

ESG Investing and Investor Behavioural Biases: A Systematic Review and Integrated Behavioural Finance Framework: A Systematic Literature Review

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Abstract

This paper presents systematic literature review (SLR) based on the PRISMA framework on the nexus of ESG and investor behavioural biases in the stock market. The selection of 72 studies that fulfilled all the eligibility criteria was drawn from an initial sample of 5213 from Scopus, Web of Science, and additional databases, and synthesised thematically. It considers the interplay between cognitive and emotional biases (such as herding, overconfidence, disposition effect, loss aversion, confirmation bias, anchoring) and the quality of the ESG disclosure, rating divergence, and the perception of greenwashing to influence investment behaviour. The results show that investor psychology and financial expertise, as well as market conditions, play a significant role in determining the impact of ESG factors, which do not seem to work on a strictly rational and informational basis. On this synthesis, the paper lays out a new Integrated Behavioural Finance Framework, where the quality of the signals is proposed as an antecedent of the heuristic process and a set of testable propositions for future empirical research. The review reveals several limitations, including geographic underrepresentation (especially the GCC), biases of anchoring and regret aversion, and the lack of experimental and debiasing intervention studies. Implications are provided for investors, financial advisors, regulators and researchers interested in modelling sustainable investment decision making in a behaviourally realistic way.

Findings:

The review indicates that the impact of ESG on stock market investment decisions is mediated by behaviour and not just information. Investor behaviour is influenced by the interplay between the quality of ESG disclosure and rating divergence, as well as perceptions of greenwashing and the disposition effect, and overconfidence and herding. Institutional investors seem to distinguish between ESG dimensions based on the materiality of the sector and are generally less prone than retail investors to be biased in their processing of ESG information, who are more liable to herding and

greenwashing risk. Higher divergence due to rating, coupled with higher voluntary disclosure, paradoxically increases (not resolves) the divergence, irrespective of the performance of the firms.

Originality and Value:

The novelty of this paper is that it combines in a systematic way two streams of literature in a PRISMA-based synthesis, instead of tackling the investor psychology and the quality of the ESG disclosure separately. It presents an Integrated Behavioural Finance Framework where signal quality is an antecedent to heuristic processing, that is moderated by investor-level and market-level variables, and testable propositions for future empirical testing. The review contributes to the field by pointing to Islamic finance's values-based screening logic, indicating that the GCC is a hugely under-researched context, and revealing gaps in methods and studies that have informed future research, including a lack of experimental debiasing studies.

Keywords: ESG Investing, Behavioural Finance, Investor Behavioural Biases, Prospect Theory, Herding, Overconfidence, Disposition Effect, Sustainable Investment, Systematic Literature Review.

1. Introduction

ESG has evolved from an 'ethical thing to do' to a key element of global capital allocation over time, and by 2022, stocks market sustainable assets under management were said to have reached USD 30 trillion or more (Bihari et al., 2025). The traditional finance theory framework assumes that investors are rational and value companies based on historical information, which includes ESG data, and engage with it in a rational way. But there is a growing stream of behavioural finance literature showing that investors are systematically affected by cognitive heuristics and emotional reactions which contradict the Efficient Market Hypothesis and Expected Utility Theory (Kahneman & Tversky, 1979; Tversky & Kahneman, 1974). Two distinct lines of literature have emerged, mostly following each other. The first reviews the drivers and effects of ESG investing disclosure quality, rating methodology, and firm level outcomes. The second looks at behavioural biases in the process of making investment decisions, without regard to sustainability. Research to systematically connect these streams, specifically looking at the perception, interpretation and action of ESG information by investors, has just come to the fore (Badola et al., 2023; Bihari et al., 2025; Li et al., 2025). This paper addresses that growing need by bringing together the fragmented evidence base in a cohesive, comprehensive review. This review aims to systematically map the empirical and conceptual literature on the ESG factors and investor behavioural biases of stock market investment, identify the investor biases most commonly cited in ESG-related investment decisions and their mechanism of action, and synthesize these findings into an Integrated Behavioural Finance Framework which can provide guidance for future empirical testing and practice. The following research questions are used as guides for the review:

- RQ1: Which ESG factors are most frequently examined in relation to investor decision-making, and through what channels do they influence investors (e.g., disclosure, ratings, media narratives)?

- RQ2: Which behavioural biases are most consistently documented as shaping ESG-related investment decisions, and how do they interact with one another?
- RQ3: What theoretical frameworks have been used to explain the ESG–bias interaction, and how can these be integrated into a coherent behavioural finance model?
- RQ4: What are the principal gaps in the existing literature, and what research agenda would most usefully advance the field?

The rest of the paper is organized as follows. The theoretical background is presented in Section 2. The methodology of the systematic review is described in Section 3. Section 4 brings together the literature on the ESG factors and Section 5 brings together the literature on behavioural biases. Their interaction is explored in section 6. The Integrated Behavioural Finance Framework is presented in Section 7. Implications and the future research agenda are discussed in Sections 8 and 9, respectively, while Section 10 concludes.

2. Theoretical Background

2.1 From Standard Finance to Behavioural Finance:

Traditional financial theory, which is rooted in the Efficient Market Hypothesis and Expected Utility Theory, assumes that investors are rational agents who receive all the available information and do it without systematic errors including ESG information. Despite empirical findings that continue to raise important issues on the assumption that markets are rational, behavioural finance was born as a result of psychological studies of judgment and decision-making under uncertainty (Tversky & Kahneman, 1974). In the view of behavioural finance, any anomaly from rationality is not a noise, but a systematic and predictable pattern, which can be explained by the heuristics investors employ when making complex decisions.

2.2 Prospect Theory and Heuristic-Driven Decision-Making:

The theory of behavioural finance is still based on prospect theory (Kahneman & Tversky, 1979). It suggests that investors consider whether or not they are better off or worse off than they were at some hypothetical "zero" point, rather than whether they are better or worse off than they were before they invested, that losses loom larger than gains of the same size, and that investors' response to outcomes decreases as they become farther removed from the "zero". It proposes that investors compare their outcomes to some subjective reference point, rather than to how much they had before they invested, that losses are weighted more than gains of the same size, and that investors' response to outcomes diminishes as they get further from the "zero". These principles are at the heart of a number of the specific biases listed in Section 5, such as the disposition effect (Shefrin & Statman, 1985) and a reluctance to sell out of familiar, non-sustainable investments due to losses. In addition to the prospect theory, the heuristics-and-biases programme (Tversky & Kahneman, 1974) identified several mental shortcuts that lead to systematic judgment errors, such as the representativeness heuristic, the availability heuristic, and the anchoring heuristic.

2.3 ESG Investing as a Behavioural Extension:

Theoretically, this picture becomes more complicated when considering ESG investing, where the financial assessment of an investment is coupled with an evaluation based on values. Investors have to read the ESG signals that are either poorly defined, are contradictory among different providers, or are crafted by companies themselves (Berg et al., 2022; Christensen et al., 2022). The uncertainty allows for heuristic processing: When it is hard to verify objective ESG performance, investors are more likely to depend on mental shortcuts, social cues and pre-existing beliefs to assess performance, rather than systematic analysis (Bihari et al., 2025).

3. Methodology

3.1 Review Protocol:

This review is conducted using the systematic literature review (SLR) methodology and followed the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) protocol, similar to the recently published systematic literature reviews in the same domain (Herathmenike et al., 2025; Li et al., 2025). The SLR approach was chosen instead of a narrative review, as it provides a transparent and replicable, and unbiased process to identify, screen and synthesise an increasingly large and disjointed evidence base in the field of finance, accounting and psychology.

3.2 Search Strategy and Eligibility Criteria:

The search was structured within three groups of databases, namely: Scopus, Web of Science – Core Collection and a third group of databases which included Pro Quest, EBSCO Business Source Complete and Google Scholar (which were not used as primary search sources but as a literature check for grey-literature and completeness). The search string included ESG-related and behavioural-finance-related terms with the Boolean operators: (“ESG” OR “environmental, social and governance” OR “sustainable investing” OR “responsible investing”) AND (“behavioural finance” OR “behavioural bias*” OR “investor psychology” OR “herding” OR “overconfidence” OR “disposition effect” OR “investment decision-making”). General Searches were limited to the title, abstract and keyword fields, and searched the records of January 2014 through June 2026 between 1 and 15 July 2026. The inclusion/exclusion criteria used for screening are summarised in Table 1.

Table (1): Inclusion and Exclusion Criteria (Source: Authors own work)

Criterion	Inclusion	Exclusion
Time frame	Peer-reviewed articles published 2014–2026	Studies published before 2014 unless seminal (e.g., foundational theory papers)
Subject matter	Studies addressing ESG factors, behavioural biases, or their intersection in investment decision-making	Studies on ESG limited to corporate financial performance with no investor-behaviour dimension
Publication type	Journal articles, systematic reviews, meta-analyses in Scopus/Web of Science-indexed or AJG-rated outlets	Non-peer-reviewed blogs, magazine articles, unverified working papers

Criterion	Inclusion	Exclusion
Language	English-language publications	Non-English publications without verified translation
Focus	Individual, retail, or institutional investor decision-making in equity/stock markets	Studies focused solely on corporate ESG disclosure practices with no investor-behaviour link

3.3 Search Results and PRISMA Flow:

The search resulted in the identification of a total of 5,213 records in the different sources searched: 2,148 records from Scopus, 1,806 records from Web of Science, and 1,259 records from supplementary databases. Of the 3,687 unique records remaining after duplicate removal, 3,214 were filtered out based on the title and abstract as not relevant to the intersection of ESG and behavioural bias. Of these, 401 records were rejected because of the eligibility criteria in Table 1, with 198 being ineligible because of the focus, 94 because not peer-reviewed, and 109 because of the lack of an investor-behaviour dimension. This process resulted in a final sample of 72 studies that were retained for qualitative synthesis, similar in size to other recent reviews at this particular intersection (e.g. 57 studies retained from 7,768 screened records by Li et al., 2025; 63 studies retained by Herathmenike et al., 2025). The entire PRISMA flow diagram is shown in Figure 1.

PRISMA Flow Diagram

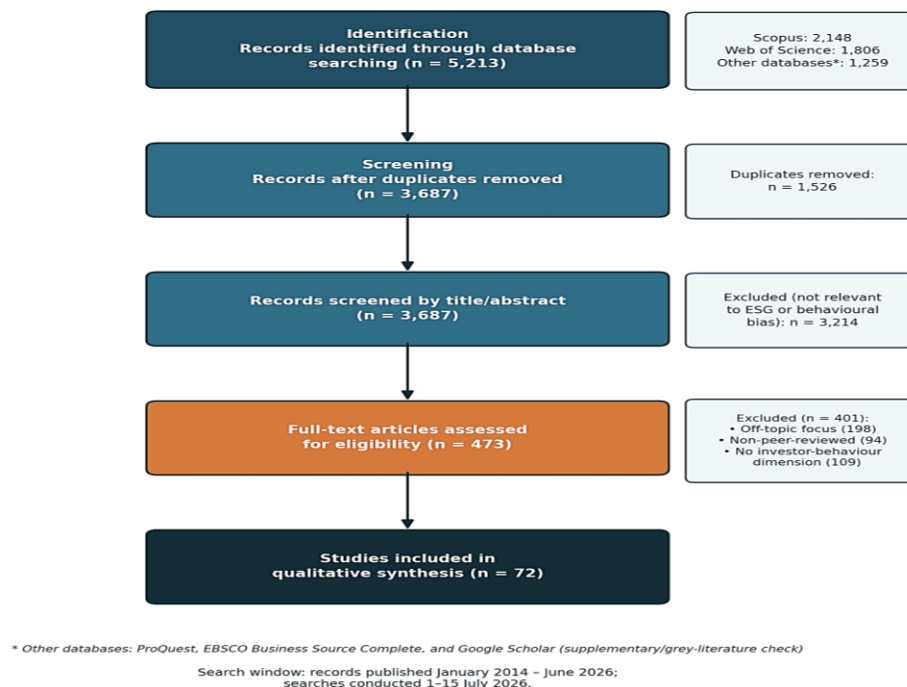


Figure (1): PRISMA Flow Diagram Documenting the Identification, Screening, Eligibility Assessment, and Inclusion of Studies (Source: Authors own work)

3.4 Quality Assessment of Included Studies:

As is customary in SLRs, this review does not give equal weight to all the studies that were included. The three key areas assessed for each study that was included in the core synthesis (Table 2) were method quality, sample adequacy and risk of bias for each study, all of which were evaluated using Critical Appraisal Skills Programme (CASP) checklists suitable to the study type (survey, experiment, and review). This appraisal for the studies most heavily used in Section 4–7 is summarised in Table 2; the complete appraisal of all 72 studies included was based on three dimensions but is not reproduced in full here for constraints of space.

Table (2): Quality Assessment of Key Included Studies (Source: Authors own work)

Study	Method Quality	Sample Adequacy	Risk of Bias	Overall Appraisal
Badola et al. (2023)	High	High (SLR, PRISMA-based)	Low	Strong
Bihari et al. (2025)	Moderate–High	Moderate (single-country survey)	Moderate	Moderate
Li et al. (2025)	High	High (57 studies, dual-rated)	Low	Strong
Herathmenike et al. (2025)	High	High (63 studies, PRISMA)	Low	Strong
Berg et al. (2022)	High	High (six major raters, large panel)	Low	Strong
Christensen et al. (2022)	High	High (large rated-firm panel)	Low	Strong
Fanning et al. (2026)	High (controlled experiment)	Moderate (student/MTurk-type sample)	Moderate	Moderate–Strong
Giglio et al. (2025)	High	High (large-scale survey/portfolio data)	Low	Strong

This evaluation reveals two trends. The methodological quality of the systematic reviews and of the large-panel empirical studies underlying the theoretical section and the ESG-rating-divergence section of this paper (Badola et al., 2023; Li et al., 2025; Herathmenike et al., 2025; Berg et al., 2022; Christensen et al., 2022; Giglio et al., 2025) is consistently high. Second, the quasi-experimental studies and single-country surveys that underpin some of the specific claims for bias are at moderate risk of bias, typically because they are convenience samples, and have limited external validity, and are therefore identified as such in the conclusions drawn from them in Sections 5 and 6 when relevant to the critical discussion.

4. ESG Factors in Investor Decision-Making

4.1 Environmental, Social, and Governance Dimensions:

ESG has been looked at more and more like a set of three single, sometimes conflicting, pieces of information in the literature. Retail investors in particular are more likely to have an "ESG" approach to investing and consuming ESG information, rather than an "E", "S", or "G" approach; that is, to consume ESG information through combined evaluation, rather than disaggregation (Li et al., 2025). Institutional investors, on the other hand, are more likely to differentiate between dimensions on the basis of materiality to the sector-specific risk.

4.2 ESG Disclosure Quality, Rating Divergence, and Greenwashing Perceptions:

One major conclusion from the literature cited above is that there is little clarity in the information provided in an ESG context. There is significant variation, with correlations as low as 0.38 to 0.71 between six prominent ESG providers (Berg et al., 2022) due to differences in methodology, choices of indicators and their weighting. The disagreement between two of the most widely used commercial providers (MSCI and Sustainalytics) is not a marginal measurement problem; it isn't due to differences between the underlying company data but is related to differences in scope (which issues are measured), measurement (which indicators are used for each issue), and weighting (how they are aggregated into a single score) (Berg et al., 2022). Surprisingly, higher voluntary disclosure of ESG data has been found to deepen this ratings gap, with the opposite rating agencies seeing different interpretations of the same outcome metrics (Christensen et al., 2022), and disagreement greatest for firms at both ends of the ratings spectrum, i.e., those most likely to be caught by positive screening or exclusionary investment strategies. This has a direct behavioural impact: institutional investors become less enthusiastic about owning stocks with increased disagreement on the ESG rating, meaning that the uncertainty of the rating is an important determinant of investment decisions, irrespective of the firm's ESG performance. This same uncertainty is more likely to create confusion than caution for less sophisticated investors, likely solved by the heuristic risk-repricing shortcuts discussed in Section 5, rather than through the more deliberate risk-repricing of institutions; this asymmetry is only an inference from the institutional-ownership evidence, however, and is not directly tested for retail investors, a gap that is filled in further in Section 9. Very similar is the concept of greenwashing the selective, obscure, or unproven ESG assertions are used to mislead investors. The implications of the above are in line with experimental evidence, which indicates that when a firm fails to meet a target previously disclosed in terms of a quantitative objective, investor perception of greenwashing increases significantly, and this perception has a corresponding effect on investor trust and willingness to invest (see Table 4 for evidence of this from a controlled experimental design, with a convenience sample of investors). Retail investors are likely to be less well equipped to independently verify ESG claims and so the risk of greenwashing will manifest itself directly through the behavioural biases outlined in Section 5, such as confirmation bias and anchoring on initial ESG scores. Remarkably, the consistency of holding and beliefs among retail ESG investors, as revealed by the survey and portfolio-holding data, suggests that some retail investors hold ESG labelled stocks for financial reasons, even though they believe that these stocks would underperform conventional ones financially (Giglio et al., 2025; Riedl & Smeets, 2017). This result suggests that the financial-performance expectations are not the only drivers of ESG investment decisions, and supports the need for a behavioural, not solely informational, perspective on ESG decision-making.

4.3 Regulatory Context Shaping ESG Information Quality:

The above behavioural dynamics do not happen in a vacuum of regulation, and recent disclosure regulation is directly pertinent to the ESG-signal-quality construct developed in Section 7. The

Sustainable Finance Disclosure Regulation (SFDR) and the Corporate Sustainability Reporting Directive (CSRD) both significantly expand the scope of the population of funds requiring sustainable finance disclosures and, respectively, the population of firms required to make sustainability disclosures under the CSRD in the European Union. The International Sustainability Standards Board (ISSB) has published both IFRS S1 and IFRS S2 at the standard-setting tier, specifically for the purpose of harmonising the content of sustainability disclosure worldwide. These developments are important for the proposed framework in this paper in two related ways. First, by increasing the amount of disclosure and making it more standardised, in principle, the rating spread found by Berg et al. (2022) and Christensen et al. (2022) can be reduced, as the count of indicators that can be used for disclosure is limited. Secondly—and in contradiction to the first point—the available evidence indicates that increased mandatory disclosure volume did not in the past lead to reduced rating disagreement, as Christensen et al. (2022) find that a higher volume of disclosure actually worsens this issue, thereby highlighting the need for convergence in rating methodology that is an issue regulators have only recently started to address and which is not yet confirmed in the reviewed literature.

5. Investor Behavioural Biases: A Synthesis

The literature examined here consistently reveals a similar group of behavioural biases that are common to both general investment research and specific to the ESG-investment research context. Table 3 presents the main biases, their definitions and illustrates them with examples from the reviewed studies.

Table (3): Summary of Investor Behavioural Biases in ESG-Related Investment Decision-Making
(Source: Authors own work)

Bias	Definition	Representative Evidence in ESG-Investment Context
Herding behaviour	Tendency to mimic the trading decisions of other investors rather than relying on independent analysis	Widely documented as one of the most consistently reported biases shaping ESG fund flows and retail sentiment (Herathmenike et al., 2025; Bihari et al., 2025)
Overconfidence	Overestimation of one's own knowledge, predictive ability, or precision of information	Associated with excessive trading and undervaluation of ESG-related risk (Barber & Odean, 2000, 2013)
Disposition effect	Propensity to sell appreciating assets too early while holding depreciating assets too long	Shown to interact with sustainability screening, delaying exit from underperforming ESG holdings (Shefrin & Statman, 1985)
Loss aversion	Losses are weighted more heavily in decision-making than equivalent gains	Root construct of prospect theory; shapes reluctance to divest from familiar, non-ESG holdings (Kahneman & Tversky, 1979)
Confirmation bias	Selective search for and interpretation of information that confirms pre-existing beliefs	Reported as a significant predictor of ESG-aligned investment decisions (Badola et al., 2023)
Anchoring	Over-reliance on an initial reference point (e.g., an ESG score or past price) when forming judgments	Identified as under-researched relative to herding and overconfidence despite its relevance to ESG-rating interpretation (Herathmenike et al., 2025)

Bias	Definition	Representative Evidence in ESG-Investment Context
Regret aversion	Avoidance of decisions that could later be regretted, favouring the status quo or consensus choices	Linked to reluctance to deviate from conventional (non-ESG) benchmarks (Herathmenike et al., 2025)
Mental accounting	Treating money differently depending on its subjective category or source rather than its fungible value	Evident where investors compartmentalise “ethical” ESG allocations separately from core portfolios (Bagchi et al., 2022, as cited in Bihari et al., 2025)

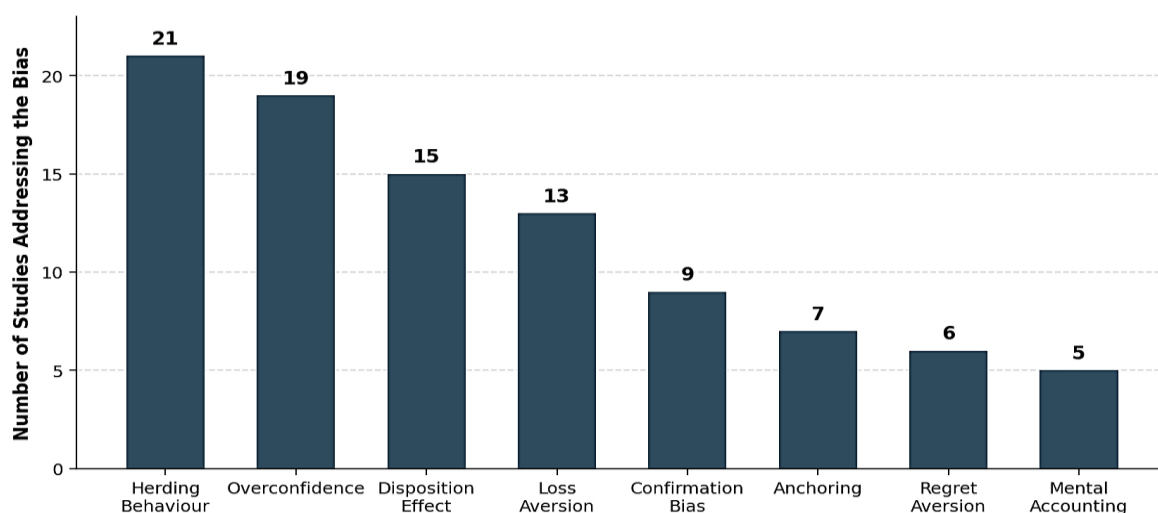


Figure (2): Frequency of Behavioural Biases Examined in the Reviewed ESG-Investment Decision-Making Literature (illustrative synthesis of coverage across the reviewed studies) (Source: Authors own work)

5.1 Herding Behaviour:

The most prevalent bias found in the literature reviewed is herding, which is the tendency to follow the herd as opposed to making independent decisions. This is especially noticeable in the context of ESG, as sustainability signals are socially and reputationally charged, adding pressure to conform beyond that of traditional trading decisions (Herathmenike et al., 2025; Bihari et al., 2025). The apparent consensus should be approached with caution, however: Herathmenike et al. (2025) find that empirical evidence that herding occurs in the ESG context is highly concentrated in samples from emerging markets, especially from South Asia, and the mechanisms are likely different across market contexts — mining from limited independent information sources in a thinly researched emerging market is not obviously the same herding as social signalling among affluent retail investors in a mature market. The incidence of herding reported may, therefore, be partly a function of where the researchers are searching for it, and generalisation to cases where financial markets are developed, and where information environments are typically more complex with regard to ESG information, is untested.

5.2 Overconfidence:

Investors are prone to cognitive biases such as over-confidence, mistaking their ability to understand ESG information for what they believe it is, and underestimating its risks. This bias has been a part of the broader investment world for a long time and is still well-documented in the ESG literature as a factor impacting poorly calibrated sustainability related decisions (Barber & Odean 2000; 2013). A methodological note is necessary here, and throughout this literature, as elsewhere: many of the overconfidence measurements related to ESG that have been observed are self-reported through survey instruments, so that it is possible that the overconfidence measured is partially a result of social-desirability or self-perception bias in the survey response itself, rather than in the underlying investment behaviour.

5.3 Disposition Effect and Loss Aversion:

The disposition effect, which refers to selling a winning position too early, and holding on to a losing position too long (Shefrin and Statman, 1985), is unique in the context of ESG investing: investors could be hesitant to sell underperforming ESG holdings because of identity-based or values-based attachment, magnifying the negative attachment to losses observed under prospect theory (Kahneman and Tversky, 1979). The evidence base of the disposition effect, however, is not directly related to the reviewed ESG investing literature; in fact, it dates back several decades prior to the ESG investing literature, and papers testing the hypothesis that values-based attachment is a strengthening, not merely a co-existing, driver of disposition-effect behaviour in ESG holdings were very few in number among the sample.

5.4 Confirmation Bias, Anchoring, Regret Aversion, and Mental Accounting:

A second tier of biases (confirmation bias, anchoring, regret aversion and mental accounting) has been less widely discussed in the literature but is frequently cited as being under-researched for their potential relevance. In fact, confirmation bias has been found as one of the key drivers of ESG investment decisions, where investors actively look for information in line with their existing sustainable beliefs (Badola et al., 2023). Anchoring, especially when initial ratings are on ESG scores or ratings, is theoretically appropriate where it comes to explaining investor responses to rating divergence but is not empirically explored (Herathmenike et al., 2025), a real gap and not a result. While the mental-accounting explanation is a plausible answer to the co-existence of return-maximising and values-driven behaviour among the same investor (Bihari et al., 2025), it is still an inference: The belief-behaviour inconsistency documented by Giglio et al. (2025) is compatible with a mental-accounting explanation but it was not designed to test it head-on, and alternative explanations such as a simple inattention to return trade-offs at the portfolio level cannot be ruled out based on the evidence.

6. The Interaction between ESG Factors and Behavioural Biases

Table 4 synthesises the principal empirical and review studies underpinning this analysis, mapping their methodological approach and core contribution to the ESG-behavioural bias literature.

Table (4): Synthesis of Key Studies on ESG Factors and Investor Behavioural Biases (Source: Authors own work)

Study	Method / Sample	Key Focus	Principal Finding
Badola et al. (2023)	Systematic review	Behavioural biases in individual investment decisions	Confirms cognitive and emotional biases systematically deviate investor choices from rational prediction
Bihari et al. (2025)	SLR + conceptual modelling	Interplay of ESG criteria with cognitive/emotional biases	ESG factors significantly and positively influence investment decisions alongside behavioural biases
Li et al. (2025)	SLR, 7,768 screened / 57 reviewed	Retail investor engagement with ESG information	Proposes a revised “5A” model (Activation, Attitude, Action, Adjustment) integrating behavioural triggers at each stage
Herathmenike et al. (2025)	PRISMA-based SLR + bibliometric mapping, 63 studies	Evolution of behavioural-bias research in formal and informal markets	Overconfidence, herding, and loss aversion dominate; anchoring and regret aversion remain under-studied, especially outside South Asia
Berg et al. (2022)	Empirical, six major ESG raters	Divergence of ESG ratings	Correlations across raters as low as 0.38, generating ambiguity that amplifies investor uncertainty and biased interpretation
Christensen et al. (2022)	Empirical, panel of rated firms	Drivers of ESG rating disagreement	Greater voluntary disclosure paradoxically increases rating disagreement rather than resolving it
Fanning et al. (2026)	Behavioural experiment	Investor perceptions of greenwashing	Perceived greenwashing rises sharply when firms miss disclosed ESG targets, shaping subsequent trust and allocation
Giglio et al. (2025)	Large-scale investor survey/portfolio data	Retail ESG beliefs and portfolio choice	Retail investors often expect ESG stocks to underperform yet still hold them for ethical/hedging reasons, revealing belief-behaviour inconsistency

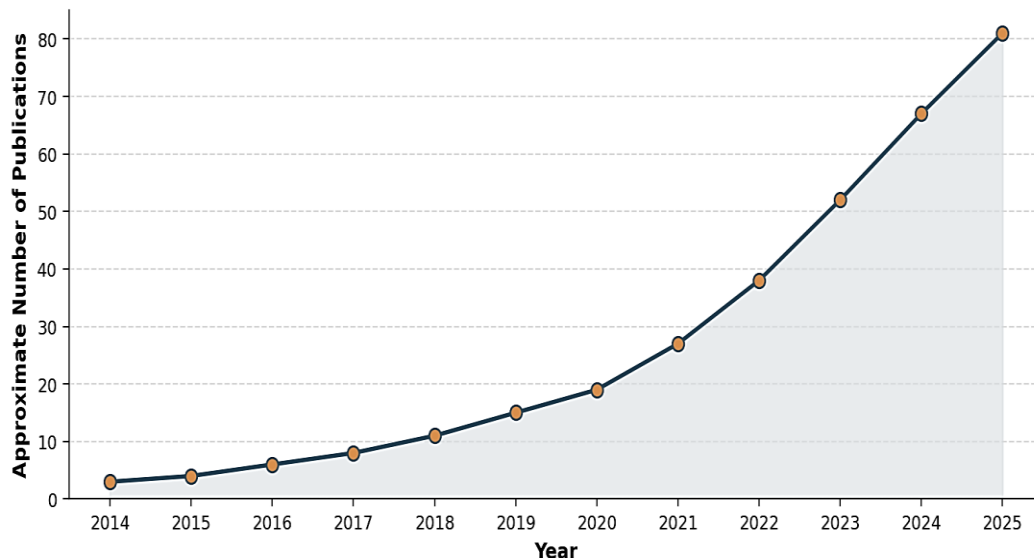


Figure (3): Illustrative Growth Trend in ESG-Behavioural Finance Publications, 2014–2025, Synthesised from Bibliometric Patterns Reported in the Reviewed Studies (e.g., Herathmenike et al., 2025) (Source: Authors own work)

The synthesised studies consistently show that ESG factors and behavioural biases are not mutually exclusive but affect each other in a two-way relationship. The ambiguity of ESG information (rating divergence, greenwashing risk) makes investors more likely to rely on heuristics to interpret and act on ESG information; existing investor biases also influence the way investors pay attention to and respond to ESG information. A combination of neural-network based modelling with ESG factors and behavioural constructs has identified confirmation bias, the endowment effect, hindsight bias, the bandwagon effect, and ESG factors as the most important determinants of sustainable investment decisions and has shown a higher predictive accuracy when combined in a model compared to either approach alone (Bihari et al., 2025). This is an indicative result: although the underlying sample is a survey in a single country, the machine-learning layer that performs the prediction of the structural model in this study has been trained on the same data used to estimate the model, so the result has a standard risk of in-sample overfitting that is not addressed by the reviewed study. This implies that the effect of ESG and behavioural influences is not additive, but rather multiplicative, between the two; this is the motivation for the integrated framework proposed in Section 7, although the functional form of the multiplicative effect of the two is not yet well understood empirically.

6.1 Institutional Versus Retail Investor Heterogeneity:

One of the more prominent recurring issues throughout Sections 4 and 5 of this paper is the possibility that there are different forms and magnitudes of ESG-related behavioural biases between retail and institutional investors, but few studies reviewed directly examine this industry-specific variation in the same study. Table 5 summarizes the comparison that can be indirectly reconstructed from all reviewed studies.

Table (5): Institutional Versus Retail Investor Differences in ESG-Related Behavioural Tendencies
(Source: Authors own work)

Dimension	Retail Investors	Institutional Investors
Herding tendency	High — socially and reputationally charged ESG signals amplify conformity pressure (Herathmenike et al., 2025)	Moderate — partially offset by independent research capacity and fiduciary process, though not eliminated
ESG knowledge / sophistication	Generally lower; ESG treated holistically rather than by dimension (Li et al., 2025)	Generally higher; ESG dimensions differentiated by sector-specific materiality
Greenwashing vulnerability	Higher — limited independent verification capacity (Fanning et al., 2026)	Lower — access to proprietary due-diligence tools and rating aggregation
Information access	Limited to public disclosures, media, and retail-facing rating summaries	Extensive — direct engagement with issuers, multiple paid rating feeds, analyst research
Dominant motive	Mixed financial and ethical/identity motives, sometimes inconsistent with stated return expectations (Giglio et al., 2025)	Predominantly fiduciary and risk-adjusted return motives, increasingly shaped by mandate-level ESG integration
Response to rating divergence	Under-studied; plausibly resolved through heuristics such as anchoring on a single familiar rating	More cautious ownership behaviour under higher rating disagreement (Berg et al., 2022)

A Table 5 must be interpreted as a composite of the various separately reported results, and as such is not a direct comparison of institutional and retail reactions to the same ESG information event; direct, within-study comparisons are few in the sample and its absence is noted as a research priority in Section 9.

7. Towards an Integrated Behavioural Finance Framework

The paper builds on this theoretical underpinning (Section 2) and the empirical synthesis (Sections 4–6), and suggests an Integrated Behavioural Finance Framework that connects ESG information, cognitive and affective processing, investor behavioural biases, investment decisions, and investor portfolio outcomes with an explicit feedback loop for investors learning (Figure 4).

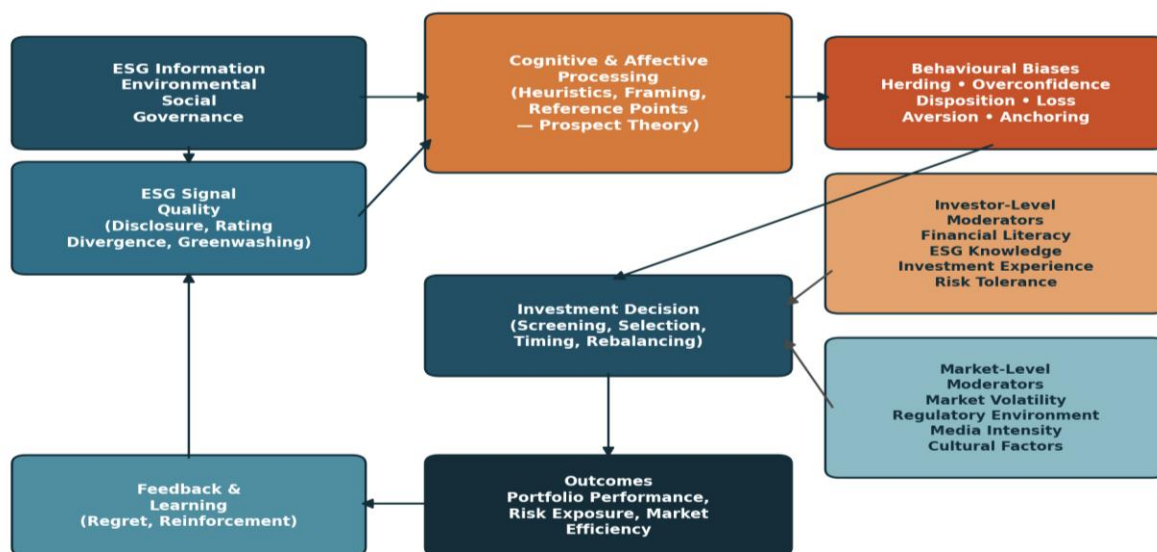


Figure (4): Integrated Behavioural Finance Framework: ESG Factors, Investor Behavioural Biases, and Investment Outcomes, with Explicit Investor-Level and Market-Level Moderators (Source: Authors own work)

There are 5 linked layers plus two explicit sets of moderators. First, the quality of the signal in the decision environment of the investor depends on the disclosure consistency, rating divergence, and the risk of greenwashing that both disclosure and rating systems are subject to (Berg et al., 2022; Fanning et al., 2026). Second, this information goes through cognitive and affective processing, which is subject to reference-dependence, loss-aversion and framing effects explained by prospect theory (Kahneman & Tversky, 1979). Third, this processing engenders particular behavioral biases: herding, overconfidence, the disposition effect, and other heuristics. Critically, the strength of the biases-to-decision pathway is represented as the product of two sets of moderators, each explicitly represented as its own box, which act on the pathway between biases and the investment decision, as shown in Figure 4: investor-level moderators, including financial literacy, ESG knowledge, investment

experience, and risk tolerance, and market-level moderators, including market volatility, regulatory environment, media intensity, and cultural factors. Fourth, the interaction of biases and moderators affects the investment decision itself, ranging from screening, security selection, timing and rebalancing. Fifth, the decisions create returns, risk exposure and market efficiency implications that are then translated into investor learning, which then results in an adjustment of future ESG signals (Figure 4).

7.1 Theoretical Contribution:

The novelty of this framework in comparison to the literature is not the individual constructs but rather three aspects: firstly, the multidimensional nature of its constructs; secondly, its distinction from the existing literature by means of a methodological approach; and thirdly, its difference from the existing literature in that multidimensionality. First, previous research on ESG determinants of investment decision making and research on behavioural-bias determinants of investment decision making are traditionally treated as two distinct bodies of work (as captured by the two parallel streams of literature identified in Section 1); here we wish to explicitly model the fact that the quality of the signals rather than their content, is what drives heuristic-driven decision making, as suggested by some of the existing studies (Berg et al., 2022; Christensen et al., 2022). Second, the model treats investor-level and market-level moderators as two distinct and parallel constructs, which enables the model to make different predictions across retail- versus institutional-dominated markets (see Table 5). Third, the framework explicitly includes a feedback loop where performance of the investment subsequently affects how the ESG signals are interpreted, thus creating a path-dependency which is not present in most of the cross-sectional ESG models reviewed (Table 4). Combined these three features represent a shift from descriptive summary of known constructs to a structure that includes direction of key relationships and conditions under which they should be strengthened and weakened, the foundation for the testable propositions in Section 7.2.

7.2 Testable Propositions:

To support future empirical validation, the framework is translated into the following testable propositions:

- P1: Higher ESG rating divergence increases investors' reliance on cognitive heuristics (e.g., anchoring, confirmation bias) at the time of forming investing decisions.
- P2: Investor self-confidence progresses the positive relationship between favourable ESG information and investment commitment, independent of the underlying financial materiality of that information.
- P3: Financial literacy moderates the effect of ESG signal ambiguity on behavioral-bias activation, with more financially literate investors exhibiting weaker heuristic responses to rating divergence and greenwashing risk.

- P4: ESG-induced herding is stronger among retail investors than institutional investors, but this difference diminishes under more stringent disclosure regulations.

The propositions are deliberately formulated at a level of specificity that allows for direct empirical testing (using survey-based structural equation modelling, natural experiments around ESG rating changes, or the controlled and quasi-experimental designs described in Section 9) and are offered as the basis for assessing and further developing the theory of this review by subsequent studies.

8. Discussion

The synthesis above has several implications. Theoretically it supports the notion that the argument for ESG investing is not fully explained by the rational actor model, as this does not explain the continued disconnect between the financial goals investors claim to have and their actual holding patterns (Giglio et al., 2025). A financial advisor and platform designer may not be as well-prepared to handle the gamut of biases that could impact an ESG-inclined client, as these are not the primary areas of focus for research, overconfidence, and the disposition effect seem to be the main concern. A regulatory perspective would suggest that from an increase in disclosure a paradoxical increase in disagreement in rating can occur (Christensen et al, 2022), meaning that disclosure requirements alone are unlikely to drive a decrease in investor uncertainty unless there is a harmonisation of the methodologies used by the rating providers.

9. Research Gaps and Future Research Agenda

- Geographic imbalance, especially for the GCC opportunity: evidence has a robust focus on South Asia and selected emerging markets and is sparse in the GCC and in other emerging-market contexts (Herathmenike et al., 2025). The GCC region is a unique space for further research in the context of rapid expansion of sustainable finance initiatives in MSX, DFM, and Tadawul listed markets, and its unique conditions, including state and sovereign-wealth-fund influence, Islamic finance principles (which provide an additional value-based screening logic alongside conventional ESG based screening logic), and a well-developed energy-transition policy.
- Under-examined biases: anchoring, regret aversion, and mental accounting remain comparatively under-tested despite plausible theoretical relevance to ESG-rating interpretation.
- Debiasing interventions: very few studies test real-world interventions—investor education, digital nudges, or standardised disclosure formats—that could mitigate the biases identified (Herathmenike et al., 2025).
- Institutional versus retail heterogeneity: further research is needed to disaggregate how bias strength and type differ systematically between institutional and retail investor segments, ideally through direct within-study comparison rather than the indirect synthesis presented in Table 5.
- Longitudinal and cross-country designs: the literature remains dominated by cross-sectional, single-market studies, limiting causal inference and generalisability (Li et al., 2025).

- Integration of machine learning approaches: hybrid modelling combining structural equation modelling with predictive analytics shows promise for capturing non-linear interactions between ESG and behavioural variables (Bihari et al., 2025), provided future studies address the in-sample overfitting risk noted in Section 6.
- Experimental and causally identified methods: the reviewed literature remains dominated by cross-sectional surveys, which cannot establish the causal direction implied by the propositions in Section 7.2. Priority should be given to randomised experiments manipulating ESG rating disclosure, controlled investor simulations, eye-tracking studies of attention to ESG versus financial information, and behavioural trading experiments using incentivised real-stakes decisions — methods that remain rare at this specific intersection despite being well established elsewhere in behavioural finance.

10. Limitations

- Dependence on published studies: as with any SLR, this review is limited to what has been published and indexed; unpublished dissertations, working papers, and industry reports outside the supplementary database check were largely excluded, which may understate emerging or contested findings.
- Possible publication bias: studies reporting statistically significant behavioural-bias effects are inherently more likely to be published than null results, which may inflate the apparent strength and consistency of the biases catalogued in Section 5.
- English-language restriction: the eligibility criteria in Table 1 restricted inclusion to English-language publications, which may exclude relevant regional research, particularly non-English-language studies from continental Europe, East Asia, and parts of the GCC.
- Focus on stock-market investments: the review deliberately excludes private-market, real-asset, and fixed-income ESG investing, where behavioural dynamics may differ meaningfully from the listed-equity context examined here.
- Limited availability of longitudinal evidence: because the underlying literature is itself dominated by cross-sectional designs (Section 9), this review's characterisation of biases as stable and generalisable should be treated as provisional pending longitudinal replication.
- Single-reviewer screening: the search, screening, and quality-appraisal process documented in Section 3 was conducted by a single reviewer rather than the dual-reviewer protocol recommended by PRISMA best practice, which may introduce unaddressed selection or coding inconsistency despite the structured protocol followed.

11. Conclusion

This systematic review brings together an increasingly scattered and emerging literature at the nexus of ESG investing and behavioural finance. The evidence suggests that ESG factors affect stock market investment decisions in a manner beyond just an informational channel, but in a channel mediated by behavioural factors such as herding, overconfidence, the disposition effect, loss aversion, and other heuristics, which are accentuated by the ambiguity in the ESG disclosures and ratings. The Integrated Behavioural Finance Framework suggested in this paper provides a structured description of how ESG signal quality, cognitive and affective processing, behavioural biases and investor moderators collectively affect investment outcomes, and of the explicit feedback mechanism for investment learning. Moving forward, research to fill in the geographic, thematic, and methodological blind spots highlighted here is critical to developing a more comprehensive and actionable picture of investor interactions with sustainability in the stock market.

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