



# Issues that Matter When Behavioral Finance Factors Drive the Largest Initial Public Offering in the Saudi Financial Market

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## ABSTRACT

Behavioral financing is an emerging science and a relatively new area for academic research, leveraging investors' irrational behavior. To a certain degree, most investment decisions are affected by investors' biases and expectations, which do not follow rationality requirements. This study rigorously investigated a group of behavioral financial factors—optimism, pessimism, overconfidence, herd behavior, and loyalty—and firm characteristics, and then it examined whether and to what extent behavioral financial factors drive investors' behaviors about the largest initial public offerings (IPOs). This study employed structural equation modelling and used a representative survey of 353 investors during the IPO of Saudi Aramco. The study found that the factors that stimulated investors in the Saudi market, especially during the Aramco IPO behavior decision, included behavioral finance factors, such as optimism, overconfidence, loyalty, and herd behavior, while firm characteristics failed to shape investors' decisions during Aramco's IPO.

**Keywords:** Behavioral Financial, Firm Characteristics, Initial Public Offering, Optimism, Herd Behavior, Overconfidence

**JEL Classifications:** G40, G41

## 1. INTRODUCTION

The controversy about how behavioral finance factors shape investors' decisions, especially their initial public offering (IPO) investment behavior, has generated practical questions (Alcaniz et al., 2017). Indeed, over the past several decades, financial theories have been developed to understand the rationality of investors' decisions across financial markets.

However, several empirical studies have faced difficulties when explaining many phenomena in financial markets. Typically, investors in financial markets might make different and important financial decisions. The most common financial decisions seek to maximize investors' wealth, especially via IPOs (Baker et al., 1977; Ricciardi and Simon, 2000; Ritter, 2003; Ricciardi, 2004). Conversely, other investors are more risk averse, so they follow IPO behavior decisions that have a lower risk. Notably, traditional financial theory has concentrated on the rationality of

financial decisions with the view to maximize investors' wealth by following traditional financial rules and trading-off risks and returns by adopting new models (Virigineni and Rao, 2017; Baddeley, 2018; Singh, 2019). Theoretically, financial theories are based on traditional financial theories, which emphasize that all decisions in financial markets are rational and investors are well-informed, consistent, and careful; thus, investors do not have difficulty making investment decisions (Tseng, 2006; Ricciardi, 2008; Bloomfield, 2010). Consequently, modern portfolio theory assumes that investors in financial markets are not puzzled about the amount of information, and they are not controlled by behavioral financial factors (Alquraan et al., 2016), while, their inclinations and emotional and psychological biases (optimism, pessimism, overconfidence, herd behavior, and loyalty) might affect their rationality, especially during IPO behavior decisions that have a limited time (Barberis et al., 1998; Haruvy et al., 1999; Akerlof and Shiller, 2010; Dhaoui et al., 2013; Dhaoui, 2015; Alquraan et al., 2016). Accordingly, studying the behavioral

financial factors that impact investors' IPO investment decisions is very important since investors rarely make their financial decisions using financial theories.

There are several reasons for studying the investment behavior intention determinants in financial markets. First, it is connected with a new field of scientific science popularly known as behavioral finance and economics. Second, this subject is valuable to investment and personal finance industry practitioners. Finally, extensive observational work on investor behavior has been conducted on growing markets and economies, often using financial market data. Yet, in Saudi Arabia, very few attempts have been made to consider investor behavior using primary research techniques, such as questionnaires, psychometrics, and experimental methods. Thus, presenting scientific data using these distinctive methods, which are generally deemed to be superior for explaining behavioral issues, would contribute to the literature on behavioral finance and economics. This study contributes to financial behavior literature in several ways. First, we investigated the effects of investor behavior on IPO investment decisions specifically in the context of the Kingdom of Saudi Arabia's (KAS) Stock Market. Second, this study aimed to develop a framework about financial behavioral factors using the financial behavior theory of individual investors in of the KAS Stock Market.

Hence, in this study, we rigorously investigated the influence of behavioral finance factors and firm characteristics on IPO investment decisions of 353 investors using questionnaires, which were valid for analysis and were randomly distributed among the participants during the IPO investment decision of Saudi Aramco. This study distinguishes itself from existing studies in the following manner: while most behavioral finance studies concentrate on the decisions of investors when trading stocks, the current study focused on investors' decisions during an IPO investment decision. Additionally, we concentrated on an emerging market, specifically, the Saudi financial market, via the case of Aramco's IPO decision. Moreover, we considered the effects of both behavioral finance factors and firm characteristics by adopting structural equation modelling (SEM).

The case of Saudi Aramco might provide an opportunity to investigate the impacts of behavioral financial factors for local investors as well as regional investors, which may result in significant contributions that would extend our findings. Indeed, the world's most profitable company might provide the opportunity to determine the behavioral financial elements of investors, and compare the influences of behavioral financial factors with the impacts of firm characteristics on an IPO investment decision. Saudi Aramco aims to continue to be the global leader in the energy sector, as well as one of the key firms for both the Saudi market and global markets (Franklin, 2020). These elements provide incentives for investors to join the world's largest IPO.

In this study, we empirically explored how behavioral financial factors influence investors' IPO investment decisions compared to firm characteristics. The empirical results reveal that optimism has a significant positive influence on the IPO decision of Saudi Aramco. Additionally, overconfident investors have a significantly

positive impact on IPO investment decisions, and herd behavior has a significantly positive impact on IPO decisions. Moreover, the study's results show that loyalty has a significantly positive influence on investors' IPO investment decisions. However, firm characteristics did not result in any significant differences in investor decisions.

The rest of this paper is organized as follows. Section 2 presents a review of the relevant literature on behavioral finance. Section 3 describes the data and the methodology used in the study. Section 4 presents the discussion and the empirical results. Section 5 concludes the paper.

## 2. LITERATURE REVIEW

### 2.1. Background on Behavioral Finance

The study of behavioral finance, with its roots in human decision-making based on psychological studies, is considered to be a new and evolving topic in the field of finance. The rapid changes in the global financial markets and the competition between financial institutions and social and economic changes have created instability and uncertainty in financial markets, consequently making financial decision processes more complex (Dhankar, 2019). Thus, the behavioral finance approach has concentrated on the implementation of financial and psychological principles to promote financial decision-making processes. In this respect, the behavioral finance approach not only aims to improve faulty or biased financial decision-making processes, it also aims to understand and predict the systematic behaviors of financial markets via psychological decision-making processes (Firat and Fettaoglu, 2011). Both finance and psychology play a role in mental decision-making models; however, finance is primarily focused on prediction, which allows financial theorists to freely construct analytical and normative models based on abstractions of decision-making processes; for example, the capital asset prices model introduced by Sharpe (1964), the option pricing models of Cox and Ross (1979), and the arbitrage pricing theory developed by Roll and Ross (1980). In other words, behavioral finance is a field that uses psychological-based theories to study financial market anomalies by assuming that the characteristics and information structure of the market participants systematically impact the decisions of investors and market outcomes (Thaler, 2005). However, investors might sometimes fall prey to the mistakes made by others, and many times they will make their own mistakes due to overconfidence and self-attribution bias, or they may use emotions when making financial decisions. Nevertheless, the concept of financial behavior is still unfamiliar to and unused by many financial advisors (Daniel et al., 1998). Theoretically, expected utility theory is considered to be the premier concept or starting point of traditional theories (Risk and Bernoulli, 1954). Thus, utility has been used to measure individual satisfaction by introducing the concept of the homo economicus or rational economic man, which focuses on maximizing satisfaction (Mill, 1874). This agent was subject to three assumptions: (i) perfect information, (ii) perfect self-interest, and (iii) perfect rationality. These formed the cornerstone of traditional financial theories (Pompian, 2011). In this context, Table 1 presents a summary of the development of several traditional financial theories.

Traditional financial theories had to be well-constructed in order to create appropriate financial decisions. However, these theories failed to interpret the anomalies and disruptions in financial markets (Tversky and Kahneman, 1979). From time to time, anomalies and disruptions emerge in the form of financial market bubbles, market under- or overreaction, reversals, and momentum (Shleifer, 2000). In this regard, the field of financial behavior started to evolve and it tried to provide good illustrations of these disruptions and anomalies in financial markets by creating other financial behavior models. For instance, the concept of prospect theory has been considered to be the backbone of financial behavior. It studies the investors' decision-making process under risk, and it concentrates on the value that individuals attach to losses or gains. Therefore, this value function replaces the utility function within utility theory, and it has been proven that some losses or gains are felt more than others (Simon, 1955; Pratt, 1964; Raiffa, 1968; Tversky and Kahneman, 1979). However, sometimes, the pain experienced from losses is greater than the happiness felt from gains (Kapoor and Prosad, 2017). Thus, this theory could be the seminal work in financial behavior, and it is considered to be the underlying basis of "loss aversion" and

dispositional impacts. This theory started to be spotlighted after incorporating traditional financial theories and behavioral aspects to create new behavioral financial theories, which, for example, might provide new alternatives to the expected utility theory (Shefrin and Statman, 1994). Table 2 illustrates the development of behavioral financial theories over time.

Rational expectations and the efficient market hypothesis significantly failed to explain the behavior of risk and returns across international financial markets in both emerging and developed countries (Akerlof and Shiller, 2010; Dhaoui et al., 2013). In financial markets, this dysfunction is caused by human psychology (Dhaoui et al., 2013). Hence, behaviors, such as sentiments and feelings (Keynes, 1936; Akerlof and Shiller, 2010), overconfidence (Daniel et al., 2001), pessimism (De Bondt and Thaler, 1985; Barberis et al., 1998), optimism (Weinstein, 1980; Haruvy et al., 1999), and many other human characteristics might contribute to disruptions in financial markets and increase the need to incorporate elements of human psychology in financial modelling.

In this regard, the incorporation of psychological indicators within financial models may help confirm the predictions of financial behavior theory when the behavior of investors is not completely rational over time since, in major cases, financial markets are affected by human psychology (Shiller, 2002). Therefore, the rationality hypothesis and efficient market hypothesis fail to explain market returns when the dysfunction in financial markets may be attributed to irrational behavior and human psychology (Lavoie, 2010). Actually, arriving at rationality might require two things in addition to using knowledge to enhance satisfaction: updating information and knowledge (Barberis and Thaler, 2003). However, investors might fail if they expect the behavior of risks and returns in financial markets to be rational (Dhaoui et al., 2013). Consequently, they attribute the dysfunction in

**Table 1: Traditional financial theories**

Theories	Author	Year
Economic Man or homo economicus	John Stuart Mill	1844
	Bernoulli	1738,1954
	Von Neumann and Morgenstern	1944
Markowitz portfolio theory	Harry Markowitz	1952
	Treynor, Sharpe, and Lintner	1962,1964, 1965
	Jan Mossin	1966
Efficient market hypothesis	Eugene Fama	1970

Source: Kapoor and Prosad (2017)

**Table 2: Behavioural financial theories**

Model/concept/theory	Author	Year
Bounded rationality model	Herbert Simon	1955
Cognitive dissonance theory	Festinger, Riecken and Schachter	1956
Heuristic biases theory	Tversky and Kahneman	1973,1974
Prospect theory	Kahneman and Tversky	1979
Framing bias theory	Tversky and Kahneman	1981
Mental accounting bias	Richard Thaler	1985
Overreaction in stock markets theory	De Bondt and Thaler	1985
Model of investor sentiment	Barberis, Shleifer and Vishny	1998
Behavioural portfolio theory and behavioural asset pricing theory	Meir Statman	1999
Stock markets are inefficient: linkage of efficient market hypothesis with behavioural finance	Andrei Shleifer	2000
Asset pricing via prospect theory view	Barberis, Huang and Santos	2001
Determining trading behaviour	Grinblatt and Keloharju	2001
Realistic paradigm of "homo economicus"	Hubert Fromlet	2001
Behavioural finance survey	Barberis and Thaler	2003
Prospect theory and IPO BEHAVIOR DECISION	Ljungqvist and Wilhelm	2005
Behavioural biases in stock prices	Coval and Shumway	2006
Normative behavioural finance of CEOs	Avanidhar Subrahmanyam	2008
Consumer choice behaviour and mental accounting	Richard Thaler	2008
Traditional and behavioural finance approaches with market inefficiencies	Robert Bloomfield	2010
Explaining value investing via investor sentiment and behavioural finance	Parag Parikh	2011
Evolution of behavioural finance	Uzar and Akkaya	2013
Factors influencing IPO behavior decision- Survey	Szyszka	2014

Source: Kapoor and Prosad (2017)



financial markets, particularly, to human characteristics or human psychology elements (Dhaoui, 2015). Accordingly, some psychological elements may impact the behavior of investors in financial markets, especially when investors' emotions and beliefs matter when making financial decisions (De Bondt and Thaler, 1995; Odean, 1998; Gervais and Odean, 2001; Akerlof and Shiller, 2010; Kapoor and Prosad, 2017); therefore, these beliefs and emotions might cause investors to make irrational decisions (Rousseau et al., 2008). However, the effects of psychological factors on investors' behavior in IPOs remain debatable because homogeneous opinions are not possible due to the heterogeneity in investors' beliefs (Miller, 1977).

## 2.2. Behavioral Finance and IPOs

There are differing views about investors' behavior during IPOs. Future returns from a new issuance are uncertain, and this divergence of views becomes most significant after a stock is issued (Miller, 1977). Moreover, the lack of knowledge and information about the new firm enhances the uncertainty about the new issuance and creates heterogeneous opinions about it. However, these heterogeneous opinions become narrower over time as more information about the firm becomes available (Low and Yong, 2013).

Evidently, the differences of opinion regarding an IPO investment decision are not observable. However, investors' behaviors can assist in inferring these differences of opinion, and the pricing mechanism of an IPO decision might provide a potential opportunity to reveal the private valuations of investors for this new issuance. The pricing mechanisms of IPO investment decisions stimulate investors to provide bids that encourage investors to disclose their beliefs about the fair value of the new issuance (Benveniste and Spindt, 1989; Biais et al., 2002; Derrien and Womack, 2003; Chahine, 2007; Low and Yong, 2013). Collectively, most theoretical and empirical studies have emphasized that investors' opinions are not observable. In the context of a new IPO investment decision issuance, this is also significant when inferring about the IPO aftermarket decision, where investors' aftermarket behaviors are influenced by their expectations of the new IPO decision issuance. Therefore, the divergence of investors' expectations is likely to influence investors' decisions about selling and buying the new issuance (Bayley et al., 2006).

Furthermore, the initial pricing is based IPO investment decision-specific information and the expected information about the behavior of the IPO decision when it starts trading on a secondary market. In other words, the value of a behavior decision captures both ex-post and ex-ante information that might be available to the IPO investment decision. Hence, this information is significant in shaping the investors' opinions about and expectations of the issuance. Given the uncertainty about the fair value of the new IPO investment decision, differences of opinions are likely to occur among investors since the potential IPO investors have no opportunity to reveal their beliefs about the new issuance and they have different estimations about the expected return of the new IPO investment. These varying beliefs and expectations might be influenced by some behavioral factors that might

influence investors' financial decisions (e.g., optimism, pessimism, overconfidence, herd behavior, and loyalty).

## 3. RESEARCH MODEL AND HYPOTHESIS

Behavioral finance provides options for making investment decisions that have become very popular in the stock market. During the 2008 financial crisis, most investors suffered as a result of their behavioral attitudes (Adam, 2010). When conducting a behavioral finance study, it was found that investors are not completely rational. Investment decisions are influenced by behavioral factors/biases. Such behavioral/psychological factors include overconfidence, emotions, and overreaction (Martin et al., 2009).

Gervais and Odean (2001) and Odean (1998) have established theoretical models that suggest that insecure investors typically have behavioral biases, such as self-assignment and overconfidence. Consequently, due to a lack of expertise and overconfidence, these investors typically have little confidence in themselves.

Past studies have shown that conduct, including the impact of temperament, over-confidence, and misunderstanding, has caused some investors to suffer heavy losses in their stock investments (Odean, 1998). In fact, females typically make more money on the stock market than males. One of the reasons for this difference is that males make whimsical decisions because of overconfidence. Moreover, it is argued that overconfidence among investors has led to a bullish trading trend (Grinblatt and Keloharju, 2009). The study also found that investors' attitudes towards risk affect their actions (Grinblatt and Keloharju, 2009).

One of the most commonly debated issues is individual investment actions and cognitive discrimination. Many previous research studies have been conducted to understand the essence of individual behavior in financial markets. However, most of these studies were conducted in the United States (US), the European Union, and other developed countries. Few studies have been conducted in Asia, or more explicitly in the Saudi Arabia context. Thus, the present empirical research study successfully represents one of the aims of investigating the factors that affect the actions of individual investors on the Saudi Stock Market, and it sheds light on the role of individual investors and their effects on that stock market. Financial researchers have attached greater importance to investigating how individual investors influence stock prices. However, it is widely assumed that individual investors seldom have any effect on stock prices (Barber et al., 2005). With this understanding of individual investors without any empirical evidence in the Saudi context, it is important to note that most of the investment strategies and policies for trading or stock prices are designed and geared towards institutional investors.

The strategies and policies for trading or stock prices in the stock market are designed and geared towards institutional investors. Due to the money or monetary interest of institutional investors, investment managers and policymakers have focused more on institutional investors. To some degree, individual investors are being overlooked solely based on this principle.

Optimism and pessimism might explain investors' beliefs about the price of an IPO investment decision. De Bondt and Thaler (1985, 1987), Benos (1998), Daniel et al. (2001), and Ciccone (2003) related the anomalies in IPO pricing decision and the presence of overreactions or underreactions in IPO decisions to optimistic and pessimistic beliefs about the new issuance. These authors emphasized that overreactions and underreactions are driven by optimistic and pessimistic views about new IPO investment decisions. Similarly, Ciccone (2003) added that the behaviors and emotions of investors might play pivotal roles in new IPO investment decisions; hence, pessimism and optimism may shape the value of that decision. However, optimism can be interpreted in different ways. For instance, according to Haruvy et al. (1999), optimistic investors are "those who tend to choose the strategy which can potentially give them the highest payoff." Other authors have considered optimistic investors to be "investors who are motivated by worst-case scenarios and hence tend to choose a secure action." By extension, optimistic investors believe that good events always happen for them, and bad events rarely occur for them (Weinstein, 1980, 1987, 1989). In contrast, pessimistic investors are more likely to experience bad events, and good events rarely occur for them (Chen, 2013). In summation, optimism and/or pessimism might drive the financial decisions of investors, especially for new issuances. In contrast, some authors argued against the role of optimism and pessimism in financial markets, especially in the case of a new IPO investment decision; and they emphasized that this role is implicit without providing any strong supporting evidence. Additionally, it is difficult to distinguish between these sentiments and random decisions, and it is hard to measure optimistic and pessimistic sentiments (Baker and Wurgler, 2006). Consequently, those scholars believe that optimism and pessimism do not have a significant influence on new investment behavior decision. Rather, certain investors are more likely to behave according to their predictions; if they are too optimistic, prices will rise; if they are too pessimistic, they will have a negative effect on the market. Many studies have investigated the impact of optimism and pessimism on stock prices and investors' decisions, including Tariq and Ullah (2013) on the Pakistan Stock Exchange and Tran (2017) on the Thai Stock Market.

Thus, the following hypothesis was developed:

H1: There is a positive relationship between optimistic and pessimistic sentiments and IPO investment decisions.

Regarding overconfidence, many studies have defined this behavioral factor as "an overestimation of the precision of private information signals" (De Long et al., 1988; Kyle and Wang, 1997; Benos, 1998; Wang, 1998; Gervais and Odean, 2001; Hirshleifer and Luo, 2001; Scheinkman and Xiong, 2003; Chuang and Lee, 2006). Therefore, asymmetric information becomes a logical source of more risk. In the context of a new IPO investment decision, the value of that decision is quickly adjusted based on the available information (Triatyati and Husnan, 2004; Su and Bangassa, 2011; Dong et al., 2011; Brämisch et al., 2011). Consequently, the new IPO investment decision might be influenced by investor overconfidence, which causes investors to overreact in their demand for the new issuance (Ajlouni and Abu-Ein, 2009). This scenario might be applicable for informed

investors who are overconfident in their decisions and have the abilities and skills needed to analyze the potential of an IPO investment decision. Other studies have concentrated on the effects of self-attribution and overconfidence on the prospects of an IPO investment decision. Thus, the self-attribution model predicts that overconfident investors can be successful in their new IPO decisions, but they need to gradually develop some level of overconfidence (Baker et al., 2007). In fact, due to this model, experienced investors who have reasonable levels of overconfidence may exhibit more optimism regarding the prospects of a new IPO investment decision (Hsu and Shiu, 2010). However, other models assume that overconfidence exists in a dynamic model; thus, the degree of overconfidence changes over time, which creates biased self-attribution and impacts the success of investors' decisions (Hirshleifer and Luo, 2001; Glaser et al., 2004). Consequently, the influence of overconfidence on an IPO investment decision needs to be further studied. Lim (2012) and Bakar and Yi (2016) reported that investor judgments are significantly influenced by overconfidence. Moreover, Hon (2012) concluded that in the Hong Kong Stock Market, most of the individual investors were overconfident. Longjie and Anfeng (2017) found a strong link between overconfidence and investment level in their study on the Chinese Stock Market.

Thus, the following hypothesis was developed:

H2: There is positive relationship between overconfidence and IPO investment decisions.

For the most part, the relationship between loyalty and IPOs is a new subject. Some studies have suggested that investor loyalty could be defined based on investors' attitudes and behaviors (Morck, 2010). Attitudinal loyalty might refer to feelings that create an individual's attachment to a specific organization's stocks, where these feelings determine the degree of loyalty in both the primary market and the secondary market (Jacoby and Kyner, 1973). Therefore, with the goal to attract retail investors, firms with potential IPO investment decisions attract investors via a bonus (loyalty) share issue with no additional outlay (Ramady, 2018). For instance, Narayanan, Martin, and Fattah (2019) noted: "Aramco is exploring ways to reward loyal investors in its initial public offering to make sure the record share sale is not followed by a wave of selling by offering bonus shares to retail stock buyers who keep their holdings for six months<sup>1</sup>". However, some research studies have suggested that loyalty is a behavioral approach that reflects the decision to continue to purchase goods and services from the same supplier, so it is not applicable for stocks or IPO investment decisions (Yi, 1990).

Thus, the following hypothesis was developed:

H3: There is positive relationship between loyalty and IPO investment decisions.

Herd behavior occurs when investors follow or mimic other investors' decisions (Scharfstein and Stein, 1990; Christie and Huang, 1995; Chang et al., 2000). Investing in an uncertain environment can cause investors to follow the decisions of other

<sup>1</sup> According to (Narayanan, Martin, & Fattah, 2019).

investors with the goal of avoiding investment risk or potential losses due to information disadvantages, or to reduce the cost of information; this might create herd behavior among investors (Wang et al., 2017). Kumar and Lee (2006) emphasized that individual investors typically have inferior information, which would enhance the motivation to engage in herding behavior among individual investors, especially in an investment environment in which there is significant information asymmetry (Lin et al., 2010). In the context of IPO investment decisions, investors are more exposed to this phenomenon, where the lack of information about new issuers encourages investors, especially individual investors, to follow a herding strategy (Yao et al., 2014). Furthermore, the unique features of the primary market in emerging countries make it ideal for herding behavior (Wang et al., 2017). Conversely, other financial researchers have observed that herd behavior is a vague concept that ignores the judgements, information, and experiences of investors regarding the merits of their financial decisions (Kahan and Klausner, 1996). Financial analysts have provided other arguments about herd behavior that do not support the rationality of investors when following each other's actions; to some extent, they emphasized that the value of deviating from the herd is greater than the value of following the herd (Bikhchandani and Sharma, 2000). Balcilar and Demirer (2015) and Shams and Passand (2015) considered herding behavior in high volatility stock markets. The herd rate was also evaluated in various stock markets worldwide, including developed and Asian stock markets (Chiang and Zheng, 2010). Hon (2012) found that the Hong Kong Stock Market exhibits herd behavior.

Thus, the following hypothesis was developed:

H4: There is a positive relationship between herd behavior and IPO investment decisions.

Firm characteristics play essential roles in determining the value of IPO investment decisions. Many researchers have suggested that the specific characteristics of a company influence IPO investment decisions by increasing uncertainty about the firm (Beatty and Ritter, 1986). For instance, James and Wier (1990) and Habib and Ljungqvist (2001) used firm characteristics, such as age, size, ownership, industry, CEO, and capital structure, as variables that might impact investors' decisions about a new IPO investment decision. Thus, these firm characteristics and disclosed prospectus information have received significant empirical support since asymmetric information among these characteristics influence investors' decisions on IPO pricing by increasing uncertainty about the new IPO investment decision (Farooq et al., 2018). Khan, Ahmad Anuar, Muhammad, and Ramakrishnan (2016) stated that the value of an IPO investment decision is different in every country and market depending on the rules and regulations, the institutional structure, and the characteristics of the company going public. However, in many cases, investors focus on underpriced IPO investment decisions to reap gains in the first days of trading, regardless of the firm's characteristics (Farooq et al., 2018). In fact, firms underprice their shares by lowering their price from the fair market value to help the firm sell the IPO investment decision in the initial days of trading, without considering the characteristics of the firm (Ibbotson et al., 1988).

Thus, the following hypothesis was developed:

H5: There is positive relationship between firm characteristics and IPO investment decisions.

Based on the literature analysis, the research model variables are overconfidence, loyalty, Herd behavior, firm characteristics, optimism and pessimism, and IPO investment decision. Figure 1 represents the relationships among them.

## 4. RESEARCH METHODOLOGY AND DATA

### 4.1. Instrument and Procedure

To assess the proposed model, we generated a questionnaire that initially included 21 items with four items for overconfidence, three items for herd behavior, four items for optimism and pessimism, three items for company nature, four items for loyalty, and three items for investment intentions. For all the items, a five-point Likert scale (1–5) was used, ranging from '1 strongly disagrees' and '5 strongly agree'. Table 3 Show the Construct measurement summary. Demographic data for the sampled participants were also collected.

The research participants were included in the study if they had invested in the Saudi Stock Market. Specifically, to achieve the goals of this investigation, we chose people that were current investors in the KSA Stock Market. We used an online survey because it has several advantages over traditional paper surveys (Tan and Teo, 2000). For example, it is more affordable to conduct an online survey, and it can measure the target population without geographical limits (Hsu and Lu, 2004). Additionally, surveys have been utilized by researchers to accomplish research goals. We performed an online survey targeting investors in the KSA Stock Market. The online survey was conducted over a three-month period. We sent the online survey to participants on social media sites, such as Twitter and Facebook, using a convenience sampling technique. We obtained a final sample of 353 responses from Saudi participants who were current or past investors in the KSA Stock Market. Table 4 summaries the profile of survey participants.

### 4.2. Common Method Bias (CMB)

We utilized the Harman (1967) factor to examine a single factor. The Harman common method variance was not present in this investigation since the total variance, defined by one factor, was only 36.846%, which was not >50% (Podsakoff et al., 2003). Hence, there was no severe CMB that influenced the research model's outcomes.

### 4.3. Kaiser-Meyer-Olkin (KMO) and Bartlett's Test

It is essential to use the KMO test and Bartlett's test to conduct confirmatory factor analysis (CFA). Hinton et al. (2004) stated that the KMO test and Bartlett's test can determine whether it is proper to continue with CFA. The KMO test examines whether the variables in a given sample are sufficiently correlated, and Bartlett's test of sphericity can confirm the correlation among the variables (Hair et al., 2010). The KMO value should exceed the minimum value of 0.60 and Bartlett's test should produce a value that is significant at  $p < 0.05$  (Hair et al., 2010). The outcomes of this study indicated a KMO value of 0.940; the Bartlett's test was significant at  $p < 0.05$ . Hence, the results exceed the minimum significance needed, and they verify the fitness of the data for conducting CFA.



**Table 3: Summary of the measurement scales**

Construct	Item	source
Optimism and Pessimism	<ul style="list-style-type: none"> <li>• Plan to increase my investment in the stock market in next 12 months (Increased Investments)</li> <li>• The prices of stocks will increase in next 12 months</li> <li>• If the stock price drops by &lt;3%. I would suggest that it will recover most of its losses in a few days</li> <li>• I will stay invested in the Saudi Stock Market even during Crisis.</li> </ul>	Iqbal et al., (2014)
Overconfidence	<ul style="list-style-type: none"> <li>• I have complete knowledge of stock market</li> <li>• I am fully responsible for the results of my investment decisions.</li> <li>• I am confident of my ability to do better than others in picking stocks</li> <li>• Performance of the Saudi Stock Market</li> </ul>	Iqbal et al., (2014)
Herd Behavior	<ul style="list-style-type: none"> <li>• Stories of successful Investors</li> <li>• Media focus on Stock Market</li> <li>• Perception of easy money among Investors</li> </ul>	Bennet, et al. (2012)
Firm Characteristic	<ul style="list-style-type: none"> <li>• Corporate success</li> <li>• Financial performance</li> <li>• Quality of product</li> </ul>	Helm (2007)
Loyalty	<ul style="list-style-type: none"> <li>• Do you feel bonded to company x</li> <li>• Do you identify with company x</li> <li>• Are you interested in the welfare of company x</li> <li>• Would you regret if company x and products no longer available</li> </ul>	Helm (2007)
IPO investment decision	<ul style="list-style-type: none"> <li>• I will invest in Company—stocks.</li> <li>• I will encourage my friend and family to invest in Cmpany—stock</li> <li>• I will invest in company—stocks in near futur</li> </ul>	Akhtar and Das (2019)

**Table 4: Demographic characteristics of the study participants**

Demographic variable	Frequency	Percent
Age		
<25	76	21.5
26-35	152	43.1
36-45	89	25.2
Above 45	36	10.2
Gender		
Male	283	80.2
Female	70	19.8
Occupation		
Military sector	43	12.2
Public sector	124	35.1
Private sector	85	24.1
Own business	26	7.4
Student	75	21.2
Education		
Less than High School	5	1.4
High School	55	15.6
Bachelor	193	54.7
Postgraduate	100	28.3
Income		
Less than 5000 SR	96	27.2
5000-10000 SR	83	23.5
10001-14999 SR	71	20.1
15000 or more SR	103	29.2
Location		
Main city	264	74.8
Medium city	63	17.8
Village	26	7.4
Status		
Single	131	37.1
Married	222	62.9

#### 4.4. Reliability, Validity, and Model Fit Analyses

The reliability of the scales used to measure the constructs in this study was assessed using Cronbach's alpha, which measures the internal consistency of a scale. The Cronbach's alphas for all the

study constructs are presented in Table 5. The Cronbach's alphas for all the measures were comfortably above the recognized lower limit of 0.70 endorsed by Nunnally (1978).

The content validity was assessed using three methods. First, we reviewed the literature to determine the variables and items to be employed in the research model. Following that, the variables and items were examined to confirm that all the aspects represent the research goals. A pilot study was conducted that was aimed at ensuring that the participants were able to understand the survey questions (Alreck and Settle, 2004).

CFA was conducted to assess the model's construct validity using SPSS AMOS 24. As proposed by Jaccard and Wan (1996), we used the root mean squared error of approximation (RMSEA), the  $\chi^2/df$  fit measure (the ratio of the chi squared to the df), the comparative fit index (CFI), and the normed fit index (NFI) to assess the model's goodness of fit. Initially, after making revisions by deleting some of the items with low factors or insignificant loadings, we performed CFA on all the constructs in the model. The results provided strong evidence that the model had adequate convergent and discriminant validity; therefore, they confirmed the construct validity of the model. All the model fit statistics met the cut off values to indicate a good fit: a CMIN/df of 3.129 (cut off value 0.5; Carmines and McIver, 1981), a TLI of .901 (cut off value >0.8; Hu and Bentler, 1999), a CFI of 0.926 (cut off value of 0.9; Browne and Cudeck, 1993), an RMSEA of .071 (cut off value of <0.08; Browne and Cudeck, 1993), and a Parsimony Comparative Fit Index (PCFI) of .804 (cut of value >0.8; Hair et al., 2010).

##### 4.4.1. Convergent validity

Fornell and Larcker (1981) suggested that the average variance explained (AVE) measure of the research construct should be >0.5 and the construct reliability (CR) of all the constructs should be >0.7 to substantiate the convergent validity of the research model. Table 5 reports the AVE and CR for each construct calculated

using the final fitted measurement model. The constructs have AVEs >50%, the construct reliabilities are >0.70, and the all factor loadings are acceptably >0.50. Therefore, the results for all three measures provide solid confirmation of the convergent validity of the proposed model.

#### 4.4.2. Discriminant validity

Table 5 presents a summary of the AVE for each construct and the squared inter construct correlation for each of the constructs in the model. To confirm divergent validity, the AVE for a construct must be higher than the squared correlation of that construct with the other constructs in the study. Table 6 reports the AVE and squared inter-construct correlations, and the results indicate that the AVE for each construct is larger than its squared correlation with the other constructs in the proposed model. These results support the divergent validity of the measurement model. In conclusion, the CFA shows clear proof for convergent and divergent validity and high reliability.

**Table 5: AVE and CR for each construct in the final measurement model**

Construct	Items	Factor loading	Composite reliability	AVE	$\alpha$
Optimism and Pessimism	OP1	0.856	0.911	0.719	0.808
	OP2	0.759			
	OP3	0.904			
	OP4	0.867			
Overconfidence	OC1	0.853	0.839	0.567	0.746
	OC2	0.676			
	OC3	0.777			
	OC4	0.694			
Firm characteristics	CN1	0.891	0.900	0.751	0.767
	CN2	0.933			
	CN3	0.891			
Herd Behaviour	HB1	0.663	0.762	0.518	0.685
	HB2	0.793			
	HB3	0.696			
Loyalty	LOY1	0.835	0.881	0.654	0.853
	LOY2	0.876			
	LOY3	0.897			
	LOY4	0.590			
IPO investment decision	IN1	0.879	0.935	0.828	0.926
	IN2	0.937			
	IN3	0.913			

#### 4.5. Hypothesis Test

Many researchers have used SEM to analyze their research models. Following the CFA results, the structural measurement model was developed by adding arrows between the endogenous and exogenous variables in the diagram to indicate the hypothesized relationships. The maximum likelihood estimation method was used to examine the model. The study's SEM relates the proposed model's constructs to reflect all of the study's hypotheses. All the model fit statistics met the cut off values to indicate a good fit: a CMIN/df of 0.304 (cut off value 0.5; Carmines and McIver, 1981), an NFI of 0.901 (cut off value >0.9; Hair et al., 2010), an RMSEA of .076 (cut off value of <0.08; Browne and Cudeck, 1992), a TLI of .916 (cut off value >0.8 Hu and Bentler, 1999), and a CFI of 0.931 (cut off value of 0.9; Browne and Cudeck, 1993). Table 7 and below show the results of the hypotheses testing. In addition, the subsequent path coefficient analysis evaluated the proposed relationships among variables, as presented in Figure 2.

## 5. RESULTS AND DISCUSSION

Table 7 illustrates the results of our analyses; the outcomes reveal that rational investors were influenced largely by non-rational behavior; hence, rational investors do not control the way the financial market works. Instead, other human characteristics might play a pivotal role in influencing investors' IPO investment decisions. Consequently, optimism, overconfidence, loyalty, and herd behavior significantly influence IPO investment decisions in the Saudi financial market, in general, and in the Saudi Aramco IPO decision in particular, in comparison to firm characteristics. Generally, the results indicate that the rational expectations hypothesis fails to explain investors' IPO investment decisions, and so the rationality hypothesis is rejected.

In this sense, the results show that the null hypothesis of optimism can be rejected. Therefore, optimism has a significant positive impact on investors' Saudi Aramco IPO investment decisions. The study proved that optimistic sentiments have an impact on financial decision-making processes. This indicates that Saudi investors react positively when they expect gains, they

**Table 6: Factor correlation matrix with the square root of the AVE**

	Optimism and pessimism	Overconfidence	Loyalty	Hard behavior	IPO investment decision	Firm characteristics
Optimism and pessimism	0.848					
Overconfidence	0.831	0.753				
Loyalty	0.844	0.702	0.809			
Hard behavior	0.840	0.706	0.802	0.719		
IPO investment decision	0.716	0.716	0.733	0.617	0.910	
Firm characteristics	0.759	0.713	0.759	0.713	0.666	0.867

**Table 7: SEM results with estimates of the standardized path coefficients**

Hypothesis		Estimate	t-value	P	p	
Optimism and Pessimism	→	IPO decision	0.255	4.184	***	Hypothesis supported
Overconfidence	→	IPO decision	0.239	2.166	0.030	Hypothesis supported
Loyalty	→	IPO decision	0.255	4.184	***	Hypothesis supported
Herd Behaviour	→	IPO decision	0.342	2.570	0.010	Hypothesis supported
Firm characteristics	→	IPO decision	-0.039	-0.308	0.758	Hypothesis not supported



Figure 1: Research Model

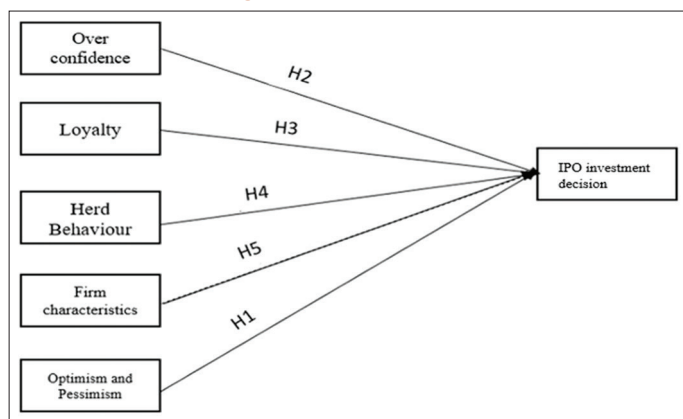
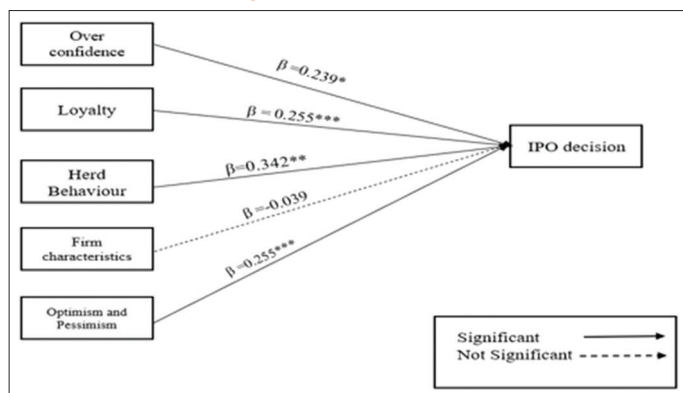


Figure 2: Revised Model



underestimate any risk exposure, and they are highly confident about Aramco’s future. In fact, the Saudi government’s implicit guarantees for financial markets, in general, and for Aramco in particular, enhance investors’ optimism about the issuance of Aramco’s IPO (Shaddady and Moore, 2015). Furthermore, this implicit guarantee increases investors’ optimism about exploiting opportunities, which might occur on the first day of trading, and it induces excessive reactions about the IPO investment decision (Dhaoui, 2015).

Similarly, overconfidence impacts IPO investment decisions. The study revealed that investors that are more overconfident have a significantly positive influence on IPO investment decisions in the case of the Saudi financial market; this result leads to rejecting the null hypothesis regarding overconfidence. In fact, as an Arab population, Saudi investors are more exposed to overconfidence bias. In this context, studies have emphasized that the Saudi population is overconfident about life in general (Alquraan et al., 2016; Alsabban and Alarfaj, 2020). This implies that Saudi investors, among others, might have a psychological bias that leads to overconfidence bias. The overconfidence bias among investors might produce an underestimation of the risk exposure and create aggressive decisions, which can be reflected in IPO investment decisions (Odean, 1998). Moreover, the success of most IPO behavior decisions in the Saudi financial market enhances investors’ beliefs that they make better investment decisions than everyone else, which leads to overconfidence

bias among Saudi investors about new IPO investment decisions (Bessière and Elkemali, 2014).

Equally important, herd behavior has significantly positive impacts on IPO investment decisions; this finding rejects the null hypothesis and supports the alternative hypothesis. This result is consistent with herd theory, which emphasizes that individuals sometimes might make decisions that favor the group (Alquraan et al., 2016). Indeed, individuals believe that they are more exposed to risk, individually; thus, the risk can be reduced by engaging in group thinking. In the case of the Saudi market, one is more likely to observe sentimental herding, especially during a new IPO behavior decision, due to weak governance, less informed investors, and the market not being completely informed about the market fundamentals.

We also reject the null hypothesis and confirm the alternative hypothesis for loyalty by revealing the significantly positive influence of loyalty on IPO investment decisions in the Saudi Stock Market, in general, and in the Aramco IPO decision in particular. Emerging markets, and the Saudi market in particular, suffer from the phenomenon of flipping investors. When a firm issues shares, the real challenge is flipping investors who buy the newly issued shares and then sell them in the early hours of trading (Bolton and Samama, 2013). Sometimes, this phenomenon causes a firm to adopt a buy-hold strategy in order to enhance investor loyalty. In other words, firms might offer bonus shares to buyers to incentivize them to hold onto their stock, which only benefits long-term investors. In the case of Saudi Aramco, the firm is exploring ways to reward loyal investors by offering bonus shares, thus enhancing loyalty among investors and attracting potential investors to invest in its IPO.

Contrary to the behavioral finance factors, the study found no significant impact of firm characteristics on IPO investment decisions, especially in the case of Saudi Aramco. This result supports the null hypothesis and rejects the alternative hypothesis. Markedly, ambiguity concerning the potential information and future profitability of IPO decision firms in the Saudi market poses significant obstacles for investors; thus, they might tend to concentrate on behavioral financial factors more than firm characteristics.

In summary, in the Saudi market, especially during the Aramco IPO investment decision, investors’ decisions are impacted by behavioral finance factors or human characteristics, such as optimism, overconfidence, loyalty, and herd behavior, rather than firm characteristics.

## 6. CONCLUSION

In this study, we contributed to the current body of literature by providing further insight and exploring the impacts of behavioral finance factors (optimism, overconfidence, loyalty, and herd behavior) and firm characteristics on the IPO investment decisions of individual investors in Saudi Aramco, which is one of the most vital firms in the Saudi financial market. To conduct this study, we developed a survey to assess the influence of behavioral

finance elements other than firm characteristics on IPO investment behavior decisions. A total of 353 investors completed the questionnaire; after the questionnaires were distributed among the participants using convenience sampling during Aramco's IPO, the results were found to be valid for the analysis. The study used SEM to test the hypotheses.

The main results reveal that optimism had a significant positive impact on the investors' decision to invest in Aramco's IPO. Equally important, overconfident investors have a significantly positive influence on IPO investment decisions. Likewise, herd behavior has a significantly positive impact on IPO investment decisions. Similarly, the results show that loyalty has a significantly positive influence on IPO investment decisions. However, firm characteristics do not have a significant impact on investors' decisions. Consequently, investors in the Saudi market, in general, and in Aramco specifically, are driven by behavioral financial factors when making their IPO investment decisions more than firm characteristics. These results might be beneficial for financial market policy makers, investors, and IPO investment decision underwriters.

## REFERENCES

- Ajlouni, M., Abu-Ein, O. (2009), Long-run performance of initial public offerings in an emerging market: The case of Amman stock exchange. *Journal of International Finance and Economics*, 9(1), 25-44.
- Akerlof, G.A., Shiller, R.J. (2010), *Animal Spirits: How Human Psychology Drives the Economy, and Why it Matters for Global Capitalism*. United States: Princeton University Press.
- Akhtar, F., Das, N. (2019), Predictors of investment intention in Indian stock markets. *International Journal of Bank Marketing*, 37(1), 97-119.
- Alcaniz, L., Gomez-Bezars, F., Ugarte, J.V. (2017), Efficiency in initial public offerings and intellectual capital disclosure. *The European Journal of Finance*, 23(12), 1129-1149.
- Alquraan, T., Alqisie, A., Shorafa, A.A. (2016), Do behavioral finance factors influence stock investment decisions of individual investors? (Evidences from Saudi stock market). *American International Journal of Contemporary Research*, 6(3), 159-169.
- Alreck, P.L., Settle, R.B. (2004), *Initiating a survey*. In: *The Survey Research Handbook*. Boston: McGraw-Hill/Irwin. p3-25.
- Alsabban, S., Alarfaj, O. (2020), An empirical analysis of behavioral finance in the Saudi stock market: Evidence of overconfidence behavior. *International Journal of Economics and Financial Issues*, 10(1), 73-86.
- Baddeley, M. (2018), *Behavioural Economics and Finance*. London: Routledge.
- Baker, H.K., Hargrove, M.B., Haslem, J.A. (1977), An empirical analysis of the risk-return preferences of individual investors. *Journal of Financial and Quantitative Analysis*, 12(3), 377-389.
- Baker, M., Ruback, R.S., Wurgler, J. (2007), *Behavioral Corporate Finance Handbook of Empirical Corporate Finance*. Amsterdam: Elsevier. p145-186.
- Baker, M., Wurgler, J. (2006), Investor sentiment and the cross-section of stock returns. *The Journal of Finance*, 61(4), 1645-1680.
- Baker, M., Wurgler, J. (2007), Investor sentiment in the stock market. *Journal of Economic Perspectives*, 21(2), 129-152.
- Balcilar, M., Demirel, Z. (2015), Impact of global shocks and volatility on herd behavior in an emerging market: Evidence from Borsa Istanbul. *Emerging Markets Finance and Trade*, 51, 1-20.
- Barber, B.M., Odean, T. (1999), The courage of misguided convictions: The trading behavior of individual investors. *Financial Analysts Journal*, 55, 41-55.
- Barberis, N., Shleifer, A., Vishny, R. (1998), A model of investor sentiment. *Journal of Financial Economics*, 49(3), 307-343.
- Barberis, N., Thaler, R. (2003), A survey of behavioral finance. *Handbook of the Economics of Finance*, 1, 1053-1128.
- Bayley, L., Lee, P.J., Walter, T.S. (2006), IPO flipping in Australia: Cross-sectional explanations. *Pacific-Basin Finance Journal*, 14(4), 327-348.
- Beatty, R.P., Ritter, J.R. (1986), Investment banking, reputation, and the underpricing of initial public offerings. *Journal of Financial Economics*, 15(1-2), 213-232.
- Bennet, E., Amoako, L.O., Charles, R.O., Edward, A., Darkwah, J.A. (2012), The impact of investors' sentiment on the equity market: Evidence from Ghanaian stock market. *International Journal of Business Administration*, 3(5), 99-110.
- Benos, A.V. (1998), Aggressiveness and survival of overconfident traders. *Journal of Financial Markets*, 1(3-4), 353-383.
- Benveniste, L.M., Spindt, P.A. (1989), How investment bankers determine the offer price and allocation of new issues. *Journal of Financial Economics*, 24(2), 343-361.
- Bessière, V., Elkemali, T. (2014), Does Uncertainty Boost Overconfidence? The Case of Financial Analysts' Forecasts, *Managerial Finance*.
- Biais, B., Bossaerts, P., Rochet, J.C. (2002), An optimal IPO mechanism. *The Review of Economic Studies*, 69(1), 117-146.
- Biais, B., Hilton, D., Mazurier, K., Pouget, S. (2002), *Psychological Traits and Trading Strategies*, CEPR Discussion Paper No. 319.
- Bikhchandani, S., Sharma, S. (2000), Herd behavior in financial markets. *IMF Staff Papers*, 47(3), 279-310.
- Bloomfield, R. (2010), Traditional versus behavioral finance. In: *Behavioral Finance: Investors, Corporations, and Markets*. New York: John Wiley & Sons. p23-38.
- Bolton, P., Samama, F. (2013), Loyalty-shares: Rewarding long-term investors. *Journal of Applied Corporate Finance*, 25(3), 86-97.
- Brämisch, F., Rottke, N., Schiereck, D. (2011), IPO underpricing, signaling, and property returns. *Financial Markets and Portfolio Management*, 25(1), 27-51.
- Browne, M.W., Cudeck, R. (1993), *Alternative ways of assessing model fit*. Sage Focus Editions, 154, 136-136.
- Carmine, E.G., McIver, J.P. (1983), An introduction to the analysis of models with unobserved variables. *Political Methodology*, 9, 51-102.
- Chahine, S. (2007), Investor interest, trading volume, and the choice of IPO mechanism in France. *International Review of Financial Analysis*, 16(2), 116-135.
- Chang, E.C., Cheng, J.W., Khorana, A. (2000), An examination of herd behavior in equity markets: An international perspective. *Journal of Banking and Finance*, 24(10), 1651-1679.
- Chen, S. (2013), *Optimistic Versus Pessimistic-Optimal Judgemental Bias with Reference Point*, arXiv Preprint No. 1310.2964.
- Chiang, T.C., Zheng, D. (2010), An empirical analysis of herd behaviour in global stock markets. *Journal of Banking and Finance*, 34, 1911-1921.
- Christie, W.G., Huang, R.D. (1995), Following the pied piper: Do individual returns herd around the market? *Financial Analysts Journal*, 51(4), 31-37.
- Chuang, W.I., Lee, B.S. (2006), An empirical evaluation of the overconfidence hypothesis. *Journal of Banking and Finance*, 30(9), 2489-2515.
- Ciccone, S. (2003), Does analyst optimism about future earnings distort stock prices? *The Journal of Behavioral Finance*, 4(2), 59-64.
- Cox, J.R., Ross, S.A., Rubinstein, M. (1979), Option pricing: A simplified approach. *Journal of Financial Economics*, 7, 229-263.
- Daniel, K., Hirshleifer, D., Subrahmanyam, A. (1998), Investor

- psychology and security market under-and overreactions. *The Journal of Finance*, 53(6), 1839-1885.
- Daniel, K.D., Hirshleifer, D., Subrahmanyam, A. (2001), Overconfidence, arbitrage, and equilibrium asset pricing. *The Journal of Finance*, 56(3), 921-965.
- De Bondt, W.F., Thaler, R. (1985), Does the stock market overreact? *The Journal of Finance*, 40(3), 793-805.
- De Bondt, W.F., Thaler, R.H. (1987), Further evidence on investor overreaction and stock market seasonality. *The Journal of Finance*, 42(3), 557-581.
- De Bondt, W.F., Thaler, R.H. (1995), Financial decision-making in markets and firms: A behavioral perspective. *Handbooks in Operations Research and Management Science*, 9, 385-410.
- De Long, J.B., Shleifer, A., Summers, L.H., Waldmann, R.J. (1988), *The Survival of Noise Traders in Financial Markets*. Cambridge: National Bureau of Economic Research.
- Derrien, F., Womack, K.L. (2003), Auctions vs. bookbuilding and the control of underpricing in hot IPO markets. *The Review of Financial Studies*, 16(1), 31-61.
- Dhankar, R.S. (2019), *Behavioural Finance Capital Markets and Investment Decision Making*. Berlin: Springer. p291-299.
- Dhaoui, A. (2013), Animal spirits and trading volume in international financial markets between 2002 and 2011. *Journal of Economic and Social Studies*, 3(1), 163.
- Dhaoui, A. (2015), What does matter in economy today: When human psychology drives financial markets. *Arab Economic and Business Journal*, 10(1), 39-47.
- Dhaoui, A., Bourouis, S., Boyacioglu, M.A. (2013), The impact of investor psychology on stock markets: Evidence from France. *Journal of Academic Research in Economics*, 5(1), 35-59.
- Dong, M., Michel, J.S., Pandes, J.A. (2011), Underwriter quality and long-run IPO performance. *Financial Management*, 40(1), 219-251.
- Farooq, K., Akbar, S., Alim, K. (2018), Impact of firm characteristics on IPO's short run performance: Evidence from Pakistan. *Journal of Business and Tourism*, 4, 65-78.
- Firat, D., Fettahoglu, S. (2011), Investors' purchasing behaviour via a behavioural finance approach. *International Journal of Business and Management*, 6(7), 153.
- Fornell, C., Larcker, D.F. (1981), Evaluating structural equation models with unobservable variables and measurement error. *Journal of Marketing Research*, 18(1), 39.
- Franklin, J. (2020), *Global IPO Markets in 2020: What to Expect*. London: International Financial Law Review.
- Gervais, S., Odean, T. (2001), Learning to be overconfident. *The Review of Financial Studies*, 14(1), 1-27.
- Glaser, M., Nöth, M., Weber, M. (2004), Behavioral finance. In: *Blackwell Handbook of Judgment and Decision Making*. New York: John Wiley & Sons. p527-546.
- Habib, M.A., Ljungqvist, A.P. (2001), Underpricing and entrepreneurial wealth losses in IPOs: Theory and evidence. *The Review of Financial Studies*, 14(2), 433-458.
- Hair, J.F., Black, W.C., Babin, B.J., Anderson, R.E. (2010), *Multivariate Data Analysis*. 7<sup>th</sup> ed. London: Pearson.
- Hallowell, R. (1996), The relationships of customer satisfaction, customer loyalty, and profitability: An empirical study. *International Journal of Service Industry Management*, 7, 27-42.
- Harman, H.H. (1976), *Modern Factor Analysis*. Chicago: University of Chicago Press.
- Haruvy, E., Stahl, D.O., Wilson, P.W. (1999), Evidence for optimistic and pessimistic behavior in normal-form games. *Economics Letters*, 63(3), 255-259.
- Helm, S. (2007), The role of corporate reputation in determining investor satisfaction and loyalty. *Corporate Reputation Review*, 10(1), 22-37.
- Hirshleifer, D., Luo, G.Y. (2001), On the survival of overconfident traders in a competitive securities market. *Journal of Financial Markets*, 4(1), 73-84.
- Hon, T. (2012), The behaviour of small investors in the Hong Kong derivatives markets: A factor analysis. *Journal of Risk and Financial Management*, 5, 59-77.
- Hsu, Y., Shiu, C.Y. (2010), The overconfidence of investors in the primary market. *Pacific-Basin Finance Journal*, 18(2), 217-239.
- Hu, L.T., Bentler, P.M. (1999), Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. *Structural Equation Modeling*, 6(1), 1-55.
- Ibbotson, R.G., Sindelar, J.L., Ritter, J.R. (1988), Initial public offerings. *Journal of Applied Corporate Finance*, 1(2), 37-45.
- Iqbal, N., Ahmad, N., Abrar, M., Hassan, A. (2014), Determinants of retail investors behavior and its impact on investment decision. *International Letters of Social and Humanistic Sciences*, 7, 31-43.
- Jacoby, J., Kyner, D.B. (1973), Brand loyalty vs. repeat purchasing behavior. *Journal of Marketing Research*, 10(1), 1-9.
- James, C., Wier, P. (1990), Borrowing relationships, intermediation, and the cost of issuing public securities. *Journal of Financial Economics*, 28(1-2), 149-171.
- Kahan, M., Klausner, M. (1996), Path dependence in corporate contracting: Increasing returns, herd behavior and cognitive biases. *Washington University Law Quarterly*, 74, 347.
- Kapoor, S., Prosad, J.M. (2017), Behavioural finance: A review. *Procedia Computer Science*, 122, 50-54.
- Keynes, J.M. (1936), *The General Theory of Interest, Employment and Money*. London: MacMillan.
- Khan, S., Anuar, M.A., Muhammad, M., Ramakrishnan, S. (2016), Short-Run Underpricing of Initial Public Offerings (IPOs): A Conceptual Review. Malik and Ramakrishnan, Suresh, Short-Run Underpricing of Initial Public Offerings (IPOs): A Conceptual Review.
- Kumar, A., Lee, C.M. (2006), Retail investor sentiment and return comovements. *The Journal of Finance*, 61(5), 2451-2486.
- Kyle, A.S., Wang, F.A. (1997), Speculation duopoly with agreement to disagree: Can overconfidence survive the market test? *The Journal of Finance*, 52(5), 2073-2090.
- Lavoie, M. (2010), Are we all keynesians? *Brazilian Journal of Political Economy*, 30(2), 189-200.
- Lim, L.C. (2012), The relationship between psychological biases and the decision making of investor in Malaysian share market. In: *International Conference on Management, Economics and Finance Proceeding*.
- Lin, D.K., Kao, L., Chen, A. (2010), Winner's curse in initial public offering subscriptions with investors' withdrawal options. *Asia-Pacific Journal of Financial Studies*, 39(1), 3-27.
- Longjie, X., Anfen, Z. (2017), The impact of managers overconfidence on corporate investment. *International Journal of Social Science and Humanity*, 7(2), 109-114.
- Low, S.W., Yong, O. (2013), Initial public offerings and investor heterogeneity: Evidence from Malaysia. *American Journal of Finance and Accounting*, 3(1), 41-56.
- Mill, J.S. (1874), *Essays on some unsettled questions of political economy*. London: JW Parker.
- Miller, E.M. (1977), Risk, uncertainty, and divergence of opinion. *The Journal of Finance*, 32(4), 1151-1168.
- Morck, R. (2010), *Loyalty, Agency Conflicts and Corporate Governance*. Behavioral Corporate Governance. New York: John Wiley & Sons. p453-474.
- Narayanan, A., Martin, M., Fattah, Z. (2019), *Aramco Said to Explore Incentives to Reward Loyal IPO Buyers*. New York: Bloomberg.
- Odean, T. (1998), Volume, volatility, price, and profit when all traders are above average. *The Journal of Finance*, 53(6), 1887-1934.
- Podsakoff, P.M., MacKenzie, S.B., Lee, J.Y., Podsakoff, N.P. (2003), Common method biases in behavioral research: A critical review



- of the literature and recommended remedies. *Journal of Applied Psychology*, 88(5), 879-903.
- Pompian, M.M. (2011), *Behavioral Finance and Wealth Management: How to Build Investment Strategies that Account for Investor Biases*. Vol. 667. New York: John Wiley & Sons.
- Pratt, J. (1964), Risk aversion in the small and in the large. *Econometrica*, 32, 122-136.
- Raiffa, H. (1968), *Decision Analysis: Introductory Lectures on Choices under Uncertainty*. Reading, Massachusetts: Addison-Wesley.
- Ramady, M.A. (2018), The Aramco IPO: Governance, listing, options, and policy implications. In: *Saudi Aramco 2030*. Berlin: Springer. p167-248.
- Ricciardi, V. (2004), *A Risk Perception Primer: A Narrative Research Review of the Risk Perception Literature in Behavioral Accounting and Behavioral Finance*.
- Ricciardi, V. (2008), Risk: Traditional finance versus behavioral finance. In: *Handbook of Finance*. Vol. 3. New York: John Wiley & Sons.
- Ricciardi, V., Simon, H. (2000), The Case for Behavioral Finance: A New Frontier. Islandia, New York: Paper Presented at the Northeast Business and Economics Association, 27<sup>th</sup> Annual Conference.
- Risk, O., Bernoulli, D. (1954), Exposition of a new theory on the measurement. *Econometrica*, 22(1), 23-36.
- Ritter, J.R. (2003), Behavioral finance. *Pacific-Basin Finance Journal*, 11(4), 429-437.
- Roll, R., Ross, S.A. (1980), An empirical investigation of the arbitrage pricing theory. *The Journal of Finance*, 35(5), 1073-1103.
- Rousseau, F., Germain, L., Vanhems, A. (2008), *Irrational Financial Markets*, Economic. Maynooth: Finance and Accounting Department Working Paper Series, National University of Ireland-Maynooth.
- Scharfstein, D.S., Stein, J.C. (1990), Herd behavior and investment. *The American Economic Review*, 80, 465-479.
- Scheinkman, J.A., Xiong, W. (2003), Overconfidence and speculative bubbles. *Journal of Political Economy*, 111(6), 1183-1220.
- Shaddady, A., Moore, T. (2015), Determinants of capital adequacy ratio in oil exporting countries: Evidence from GCC commercial banks. In: Paper Presented at the Second Middle East Conference on Global Business, Economics, Finance and Banking, ME15 Dubai Conference.
- Shams, S., Passand, A. (2015), The Relationship between investors herding and volatility: Evidence from Tehran stock exchange. *Iranian Journal for Business and Economics*, 2(3), 1-6.
- Sharpe, W.F. (1964), Capital asset prices: A theory of market equilibrium under conditions of risk. *The Journal of Finance*, 19(3), 425-442.
- Shefrin, H., Statman, M. (1994), Behavioral capital asset pricing theory. *Journal of Financial and Quantitative Analysis*, 29(3), 323-349.
- Shiller, R.J. (2002), Bubbles, human judgment, and expert opinion. *Financial Analysts Journal*, 58(3), 18-26.
- Shleifer, A. (2000), *Inefficient Markets: An Introduction to Behavioural Finance*. Oxford: Oxford University Press.
- Simon, H.A. (1955), A behavioral model of rational choice. *The Quarterly Journal of Economics*, 69(1), 99-118.
- Singh, R. (2019), *Behavioural Finance*. New Delhi: PHI Learning Pvt. Ltd.
- Su, C., Bangassa, K. (2011), Underpricing and long-run performance of Chinese IPOs: The role of underwriter reputation. *Financial Markets and Portfolio Management*, 25(1), 53-74.
- Tariq, B., Ullah, N. (2013), Investor overconfidence and stock returns: Evidence from Pakistan. *Journal of Business and Management*, 8, 77-84.
- Thaler, R.H. (2005), *Advances in Behavioral Finance*. Vol. 2. United States: Princeton University Press.
- Tran, Q. (2017), The behaviour patterns of investors in the Thailand stock market. *Asian Journal of Finance and Accounting*, 9(1), 155-165.
- Triatyati, N., Husnan, S. (2004), Perbandingan Abnormal Return Emisi Saham Perdana Perusahaan Keuangan dan Non-Keuangan di Pasar Modal Indonesia: Pengujian Terhadap Hipotesis Informasi Asimetri, The Abnormal Return of IPOs of Financial and Non.
- Tseng, K. (2006), Behavioral finance, bounded rationality, neuro-finance, and traditional finance. *Investment Management and Financial Innovations*, 3(4), 7-18.
- Tversky, A., Kahneman, D. (1979), Prospect theory: An analysis of decision under risk. *Econometrica*, 47(2), 263-291.
- Ullah, I., Ullah, A., Rehman, N.U. (2017), Impact of overconfidence and optimism on investment decisions. *International Journal of Information, Business and Management*, 9(2), 231-240.
- Virigineni, M., Rao, M.B. (2017), Contemporary developments in behavioural finance. *International Journal of Economics and Financial Issues*, 7(1), 448-459.
- Wang, C.S., Tang, H.W., Chen, R.C. (2017), Does IPO subscription demand affect investor herd behavior in Taiwan? *International Review of Economics and Finance*, 51, 258-272.
- Wang, F.A. (1998), Strategic trading, asymmetric information and heterogeneous prior beliefs. *Journal of Financial Markets*, 1(3-4), 321-352.
- Weinstein, N.D. (1980), Unrealistic optimism about future life events. *Journal of Personality and Social Psychology*, 39(5), 806.
- Weinstein, N.D. (1987), Unrealistic optimism about susceptibility to health problems: Conclusions from a community-wide sample. *Journal of Behavioral Medicine*, 10(5), 481-500.
- Weinstein, N.D. (1989), Optimistic biases about personal risks. *Science*, 246(4935), 1232-1234.
- Yao, J., Ma, C., He, W.P. (2014), Investor herding behaviour of Chinese stock market. *International Review of Economics and Finance*, 29, 12-29.
- Yi, Y. (1990), A critical review of consumer satisfaction. *Review of Marketing*, 4(1), 68-123.