International Journal of Commerce and Management Studies (IJCAMS)
Peer Reviewed, Indexed Journal, ISSN 2456-3684
Vol.9, No.1, 2024, www.ijcams.com

Elucidating Investors' Rationality and Behavioural Biases

Jhankar Arora1[a] , Prof. Deepa Mangala 2[b] , Prof. Usha Arora 3 [c]

[1]Ph.D. Research Scholar, Haryana School of Business, Guru Jambheshwar University of Science & Technology, Hisar, Haryana, India.

[2]Professor, Haryana School of Business, Guru Jambheshwar University of Science & Technology, Hisar, Haryana, India.

Abstract
The motive behind this paper is to analyse the link between investor's rationality and behavioural biases based on the published relevant studies. It has been observed from the studies that investors try to be rational but cannot be fully rational as they are influenced by various biases. Therefore, they cannot be regarded as completely irrational or rational. There is a dearth of literature on this topic and hence an attempt has been made to highlight the importance of this relationship. As per knowledge of the author, this is the first review study which highlights the concept of rationality and description of biases exhibited by investors and also depicts the empirical evidences of dimensions of investors' rationality and behavioural biases. This study will help the stakeholders in understanding the investors' biases and irrationality thus, reducing their ill effects.

Keywords Behavioural finance, Rationality, Behavioural biases, Rationality and Behavioural biases.

Paper Type Literature Review.

Introduction

Behavioural finance is the study of psychological factors and their influence on investor's behaviour. It focuses on the fact that investors are not always rational, have limits to their self-control, and are influenced by their own biases. However, it is not as simple to comprehend humans and their behaviour, and there is an entire subject dedicated to behavioural finance. With the simplified assumptions of traditional finance i.e., investors are rational and market is efficient, it does a commendable job for a while but with the passage of time, these theories fail to explain some anomalies in the world of finance that prompted the need and development of behavioural finance and to understand that people are not always rational (Fama, 1991) and stock markets are not always efficient (Tekce *et al.,* 2016). Behavioural finance

explains the rationale which were unanswered earlier like why there are severe ups and downs in prices of some stocks, why stock markets crash (Kahneman and Tversky, 1979) and why at times, investors and markets behave in an unusual way (Zahera and Bansal, 2018). Behavioural finance assumes individuals to be guided and impelled by their sentiments, irrationality and biases instead of being a typical rational person (Kahneman and Tversky, 1972; Fama, 1991; Tversky and Kahneman, 1992; Thaler, 1999). The relevant information can reduce the irrationality and biases among investors but it cannot completely eliminate it (Mukherjee and De, 2019) but one can take necessary steps to recognize those biases and safeguard from its ill effects (Aren *et al*., 2016; Ahmad *et al.*, 2017; Mushinanda and Veluri, 2018). In order to appropriately manage portfolio risk, financial advisors must evaluate the risk profile of customers(Mazzoli & Palmucci,2023).Investors' rationality and behavioural biases are essential and integral part of behavioural finance (Lin, 2011; Kimeu *et al.*, 2016; Kumar and Goyal, 2016) because they both are considered as a tool to peep into the minds of investors. Further, Rationality is the state or attribute of thinking or acting logically. 'Ideal rationality' states that when making a decision, one must think rationally and analyse options using logic. Rationality, the most significant notion in management thought, is claimed to have originated in Greek philosophy. The word 'Logos' was employed for it by the Greeks. Some studies refer to logos as a 'rational cosmos' whereas Aristotle refers to it as 'rational creatures'. The Romans described it as 'ratio' and it eventually evolved into the notion of 'Rationality' (Rutgers, 1999).Investors constantly strive to arrive at the rational decision by evaluating and interpreting data gathered from diverse sources for a range of investment opportunities (Deshmukh and Joseph,2016).

Comprehending behavioural finance will make the stakeholders aware about emotion driven trading by investors (Sent, 1997) and realise that biases may deviate their success (Thaler and Benartzi, 2004). This area of study equips professionals with insights of investor's mind (Lin, 2011; Zahera and Bansal, 2018; Bihari *et al.* 2022) and psychological factors that influence their financial decision-making (Ahmad *et al.*, 2017). Financial education programs should therefore not only seek to increase the

population's financial literacy but also to foster positive financial behavior and attitudes (Bhushan and Medury, 2014).The study of Bhatia *et al.,* (2023) offers a critique of the writing that Indian authors have produced thus far and their significance to the field. Compared to industrialized markets, individual investors have relatively little exposure to the stock market, and behavioral finance can help explain why. That's why combining psychology with finance becomes essential (Thaler and Benartzi, 2004; Zahera and Bansal, 2018; Mukherjee and De, 2019). This study can assist stakeholders in understanding rationale behind investors' decisions and identifying various biases in order to formulate strategies to capitalise investment opportunities.

1. Literature Review

2.1 Rationality

Rutgers (1999) further discussed that rationality was given a novel meaning and associated with human reasoning. Kuhn (1962) imparted that science is not general, but cumulative, but he doesn't fully condemn scientific rationality. Many other enlightenment researchers observed different concepts of rationality, for instance, Cleaver (2000) emphasised on 'ecological rationality' and did not see rationality from the perspective of logic, but from the viewpoint of human mind and its interaction with real world. It is considered as the adjustment between surroundings and human mind (Cleaver, 2000; Gigerenzer, 2021).

Powell (2018) discussed 'economic and behavioural rationality'. The economic rationality believes that humans behave rationally and avoid emotions, moral and other behavioural traits (Powell, 2018) whereas behavioural rationality put emphasis on use of simple and intuitive decision rules (Hommes, 2013; Powel, 2018). Similar findings could be seen in Herbert Simon's influential work that made him one of the major contributors in the area of 'rational decision-making'. Simon (1956, 1976) uses the term 'bounded rationality' in place of rationality and described it as one cannot be fully rational while choosing an alternative because one has constraints always. Simon demonstrated that managers should try to take optimal decisions with full information and knowledge but due to lack of resources like shortage of time, finance etc., they are forced to take satisfactory or sub-optimal decisions. It serves the idea that humans are bounded by limitations while taking decisions (Sent, 1997; Augier, 2001; Barros, 2010). Simon (1976) considered 3 main limitations for an optimal decision i.e., imperfect information, time limitation and analytical constraints. Rationality and bounded rationality both are weaved together as an essential part (Sent, 2018).

Mintzberg *et al.* (1976) deduced three phases of rational decision making namely, problem identification, seeking relevant information and evaluation of alternative solutions. Simon (1977) discussed three stages in the decision-making process i.e., intelligence, decision and choice. He added fourth stage later on and named it as 'implementation'. Further, the prospect theory developed by Kahneman and Tversky in 1979 focussed on psychological factors which they termed as 'biases' and how these biases affect people when they make choices.

Due to the differences in the behaviour and thinking abilities, people do violate assumptions of rationality (Simon, 1956,1976) and that fails the notion of 'ideal rationality' (Lin, 2011; Mushinada and Veluri, 2018). Simon (1976) also gave way from substantive rationality to procedural rationality. Substantive rationality is the rationality of the decision and procedural rationality is the rationality of the process which is used to arrive at a decision (Simon, 1976; Barros, 2010). The concept of rationality and irrationality are just different perspective of the same thing and can be regarded as complementary to each other (Barros, 2010).

Irrationality in the mind of investors and in the market exists too (Kartasova and Vicoskaite, 2013). Humans are not always logical, though they try to be. Various constraints always act as limitations and that's why they sometimes rely on intuitions. Despite the fact that intuition can be helpful at the time of emergency but depending on intuition is quite risky and leads to cognitive biases. Intuition has two foundations: first, it is formed through a long, difficult, and demanding process and second, it is developed through expertise and professional experience. The Activating-Beliefs-Consequences (ABC) theory was developed by Albert Ellis who provided a foundation for comprehending the cause and effect of investor's behavioural anomalies. He stated that behaviours are influenced by some external events which can be regarded as the cause of irrational behaviour in creating illogical investing strategies (Ahmad *et. al*, 2017) and impacts stock market (Babajide and Adetiloye, 2012; Mushinada and Veluri, 2018). According to Ahmad *et al.* (2017), the genesis of behavioural biases may be traced back to theory of mind, which outlines how humans make decisions based on two systems of thought: cognitive and affective and these theories can be combined to form a coherent framework to explain investor's constrained rational behaviour. 'Rational choice theory' is a prominent theory for rational decision making which serves as a basis for understanding social and economic behaviour of individuals who are taking their own decisions (Blume and Easly, 2008; Sent, 2018).

In order to simplify their decision-making, investors base their decisions on restricted information and previous experiences (Mushinada and Velurri, 2018) which cause irrationality (Simon, 1976; Lin, 2011; Ahmad *et al.*, 2017; Mushinada and Veluri, 2018) and ultimately leads to behavioural biases (Kimeu *et al.*, 2016; Mushinada and Veluri, 2018) among them.

2.2 Behavioural Biases among investors

The study of influence of behavioural biases is one of the important aspects of behavioural finance. These biases affect investors directly or indirectly and sometimes they are not even aware of it (Mahalakshmi and Anuradha, 2018). Various studies have unearthed the presence of behavioural biases among investors across countries. It has been evidenced from the extensive literature review that the topic of behavioural biases has a substantial evidence in developed economies (Cohen and Kudryavtsev, 2012; Zahera and Bansal, 2018) and is slowly getting noticed in developing countries like Jorden (Alrabadi *et al.*, 2018), China (Tauni *et al.*, 2017), India (Kumar and Goyal, 2016; Zahera and Bansal, 2018; Jain *et al.*, 2019; Baker *et al.*, 2018; Mehtab and Nagraj, 2019), Pakistan (Anjum *et al.*, 2019), Kenya (Kimeu *et al.*, 2016) and South Africa (Dickason and Ferreira, 2018), Indonesia (Beatrice *et al.*, 2021), Malasiya (Bakar and Yi, 2016) and Turkey (Tekce *et al.*, 2016). Fromlet (2001) and Montier (2002) identified the dangers of overlooking biases while conducting investment analysis. Fromlet (2001) suggested that individual investors in the market should hire financial advisors to reduce personal biases in portfolio management.. Humans at times ignore empirical data (Pompian, 2006) and thus lose profitable opportunities because of their prejudices and illogical inclinations (Pompian, 2006; Jindal and Chander, 2015). There are various behavioural biases investors are susceptible to such as *overconfidence bias, self-attribution bias, representative bias, availability bias, anchoring bias, herding bias, mental accounting, conservatism bias, regret aversion and disposition effect.*

Overconfidence bias

This bias makes an individual feel more confident about his information, knowledge and skills leading to decisions with unrealistic high optimism of earning extraordinary returns while ignoring real risk factors (Mahalakshmi and Anuradha, 2018). Generally it is assumed that people who have more information (Aren *et al.*, 2016), knowledge (Chen, 2007; Cohen and Kudryavtsev, 2012; Zahera and Bansal, 2018; Beatrice, Murhadi and Herlambang 2021), and experience (Cohen and Kudryavtsev, 2012; Aren *et al.*, 2016; Zahera and Bansal, 2018) become overconfident. The factual research narrates that investor's financial decision making is greatly influenced by overconfidence bias (Bakar and Yi, 2016; Aren *et al.*, 2016; Anjum *et al.*, 2019; Alrabadi *et al.*, 2018; Dickason and Ferreira, 2018; Mahalakshmi and Anuradha, 2018; Jain *et al.*, 2019; Beatrice *et al.*, 2021; Bihari *et al.*, 2022).

Self -attribution bias

Identified by Bem (1967), self-attribution bias is defined as people's inclination of giving credit to themselves for success and blaming others for failures. (Bem, 1967; Mushinada and Veluri, 2018; Mushinada, 2019). This bias is considered to reinforce investor's overconfidence (Hoffmann and Post, 2014). According to Mushinada (2019), most of the investors are influenced by overconfidence and self- attribution bias.

Representativeness bias

People are prone to representative bias because of people's belief that some samples can represent the whole universe (Kahneman and Tversky, 1981). Identified by Kahneman and Tversky (1972), it is a tendency of investors to process information on the basis of past experiences (Kahneman and Tversky, 1981; Bakar andYi, 2016; Dickason and Ferreira 2018; Zahera and Bansal, 2018). This makes them ignore other significant factors while taking investment decisions. Representativeness bias has been interpreted as significant while making investment by different authors (Chen, 2007; Alrabadi *et al.*, 2018; Dickason and Ferreira, 2018).

Availability bias

Identified by Tversky and Kahneman (1974), availability bias refers to individual's decisions on the basis of information which are easily obtainable (Bachisse and Hassainate, 2018) and recallable (Tversky and Kahneman, 1974; Jindal and Chander, 2015). Availability bias has a strong and notable impact on the financing decision of the individual investors (Bakar and Yi, 2016; Dickason and Ferreira, 2018; Alrabadi *et al.*, 2018).

Anchoring bias

Discovered by Tversky and Kahneman in 1981, anchoring bias makes people predict and modify the final outcome based on a specific anchor. Anchoring bias occurs when investor uses initial piece of information while making investment decision (Tversky and Kahneman, 1981) and everything revolves around that anchor. Investors inclined to this bias may buy shares at a higher price or may sell shares at a lower, thus resulting in losing opportunities (Jain *et al.*, 2019). Anchoring bias has been counted as having strong impact on financial decision making of investors (Kimeu *et al.*, 2016; Dickason and Ferreira, 2018; Jain *et al.*, 2019).

Herding bias

When investors invests in stocks that other investors are investing in, they are said to be susceptible to

herding bias. It is the inclination of investors to act alike (Kahneman and Tversky, 1979; Lin, 2011; Kimeu *et al.*, 2016; Aren *et al.*, 2016; Kumar and Goyal, 2016; Baker *et al.*, 2018) or seek advices from brokers, colleagues and friends for making any investment decisions (Kimeu *et al.*, 2016; Zahera and Bansal, 2018; Jain *et al.*, 2019). Herding bias is regarded as influential for determining investor behaviour (Kimeu *et al.*, 2016; Anjum *et al.*, 2019; Jain *et al.*, 2019; Beatrice *et al.*, 2021). According to Mushinada and veluri (2018), males are more prone to this bias. Beatrice *et al.* (2021) enunciated that herding bias is influenced specifically by age and occupation.

Mental accounting bias

Mental accounting has been introduced by Thaler (1985). This behavioural bias occurs when individuals treat each and every element in the portfolio as separate (Thaler, 1999; Dickason and Ferreira, 2018; Jain *et al.*, 2019; Beatrice *et al.*, 2021). The existence of mental accounting is confirmed among investors by Bakar *et al.* (2016), and Dickason and Ferreira (2018). According to Beatrice *et al.* (2021), mental accounting bias is influenced by income level only.

Conservatism bias

It was introduced by Edwards (1982). Sometimes investors cling to the information they already have and don't accept any new information or knowledge that leads them to Conservatism Bias (Bakar and Yi, 2016). For instance, whenever investors hear about a bad news, they indulge into panic selling (Beatrice *et al.*, 2021). The presence of this bias is confirmed by Bakar and Yi (2016).

Regret aversion bias

Loomes and Sugden (1982) identified regret aversion which arises from the feelings of regret of taking any wrong decision. Fishburn (2013) agreed that most of the investors do not want to admit their mistakes that induce regret aversion among them. Investors prone to this bias avoid taking important decisions as they think they won't be able to take an optimal decision (Bell, 1982; Loomes and Sugden, 1982; Zahera and Bansal, 2018; Jain *et al*., 2019). Financial decision is impacted greatly by regret aversion bias (Zahera and Bansal, 2016; Dickason and Ferreira, 2018; Jain *et al.* 2019)

Disposition effect bias

This bias was identified by Shefrin and Statman (1985). They stated that an individual is inclined to such bias when he laments for keeping a loss-making stock for a long time and selling a profit-making stock too early (Tekce *et al.*, 2016). Individuals regret for holding a non- profitable stock for an extended time and selling the profitable one too early (Chen, 2007; Kimeu *et al.*, 2016; Dickason and Ferreira 2018; Baker *et al.*, 2019). According to Tekce *et al.* (2016), men are more inclined towards disposition effect and the impact of this bias increases with age and wealth of investors. On the contrary, some studies found an insignificant relationship between financial decision making and disposition effect (Baker *et al.*, 2018).

It is evident from the literature that the investor behaviour is studied dominantly with the variables such as demographic factors (Beatrice *et al.*, 2021), personality (Tauni *et al.*, 2017; Baker *et al*., 2018; Mehtab and Nagraj, 2019), financial literacy (Baker *et al.*, 2018), investment advice (Tauni *et al*., 2017) and trading frequency (Feng and Seasholes, 2005; Graham *et al.*, 2009; Aren *et al*., 2016; Tauni *et al.*, 2017). Mangala and Sharma (2014) concluded that the behavioural bias impacts the investor's current as well as future financial decisions.

2.3 Investor's rationality and behavioural biases: Empirical evidences

Individual and institutional investors both are affected by behavioural biases and irrational behaviour (Aren *et al*., 2016; Ahmad *et al.*, 2017). Biases have influence on all types of decision making even day to day decisions but have specific implications in relation to finance and investment. Kahneman and Tversky (1972) explored the reason behind unintentional dependence of people on these biases as lack of forecasting ability.

Cunningham (2002) conferred that even sensible and rational investors cannot be unaffected from the effects of these biases. Behavioural finance examines the unexpected behaviour of individual investors which prevents them from behaving fully rational (Kartasova and Vicoskaite, 2013). Thaler (1999) used the word 'quasi rational' for the investors who try to act rational. Rubinstein (2000) emphasised on 'minimally rational markets' and argued that humans are irrational in specific ways and investor's overconfidence leads to irrational decision making. Contrary to this, Cohen and Kudryavtsev (2012), conferred that investment decisions in stocks, corporate bonds and government bonds are least likely to be based on rationality. Instead they are driven by trading experiences and investor's expectations. Contrarily, Bachisse and Hassainate (2018) , Mushinada and Veluri (2018) strongly stated that despite investors trying to be rational, overconfidence bias and self-attribution bias do exists in Indian investors and with the use of structural equation modelling recommended that while preparing portfolios, the fund manager should be aware of these biases and try to 'de-bias' them. For empirical evidences, most of the researchers used prominent Mintzberg's model of rational decision-making that involves three stages - demand identification, information search and evaluating the alternatives.

Lin (2011) explored the relationship between rationality and behavioural biases in Taiwanese stock market. Lin (2011) and Kumar and Goyal (2016) concluded that investors follow a rational decision making but psychological factors interferes in the process. Kumar and Goyal (2016) interpreted a positive correlation between stage 2 i.e. information search with overconfidence bias in Indian stock market and no correlation was discerned between any other stage and herding bias. This positive co-relation demonstrated that immediately after the investors identified investment demand, they start searching for the information. But due to lack of availability of information, investors get vulnerable to overconfidence bias and start behaving unreasonably and irrationally (Kumar and Goyal, 2016). Kumar and Goyal (2016) concluded that the last stage of decision making, i.e. evaluating alternatives is directly related to the disposition effect. The findings of the studies of Kumar and Goyal (2016) and Lin (2011) were similar that no stage of rational decision making is related to herding bias directly.

The findings of Bachisse and Hassainate (2018) empirically demonstrated the link between distinct biases among portfolio managers in the Moroccan stock market and their rationality. The authors presumed that investors act according to their emotions and feelings without giving much head to their brain.

It has been observed from the literature that investors act rationally to some extent but beyond that most of the investors tend to get irrational (Lin, 2011; Kumar and Goyal, 2016; Mushinada and Veluri, 2018; Baker *et al.*, 2018; Mushinada, 2019; Sharma and Firoz, 2022) and thus exhibit biases in their financial behaviour and that too considered 'normal' (Lin, 2011). They possess rational and irrational thought process at the same time (Mushinda and Veluri, 2018; Mushinada, 2019) making it more complex to understand. Similarly, on the basis of meta-analysis of previous 20 research studies, the study of Jindal and Chander (2015) reviewed that the investors exhibit rationality and cognitive biases simultaneously and ultimately it affects their stock market decisions. Based on the literature review attempted by Joo and Durri (2015), it can be inferred that behavioural finance aims to bridge the gap between expected (rational behaviour) and actual (normal) behaviour. It also emphasised that there is currently no cohesive theory of behavioural finance that appropriately considers the variables influencing investors' financial decisions.

Contrary to all the traditional beliefs, the study of Altaf and Jan (2023) suggested a fresh perspective on financial psychology and concluded that generational prejudices have positive influence on the investing behaviour of millennials. An online poll of 516 millennial investors found that herding, socially responsible investment, fear of missing out, and overconfidence are generational biases that positively impact millennials' intention to invest.

3. Research Methodology

This literature review is based on various studies available in public domain on behavioural biases among investors, rationality and the relationship between the both. To search the relevant papers, various keywords such as behavioural finance, rationality, rationality and behavioural biases, behavioural biases among investors and irrationality have been used. Various databases such as Emerald, JSTOR, Science direct, Google Scholar and others have been used to find the relevant literature published in various countries. Most of the publications included are from the Google Scholar due to its free and open access. The selected literature is from the time horizon incorporating from the year 1956 by Simon (1956) in the article 'Rational choice and the structure of the environment' to the most recent literature published in July, 2023 by Altaf and Jan (2023) in the article 'Generational theory of behavioral biases in investment behavior'. The identified and selected literature includes conceptual studies, literature review, empirical, analytical, descriptive papers and prominent books. The following selection criteria have been applied to identify and select the literature for this study-

- Articles published in Peer- reviewed journals;
- Literature available on online database;
- Literature published in English and having free access on full content and
- Literature including search keywords in title/abstract;

Some publications were searched from the Google Scholar from the references of other relevant papers. The literature which does not fit the inclusion criteria was not included for the purpose of literature review. Out of 90 identified publications, 74 publications including prominent books and articles were finally selected for the review as it fits the inclusion criteria. Table I shows the no. of studies included in this review paper according to the topics.

Table I-

No. of Studies included According to Topics

Topics	Total no. of studies included
Behavioural Finance	10
Rationality	18
Behavioural biases among investors	34
Investors' rationality and behavioural biases: empirical evidences	12
Total	74

Source- Compiled by authors

Citation analysis assists in including the most influential literature in the relevant area of study. The citation information on Google Scholar has been exercised in Oct, 2023 to ascertain the number of citations of the identified literature. Out of the 74 elected publications, 68 are cited. Out of the cited studies, 27 publications including 20 articles and 7 prominent books are having more than 300 citations. The most cited publication is Kuhn (1962) having 138070 citations, followed by Kahneman and Tversky (1981) having 71112 citations, Tversky and Kahneman (1981), Tversky and Kahneman (1974) and so on. Most of the studies having high citations are from the topic 'rationality'.

4. Conclusion

This review paper confirms that the rationality impacts the behavioural biases of investors but certainly there are other factors too which impacts the investment decisions of investors like financial literacy, personality, risk tolerance etc. After a comprehensive literature review, it can be concluded that investors are normal human beings who are influenced by different biases which are inherent and inbuilt in every human (Bakar and Yi, 2016). Biases do exist in the minds of human beings at their sub conscious level and sometimes they are unaware of it and possess them. The investors are different in various ways, for example, some are risk averse, some are risk seekers, some investors do a lot of analysis while investing and some simply go with the herd, it is evident that the concept of behavioural finance can assist stakeholders to identify their own as well as other's natural biases and avoid making illogical and irrational financial investment decisions. Some investors do analyse the past data and returns, but they need to understand that past performance is not indicative of future returns. Investors need to analyse stocks from all the directions. Lack of financial awareness, availability of limited information, lack of investment experience and investor's emotions, all contribute to irrational behaviour that leads to behavioural biases and financial market anomalies. Rationality and irrationality exist simultaneously in human mind. It is all about which trait is more dominant while making financial decisions. So, investors are suggested to identify and keep a check on the behavioural biases with which they are more influenced and strategies can be made to minimize the ill effects of those. There is a need to comprehend that biases and irrationality can be reduced to a certain level with the help of counselling, training and educating the investors but complete elimination is not possible. This review could contribute and assist the researchers concentrating on behavioural biases and investor's rationality by providing them with a comprehensive theoretical and empirical interpretation of various author

Acknowledgement

All the authors have made substantial contributions to conception in drafting this review article and revising it critically for important intellectual content. No financial support has been taken from any institution for drafting this review article**.** Ms. Jhankar Arora, Prof. Deepa Mangala and Prof. Usha Arora have made a great contribution in the drafting of this review paper. The expertise of Prof. Deepa Mangala has made this wonderful contribution possible..

5. References

Ahmad, Z., Ibrahim, H. & Tuyon, J. (2017). Institutional investor behavioral biases: syntheses of theory and evidence. *Management Research Review*, 4(5), 578-603.

Alrabadi, D. W. H., Abdallah, S. Y., & Aljarayesh, N. I. A. (2018). Behavioral biases and investment performance: Does gender matter? Evidence from Amman Stock Exchange. *Jordan Journal of Economic Sciences*, 5(1), 77-91.

Altaf, H. & Jan, A. (2023). Generational theory of behavioral biases in investment behavior, *Borsa Istanbul Review*, 23(4), 834-844. https://doi.org/10.1016/j.bir.2023.02.002.

Anjum ,Z., Phulpoto ,N, H ., Memon, S, A., Pahore, R, M.,Imran ,M., & Bhutto, Z. (2019). Impact of psychological biases and personality traits on Investors' Trading Behaviour. *International Journal of Computer Science and Network Security*, 19(8), 115- 122.

Aren, S., Aydemir, S. D., & Sehitoglu, Y. (2016). Behavioral biases on institutional investors: a literature review. *Kybernetes*, 45(10), 1668–1684.

Augier, M. (2001). Simon Says: Bounded Rationality Matters: Introduction and Interview. *Journal of*

Management Inquiry, 10(3), 268–275. https://doi.org/10.1177/1056492601103010

Babajide, A. & Adetiloye, K.A. (2012). Investors' Behavioural Biases and the Security Market: An Empirical Study of the Nigerian Security Market. *Accounting and Finance Research*, 1(1), 219-229. http://dx.doi.org/10.5430/afr.v1n1p219

Bachisse, M. & Hassainate.(2018.) Behavioral Biases and Rational Decision Making Process: Structural Equation Modelling Approach, Moroccan Stock Market, *International Journal of Current Research*, 10(06), 70756-70761.

Bakar, S., & Yi, A. N. C. (2016). The impact of psychological factors on investors' decision making in Malaysian stock market: A case of Klang Valley and Pahang. *Procedia Economics and Finance*, 35, 319-. 328.

Baker, H. K., Kumar, S., & Goyal, N. (2019). Personality traits and investor sentiment. *Review of Behavioural Finance*. doi:10.1108/rbf-08-2017-0077

Baker, H.K., Kumar, S., Goyal, N. & Gaur, V. (2018). How financial literacy and demographic variables relate to behavioural biases. *Managerial Finance*, 45(1), 124- 146.

Barros, G. (2010). Herbert A. Simon and the concept of rationality: boundaries and Procedures. *Brazilian Journal of political Economy*, 30(3), 455-472.

Beatrice, V., Murhadi, W.R., Herlambang, A. (2021). The Effect of demographic factors on behavioural biases. *The Management Development Centre, Department of Management, Faculty of Business & Economics, Universita Islam Indonesia*, 25(1), 17-29.

Bell, D.E. (1982). Regret in decision making under uncertainty. *Operations Research*, 30(5), 961-981.

Bem, D.J.(1967). Self-perception: an alternative interpretation of cognitive dissonance phenomena. *Psychological Review*, 74(3), 183-200.

Bhatia, A., Chandani, A., Divekar, R., Neeraja, B. (2023). Behavioral Finance: A Bibliometric Analysis. In: Joshi, A., Mahmud, M., Ragel, R.G. (eds) Information and Communication Technology for Competitive Strategies (ICTCS 2022). ICTCS 2022. Lecture Notes in Networks and Systems, 623. *Springer*, Singapore. https://doi.org/10.1007/978-981-19-9638-2_69.

Bhushan,P. & Medury, Y. (2014). An Empirical Analysis of Inter Linkages between Financial Attitudes, Financial Behaviour and Financial Knowledge of Salaried Individuals, *Indian Journal of Commerce and Management Studies*, 5(3), 58-64.

Bihari, A., Dash, M., Kar, S.K., Muduli, K., Kumar, A. and Luthra, S. (2022), "Exploring behavioural bias affecting investment decision-making: a network cluster based conceptual analysis for future research, *International Journal of Industrial Engineering and Operations Management*, Vol. 4 No. 1/2, pp. 19-43. https://doi.org/10.1108/IJIEOM-08-2022-0033.

Camilla Mazzoli & Fabrizio Palmucci (2023) Reconcilin g Self-Assessed with Psychometric Risk Tolerance: A New Framework for Profiling Risk among Investors, *Journal of Behavioral Finance*, DOI: 10.1080/15427560.2023.2271108.

Chen, G.(2007). Trading Performance, Disposition Effect, Overconfidence, Representativeness Bias, and Experience of Emerging Market Investors. *SSRN Electronic Journal*, 425-451.

Cleaver, F. (2000). Moral Ecological Rationality, Institutions and the Management of Common Property Resources. *Development and Change*, 31*(2)*, 361–383.

Cohen, G. & Kudryavtsev(2012). A.Investor rationality and financial decisions. *Journal of Behavioral Finance*, 13(1), 11-16.

Cunningham, L.A. (2002). Behavioral finance and investor governance. *Washington & Lee Law Review*, 59*(32)*, 767- 837.

Dickason, Z., & Ferreira, S. (2018). Establishing a link between risk tolerance, investor personality and behavioural finance in South Africa. Cogent. *Economics & Finance*, 6(1), 1519. DOI : 10.20409/berj.2016321805.

Fama, E. F. (1991). Efficient capital markets: II. *Journal of Finance*, 46(5), 1575-1617.

Feng, L., & Seasholes, M. S. (2005). Do investor sophistication and trading experience eliminate behavioral biases in financial markets?. *Review of Finance*, *9*(3), 305-351.

Fromlet, H. (2001). Behavioral finance- Theory and practical application. *Business Economics.* 36(3), 63-69.

Gigerenzer, G.(2021) Axiomatic rationality and ecological rationality. *Synthese*, 198 (4), 3547–3564. https://doi.org/10.1007/s11229-019-02296-5.

Graham, J. R., Harvey, C. R., & Huang, H. (2009). Investor competence, trading frequency, and home bias. *Management Science*, *55*(7), 1094-1106.

Hoffmann, A. O. I., & Post, T. (2014). Self-attribution bias in consumer financial decision-making: How investment returns affect individuals" belief in skill. *Journal of Behavioral and Experimental Economics*, 52, 23–28.

Jain, J., Walia, N. & Gupta, S. (2019). Evaluation of behavioral biases affecting investment decision making of individual equity investors by fuzzy analytic hierarchy process. *Review of Behavioural Finance*, 12(3), 297-314.

Jindal, M., & Chander, R. (2015). Investors Rationality for IPOs Using Meta Analysis and Forest Plots in Neyeloff *et al.* (2012) Framework: An Investigation. *Asia-Pacific Journal of Management Research and Innovation*, 11(1), 9–15. doi:10.1177/2319510x14565014.

Joo, B.A., and Durri, K. (2015). COMPREHENSIVE REVIEW OF LITERATURE ON BEHAVIOURAL FINANCE. *Indian Journal of Commerce & Management Studies*, 6(6), 11-19.

Kahneman & Tversky (1972). Subjective probability: A judgment of representativeness , *Cognitive psychology. 3(3), 430–454.* doi:10.1016/0010-0285(72)90016-3

Kahneman, D. & Tversky, A. (1979). Prospect theory: an analysis of decision under risk Econometrica. *Journal of the Econometric Society*, 47*(2)*, 263-291.

Kahneman, D. and Tversky, A. (1981). Prospect theory: an analysis of decision under risk. Econometrica. *Journal of the Econometric Society*, 47(3), 263-291. https://doi.org/10.1111/j.1536-7150.2011.00774.x.

Kartasova, J. & Vicoskaite, I. (2013). Financial Market Anomalies: efficient market nonexistence evidence. KSI Transactions, 6(4), 5-11.

Kimeu, C., Anyango, W., & Rotich, G. (2016). Behavioural factors influencing investment decisions among individual investors in Nairobi Securities Exchange. *Strategic Journal of Business & Change Management*, *3*(4), 1244-1258.

Kumar, S. & Goyal, N. (2016). Evidence on rationality and behavioural biases in investment decision making. *Qualitative Research in Financial Markets*, 8(4), 270- 287.

Lin, H.W. (2011). Elucidating rational investment decisions and behavioural biases: Evidence from the Taiwanese stock market. *African Journal of Business Management*, 5(5), 1630-1641.

Mahalakshmi, T. N. & Anuradha, N. (2018). Gender based study on the Implications of Behavioral Biases in Investment Decision making. *International Journal Global Business Management & Research*, 7(1), 35-43.

Mangala, D. & Sharma, M. (2014). A Brief Mapping of Theory and Evidence of Investors' Behavioural Biases. *Indian Journal of Finance*. 8(8), 44-56.

Mehtab, F., & Nagaraj, H. (2019). Personality Traits and Behavioral Biases of Indian Investors. *UNNAYAN : International Bulletin of Management and Economics*, 11 (2), 144-150.

Mintzberg,H., Raisinghani, D. & Theoret, A. (1976). The structure of "unstructured" decision processes. *Administrative science quarterly*, 21(6), 246-27.

Mukherjee, S. & De, S. (2019).When are Investors Rational?. *Journal of Behavioral Finance*, 20(1), 1-18.

Mushinada, V. N. C. & Veluri, V. S. S. (2018). Elucidating investors rationality and behavioural biases in Indian stock market. *Review of Behavioral Finance*, 11(2), 201-219.

Mushinada, V. N. C. (2019). Are individual investors irrational or adaptive to market dynamics?. *Journal of Behavioral and Experimental Finance.*, 25(C), 1-34. doi:10.1016/j.jbef.2019.100243.

Powell, T. C. (2018). Romantics, Mercenaries, & Behavioral Rationality. *Behavioral Strategy in Perspective*, 39, 151–160.

Rubinstein, M. (2000). Rational Markets: yes or No? The affaffirmative Case. *Financial Analyst Journal*, 57(2), 15-29.

G. K. Deshmukh & Sanskrity Joseph, 2016. Behavioural Finance: An Introspection of Investors Psychology, *Indian Journal of Commerce and Management Studies*, Educational Research Multimedia & Publications, India, 7(1), 97-102.

Rutgers, M. R. (1999). Be rational! but what does it mean?. *Journal of Management History (Archive)*, 5(1), 17–35.

Sent, E.M. (1997). Sargent versus Simon: bounded rationality unbound. *Cambridge Journal of Economics*, 21(3), 323–338.

Sent, E.M. (2018). Rationality and bounded rationality: you cannot have one without the other. *The European Journal of the history of Economic Thought*, 25(6), 1370-1386.

Sharma, M., & Firoz, M. (2022). Delineating investors' rationality and behavioural biases-evidence from the Indian stock market. *International Journal of Management Practice*, *15*(1), 59-86.

Shefrin, H. & Statman, M. (1985). The disposition to sell winners too early and ride losers too long: theory and evidence. *The Journal of Finance*, 40 (3), 777-790.

Simon, H. A. (1956). Rational choice and the structure of the environment. *Psychological Review*, *63*(2), 129–138. https://doi.org/10.1037/h0042769.

Tauni, M. Z., Majeed, M.A., Mirza, S.S.,Yousaf, S. & Jebran, K. (2017). Moderating influence of advisor personality on the association between financial advice and investor stock trading behavior. *International Journal of Bank Marketing*, 36(5), 947- 968.

Tekce, B., Yılmaz, N., & Bildik, R. (2016). What factors affect behavioral biases? Evidence from Turkish individual stock investors. *Research in International Business and Finance*, *37*, 515-526.

Thaler, R. H. (1999). Mental accounting matters. *Journal of Behavioral Decision Making*, 12(3), 183–206.

Thaler, R.(1985). Mental accounting and consumer choice. *Marketing Science*, 4(3), 199-214.

Thaler, R., & Benartzi, S. (2004). Save more tomorrow: using behavioral economics to increase employee savings. *Journal of Political Economy*, 112, S164-S187

Tversky, A. & Kahneman, D. (1974). Judgment under Uncertainty: Heuristics and Biases. *Science 185(4157), 1124–1131*. doi:10.1126/science.185.4157.1124

Tversky, A. & Kahneman, D. (1981). The framing of decisions and the psychology of choice. *Science New Series*, 211 (4481), 453-458.

Tversky, A., & Kahneman, D.(1992).Advances in prospect theory: Cumulative representation of uncertainty. *Risk Uncertainty*, 5(3), 297–323.

Zahera, S.A. & Bansal, R. (2018). Do investors exhibit behavioural biases in investment decision making? a systematic review. *Qualitative Research in Financial Markets*, 10(2), 210-251.

Blume, L.E. & Easly, D. (2008). *The New Palgrave Dictionary of Economics, Second Edition. Palgrave, Macmillan.* Retrieved from: http://www.dictionaryofeconomics.com/

Edwards, W. (1982). *Conservatism in Human Information Processing* (excerpted), in Kahneman, D.,Slovic, P. and Tversky, A. (Eds), Judgment under Uncertainty: Heuristics and Biases,Cambridge University Press, New York, NY.

Fishburn, P.C. (2013). *The Foundations of Expected Utility.* Springer Science & Business Media.

Hommes, C. (2013). *Behavioural Rationality and Heterogeneous Expectations in Complex Economic Systems*. Cambridge University Press, NY.

Kuhn, T. (1962). *The Structure of Scientific Revolutions.* Chicago and London: university of Chicago Press. Retrieved from: https://plato.stanford.edu/enteries/thomas-kuhn/

Montier, J. (2002). *Behavioral finance: Insights into irrational minds and markets.* John Wiley & Sons Ltd: England.

Pompian, M. M. (2006). *Behavioural finance and wealth management: Building optimal portfolios that account for investor biases*. John Wiley & Sons.

Simon H. A (1977). *The New Science of Management Decision*. (3rd revised edition; first edition 1960) Prentice-Hall, Englewood Cliffs, NJ.

Simon, H. (1976). *From substantive to procedural rationality.* S.J., Method and Appraisal in Economics, Cambridge University Press.