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Behavioural Biases in Investment Decision-Making: A Conceptual Review

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Abstract: Behavioural finance, founded on the concept of bounded rationality and holding that individuals tailor their logical decision-making process by taking note of their knowledge constraints, emotional, and psychological factors, deviates from the notion of rationality, further diverging from conventional financial theory. This paper is a synthesis of the present literature to identify the common behavioural biases and the key research topics relating to behavioural biases in investments. The paper further summarizes the synthesis insights into a coherent framework and identifies the future scope for investigation. The paper highlights the requirement for more research to address these inconsistencies in findings, and thoroughly understand the complex relationships between psychological biases and investors' decisions.

Keywords: Behavioural finance; behavioural bias; investment decision; risk perception; risk propensity

1. Introduction

The traditional financial theories began in the mid-eighteenth century [1, 2]. The expected utility theory was the central idea among them. According to this theory, the anticipated utility values of the different choices are weighed while making decisions under risk. This theory is broadly recognized in the traditional literature for making choices in a risky scenario. The Markowitz Portfolio Theory elucidates the behaviour of investors seeking to optimize their returns. The theory assumes that investors exhibit aversion to risk and either aim to maximize the expected portfolio returns for a particular risk level or to minimize the expected portfolio risk for a particular level of anticipated portfolio return. This theory offers the cornerstone of the Capital Asset Pricing Model (CAPM). It is considered that lendings and borrowings take place at risk-free rates. In line with the CAPM, Eugene Fama advocated the market efficiency hypothesis in the 1960s, which elucidates that all data at hand are integrated into security prices, and securities are accurately priced, with their price being equivalent to their fundamental value at all times. However, various empirical studies argue that the assumptions of the CAPM are too simplified to be applicable to actual markets [3,4]. Investors employ manifold approaches while making investments [4]. While research studies have extended their support for the EMH, researchers have discerned the existence of financial market disruptions or anomalies [2]. Since the beginning of the twenty-first century, the EMH's dominance has significantly diminished [1]. A movement towards integrating more behavioural sciences into financial theory emerged in the early 1980s [5-8]. Behavioural theory

suggests integrating insights from behavioural sciences, such as sociology and psychology, into the finance discipline [9,1].

Human behaviour in the process of making decisions is a widely investigated subject [10]. Behavioural finance "examines why investors deviate from the normative, rational approach to investment, and—in sufficient numbers to be economically apparent—apply alternative criteria" [11]. Investors divert from rationality because of the uncertainty and the sizeable amount of data they have to deal with, which overwhelms them and necessitates them to use mental shortcuts, also called heuristics, to make decisions [11]. The way of information framing may also cause individuals to diverge from rationality [11].

The paper aims to discuss the common behavioural biases and synthesize the key research topics relating to behavioural biases in investment decision-making from the present literature. The paper further summarizes the insights from the synthesis of the existing literature into a conceptual framework that could serve as a roadmap for forthcoming research studies and be beneficial for researchers, practitioners, and policymakers. This framework provides a synthesized representation of the important concepts, relationships, and patterns identified in the existing research documents. The framework indicates the different courses through which biases may be related to investors' decisions and therefore introduces areas for further exploration and thinking. Again, the researchers have not come across any work that has collectively explored the relationships presented in the framework, especially while considering a comprehensive extent of socio-demographic and investor-specific factors and investors' biases. Scholars can empirically test the connections proposed in the framework to examine its validity, thereby adding to the present knowledge. The paper also highlights the shortcomings in the present literature and identifies the future scope for investigation.

2. Emergence of Behavioural Finance

Since the 1960s, the EMH given by Eugene Fama has long dominated the finance field [1]. There are three theoretical arguments that form the basis of the EMH. These are:

1. Investors are logical, and security valuation is done rationally.
2. The investment decision-making process takes into account all data at hand.
3. Decision-makers are driven by self-interest.

The EMH holds that every subsequent price change demonstrates unpredictable departures from prior prices given that the information flow is unimpeded and information is quickly incorporated into security prices [1]. Economists and statisticians, however, started recognizing that security prices could be predicted to some extent either through historical stock price trends or specific fundamental valuation indicators because of the relevance of behavioural and psychological aspects in security price determination [12,13]. [14-16] challenged the EMH. Traditional finance failed to explain the actual financial market mechanisms and structures [1]. The ideas of classical decision theory have frequently been replaced with a more descriptive approach known as behavioural decision theory since it is crucial to comprehend the actual behaviour of investors [17]. The subdiscipline of behavioural finance emerged as a result of its application to finance [17]. Behavioural finance, founded on the concept of bounded rationality and holding that individuals tailor their logical decision-

making process by taking note of their knowledge constraints, emotional, and psychological factors, deviates from the notion of rationality, further diverging from conventional financial theory [1]. The ability of the behavioural finance approach to provide insight into the actual capital market occurrences that are not covered by conventional financial theories is one of its main accomplishments [1].

The prospect theory, or theory of perspectives, serves as the foundation for behavioural finance [2]. The prospect theory's value function evaluates the "value" that people place on their profits or losses. It holds that individuals experience certain profits or losses more strongly than others. The theory suggests that individuals have a propensity to be more prompted to avoid losses than to seek gains. This is known as loss aversion. Prospect theory lays the groundwork for behavioural biases such as the disposition effect, loss aversion, and framing**.**

3. Behavioural Biases

Individual investors' behaviour is typically affected by various psychological variables, namely, overconfidence [18-21], anchoring [18, 19, 21, 22], loss aversion [18, 21, 22], herding [21-23], regret aversion [18, 22], and representativeness [19, 21]. Such behavioural biases result in subpar investment decisions [2]. Individuals can boost their performance by being aware of their own psychological errors [2, 24].

3.1. Self-Attribution Bias

Two distinct components, namely the self-enhancement and self-protection biases, make up the self-attribution bias [25]. The self-enhancement bias denotes the accreditation of successes to oneself [4, 25, 26, 27], whereas the self-protection bias refers to ascribing setbacks to external factors [4, 25, 27]. When investors are able to accurately predict future returns, their overconfidence increases, and they tend to trade more in the periods that follow [28-30]. However, their overconfidence declines gradually if their predictions prove to be inaccurate [28-30]. Thus, self-attribution leads to overconfidence [28-30]. Traders affected by self-enhancement bias trade frequently and hold less diversified portfolios [27]. This suggests that overconfidence is triggered by the self-enhancement bias, which could possibly cause them to underperform in the future [27].

3.2. Overconfidence

Researchers in [31] consider overconfidence as 'miscalibration' and the 'better than average effect'. They model 'miscalibration' as "the degree of overestimation of the precision of information". Investors who suffer from the 'better than average effect' consider themselves to be above average when it comes to their investment expertise or performance in the past, even if they have not historically outperformed.

Overconfidence is more prominent in challenging, skill-demanding tasks [11, 32]. Professionals are subject to higher degrees of overconfidence [11]. Overconfident investors do not diversify their investments [18, 33, 34] as they mostly invest in avenues or assets they are familiar with [18]. Such investors think that they are better acquainted and skilled at choosing profitable stocks in comparison to others [18, 32, 35, 36, 37] and engage in trading activities

to a greater degree than is necessary [32, 34, 38, 39, 40, 41]. Investors who are overconfident tend to own highly risky portfolios due to their underrated estimations of risk [42, 43].

3.3. Herding

Herding occurs when ordinarily rational individuals act illogically as a result of following the decision-making process of other individuals [24]. Investors who are subject to herding perceive the moves of influential investors to be superior and tend to mimic them [11, 36]. Herding ensnares individuals who intend to avoid a risk [44], which could include anything from reputational harm to wealth loss by acting according to the decisions of the majority [11, 24]. Herding behaviour is especially witnessed during extremely volatile periods [43]. Herding has a negative influence on people's perception of market functioning [24]. Investors who follow the crowd trade too much, impeding their investment success [24]. Herding causes inefficiencies in pricing and leads to market bubbles and crashes [11]. The harmful effects of herding can be negated through diversification [44].

3.4. Regret Aversion

The concern that a decision may turn out to be poor or faulty and hence be regretted is known as regret aversion [45]. Because of this bias, investors may be prompted to skip periodic assessment of their portfolios. Investors are hesitant to sell stocks at declining prices as a result of susceptibility to regret aversion [18].

3.5. Disposition Effect

Investors are predisposed to realize losses less often than profits [35]. Investors realize a higher proportion of gains than losses during the year [7, 46]. The realization of gains exceeds that of losses [47, 48]. [49] note that it took investors a relatively shorter period to realize winners. Traders postpone the sale of losing stocks until December, when they finally realize losses in order to benefit from the tax perspective before the expiry of the deadline, despite their unwillingness to sell at a loss [5]. Losses that are short-term and gains that are long-term are realized only when tax advantages alone form the basis of one's consideration [5]. However, such trades motivated by tax considerations constitute only a small proportion of all trades and are a measure of self-control [5]. The pattern of gain or loss realizations is thus driven by both tax considerations and dispositional behaviour [5].

3.6. Availability

Investors who suffer from availability bias depend upon easily accessible information [50]. The preferences of investors vary in accordance with the accessibility of data [50]. More availability of information results in an increase in risk perception and, therefore, fewer investments in stocks [50].

3.7. Representativeness

Representativeness bias exaggerates investors' reactions and prompts them to purchase hot stocks instead of investing in stocks having poor past performance [50]. Investors prone to

representativeness neglect the laws of probability and decide based on small samples [43, 50, 51].

3.8. Anchoring

Investors commonly make investment choices based on information that is already available, such as the investment's initial purchase price [52]. Investment decisions of individuals who exhibit anchoring bias are based on previous prices [53].

3.9. Barnum Effect

The Barnum effect, or the Forer effect, occurs when people tend to trust generic ideas and personalize them [54]. It was first brought to light by psychologist Bertram Forer. It is the belief that individuals misconceive generalized knowledge applicable to everyone to be only personally associated with them [54]. For example, individuals who regularly follow their horoscopes may make investing choices on the basis of such predictions. The Barnum effect has been scarcely explored in the literature [55].

4. Socio-Demographic and Investor-Specific Factors and Behavioural Biases

Demographic variables are significant determinants of investment behaviour [56, 57]. Young investors exhibit greater overconfidence [25, 35, 42, 58] and self-attribution [58]. Aligned with the aforesaid findings, [59] say that young investors are higher risk-takers. Hence, age has a significant impact on investor behaviour. In contrast, [21, 60] find that overconfidence tendencies are age-invariant. Men are more affected by overconfidence [21, 38, 40, 58, 61, 62, 63, 64, 65, 66, 67] and self-attribution [58]. [38] obtained the data of ten thousand operational investor accounts from a national discount broking in the U.S. during 1987-1993. Men trade more recurrently than women, with an approximate 45 percent difference, which is accounted for by higher overconfidence [38]. [63] delineate that male investors in Delhi fall more victim to overconfidence pertaining to their understanding of the Indian stock market. [67] disclose similar observations in Pakistan. In contradiction, [42] find that women are more overconfident. The conclusions of [58] are derived from the responses of investors in Kolkata, Hyderabad, Mumbai, Bengaluru, and New Delhi. They contend that inadequate experience in trading induces self-attribution, which fosters overconfidence in individuals. Opposingly, some studies claim that more experience heightens investors' overconfidence [49, 63, 68, 69] and causes investors to trade repeatedly and earn lucrative returns [49]. Hence, overconfidence may not necessarily have a negative consequence. It may bring about higher returns as a result of high-risk investments [11]. Low-income individuals succumb to overconfidence and self-attribution [58]. Conflictingly, [63] hold that higher-income individuals develop overconfidence. [68] on the basis of information compiled from mutual fund investors in Bangalore, opine that education raises one's subjection to self-attribution and overconfidence.

Female investors are more affected by herding [62, 70], representativeness [71, 72], anchoring [72], and the disposition effect [62, 69, 73] than male investors. Disagreeing with the aforesaid finding, [74] report a higher propensity to herd among male investors. Younger investors have higher herding inclinations [62, 69], whereas researchers such as [63, 70] agree

with the contrary that older investors display greater herding behaviour. [60] do not observe any variations in behaviour on the basis of marital status distinctions among participants.

Therefore, it is observed that varied conclusions are drawn from the various studies as discussed in this section.

5. Behavioural Biases and Investment Decisions

Overconfidence [26, 35, 44, 50, 54, 67, 75, 76], the disposition effect [35, 44], anchoring [53, 67, 75, 76], regret aversion [18, 22, 54], availability [26, 75], representativeness [50, 75, 76, 77, 78], self-attribution [20], the Barnum effect [54], and herding [44, 67, 76, 79, 80] influence investors' decisions. The aforementioned findings were observed concerning the stock markets in Malaysia [26], Indonesia [35], Saudi Arabia [44], India [50, 75, 76, 78], Pakistan [67, 77], and Egypt [79]. Such biases cause wealth to decline [35]. [81] reported a negative linkage between heuristics, prospect theory, and investors' decisions. Lower exposure to heuristics and prospect theory illusion results in better decisions.

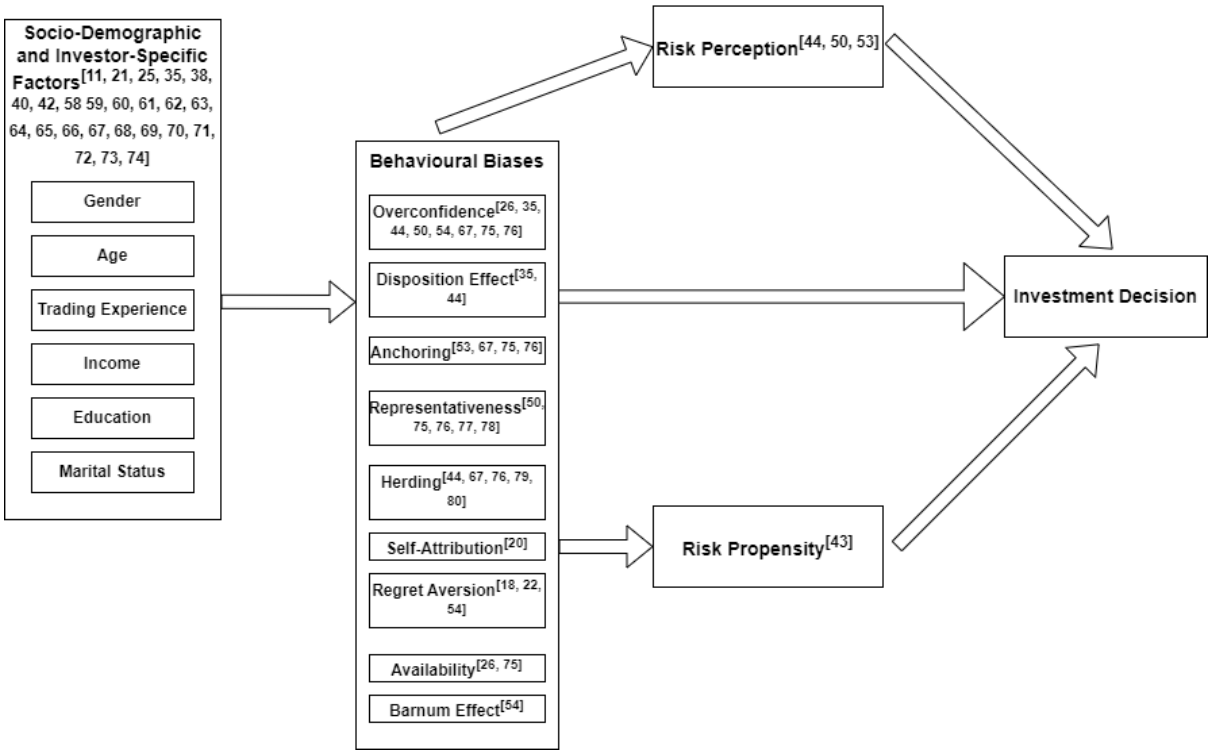
6. Risk Perception and Risk Propensity as Mediators between Behavioural Biases and Investment Decisions

Risk perception is an important mediator variable that explains how people view and comprehend risks, which in turn influences their investing choices [44]. Risk perception mediates the connection between psychological biases such as overconfidence [50], the disposition effect [44], representativeness [50], anchoring [50, 53], herding [44], availability [50], and investors' decisions. [50] say that the risk relating to a particular investment is understated by overconfident investors. Such investors tend to have deflated perceptions of risks as they assign more weightage to their private information and are less reliant on outside information. On the contrary, [44] contend that investors who display such biases see investments as riskier than actual, which would result in less-than-ideal choices and portfolio results. It is crucial to take into account a person's risk perception when making investing choices because it can greatly influence their inclination to take risks and, eventually, how well their portfolio performs [44].

The term 'risk propensity' describes an investor's attitude towards taking on or refraining from making risky decisions. Loss aversion and herding bias negatively affect investors' risk propensity [43]. This is due to investors' negligence of their risk propensity and their tendency to make investment decisions in accordance with other investors [43]. Individuals strategize their investments on gains instead of losses and keep away from risks related to losses [43]. Loss aversion is related to risk aversion [43]. Mental accounting, overconfidence, representativeness, and anchoring biases positively influence investors' risk propensity [43]. Anchoring causes investors to take higher risks during bull market situations and lower risks during bear market situations [43]. Risk propensity positively affects investment decisions [43]. The influence of these biases on investors' decisions is, therefore, mediated and reinforced by risk propensity [43].

The inferences discussed in this section were drawn from investors in Jammu & Kashmir [43], Saudi Arabia [44], and Punjab [50]. They put that the inferences may not be universal or applicable to other contexts [44]. Again, adequate exploration of the mediating

role of risk propensity and risk perception is missing in the literature. Hence, it is necessary to conduct similar studies in other geographical contexts.



Source: Researchers' compilation from literature review

Figure 1. Proposed conceptual framework showing relationship between socio-demographic and investor-specific factors and behavioural biases, the direct relationship between behavioural biases and investment decisions and the indirect relationship through risk perception and risk propensity [**Note:** The superscript numbers in the figure indicate the references listed in the paper that support the given links in the framework and correspond to studies that have been discussed in detail in the above sections of the paper.]

7. Conceptual Literature-Based Research Framework for Behavioural Biases in Investment Decision-Making

Academic works such as [11, 21, 25, 35, 38, 40, 42, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74] have explored how socio-demographic and investor-specific factors such as gender, age, trading experience, income, education, and marital status give birth to biases in investors. Scholarly investigations such as [18, 20, 22, 26, 35, 44, 50, 53, 54, 67, 75, 76, 77, 78, 79, 80] state that behavioural biases, including overconfidence, the disposition effect, anchoring, representativeness, regret aversion, self-attribution, loss aversion, availability, the Barnum effect, and herding, are related to investors' decisions. A number of research works, such as [44, 50, 53], have developed empirical models that revealed a significant indirect connection between behavioural biases and investors' decisions through risk perception. Furthermore, [43] have advanced a conceptual model that points out a noteworthy indirect link between behavioural biases (prospect, herding, and heuristics) and investors' decisions through risk propensity. After examining manifold research works, the authors have drawn ideas from the relevant ones to merge the essential relationships and

patterns observed in these works into a unified framework. The insights from the synthesis of the present literature are consolidated into a conceptual framework as depicted in Figure 1, which indicates the relationship between socio-demographic and investor-specific factors and behavioural biases, the direct relationship between behavioural biases and investment decisions, and the indirect relationship through risk perception and risk propensity. The socio-demographic and investor-specific factors interact with biases and how they affect investing choices. By taking these factors into account, the framework suggests the importance of focusing on these differences at the individual level while studying investors' behaviour. However, the framework has not been empirically validated in its unified version in a single study, though the relationships within the framework have been separately validated empirically in prior studies (as discussed above).

This coherent framework provides a synthesized representation of the important concepts, relationships, and patterns identified in the existing research documents. The framework indicates the different courses through which biases may be related to investors' decisions and therefore introduces areas for further exploration and thinking. The framework could provide a direction for upcoming research studies and therefore be of use for scholars, practitioners, and policymakers. The framework also emphasizes the necessity of programs targeted to educate investors to do away with the harmful effects of biases. Scholars can empirically test the connections proposed in the framework to examine its validity, thereby adding to the present knowledge. The framework can be examined with relevance to diverse geographical, socio-demographic, and cultural contexts.

8. Conclusions

By synthesizing the reasonings from the existing studies, the paper offers a consolidated perspective, which could serve as groundwork for future research. The assumptions of the standard financial theories were unreasonable, which led to their questioning during the 1980s. Eugene Fama defended the EMH by arguing that market disruptions are random, and when the methodology employed to measure market anomalies changes, they cease to exist. However, various empirical studies argue that the assumptions of traditional finance are too simplified to be applicable to actual markets. Investors employ numerous approaches while making investments. This led to the advent of behavioural finance. Behavioural finance eased the assumptions of mainstream finance. Behavioural finance serves as an additional component of the mainstream finance theory rather than as a substitute. Behavioural finance should be used along with traditional finance to comprehend the phenomenon of investors' decision-making [82]. Behavioural biases affect how people view and comprehend risks, which in turn influences their investing choices [44]. When biases are spotted early in the process of making decisions, personalized interventions can bring down the occurrence of errors while investing, such as trading more than is necessary because of overconfidence, etc. The prevalence of biases has been extensively investigated in developed countries. The majority of the studies focus on developed financial markets, and less is known about the behaviour of investors in emerging markets. Most studies in the literature employ secondary data. This emphasizes the need for research in emerging markets and that which is based on real data. Research relating to individual investors' behavioural biases requires ample attention in financial models. Regarding the linkage between socio-demographic and investor-specific factors and psychological biases, the conclusions drawn from the literature are contradictory. And the

findings relating to the influence of behavioural biases on investors' choices differ greatly across studies. These variations in results across existing studies may be due to differences in methodology, viz., sample size, method of data collection, scale used to measure behavioural biases, etc. This highlights the requirement for more research to address these inconsistencies in findings, and thoroughly understand the complex relationships between psychological biases and investors' decisions. This paper also posits a framework that indicates the different courses through which biases may be related to investors' decisions and therefore introduces areas for further exploration and thinking. The framework could provide a blueprint for upcoming research studies and therefore be of use for scholars, practitioners, and policymakers. Scholars can empirically test the connections proposed in the framework to examine its validity, thereby adding to the present knowledge. The framework could work as a guide for financial practitioners, academicians, scholars, and educators to comprehend the psychological drivers of investors' behaviour and, by being conscious of their biases, allow them to formulate targeted, efficient solutions that optimize investment output metrics. The framework presents only unidirectional relationships, as these are strongly established in the present literature and due to the absence of adequate documents examining the bi-directional relationships between biases and factors such as risk perception and risk propensity. The authors have come across only one study, i.e., [83], that noted the effect of risk perception on biases. The present study encourages more investigation into the interdependent dynamics between the factors, acknowledging the potential for further study of these issues.

Multidisciplinary Domains

This research covers the domains: (a) finance, (b) commerce. Behavioural finance is a multidisciplinary subject that unifies observations from finance, sociology, psychology, and economics. The finance domain sheds light on the role of biases in shaping investors' decisions. Using behavioural finance along with traditional finance facilitates the comprehension of the phenomenon of investors' decision-making and the interconnectedness between behavioural patterns and trends in the market, such as bubbles, crashes, volatility, etc. Commerce aids in comprehending how biases surface in consumer investing patterns, i.e., how psychological and socio-demographic aspects determine individuals' choices in stock markets. The perspectives gained from such explorations can be valuable in combating biases through the adoption of efficient financial practices, investing strategies, and policies, therefore ensuring that the reasonings from the studies are not only theoretical but have practical implementation.

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Conflicts of Interest

The authors declare no conflict of interest.

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