instance, Moore (2003) referred to the significance of financial skills and abilities. The researcher assured that the person is considered financially literate when this person has the will to prove his capability to use his financial knowledge. This identified understanding of financial literacy is more complex than the "theoretical one of financial literacy", as in this case required the individual to prove his ability to apply their financial knowledge. In addition, Moore (2003) also assured that the person should have financial knowledge, as well as he must have some skills and abilities in terms of mental arithmetic (to be able to understand some financial information that is offered in the form of charts).

Furthermore, Servon and Kaestner (2008) identified that each individual must own the ability to understand and get benefits from financial concepts. Moreover, other studies have stressed the significance of personal financial planning by referring that individuals must be able to demonstrate some skills in utilizing their financial backgrounds, not only when making short-term financial decisions, but also when making longer-term financial decisions. Finally, the definitions of Moore (2003) and Servon and Kaestner (2008) about financial literacy have put a focus on financial abilities and skills.

2.2.3. Financial awareness

Mason and Wilson (2000) have highlighted that financial literacy is the individual's capacity to get the relevant information, comprehend and assess them, which help in making financial decisions, by putting the focus on the awareness of potential

financial consequences. By that, Mason and Wilson (2000) have stated financial level, which is higher than the two levels identified at the preceding two types of definitions. This level requires the awareness of individuals to the consequences of their financial actions. Furthermore, Baron-Donovan, Wiener, Gross, and Block-Lieb (2005) assured that the literate person has the ability to develop his awareness of successful strategies regarding thoughtful decisions regarding spending and saving as well as credit use. Bhattacharjee and Singh (2017) highlighted that “awareness is the ability to directly know and perceive, to feel or to be of events. More broadly, it is the state or quality of being conscious of something” (p. 310). Financial literacy and financial awareness are two fundamental items for the financial market’s well performance and development. Financial literacy should lead to financial awareness; however, both terms are sometimes used interchangeably. Financial awareness plays an essential role in the financial planning of an individual. This proper financial awareness usually leads to better financial planning.

This category of financial literacy definition is considered as the most complex and comprehensive one, as it puts more complicated conditions to consider the person as financially literate, as it added financial awareness besides knowledge and abilities. After introducing the three categories of financial literacy, financial literacy could be represented in the minimal knowledge of the person about the financial terms (as interest rate, inflation, exchange rate, etc.), it also includes his abilities and skills to utilize all this knowledge in his own life as well as to be aware of the findings and impacts of the financial actions.

2.3. Behavioral finance and behavioral biases categories

Traditional finance depends on portfolio theory, while the expected returns depend on the standard asset pricing theory. However, the traditional theory explained behavioral finance as it assumed that people are normally not rational, individuals plan for their portfolios based on the guidelines of behavioral portfolios, markets are not efficient and the behavioral asset pricing theory describes the expected returns (Statman, 2014). According to both theoretical and empirical evidence, investors and researchers have challenged the efficient market hypothesis. Behavioral economists ascribe financial market distortions to a variety of cognitive biases such as overconfidence, framing, the illusion of control, recency bias, and a variety of other predictable human thinking and information processing flaws. These have been investigated by psychologists such as Kahneman and Tversky (1979) and Thaler (1999).

According to Joo and Durri (2015), there was no agreed-upon theory of behavioral finance but the focus was on pinpointing portfolio abnormalities that could be explained by individuals’ different psychological characteristics. They were confident that behavioral finance works only as a supplement and not as a substitute for standard finance theory because it describes those phenomena that cannot be clarified in traditional finance theory. Reddy (2014) analyzed how psychology influences investor

behavior and whether this could explain capital market imperfections. Often people who undergo many deviations from rational behavior make decisions that are far from rational ones. The main effect of psychological factors in the investment decision-making process cannot be denied.

2.3.1. Belief perseverance biases

The person feels a mental discomfort when receiving new information that conflicts with his own previous beliefs or cognitions. To solve this discomfort, the person tends to do some behaviors, which are: only noticing the important information that is interesting to him (which is acknowledged by selective exposure), modifying or ignoring information that is opposite to his existing beliefs (which is known by selective perception), and remembering only information that matches the individual’s existing beliefs (which is known by selective retention). The major biases which are related to belief perseverance include the following types:

- *Cognitive dissonance bias*: According to Festinger (1957), this bias depends on the tendency of the person to concentrate on the investment’s positive aspects instead of focusing on what is going wrong. People usually feel distressed when facing cognitive elements that are opposite to their thoughts, such as the conflict between empirical evidence and past choice; therefore, they may change their beliefs to decrease this discomfort.

- *Conservatism bias*: People stick to their previous opinions or expectations at the cost of admitting new knowledge. Therefore, there is the propensity of investors who are confronted with new information not to alter their beliefs and attitudes (Pompian, 2012).

- *Confirmation bias*: According to Russo and Shoemaker (1992), confirmation bias could be defined as the tendency of individuals to support data that upholds their contentions, desires, or convictions.

- *Representativeness bias*: The tendency to take decisions about many investment choices is based upon the knowledge of how alike past investments have performed (Kahneman & Tversky, 1979).

- *The illusion of control bias*: It can be also viewed as people tend to misjudge their ability to control actions but actually, they have no influence (Langer, 1977).

- *Hindsight bias*: It happens when an investor sees the investment results as if they were expected, giving investors an untrue sense of security when making investment decisions (Pompian, 2012).

2.3.2. Information processing biases

They are processing errors in which described how information could be solved and used in an unreasonable or irrational manner in financial decision-making. This bias is less related to memory errors or updating probabilities. The major biases related to information processing include the following types:

- *Anchoring and adjustment bias*: People are regularly affected by the past price movements of stocks, which indicates that historical movements serve as anchors for their expectations (Törngren & Montgomery, 2004).

- *Mental accounting bias*: According to Thaler (1999), who presented mental accounting, individuals tend to group by observing where the money comes from, where it is kept and how it is spent. This bias has the tendency to mentally influence investors so they classify their funds in separate “buckets”, or accounts, which affects the way investors think about their spending. Mental accounting bias often leads investors to make irrational suboptimal decisions as it makes people see money as less exchangeable; for instance, people are willing to pay more for goods when using credit cards than if they are paying with cash. Furthermore, when the investor is selling the winner stock even though selling the loser is more likely to be the wiser decision is an example of the suboptimal investment decision, due to tax loss benefits as well as the fact that the losing stock is a weaker investment.

- *Framing bias*: The tendency to respond differently to several situations based on the context in which a choice is framed (Tversky & Kahneman, 1991). The decision-maker's frame is influenced partly by the problem formulation and partly by the personal characteristics, norms, and habits of the decision-maker. This means that the framing effect is more of a cognitive bias where an individual's selection from a set of choices is affected more by how the information is being provided than by the information itself. The delivery frame of the information is presented with positive or negative connotations (e.g., as a loss or as a gain). Thus, individuals tend to avoid risk when a positive frame is provided but seek risks when a negative frame is provided.

- *Availability bias*: It could be defined as the tendency to give more weight to recent events and major ones that are easy to remember (Cossette, 2014).

- *Self-attribution bias*: The term was developed by Bem (1965); in this bias, people are more likely to attribute their successes to intrinsic (personal) aspects, for instance, their talent or anticipation, while they attribute their failures to outside aspects, for instance, bad luck.

- *Outcome bias*: According to Pompian (2012), this bias represents the willingness of a person to do something, such as making the decision of an investment in a mutual fund, depending on the outcome of the past event, such as profits of the last five years without observing the process that leads to these outcomes over the last five years. This bias arises when a decision is based on the outcome of past events, without paying attention to how the past events developed. Therefore, it can be said that this bias does not include investigation of the factors that lead to the outcomes of past events, and the tendency to assess a decision is based on the outcome alone. This may result in exposing investors to excessive risk if the source of the performance was a risky strategy.

- *Recency bias*: The tendency of people to recall recent events more clearly than those that happened in the near past (Pompian, 2012).

2.3.3. Emotional biases

These are the biases that are related to emotions. Emotion represents a state of mind that arises instinctively rather than through conscious effort.

Emotions are associated with thoughts, beliefs, and feelings about items, objects, or the relationships between them. Emotional biases are more difficult to correct than cognitive errors because they arise from impulsivity or intuition rather than conscious calculations. The major biases that related to emotions include the following types:

- *Loss aversion bias*: It was first proposed by Kahneman and Tversky (1979), and stated that people were more sensitive to losses than equivalent gains. According to this bias, individuals respond to losses more than gains.

- *Overconfidence bias*: Investors misjudge their ability to forecast market events; therefore, they go out regularly without getting similar returns (Nevins, 2004). So, it is a tendency of people to believe that they have better information than they really do.

- *Self-control bias*: It is a conflict between individuals' desires and their inability (Pompian, 2012). So, individuals prefer spending today rather than saving for tomorrow, which leads to the failure of people to act for their long-term goals, and this is because those people suffer from a lack of self-discipline.

- *Status quo bias*: Samuelson and Zeckhauser (1988) defined the status quo bias as an emotional bias that influences individuals facing a lot of choices to select an option that approves or prolongs the current state (i.e., the “status quo”) instead of alternative choices which might cause a change.

- *Endowment bias*: It is an emotional bias where investors appreciate an asset or object more when they own it, whether due to purchase or inheritance. It can be seen as the underweighting of opportunity cost (Pompian, 2012).

- *Regret aversion bias*: Naturally, individuals have a desire to evade admitting an error and realizing a loss (Tversky & Kahneman, 1991). So, people sometimes avoid making a decision fearing this decision, which may cause regret later. Basically, this bias seeks to avoid the emotional pain of regret related to poor decision-making.

- *Affinity bias*: It is a term that refers to an individual's propensity for making irrational and uneconomic investment decisions based on their belief that a certain product or service would reflect and adhere to their beliefs and values (Pompian, 2012).

The increasing importance of this issue in the developing countries in general and Egypt, in particular, had attracted too much attention as financial literacy and financial inclusion have become linked and equally reinforcing concepts. Focused on the actual situation in both areas, all the parties involved have a better opportunity to take relevant knowledgeable decisions and expand joint wellbeing (Altman, 2020). The connection between financial literacy and financial behaviors such as debt management, savings, wealth creation, and retirement planning has received less attention especially in developing nations (Niu & Zhou, 2018). The quick growth in Fintech around the world juxtaposed with expensive financial behavior means that more attention must be paid to the impact of mobile payment use on financial behavior. Fintech is not a substitute for financial literacy. Thus, prior researches recommended that financially

literate consumers have higher opportunities to save, contribute to financial markets and continue retirement saving plans (Ponchio, Cordeiro, & Gonçalves, 2019). Financial literacy reduces the chance of committing financial mistakes, henceforth lessening the opposing effect of behavioral biases (Baker et al., 2019).

2.4. Gender differences and behavioral biases

Graham, Stendardi, Myers, and Graham (2002) assured that gender has a significant role in investing decisions. Gender became after age and income, as the most powerful factors affecting the decisions of investment. Previous studies have indicated the occurrence of behavioral biases due to the difference in gender, which affects the performance of investment (Lee, Miller, Velasquez, & Wann, 2013). However, the study of Deo and Sundar (2015) assured that; in India, the majority of the working women have no investments; this is because of the risk aversion, the lack of financial knowledge, as well as the lack of freedom regarding taking any financial decision. Although most previous studies have proven that men are less averse to risk than women, there is a study by Kunnanatt and Emiline (2012) whose results showed that females are more likely to take risks than males. Also, the results of Bogan, Just, and Dev (2013) show evidence that not all males are looking for risks and it varies from sample to sample according to age, income, and marital status.

Numerous studies highlighted that male investors are more overconfident than female investors (Barber & Odean, 2001; Bhandari & Deaves, 2006; Kumar & Goyal, 2016). Females outperform males in their individual stock investments; they attribute this to the idea that males have a propensity to be more overconfident than females

(Barber & Odean, 2001). According to Baker et al. (2019), males are more overconfident than females about their knowledge of the stock market.

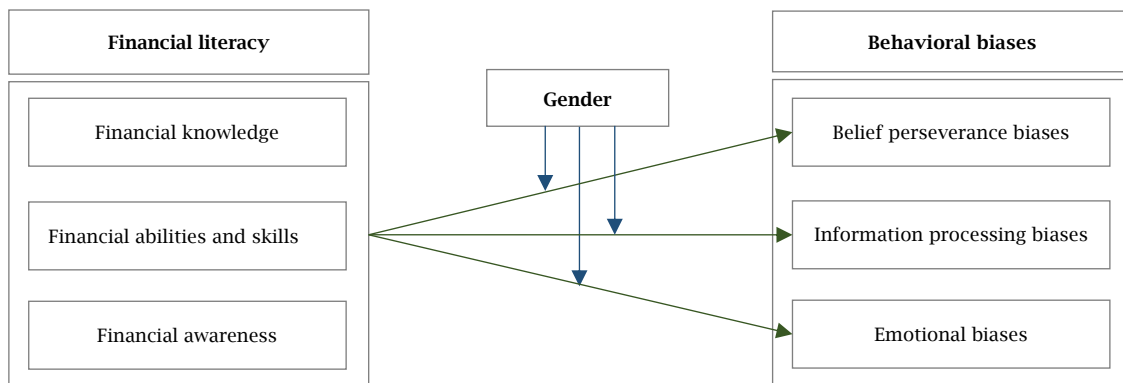
3. RESEARCH METHODOLOGY

To study the effect of financial literacy on behavioral biases of the individual investors in the Egyptian stock exchange, the researchers adopted a descriptive research design using the quantitative approach through a questionnaire survey, checked the reliability and validity of the questionnaire through the pilot study, adopted the convenience sampling techniques to distribute the questionnaires, then analyzed the collected data from 403 respondents using correlations technique to test the degree and direction of the relationship between dependent variables and independent ones that are drawn in the following figure (Figure 1), linear regression techniques to test the effect of dependent variables over the dependent ones, and ANOVA to test if the gender differences have any effect on the relationship between dependent and independent variables.

3.1. Variables identification and conceptual model

- A. The independent variables are the dimensions of financial literacy:
 - financial knowledge;
 - financial abilities and skills;
 - financial awareness.
- B. The dependent variables are the categories of the behavioral biases:
 - belief perseverance biases;
 - information processing biases;
 - emotional biases.
- C. The moderator:
 - gender.

Figure 1. Conceptual model



Source: Authors' elaboration.

From Figure 1, there are three models that could be reflected in the coming equations (1), (2), and (3).

First model: Test the influence of the dimensions of financial literacy on the belief perseverance biases:

Model 1

$$Y_1 = a + B_1X_1 + B_2X_2 + B_3X_3 + \epsilon \quad (1)$$

where:

Y_1 : refers to the belief perseverance biases;

B_1 : refers to the financial knowledge;

B_2 : refers to the financial abilities and skills;

B_3 : refers to the financial awareness;

ϵ : refers to the error term.

In addition, the impact of gender on the strength of the relationship between dimensions of financial literacy on the belief perseverance biases has been tested.

Second model: Test the effect of the dimensions of financial literacy on the information processing biases:

Model 2

$$Y_2 = a + B_1X_1 + B_2X_2 + B_3X_3 + \varepsilon \quad (2)$$

where:

Y_2 : refers to the information processing biases;
 B_1 : refers to the financial knowledge;
 B_2 : refers to the financial abilities and skills;
 B_3 : refers to the financial awareness;
 ε : refers to the error term.

In addition, the impact of gender on the strength of the relationship between dimensions of financial literacy on the information processing biases has been tested.

Third model: Test the effect of the dimensions of financial literacy on the emotional biases:

Model 3

$$Y_3 = a + B_1X_1 + B_2X_2 + B_3X_3 + \varepsilon \quad (3)$$

where:

Y_3 : refers to the emotional biases;
 B_1 : refers to the financial knowledge;
 B_2 : refers to the financial abilities and skills;
 B_3 : refers to the financial awareness;
 ε : refers to the error term.

In addition, the impact of gender on the strength of the relationship between dimensions of financial literacy on emotional biases has been tested.

3.2. Questionnaire design

The questionnaire includes items involving financial literacy, demographic variables, and behavioral biases of individuals in the Egyptian stock exchange. Both academics and industry professionals revised the survey tool as a validity check. The questionnaire consists of three parts with 35 questions, Part A and Part B consist of 32 questions that used a five-point Likert scale, where 1 = strongly disagree, 2 = disagree, 3 = neutral, 4 = agree and 5 = strongly agree, while Part C consists of 3 questions that are related to demographic factors.

The questions of Part A have been developed by the researcher from previous studies to capture the dimensions of the financial literacy for each respondent, questions 1-4 are related to financial knowledge, while questions 5-8 are related to the financial abilities and skills, and questions 9-12 are related to the financial awareness. In Part B, the researchers used the questions developed by Pompian (2012), to capture the vulnerability of individuals to behavioral biases, one question is assigned to each bias, questions 13-18 are related to belief perseverance biases which are cognitive dissonance bias, conservatism bias, confirmation bias, representativeness bias, the illusion of control bias, and hindsight bias, while questions 19-25 are related to information processing biases, which are anchoring and adjustment bias, mental accounting bias, framing bias, availability bias, self-attribution bias, outcome bias and recency bias, and questions 26-32 are related to emotional biases which are loss aversion bias, overconfidence bias,

self-control bias, status quo bias, endowment bias, regret aversion bias, and affinity bias. Part C sought to capture the following demographic factors of the respondents: gender, age, experience "years of trading".

3.3. Pilot survey

In order to test and refine the survey questionnaire before the main data collection across the full sample, we have distributed the questionnaire over a sample of 30 individual investors, practitioners, and experts to measure the reliability and validity of the scales.

First, it was needed to measure the reliability of the questionnaire, constructs to make sure it produces similar results under consistent conditions. Cronbach's alpha, α (or coefficient alpha), initiated by Lee Cronbach in 1951, is the most common measure of internal consistency "reliability". Based on the test of reliability which indicates that all the Cronbach's alpha of the scales of the dimensions of financial literacy and dimensions of behavioral biases are above 0.6, and this suggests that all items under each scale are reliable and the entire scales are internally consistent.

Secondly, validity measuring usually means the extent to which a concept or term is accurately measured in a quantitative study. After measuring the validity for each scale, we reveal that for the financial knowledge scale: all questions in this scale have p-value < 0.05, which indicates that all of them are significant, and all questions have a strong positive relationship with the scale. For the financial abilities and skills scale: all questions in this scale have a p-value < 0.05, which indicates that all of them are significant, and all questions have a strong positive relationship with the scale. For the financial awareness scale: all questions in this scale have a p-value < 0.05, which indicates that all of them are significant, and all questions have a strong positive relationship with the scale.

For the belief perseverance biases scale: all questions "which represent each bias" in this scale have a p-value < 0.05, which indicates that all of them are significant, except the questions related to representative bias and hindsight bias which have a p-value > 0.05. In addition, all the questions have a strong positive relationship with the scale except the questions related to the representative bias hindsight bias, which have a weak negative relationship with the scale, and they are not moving in the same direction of the scale. For the information processing biases scale: all questions "which represent each bias" in this scale have a p-value < 0.05 which indicates that all of them are significant, except the question related to outcome bias which has a p-value > 0.05. In addition, all the questions have a strong positive relationship with the related scale except the question related to outcome bias which has a weak negative relationship with the scale, and it is not moving in the same direction of the scale. For the emotional bias scale: all questions "which represent each bias" in this scale have a p-value < 0.05 which indicates that all of them are significant, except the questions related to self-control bias and status quo bias which have a p-value > 0.05. In addition, all the questions have a strong positive relationship with the related scale, except the questions related to the self-control bias

and status quo bias which have a moderate positive relationship for the first one and a weak positive relationship for the second one with the scale, but they still move on the same direction of the scale.

3.4. Sampling and data collection

Given the profound impact of the Egyptian stock exchange on the Egyptian economy, this research is concentrated on individual investors from the EGX who were actively investing in the traded securities up to the end of 2020. Convenience sampling was followed by the researchers, sometimes it is called "accidental sampling". Etikan, Musa, and Alkassim (2016) defined it as a type of nonprobability or nonrandom sampling where members of the target population that satisfy certain practical criteria are included for the purpose of the study. These practical situations are, for example, the availability of the members at a specific time, easy accessibility, geographical location closeness, or the willingness of members to participate in the study. However, the findings of the research will not be generalized from the sample to the population. Thus, the main assumption related to convenience sampling is that the members of the target population are homogeneous. In all research types, it would be perfect to include the whole population, but in the majority of the cases, it is not feasible to take in every item because the population is sometimes unlimited. This is the justification of using sampling techniques like convenience sampling by most researchers.

All components of the population are eligible, and the researcher did the utmost efforts to increase the representation of the sample through distributing 500 questionnaires among the investors living in the main cities like Cairo, Alexandria, Port Said, Tanta, Ismailia, Assiut, and Mansoura. The sampling frame of 500 individuals is built on the availability of information about the contact numbers and e-mail addresses of these investors. The sample size is computed based on time and costs required to collect data while decreasing the margin of error and according to Godden (2004), for an infinite population (where the population is greater than 50,000) and with a confidence interval of 95%, the sample size should be greater than 384 respondents, 412 out of 500 questionnaires were received and 9 questionnaires were excluded due to uncompleted data, so the analysis was conducted with 403 questionnaires resulting in an initial response rate of 80.6%, which is considered a high percentage for surveys of this type.

3.5. Hypotheses development

Hypothesis (H1): There is a significant relationship between financial literacy and belief perseverance biases.

H1a: There is a significant relationship between financial knowledge and belief perseverance biases.

H1b: There is a significant relationship between financial abilities and skills and belief perseverance biases.

H1c: There is a significant relationship between financial awareness and belief perseverance biases.

H1d: Gender has a significant effect on the relationship between the dimensions of financial literacy and belief perseverance biases.

Hypothesis (H2): There is a significant relationship between financial literacy and information processing biases.

H2a: There is a significant relationship between financial knowledge and information processing biases.

H2b: There is a significant relationship between financial abilities and skills and information processing biases.

H2c: There is a significant relationship between financial awareness and information processing biases.

H2d: Gender has a significant effect on the relationship between the dimensions of financial literacy and information processing biases.

Hypothesis (H3): There is a significant relationship between financial literacy and emotional biases.

H3a: There is a significant relationship between financial knowledge and emotional biases.

H3b: There is a significant relationship between financial abilities and skills and emotional biases.

H3c: There is a significant relationship between financial awareness and emotional biases.

H3d: Gender has a significant effect on the relationship between the dimensions of financial literacy and emotional biases.

4. DATA ANALYSIS AND FINDINGS

4.1. Multiple regression analysis

The study uses multiple regression and t-test analysis to examine the data. In order to assess the multiple regression analysis with the most appropriate technique; the data should fulfill the following assumptions of normality of data distribution, normality of residuals, in addition, to avoid the violations of homoscedasticity, serial correlation, and multicollinearity. After conducting the assumptions for linear regression, it seems that the data have fulfilled all the assumptions required for applying multiple regression analysis using the OLS (ordinary least square) technique except for homoscedasticity. Therefore, instead of applying the OLS technique, the most appropriate technique of multiple regression analysis is to use WLS (weighted least squares) which is a special case of GLS (generalized least squares).

4.1.1. Impact of dimensions of financial literacy on belief perseverance biases

First model: According to the multiple regression analysis that is to test the effect of dimensions of financial literacy on the belief perseverance biases, it can be concluded that:

Since the p-value for the model is < 0.05 , so the dimensions of the financial literacy significantly impact belief perseverance biases, and 52.9% of the total variations in the belief perseverance biases of the investors are attributed to the variations of the dimensions of the financial literacy collectively.

For each independent variable:

- Financial knowledge affects significantly the belief perseverance biases as the p-value for the financial knowledge is < 0.05 .

- The financial abilities and skills do not affect significantly the belief perseverance biases as the p-value for the financial abilities and skills is > 0.05 .

- The financial awareness affects significantly the belief perseverance biases as the p-value for the financial awareness is < 0.05 .

Table 1. Regression of dimensions of financial literacy on belief perseverance biases

| Model summary | R | R-square | Adjusted R-square | Std. error of the estimate | |
|--------------------------------|---------------------------------|-------------------------|-------------------------------|----------------------------|---------|
| | | 0.730 | 0.533 | 0.529 | 1.29235 |
| ANOVA | Sum of squares | df | Mean square | F | Sig. |
| Regression | 759.946 | 3 | 253.315 | 151.670 | 0.000 |
| Residual | 666.398 | 399 | 1.670 | | |
| Total | 1426.343 | 402 | | | |
| Coefficients | Unstandardized coefficients – B | Coefficients std. error | Standardized coefficients – B | T | Sig. |
| (Constant) | 3.820 | 0.147 | | 26.013 | 0.000 |
| Financial knowledge | 0.167 | 0.054 | 0.162 | 3.123 | 0.002 |
| Financial abilities and skills | -0.125 | 0.075 | -0.127 | -1.681 | 0.094 |
| Financial awareness | -0.450 | 0.039 | -0.712 | -11.439 | 0.000 |

Source: Authors' elaboration.

Therefore, Model 1 will be $Y_1 = a + B_1X_1 + B_2X_2 + B_3X_3 + \varepsilon$, so $Y_1 = 3.820 + 0.167X_1 - 0.450X_3$.

According to the analysis of the gender samples t-test was used to investigate if gender has any effect on the relationship between the independent variables and the dependent variable.

Where, μ_1 refers to the mean of the male sample, while μ_2 refers to the mean of the female sample. H_0 (null hypothesis): $\mu_1 = \mu_2$, while H_1 (alternative hypothesis): $\mu_1 \neq \mu_2$.

Table 2. T-test for the gender samples for belief perseverance biases

| Independent samples tests | Levene's test | | T-test for equality of means | | | | | | |
|-----------------------------|---------------|-------|------------------------------|--------|-----------------|-----------------|-----------------------|---------|---------|
| | F | Sig. | t | df | Sig. (2-tailed) | Mean difference | Std. error difference | 95% CI | |
| | | | | | | | | Lower | Upper |
| Equal variances assumed | 5.340 | 0.021 | -3.561 | 401 | 0.000 | -0.251 | 0.07047 | -0.3895 | -0.1124 |
| Equal variances not assumed | | | -3.252 | 180.20 | 0.001 | -0.251 | 0.07718 | -0.4032 | -0.0986 |

Source: Authors' elaboration.

Since the p-value < 0.05 , so H_0 will be rejected and H_1 will be accepted, so we can conclude that there is a significant difference between the mean of males and mean of females in favor of females $\mu_2 > \mu_1$, which indicates that the belief perseverance biases of females are highly affected by the financial literacy than males.

4.1.2. Impact of dimensions of financial literacy on information processing biases

Second model: According to the regression analysis conducted to test the impact of dimensions of financial literacy on the information processing biases, it can be concluded that:

Since the p-value for the model is < 0.05 , so the dimensions of the financial literacy significantly

impact information processing biases, and 69.4% of the total variations in the information processing biases of the investors are attributed to the variations of the dimensions of the financial literacy collectively.

For each independent variable:

- Financial knowledge affects significantly the information processing biases as the p-value for the financial knowledge is < 0.05 .

- The financial abilities and skills do not affect significantly the information processing biases as the p-value for the financial abilities and skills is > 0.05 .

- Financial awareness affects significantly the information processing biases as the p-value for the financial awareness is < 0.05 .

Table 3. Regression of dimensions of financial literacy on information processing biases

| Model summary | R | R-square | Adjusted R-square | Std. error of the estimate | |
|--------------------------------|---------------------------------|-------------------------|-------------------------------|----------------------------|---------|
| | | 0.834 | 0.696 | 0.694 | 1.25115 |
| ANOVA | Sum of squares | df | Mean square | F | Sig. |
| Regression | 1429.930 | 3 | 476.643 | 304.491 | 0.000 |
| Residual | 624.586 | 399 | 1.565 | | |
| Total | 2054.516 | 402 | | | |
| Coefficients | Unstandardized coefficients – B | Coefficients std. error | Standardized coefficients – B | t | Sig. |
| (Constant) | 4.730 | 0.176 | | 26.801 | 0.000 |
| Financial knowledge | -0.129 | 0.064 | -0.087 | -2.019 | 0.044 |
| Financial abilities and skills | 0.102 | 0.077 | 0.082 | 1.314 | 0.190 |
| Financial awareness | -0.689 | 0.044 | -0.843 | -15.566 | 0.000 |

Source: Authors' elaboration.

Thus, Model 2 will be $Y_2 = a + B_1X_1 + B_3X_3 + \varepsilon$, so $Y_2 = 4.730 - 0.129X_1 - 0.689X_3$.

According to the analysis of the gender samples, a t-test was used to investigate if gender has any effect on the relationship between the independent variables and the dependent variable.

Where, μ_1 refers to the mean of the male sample, while μ_2 refers to the mean of the female sample. H_0 (null hypothesis): $\mu_1 = \mu_2$, while H_1 (alternative hypothesis): $\mu_1 \neq \mu_2$.

Table 4. T-test for the gender samples for information processing biases

| Independent samples tests | Levene's test | | T-test for equality of means | | | | | | |
|-----------------------------|---------------|--------------|------------------------------|---------|-----------------|-----------------|-----------------------|---------|---------|
| | F | Sig. | t | df | Sig. (2-tailed) | Mean difference | Std. error difference | 95% CI | |
| | | | | | | | | Lower | Upper |
| Equal variances assumed | 33.032 | 0.000 | -4.964 | 401 | 0.000 | -0.4758 | 0.0959 | -0.6642 | -0.2873 |
| Equal variances not assumed | | | -4.368 | 169.126 | 0.000 | -0.4758 | 0.1089 | -0.6908 | -0.2607 |

Source: Authors' elaboration.

Since the p-value < 0.05 , so H_0 is rejected while H_1 is accepted, so it could be concluded that there is a significant difference between the mean of males and mean of females in favor of females $\mu_2 > \mu_1$, which indicate that the information processing biases of females are highly affected by the financial literacy than males.

4.1.3. Impact of dimensions of financial literacy on emotional biases

Third model: According to the regression analysis conducted to examine the impact of dimensions of financial literacy on the emotional biases, it can be concluded that:

Since the p-value for the model is < 0.05 , so the dimensions of the financial literacy significantly

impact emotional biases, and 20% of the total variations in the emotional biases of the investors are attributed to the variations of the dimensions of the financial literacy collectively.

For each independent variable:

- Financial knowledge affects significantly the emotional biases as the p-value for financial knowledge is < 0.05 .

- The financial abilities and skills affect significantly the emotional biases as the p-value for the financial abilities and skills is < 0.05 .

- Financial awareness affects significantly the emotional biases as the p-value for the financial awareness is < 0.05 .

Table 5. Regression of dimensions of financial literacy on emotional biases

| Model summary | R | R-square | Adjusted R-square | Std. error of the estimate | |
|--------------------------------|--|--------------------------------|--------------------------------------|----------------------------|--------------|
| | 0.454 | 0.206 | 0.200 | 1.20738 | |
| ANOVA | Sum of squares | df | Mean square | F | Sig. |
| Regression | 150.931 | 3 | 50.310 | 34.512 | 0.000 |
| Residual | 581.650 | 399 | 1.458 | | |
| Total | 732.580 | 402 | | | |
| Coefficients | Unstandardized coefficients – B | Coefficients std. error | Standardized coefficients – B | t | Sig. |
| (Constant) | 4.439 | 0.177 | | 25.026 | 0.000 |
| Financial knowledge | -0.250 | 0.067 | -0.264 | -3.733 | 0.000 |
| Financial abilities and skills | -0.474 | 0.090 | -0.523 | -5.269 | 0.000 |
| Financial awareness | 0.254 | 0.053 | 0.414 | 4.767 | 0.000 |

Source: Authors' elaboration.

Therefore, Model 3 will be $Y_3 = a + B_1X_1 + B_2X_2 + B_3X_3 + \varepsilon$, so $Y_3 = 4.439 - 0.250X_1 - 0.474X_2 + 0.254X_3$.

According to the analysis of gender samples, the t-test was used to investigate if gender has any effect on the relationship between the independent variables and the dependent variable.

Where, μ_1 refers to the mean of the male sample, while μ_2 refers to the mean of the female sample. H_0 (null hypothesis): $\mu_1 = \mu_2$, while H_1 (alternative hypothesis): $\mu_1 \neq \mu_2$.

Table 6. T-test for the gender samples for the emotional biases

| Independent samples tests | Levene's test | | T-test for equality of means | | | | | | |
|-----------------------------|---------------|-------|------------------------------|---------|-----------------|-----------------|-----------------------|---------|---------|
| | F | Sig. | t | df | Sig. (2-tailed) | Mean difference | Std. error difference | 95% CI | |
| | | | | | | | | Lower | Upper |
| Equal variances assumed | 10.332 | 0.001 | -4.096 | 401 | 0.000 | -0.28349 | 0.06921 | -0.4196 | -0.1474 |
| Equal variances not assumed | | | -3.670 | 174.346 | 0.000 | -0.28349 | 0.07724 | -0.4360 | -0.1310 |

Source: Authors' elaboration.

Since the p-value < 0.05 , so H_0 is rejected while H_1 is accepted, so it could be concluded that there is a significant difference between the mean of males and mean of females in favor of females $\mu_2 > \mu_1$, which indicate that the emotional biases of females are highly affected by the financial literacy than males.

4.2. Summary of hypotheses testing results

Based on all the previous discussion and findings, the results of all tested hypotheses could be summarized in the following table:

Table 7. Results of hypotheses testing

| Model | Hypothesis | Dependent variable | Independent variable | Result |
|-------|------------|-------------------------------|--------------------------------|--|
| 1 | H1 | Belief perseverance biases | Financial literacy | Reject the null hypothesis which indicates that there is a significant relationship. |
| | H1a | | Financial knowledge | Reject the null hypothesis which indicates that there is a significant relationship. |
| | H1b | | Financial abilities and skills | Accept the null hypothesis which indicates that there is no significant relationship. |
| | H1c | | Financial awareness | Reject the null hypothesis which indicates that there is a significant relationship. |
| | H1d | | Gender | Reject the null hypothesis which indicates that gender affects significantly the relationship between independent variables (IVs) and dependent variable (DV). |
| 2 | H2 | Information processing biases | Financial literacy | Reject the null hypothesis which indicates that there is a significant relationship. |
| | H2a | | Financial knowledge | Reject the null hypothesis which indicates that there is a significant relationship. |
| | H2b | | Financial abilities and skills | Accept the null hypothesis which indicates that there is no significant relationship. |
| | H2c | | Financial awareness | Reject the null hypothesis which indicates that there is a significant relationship. |
| | H2d | | Gender | Reject the null hypothesis which indicates that gender affects significantly the relationship between IVs and DV. |
| 3 | H3 | Emotional biases | Financial literacy | Reject the null hypothesis which indicates that there is a significant relationship. |
| | H3a | | Financial knowledge | Reject the null hypothesis which indicates that there is a significant relationship. |
| | H3b | | Financial abilities and skills | Reject the null hypothesis which indicates that there is a significant relationship. |
| | H3c | | Financial awareness | Reject the null hypothesis which indicates that there is a significant relationship. |
| | H3d | | Gender | Reject the null hypothesis which indicates that gender affects significantly the relationship between IVs and DV. |

Source: Authors' elaboration.

5. CONCLUSION

From a sample of 403 investors from the Egyptian stock exchange, there are 286 male investors and 117 female investors. The sample is examined using SPSS Statistics and Microsoft Excel. Where variables are coded into SPSS and results concluded that majority of the participant is male, most of them are aged between 30-40 years, which indicates that males are less conservative and more interested in securities trading than women. Implementing multiple regression analysis to test the impact of the dimensions of financial literacy on each category of the behavioral biases, in addition to test the effect of gender on that relationship lead to reach the following findings. Males exhibited to belief perseverance biases than other biases, while females exhibited to information processing biases than other biases, but in general, females exhibited different categories of behavioral biases than males. These results agree with previous studies, such as the ones conducted by Beckmann and Menkhoff (2008) and Jaiswal and Kamil (2012), who suggested that females tend to be more conservative and are having more risk averse behaviors, and consequently, they are more oriented towards income-based investments rather than the growth-based ones. But on the other side, these results do not agree with the research done by Lee et al. (2013), as they

suggested that men and women exhibited different behavioral biases, as evidence indicated that men have more willing to take risk than women. The majority of males show that they have good financial knowledge, while almost half of them have good financial abilities and skills but less than half of them show that they have good financial awareness. For females, less than half show that they have good financial knowledge, financial abilities and skills, and financial awareness. Those results agree with previous studies, as Baker et al. (2019) suggested males are more overconfident than females about their knowledge of the stock market. It seems that the dimensions of financial literacy have the great impact on the information processing biases, moderate impact on belief perseverance biases and weak impact on emotional biases. The effect of the dimensions of financial literacy in reducing the effect of different behavioral biases on the investment decision is greater in females than males. That results agree with previous studies conducted by Baker et al. (2019); they suggested that financial literacy has a positive relation with mental accounting bias.

Certain recommendations can be made from the findings of this research that can benefit different parties such as:

For investors: The main suggestion provided to them, is to always work on improving their

knowledge and information regarding the behavioral finance and biases context. Therefore, they must get to know more about the different behavioral biases, which will help them get better understanding of the extent to which they get affected by behavioral biases while making their financial decisions.

For the educational institutions: It is also recommended that the behavioral finance must be given an added significance inside the academic curriculum. If school succeeded in providing students with excellent knowledge in behavioral finance, it must also focus on the psychological aspect of the field, in order to help students in achieving a better self-understanding, and thus decision-making in a stressful position may not be as difficult for them as it would otherwise be the case. Knowing what to do is vital, but knowing when to do what needs to be done is invaluable.

For the financial consultants, advisors, and intermediaries: It will shed some lights on the guidelines of how the behavioral biases affect trading activities that explain the market dynamics and make specialists look more closely at factors other than price that impact the performance of the securities in the market, and how to deal with newly traded securities. Therefore, they can develop the training programs and tools that will rectify any distortions or anomalies that are in the market and which investors encounter while making investment decisions.

For the Government: The results of this paper will help in putting well-designed strategies regarding the operation and management of the stock

market effectively in Egypt, which will help in bringing the behavioral perspective regarding the decisions of trading of securities. This will be through policy formulation and regulation by the competent authorities.

Finally, some limitations should be mentioned, such as this study did not apply simple random sample technique in collecting data. This may have consequences for financial institutions in encouraging and developing the financial literacy programs for individual investors because results cannot be generalized over the whole population. So, it may be useful for future researches to use the simple random sampling technique to compare whether there will be significant differences between both results. Another limitation arises is regarding the questionnaire, as this research purposes to identify the financial literacy and behavioral biases of individual investors. Therefore, while respondents are answering the questionnaire form, they are supposed to be more comfortable and in a better frame of mind, especially in the context of questions that were presenting hypothetical positions. This set of mind is not consistent with them when exposed to real life situations.

The results of this research will offer more insights into theory and empirical evidence on the dimensions of financial literacy and how it could impact the different categories of behavioral biases of the individual investors, and the role of gender differences in this relationship, for the teaching institutions that will initiate further areas of study.

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