

Investor Behaviour in Green Investments: A Comprehensive Review of Perceptions, Biases, and Decision Processes

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Abstract

The mobilisation of retail capital toward green investments is a critical sustainable finance challenge, as investors underinvest despite stated environmental preferences. This thematic review synthesises 71 works (2015–2025) using a PRISMA-inspired protocol and deductive-inductive analysis grounded in Ajzen's TPB, Kahneman & Tversky's Prospect Theory, Spence's Signalling Theory, Davis's TAM, and UTAUT. Six clusters—perceptions and awareness; cognitive biases; ESG preferences; demographic moderators; greenwashing, policy, and trust; and fintech-driven green investment democratisation—are critically reviewed. Pro-environmental attitudes are necessary but insufficient, mediated by green financial literacy, institutional trust, loss aversion, and greenwashing perception. Ten research gaps, a six-directional agenda, and an integrated framework are advanced.

Keywords: green investment; investor behaviour; behavioural biases; Theory of Planned Behaviour; Prospect Theory; retail investors; sustainable finance; emerging markets

1. Introduction

1.1 The Green Investment Imperative: A Global Context

The intersection of environmental urgency and financial innovation has given rise to one of the most consequential transformations in contemporary capital markets. The ratification of the Paris Agreement in 2015 marked not merely a geopolitical milestone but a structural inflection points for global investment behaviour, compelling institutional and retail participants alike to reconsider the long-term viability of carbon intensive portfolios (Kumar et al., 2023). Green investments spanning renewable energy equities, green bonds, ESG integrated mutual funds, sustainability linked instruments, and impact investment vehicles have emerged as both ideologically resonant and financially material asset classes. The global green bond market expanded from a negligible \$0.8 billion in 2007 to over \$143 billion by 2018, fundamentally altering the risk-return calculus available to investors at all levels of market participation (Flammer, 2019).

On the demand side, a growing cohort of individual retail investors has demonstrated increasing sensitivity to environmental, social, and governance criteria, driven by factors as diverse as climate anxiety, generational shifts in values, and the evolution of digital financial platforms that democratise access to sustainable products (Ghosh et al., 2025; Thapa & Kafle, 2025). The rapid adoption of financial technology through mobile investment applications, robo advisory platforms, blockchain-enabled

instruments, and AI driven decision-making tools is progressively reshaping how retail investors access, evaluate, and act upon green investment opportunities. In India specifically, the green finance market has witnessed notable growth momentum, with emerging regulatory frameworks and the Reserve Bank of India's increasing emphasis on climate risk providing structural scaffolding for retail participation (Rathod, 2023).

1.2 Statement of the Problem

Despite the accelerating growth of green financial markets and the proliferation of sustainable investment instruments globally, the behavioural dimensions of retail investor participation in green investments remain insufficiently theorised and empirically fragmented. The extant literature has concentrated disproportionately on institutional investor behaviour, firm level ESG performance, and macroeconomic green finance policy neglecting the individual retail investor as the primary unit of analysis. This neglect is consequential as retail investors constitute a numerically dominant and financially significant segment of capital markets in both developed and emerging economies, and their collective green investment decisions carry profound implications for the mobilisation of private capital toward sustainability objectives. The present review addresses this gap directly by synthesising 71 scholarly works focused on the perceptions, biases, and decision processes of individual retail investors in green investment contexts, with particular emphasis on the Indian market and emerging economy comparators.

1.3 Theoretical Anchors

The review is organised around three foundational theoretical frameworks supplemented by two technological adoption frameworks. First, Ajzen's (1991) Theory of Planned Behaviour (TPB) posits that behavioural intention is determined by the interplay of attitudes, subjective norms, and perceived behavioural control validated extensively in green investment contexts (Chan et al., 2022; Ghosh et al., 2025; Sivasangari et al., 2025). Second, Kahneman and Tversky's (1979) Prospect Theory explains systematic underinvestment in green products despite stated environmental preferences as the perceived financial risk of return underperformance (loss frame) consistently dominates the anticipated environmental benefit (gain frame). Third, Spence's (1973) Signalling Theory is germane to the greenwashing dimension of green bond certification, ESG ratings, and environmental impact disclosures function as signals in information asymmetric markets whose credibility is increasingly contested (Shi et al., 2024). Supplementarily, the Technology Acceptance Model (TAM; Davis, 1989) and the Unified Theory of Acceptance and Use of Technology (UTAUT) are incorporated to account for the growing role of fintech platforms and robo-advisory tools in mediating retail green investment decisions.

1.4 Objectives of the Study

1. To systematically map and synthesise the extant literature on retail investor perceptions, attitudes, and awareness levels in relation to green investment products covering the period 2015–2025.
2. To identify and critically examine the cognitive and behavioural biases that mediate the relationship between pro-environmental attitudes and actual green investment decisions among individual retail investors.
3. To analyse the role of ESG preferences, green bond perceptions, and investment intentions in determining retail investor participation in sustainable financial markets.
4. To trace the moderating effects of demographic and socioeconomic variables including gender, age, income, education, and financial literacy on retail green investment behaviour across diverse geographic and cultural contexts.

5. To critically examine the interplay between green finance policy environments, greenwashing concerns, fintech adoption, and retail investor trust in shaping green investment participation.
6. To delineate a structured future research agenda that identifies critical gaps in the extant literature and proposes theoretically grounded directions for doctoral and post-doctoral inquiry.

1.5 Scope and Contribution of the Review

This review covers the period 2015-2025, encompassing 71 scholarly documents across empirical, conceptual, bibliometric, qualitative NLP aided, case study, and doctoral thesis literature types. The geographic scope spans India, Sri Lanka, Malaysia, Indonesia, China, Poland, Ghana, Nigeria, Iran, and several EU level studies, enabling a comparative lens that reveals both universal behavioural patterns and context specific moderating factors. The intellectual contribution is threefold: substantive providing the most comprehensive theoretically integrated synthesis of retail investor behaviour in green investments to date, including the first systematic integration of fintech and robo advisory dimensions; methodological advancing a PRISMA inspired thematic clustering approach incorporating NLP aided analysis; and practical offering evidence based implications for financial product designers, fintech platform developers, policymakers, and financial educators.

2. Methodology

2.1 Research Design and Review Approach

The present study adopts a bibliometric informed thematic review methodology, integrating the rigour and transparency of PRISMA based systematic review protocols with the interpretive flexibility of narrative thematic analysis (Braun & Clarke, 2006). The rationale is grounded in the heterogeneous nature of the corpus, which spans multiple disciplines and employs diverse methodological traditions quantitative regression and correlation analyses NLP aided qualitative synthesis, survey based TPB testing (Sivasangari et al., 2025; Ghosh et al., 2025), and econometric modelling (Wang et al., 2024).

2.2 Search Strategy

The primary corpus was assembled through structured searches of Scopus, Web of Science, Google Scholar, SSRN, JSTOR, and Zenodo. Boolean operator combinations were employed: ("green investment" OR "sustainable investment" OR "ESG investment") AND ("investor behaviour" OR "investor decision" OR "investment intention") AND ("retail investor" OR "individual investor" OR "behavioural finance"). Supplementary strings addressed green bonds, greenwashing, trust, fintech adoption, robo advisory platforms, and demographic moderators. All searches were restricted to English language publications between January 2015 and December 2025, supplemented by the researcher's compiled literature dataset and additional papers identified through author network searches, yielding a final corpus of 71 documents.

2.3 Inclusion and Exclusion Criteria

Table 1: Inclusion and Exclusion Criteria for Literature Selection

Criterion	Inclusion	Exclusion
Time period	2015–2025	Pre 2015 (unless foundational theoretical works)
Language	English language publications only	Non-English without English abstract

Subject focus	Investor behaviour, perceptions, and decisions in green or sustainable investments	Studies focused exclusively on institutional investors without a retail component
Literature type	Peer reviewed articles, reviews, empirical studies, theses, book chapters, conference proceedings	Opinion pieces and non-peer reviewed grey literature
Thematic relevance	At least one of: awareness, perception, bias, decision making, ESG preferences, greenwashing, fintech, robo advisory, demographic moderators	Studies focused purely on macroeconomic policy or engineering level green technology

Note. Criteria applied consistently across all database searches. Total corpus N = 71.

2.4 PRISMA Inspired Selection Process

The literature selection followed a four stage PRISMA 2020 protocol (Page et al., 2021). In the identification stage, 312 potentially relevant documents were retrieved across all databases. In the screening stage, duplicates were removed yielding 241 unique records; 89 were subsequently excluded at title and abstract level for being out of scope or outside the temporal boundary. In the eligibility stage, 152 full text documents were assessed, of which 85 were excluded 32 for focusing exclusively on institutional actors and 53 for macroeconomic policy focus without behavioural micro level analysis. The final included corpus comprises 71 documents. The selection process is depicted in Figure 1.

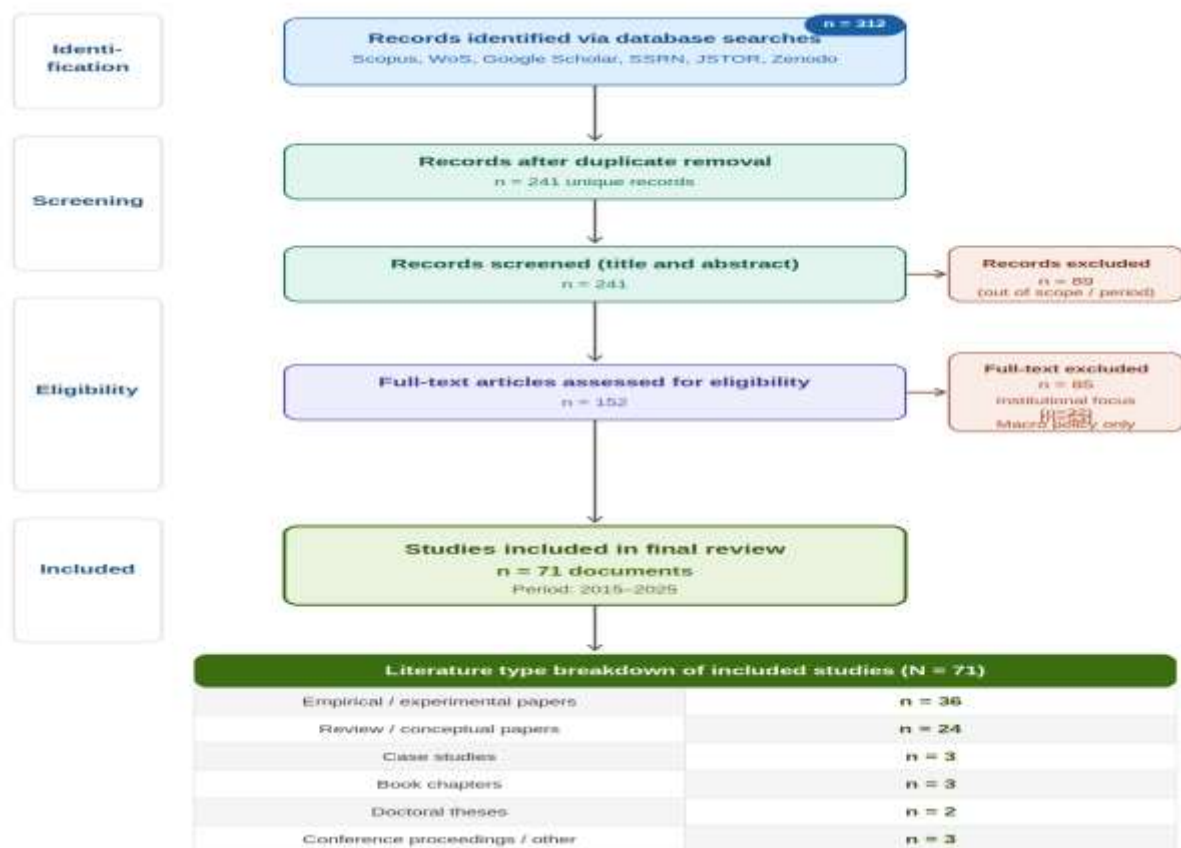


Figure 1. PRISMA 2020 flow diagram depicting the literature search and selection process. Adapted from Page et al. (2021).

2.5 Thematic Analysis Procedure

Thematic analysis was conducted using a deductive inductive hybrid approach (Braun & Clarke, 2006). Deductively, TPB, Prospect Theory, Signalling Theory, and TAM provided an initial coding structure. Inductively, additional themes emerged most notably the role of greenwashing perception, financial literacy, and fintech enabled platform adoption including robo advisory services and AI integrated wealth management. Six thematic clusters were identified through iterative coding and refined to theoretical saturation, providing the analytical framework for the substantive thematic review.

3. Bibliometric Overview of the Corpus

3.1 Publication Trends and Temporal Distribution

The temporal distribution of the 71 included documents reveals a markedly uneven pattern characterised by accelerating scholarly output from 2020 onward. Approximately 18% of the corpus was published between 2015 and 2018, representing an early foundational period (Flammer, 2019; Kakeu, 2017; Chaudhary, 2018). The period 2019 to 2021 accounts for approximately 25%, while 2022 to 2025 accounts for over 57% a striking concentration signalling the field's rapid maturation in the post COVID ESG mainstreaming era (Nnamah, 2024; Ghosh et al., 2025; Sivasangari et al., 2025). The particular density of 2025 publications reflects the emergence of the fintech and green investment intersection as a new and rapidly expanding sub-field within this domain.

3.2 Geographic Distribution

Indian studies constitute the largest single country cluster at approximately 28% of empirical papers. Southeast Asia contributes approximately 19% (Malaysia, Indonesia, Sri Lanka), East Asia 14% (China), Europe 10% (Poland, EU-level), West Africa 6% (Ghana, Nigeria), and the Middle East and Central Asia the remainder. Notably, African and Latin American retail investor perspectives remain almost entirely absent from the corpus — a geographic gap that significantly limits the field's claim to global relevance, given the scale of green investment mobilisation required in these regions to achieve Paris Agreement climate finance targets.

3.3 Thematic Cluster Distribution

Table 2: Identified Thematic Clusters and Key Representative Studies (N = 71)

#	Theme	Papers (n)	Key Studies
1	Investor Perceptions and Awareness	18	Suma & Supriya (n.d.); Hegde & Amudha (n.d.); Nnamah (2024); Chan et al. (2018)
2	Cognitive and Behavioural Biases	14	Nkukpornu et al. (2020); Panja & Das (2020); Chandrakala & Ch (2024); Rawat & Anu (n.d.)
3	ESG Preferences and Investment Intentions	16	Osman et al. (2018); Thapa & Kafle (2025); Ghosh et al. (2025); Wang et al. (2024)
4	Demographic and Socioeconomic Moderators	12	Eaw et al. (2024); Jonwall et al. (2023); Rawat (n.d.); Suma & Shreelatha (2025a)
5	Green Finance Policy, Greenwashing, and Investor Trust	8	Shi et al. (2024); Kumar et al. (2023); Ryzewska (2024); Flammer (2019)
6	FinTech, Robo-Advisory, and Digital Green Finance	3	Suma & Shreelatha (2025a); Suma & Shreelatha (2025b); Suma et al. (2025)

Note. Some papers contribute to more than one thematic cluster; assignment reflects primary thematic emphasis.

4. Thematic Review Theme 1: Investor Perceptions and Awareness of Green Investments

4.1 Conceptual Framing

The first and most foundational thematic cluster concerns the perceptions, awareness levels, and attitudinal orientations of individual retail investors toward green investment products. Perception here refers not merely to awareness of instruments but to the cognitive and affective representations investors form about the nature, risks, returns, social value, and credibility of green investments. These representations constitute the upstream antecedents of both investment intention and actual behaviour within the Theory of Planned Behaviour framework (Ajzen, 1991). A substantial body of evidence reveals that many retail investors, despite demonstrating genuine pro environmental attitudes, possess limited and often inaccurate perceptions of green investment products conflating green bonds with conventional fixed income instruments, misunderstanding the relationship between ESG ratings and financial returns, and harbouring uncertainty about the environmental additionality of their investments (Suma & Supriya, n.d.; Nnamah, 2024). Fintech platforms and robo advisory systems are progressively equipped to address this perceptual deficit by embedding ESG decision support directly into the retail investment experience.

4.2 Empirical Evidence on Awareness Levels

Suma and Supriya (n.d.), in their systematic review, identified perceived behaviour, theory of planned behaviour, green brand knowledge, fintech integration, and hedging and diversification as key themes in eco conscious investing. Hegde and Amudha (n.d.), studying Bangalore individuals, documented limited familiarity with specific green instruments even among financially active investors. Chan et al. (2018) confirmed positive general attitudes toward environmental sustainability but significantly limited understanding of green instrument mechanics and return profiles. Suma (2025), studying green bond perceptions in Bangalore, documented a persistent disconnect between awareness and action. Nnamah (2024) argued that the rise of sustainable finance reflects a genuine transformation in retail investor consciousness, particularly among millennial and Gen Z cohorts. Thapa and Kafle (2025) confirmed that green investment knowledge enhances the attitude intention relationship specifically for this cohort. Suma and Shreelatha (2025b), using NLP aided thematic analysis of millennial robo advisory users, identified algorithmic transparency, trust, personalisation, and ethical fit as the most salient drivers of platform mediated green investment awareness and participation.

4.3 Perceived Benefits, Risks, and Trust

Chan et al. (2022) found that personal attitude, subjective norm, and perceived behavioural control each positively influence trust, which mediates the investment decision. Kakeu (2017) demonstrated that environmentally conscious investors incorporate an environmental risk premium into their expected return consistent with Signalling Theory's prediction that unverifiable environmental claims suppress equilibrium participation. Rawat (n.d.) found that friends, family, and investment websites are the primary vectors through which retail investor perceptions are formed, while professional advisory channels play a comparatively modest role. For millennial investors using robo-advisory platforms, algorithmic credibility and ESG score transparency are primary trust anchors. Synthesising across this cluster: awareness is growing but incomplete and unevenly distributed; positive environmental attitudes are necessary but insufficient without accurate product knowledge and institutional trust; and fintech platforms are emerging as a new and scalable channel for perception formation and trust-building in the retail green investment market.

5. Thematic Review Theme 2: Cognitive and Behavioural Biases in Green Investment Decision Making

5.1 Theoretical Framing: Prospect Theory and Bounded Rationality

The second thematic cluster addresses the role of cognitive and behavioural biases in shaping green investment decisions. Classical finance theory's rational actor model is fundamentally challenged by Kahneman and Tversky's (1979) Prospect theory, which demonstrates that individuals evaluate outcomes relative to a reference point and exhibit systematic loss aversion. In green investment contexts, the perceived financial risk of underperformance relative to conventional benchmarks (loss frame) consistently dominates the anticipated environmental benefit (gain frame), creating a powerful asymmetry suppressing retail participation even among investors with strong pro-environmental values. Quantitative evidence confirms that fintech adoption explained only 9% of variance in green investment willingness consistent with the prediction that psychological barriers, not technological access alone, are the primary constraints on retail green investment participation.

5.2 Empirical Evidence on Behavioural Biases

Nkukporu et al. (2020), studying Ghanaian investors, confirmed that herding behaviour, overconfidence, loss aversion, and representativeness heuristic each exert statistically significant influence on investment decisions and that these biases do not diminish with higher levels of financial experience. Panja and Das (2020) found that investor sentiment shaped by anchoring to conventional return benchmarks significantly mediates market prices in the green equities segment. Chandrakala and Ch (2024), studying Bangalore investors, documented that overconfidence and representativeness interact with information quality and peer influence to produce suboptimal portfolio allocation. Rawat and Anu (n.d.) found that investors are not choosing green investment options in India, identifying investment culture and income levels as significant determinants of bias susceptibility. Greenwash scepticism and cognitive heuristics have been identified as significant behavioural biases among millennial robo-advisory users, establishing that behavioural biases operate within digital investment platforms just as they do in traditional market contexts. Rydzewska (2024) found that a significant proportion of Polish green investors evaluate green investment primarily through a financial lens, revealing a fundamental tension between pro-environmental values and financial self-interest resolved by loss aversion in specific decision contexts. Wang et al. (2024) found that ESG preferences generate significant macroeconomic green investment effects, but only when the financial return penalty remains below the loss aversion threshold of the marginal retail investor. The field urgently needs experimental studies using incentivised investment simulation designs to establish causal relationships between specific biases and green investment decisions in ecologically valid settings.

6. Thematic Review Theme 3: ESG Preferences, Green Bond Perceptions, and Investment Intentions

6.1 The ESG Framework as a Retail Decision Architecture

The third thematic cluster addresses ESG preferences of retail investors and the mechanisms through which these preferences translate or fail to translate into concrete investment intentions and decisions. The ESG framework has over the past decade been progressively adopted as a retail investment evaluation criterion, facilitated by the proliferation of ESG rating agencies, ESG labelled mutual funds, and digital investment platforms (O'Sullivan, 2024; Sharma et al., n.d.). Robo-advisory platforms are reshaping how millennial investors access and evaluate ESG-aligned portfolios, with algorithmic ESG screening,

personalised sustainability dashboards, and AI-powered portfolio matching progressively lowering information and transaction cost barriers that have historically suppressed retail ESG participation.

6.2 TPB Evidence Base and Quantitative Findings

Osman et al. (2018), examining Muslim investors in Malaysia, found that attitude, subjective norm, and perceived behavioural control jointly predict green investment intention while additionally finding that parental and family behaviour are vital to inducing adoption, underscoring the importance of culturally sensitive TPB extensions. Ghosh et al. (2025) found that green financial literacy is a particularly powerful moderator of the intention behaviour conversion suggesting that the gap is primarily a literacy deficit. Sivasangari et al. (2025) found that social influence is the most powerful driver of green investment behaviour in Sri Lanka. Suma and Shreelatha (2025a) provided complementary quantitative evidence: financial access through fintech explained 13% of variance in preference for socially responsible products ($R = 0.36$; $F = 4.37$, $p = 0.001$), while environmental awareness explained 13% of variance in green investment exploration ($R = 0.36$; $F = 4.71$, $p = 0.001$) establishing that digital financial access and environmental consciousness are co-equal enablers of green investment intention, with all Cronbach's alpha values exceeding 0.84.

6.3 Generation Z, Millennials, and Green Bond Perceptions

Thapa and Kafle (2025) found that Gen Z investment decisions are more individually driven and less susceptible to social conformity pressure than those of older cohorts. Millennial investors have been found to prioritise convenience, algorithmic reliability, ESG transparency, and ethical fit above all other platform attributes. Suma (2025) documented that actual retail green bond participation remains limited despite growing awareness constrained by minimum investment thresholds, limited retail distribution, and certification credibility uncertainty. Flammer (2019) documented positive stock market reactions to green bond issuance, consistent with Signalling Theory (Spence, 1973), while Shi et al. (2024) challenged this by finding that issuance increases quantity but not quality of corporate green innovation. Blockchain backed green bonds and mobile based crowdfunding platforms are beginning to address retail access barriers through technological transparency mechanisms. The most significant weakness of this cluster is its overwhelming reliance on intention as the primary dependent variable longitudinal designs tracking actual investment behaviour over time are urgently needed.

7. Thematic Review Theme 4: Demographic and Socioeconomic Moderators of Green Investment Behaviour

7.1 Conceptual Framing

The fourth thematic cluster investigates the demographic and socioeconomic characteristics that moderate the relationship between pro-environmental attitudes and actual green investment behaviour. The Theory of Planned Behaviour (Ajzen, 1991) predicts that perceived behavioural control will vary systematically with access to financial resources, education, and market experience. Prospect Theory (Kahneman & Tversky, 1979) predicts that loss aversion will be more acute among lower income investors for whom the financial consequences of underperformance are more materially significant. Empirical evidence establishes that age, gender, education, income, and technology literacy are major drivers of fintech adoption and, through fintech adoption, of green investment participation, providing direct quantitative grounding for the demographic moderation thesis (Suma & Shreelatha, 2025a).

7.2 Gender, Age, Income, Education, and Financial Literacy

Rawat (n.d.) found that female respondents showed higher awareness and participation in green investme-

nts relative to male counterparts within the same income and education cohorts. Panja and Das (2020) found that female investors demonstrate investment personalities more aligned with socially responsible criteria. Sivasangari et al. (2025) identified gender-based differences in green investment behaviour as a primary gap in the Sri Lankan literature. Rawat (n.d.) found that individuals above 40 years showed higher green investment participation, explainable through investment capacity older investors possess greater financial resources despite potentially weaker environmental orientations. Research documents that younger investors have higher rates of mobile trading platform and robo advisor adoption due to higher technology awareness, while older investors use fintech primarily for utilitarian purposes. Ghosh et al. (2025) established green financial literacy as the critical predictor of intention behaviour conversion. Fintech adoption has been shown to moderate the financial literacy participation relationship platforms can partially compensate for financial literacy deficits by automating ESG product selection, suggesting that fintech enabled financial inclusion may be a more scalable mechanism for closing the literacy participation gap than traditional financial education alone.

7.3 Social Influence and Cultural Context

Sivasangari et al. (2025) found that social influence is the most powerful driver of green investment behaviour in Sri Lanka. Osman et al. (2018) found that parental and family behaviour and religious values are the most significant determinants of green investment intention among Muslim investors in Malaysia. Rawat (n.d.) documented that friends and family constitute the most influential information source for green investment decisions in Uttar Pradesh. Longitudinal designs tracking how demographic effects on green investment behaviour evolve over time are conspicuously absent and represent a critical research priority, as explicitly noted by Sivasangari et al. (2025).

8. Thematic Review Theme 5: Green Finance Policy, Greenwashing, FinTech, and Investor Trust

8.1 Theoretical Framing

The fifth thematic cluster addresses the macro environmental and technological context within which retail investor green investment decisions are made. This cluster draws on Signalling Theory (Spence, 1973), supplemented by TAM (Davis, 1989) and UTAUT frameworks to account for the growing role of technology platforms in mediating trust-building and information-processing functions.

8.2 Green Finance Policy Frameworks

Rathod (2023), studying recent trends in Indian green finance, identified expanding green investment avenues and growing policy framework development alongside significant awareness barriers among retail investors outside major urban centres. Ahuja (n.d.) found that government support, infrastructure for green investments, and stakeholder understanding collectively constitute the factors affecting green investment participation. Alizadeh (2024) demonstrated that policy design is critical for channelling private retail capital toward sustainable energy in resource rich country contexts. Kumar et al. (2023) documented that green finance mechanisms are increasingly integrated with circular economy policy frameworks. Collaboration among fintech firms, regulators, and policymakers is essential to build innovative, inclusive, and sustainability-oriented financial ecosystems; integrating green features into digital platforms can bridge existing gaps and accelerate the green economy transition.

8.3 Greenwashing: The Central Trust Challenge

Greenwashing constitutes the most consequential single threat to retail investor trust in green financial markets. Shi et al. (2024) provided strong empirical evidence: green bond issuance increases the quantity but not quality of corporate green innovation suggesting that firms use green bond labels to access cheaper

capital without delivering the environmental performance improvements the label implies. Greenwashing and lack of transparency remain persistent challenges in the fintech-enabled green investment space. Suma and Shreelatha (2025b) identified greenwash scepticism as a significant behavioural bias among millennial robo advisory users establishing that greenwashing concerns operate within digital investment platforms and that algorithmic transparency and credible ESG disclosure are essential trust building requirements for robo advisory platforms targeting environmentally conscious retail investors.

8.4 FinTech Adoption and Its Ripple Effect on Green Investing

Suma and Shreelatha (2025a) established through regression and correlation analyses that fintech adoption, financial access through fintech, and environmental awareness each constitute statistically significant predictors of green investment behaviour among individual investors in India: fintech adoption explained 9% of variance in green investment willingness ($R = 0.30$; $F = 2.31$, $p = 0.037$); financial access through fintech explained 13% of variance in preference for socially responsible products ($R = 0.36$; $F = 4.37$, $p = 0.001$); and environmental awareness explained 13% of variance in green investment exploration ($R = 0.36$; $F = 4.71$, $p = 0.001$). All Cronbach's alpha values exceeded 0.84, confirming high reliability across constructs. Suma et al. (2025), in their AI integration wealth management review, demonstrated that hybrid human AI advisory platforms, transparent algorithmic decision making, and regulatory compliance are emerging as the primary operational efficiency and client trust enablers. Suma and Shreelatha (2025b) added that robo advisory platforms, when designed with ESG transparency, personalisation, and algorithmic fairness, generate significantly higher levels of millennial investor trust and green investment engagement than conventional investment advisory channels. The growing volume of research on fintech adoption and digital green finance signals an emerging and rapidly expanding dimension of the green investment behaviour literature. Purwanti (2023) proposed that standardised evaluation methodologies adapted for environmental externalities are essential for providing retail investors with credible, comparable information. Perceived security must be treated as a prerequisite, not merely an enabler, for fintech-enabled scaling of green investment adoption, particularly in emerging markets.

9. Research Gaps and Future Research Agenda

9.1 Overview of Identified Gaps

The systematic synthesis of 71 scholarly works across six thematic clusters reveals a field that is rapidly expanding in breadth but remains constrained in depth, methodological diversity, and geographic representativeness. This section presents ten critical research gaps identified through the thematic analysis, followed by a structured future research agenda organised around six directional priorities. Addressing these gaps individually and in combination would substantially advance the theoretical, empirical, and policy relevance of the green investment behaviour field, and provide a robust foundation for doctoral inquiry over the coming decade.

9.2 Critical Research Gaps

Gap 1: Absence of longitudinal and panel study designs. The overwhelming majority of studies in this corpus are cross sectional, capturing a snapshot of investor attitudes and intentions at a single point in time. This methodological limitation prevents causal inference about how green investment behaviour evolves over time in response to life events, income growth, policy changes, ESG product proliferation, or exposure to greenwashing incidents. Sivasangari et al. (2025) and Ghosh et al. (2025) each explicitly identified longitudinal designs as the primary methodological gap in their respective study contexts.

Without panel data tracking the same investors across multiple time points, the field cannot establish whether observed attitude behaviour gaps are stable characteristics of investor psychology or transitional states that resolve with experience and financial literacy accumulation.

Gap 2: Underdevelopment of experimental and quasi experimental designs. No study in the present corpus employs a randomised controlled trial, natural experiment, or incentivised investment simulation design to establish causal relationships between specific psychological variables and actual green investment decisions. The current dominance of self-reported survey data susceptible to social desirability bias, recall bias, and common method variance limits the credibility of causal claims. Experimental designs that present investors with real financial choices under controlled conditions are essential for establishing the causal mechanisms through which biases, information environments, and platform designs influence green investment behaviour.

Gap 3: Severe geographic concentration and absence of comparative international studies. Approximately 28% of empirical studies are conducted in India, 19% in Southeast Asia, and 14% in East Asia leaving Africa, Latin America, the Middle East (beyond Iran), Eastern Europe, and South Asia (beyond India) almost entirely unrepresented in the retail green investment behaviour literature. This geographic concentration severely limits the field's claim to theoretical generalisability and practical global relevance. Given the scale of green investment mobilisation required in developing and emerging economies to achieve the Paris Agreement targets, the absence of behavioural evidence from these regions is both academically problematic and practically consequential.

Gap 4: Insufficient attention to the intention behaviour gap. Despite extensive evidence that retail investors express strong green investment intentions, actual participation in green financial markets remains limited. The mechanisms through which intention fails to convert to behaviour including friction costs, product unavailability, financial literacy deficits, greenwashing perception, and platform design failures have been identified descriptively but not examined experimentally. Ghosh et al. (2025) documented this gap directly, finding that green financial literacy moderates the intention behaviour relationship without being able to establish the causal pathway. Closing this gap requires designs that can track both stated intentions and actual investment behaviour including administrative data linkages with brokerage and mutual fund records.

Gap 5: Limited gender disaggregated analysis. While gender has been identified as a significant moderator of green investment behaviour (Rawat, n.d.; Panja & Das, 2020; Sivasangari et al., 2025; Suma & Shreelatha, 2025a), no study in this corpus employs gender as the primary stratifying variable for analysis. The interaction between gender, financial literacy, risk perception, and fintech platform usage in determining green investment participation is an understudied area of considerable theoretical and practical significance. Gender targeted financial literacy and green investment education programmes may yield substantially higher returns than generic investor education campaigns, but the evidence base for designing such programmes is currently inadequate.

Gap 6: Absence of studies examining the fintech-green investment relationship in depth. Empirical research specifically examining fintech adoption and robo-advisory platforms as drivers of retail green investment participation remains nascent within the green investment behaviour literature, representing a critically underexplored dimension that warrants dedicated scholarly attention. While these studies are methodologically rigorous and theoretically innovative, they are necessarily limited in the conclusions they can support as a triad. The broader green investment behaviour literature has not yet systematically examined how specific platform design features ESG scoring transparency, algorithmic explainability,

personalisation depth, gamification elements, and community features influence retail investor green investment decisions. This is perhaps the most rapidly opening research gap in the field.

Gap 7: Theoretical fragmentation and insufficient integration across frameworks. The corpus employs TPB, Prospect Theory, Signalling Theory, TAM, UTAUT, Innovation Diffusion Theory, Stakeholder Theory, and Sustainable Consumption Behaviour Theory in largely independent literatures that rarely engage with each other. No study in the corpus attempts a comprehensive multi-theoretical integration that can simultaneously account for attitudinal, cognitive, social, technological, and institutional determinants of retail green investment behaviour. The development of an integrated theoretical framework, one that maps the interrelationships among perception, bias, intention, demographic context, platform design, and policy environment, is the primary theoretical priority for the field.

Gap 8: Neglect of emotional and identity-based dimensions of green investment. The corpus is dominated by cognitive and rational choice frameworks that treat green investment as a deliberate, calculated decision. The emotional dimensions of green investment including climate anxiety as a motivator, guilt associated with conventional investment, pride in green portfolio ownership, and identity congruent consumption spillover are almost entirely absent from the empirical literature. Emotional resonance with ESG has been identified as an underexplored construct among millennial robo-advisory users (Suma & Shreelatha, 2025b), yet no study has operationalised and measured emotional investment motivation in a manner that would allow its integration into TPB or Prospect Theory frameworks.

Gap 9: Insufficient examination of greenwashing perception as a dynamic variable. Greenwashing is treated in the existing literature primarily as a static background condition, a general level of market scepticism that suppresses participation. No study examines greenwashing perception as a dynamic variable that responds to specific information events (green bond scandals, ESG rating agency controversies, regulatory enforcement actions) and that mediates investor behaviour in real time. Natural experiments created by high profile greenwashing incidents such as the Wirecard collapse or the DWS greenwashing investigation offer valuable opportunities to study how retail investor trust responds to credibility shocks in green financial markets.

Gap 10: Absence of post investment behaviour studies. The entire corpus, without exception, addresses the antecedents of green investment intention and participation in the decision to invest. No study examines what happens after the investment decision: how retail investors monitor the environmental performance of their green portfolios, how they respond to ESG rating changes or impact report disclosures, whether they exit green positions in response to greenwashing news, and whether green investment experience changes subsequent attitudes and behaviours. This post investment dimension of the green investment lifecycle is entirely unstudied and represents a consequential gap in the field's understanding of how retail green investment markets develop over time.

9.3 Future Research Agenda

Based on the ten research gaps identified above, this review proposes six directional priorities for future research in retail green investment behaviour. These priorities are presented not as isolated research questions but as a coherent agenda that, taken together, would substantially advance the theoretical depth, empirical rigour, and policy relevance of the field.

RD1: Longitudinal and panel study designs. Future research should prioritise the design and execution of longitudinal studies that track the same retail investor populations across multiple time points ideally spanning at least three to five years to establish how green investment attitudes, intentions, and behaviours evolve in response to life events, market developments, policy changes, and platform exposure.

Administrative data linkages with brokerage records, mutual fund registries, and green bond subscription databases would provide objective behavioural outcomes that supplement self-reported survey data. The Indian market with its large and rapidly growing retail investor population, expanding green bond market, and digital investment infrastructure offers a particularly rich context for such longitudinal research.

RD2: Experimental and quasi experimental investigation of specific biases and platform design effects. Future research should employ incentivised investment simulation experiments to establish causal relationships between specific cognitive biases particularly loss aversion, herding, and greenwash scepticism and actual green investment decisions. Concurrently, Randomised platform design experiments conducted in collaboration with fintech companies and robo advisory platforms would generate rigorous evidence on which specific design features such as ESG score transparency, impact visualisation, and algorithmic explainability are most effective in closing the green investment intention-behaviour gap among retail investors.

RD3: Future research should prioritise cross-national comparative studies of retail green investment behaviour in underrepresented geographic contexts particularly Sub-Saharan Africa, Latin America, and the Middle East where the green investment mobilisation imperative is significant but behavioural evidence remains absent from the literature. Comparative cross-national studies that examine how cultural values, institutional quality, fintech infrastructure, and regulatory frameworks jointly moderate the relationship between pro-environmental attitudes and green investment behaviour would make a substantial contribution to the theoretical generalisability of the field.

RD4: Gender disaggregated and intersectional analysis. Future research should treat gender not merely as a control variable but as the primary lens for investigating retail green investment behaviour. Studies that examine how gender interacts with financial literacy, platform trust, risk perception, social influence, and cultural context to produce gender differentiated patterns of green investment participation would generate both theoretical insight and actionable policy implications. The design of gender targeted green investment education programmes and fintech platform features warrants formal evaluation through randomised controlled trials, an approach that would address the evidence gap identified across multiple studies in this corpus.

RD5: Integrated multi theoretical modelling of retail green investment behaviour. Future research should develop and empirically test an integrated theoretical framework that simultaneously accounts for attitudinal (TPB), cognitive (Prospect Theory), institutional (Signalling Theory), and technological (TAM/UTAUT) determinants of retail green investment behaviour. Structural equation modelling, partial least squares, and Bayesian hierarchical modelling offer methodological vehicles for testing such integrated frameworks using survey data, while agent-based modelling offers an alternative approach for simulating the emergent market level consequences of retail investor heterogeneity. The development of such an integrated framework is the primary theoretical contribution opportunity available in this field.

RD6: Fintech, AI, and robo advisory as drivers of green investment democratisation. Future research should systematically examine the conditions under which fintech adoption, AI enabled wealth management, and robo advisory platforms succeed in converting retail investor green investment intention to action. Future studies should examine: (a) the comparative effectiveness of human versus hybrid human AI advisory models for green investment intention conversion; (b) the role of algorithmic transparency and ESG score credibility in building platform trust among financially literate and financially illiterate investors; (c) the potential of blockchain verified green investment instruments to address greenwashing perception; and (d) the distributional consequences of fintech enabled green investment democratisation

across income, education, and gender strata. Cross country comparisons examining how different regulatory frameworks and digital infrastructure conditions moderate these relationships would further strengthen the policy relevance of this research direction.

9.4 Proposed Conceptual Framework

Based on the thematic synthesis and gap analysis presented in this review, Figure 2 presents an integrated conceptual framework for retail green investment behaviour. The framework positions five categories of antecedent variables perceptual factors (awareness, attitude, trust), cognitive behavioural factors (loss aversion, herding, overconfidence), ESG preference factors (environmental values, financial literacy, subjective norms), demographic moderators (gender, age, income, education), and contextual enablers (fintech platform design, policy environment, greenwashing exposure) as jointly determining green investment intention, which is converted to actual green investment behaviour through the moderating influence of perceived behavioural control and financial literacy. The framework explicitly incorporates a feedback loop from post-investment experience back to perceptual and cognitive factors acknowledging that investment outcomes, impact reports, and platform interactions shape subsequent green investment attitudes and decisions. This feedback loop, absent from all existing models in the corpus, is what distinguishes the proposed framework from its predecessors and what makes longitudinal research designs essential for testing it.

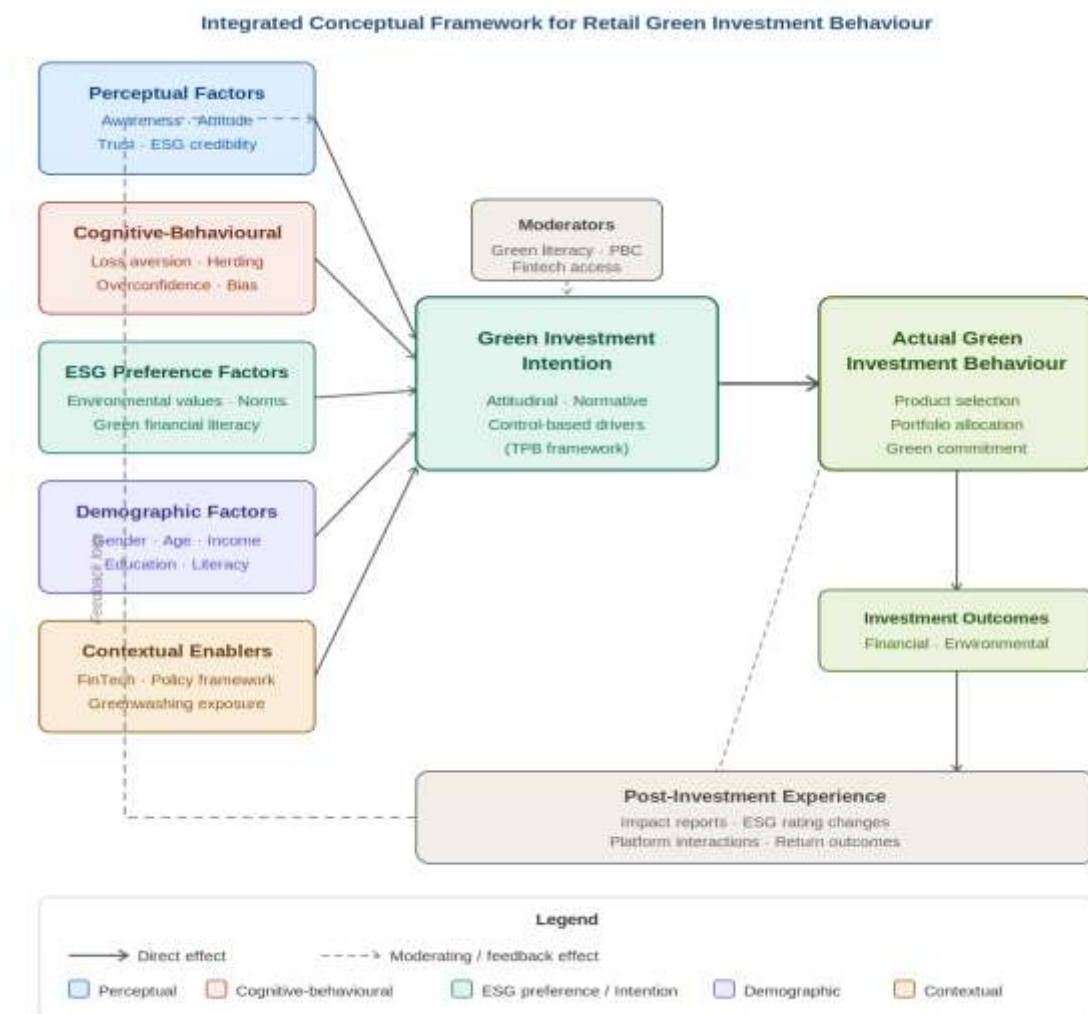


Figure 2. Proposed integrated conceptual framework for retail green investment behaviour.
PBC = Perceived Behavioural Control. Source: Author's own construction based on thematic synthesis of 71 reviewed studies (2015–2025).

10. Conclusion, Implications, and Limitations

10.1 Summary of Principal Findings

This review set out to provide a comprehensive, theoretically integrated synthesis of the extant literature on retail investor behaviour in green investments, covering 71 scholarly works published between 2015 and 2025. Six thematic clusters were identified and systematically reviewed: investor perceptions and awareness; cognitive and behavioural biases; ESG preferences and investment intentions; demographic and socioeconomic moderators; green finance policy, greenwashing, and investor trust; and the emerging domain of fintech adoption, robo advisory platforms, and AI enabled green investment democratisation. The synthesis yields five principal findings that collectively characterise the state of knowledge in this field as of 2025. First, retail investor awareness of green investments has grown substantially over the review period but remains incomplete, unevenly distributed, and vulnerable to greenwashing perception which can suppress investment intention even among investors with strong pro-environmental attitudes (Suma & Supriya, n.d.; Chan et al., 2022; Shi et al., 2024). Second, cognitive and behavioural biases particularly loss aversion, herding, overconfidence, and greenwash scepticism constitute the primary psychological barriers to retail green investment participation, operating in both traditional market and digital platform contexts (Nkukporu et al., 2020; Panja & Das, 2020). Third, pro environmental attitudes are necessary but insufficient conditions for green investment participation they must be combined with green financial literacy, institutional trust, and perceived behavioural control to reliably predict investment action (Ghosh et al., 2025; Thapa & Kafle, 2025; Sivasangari et al., 2025). Fourth, demographic characteristics particularly gender, age, income, educational attainment, and financial literacy exercise significant moderating effects on green investment behaviour, creating a heterogeneous retail investor population that resists homogeneous policy prescriptions (Rawat, n.d.; Eaw et al., 2024; Jonwall et al., 2023). Fifth, and most distinctively for this review, fintech adoption, robo advisory platforms, and AI enabled wealth management tools are emerging as powerful enablers of retail green investment democratisation, with empirical evidence establishing statistically significant relationships between digital financial access and green investment participation across all three quantitative predictors examined (Suma & Shreelatha, 2025a).

10.2 Theoretical Implications

The theoretical contributions of this review are threefold. First, it extends the application of the Theory of Planned Behaviour to the retail green investment context by demonstrating that the standard TPB model attitude, subjective norm, perceived behavioural control requires supplementation with green financial literacy as a moderating variable, cultural and religious values frameworks for non-Western investor populations, and technological platform design factors that mediate the perceived behavioural control construct. Second, it enriches Prospect Theory's application to sustainable finance by establishing that loss aversion operates in digital investment platform contexts just as it does in traditional market contexts and that fintech's democratising potential does not automatically override the psychological barriers that loss aversion creates. Third, it advances Signalling Theory's application to green financial markets by documenting that greenwashing perception represents a dynamic, platform specific phenomenon that requires active algorithmic transparency and ESG disclosure credibility as corrective signals, not merely market level certification standards.

Additionally, this review makes a theoretical contribution by proposing the first integrated conceptual framework for retail green investment behaviour that simultaneously incorporates attitudinal, cognitive, demographic, technological, and contextual determinants and that explicitly models the feedback loop

from post investment experience back to perceptual and cognitive factors. This framework provides a theoretically grounded architecture for future empirical testing and model development.

10.3 Practical and Policy Implications

The practical implications of this review are addressed to four audiences. For financial product designers and green bond issuers, the evidence strongly suggests that retail investor participation in green financial markets is constrained not by lack of environmental values but by information asymmetry, financial literacy deficits, and greenwashing perception. Product design strategies that prioritise ESG score transparency, clear impact reporting, accessible minimum investment thresholds, and credible third-party certification are more likely to succeed in attracting and retaining retail green investors than strategies that rely primarily on environmental value appeals.

For fintech companies and robo advisory platform developers, empirical evidence collectively establishes that platform design specifically the integration of algorithmic transparency, personalised ESG screening, hybrid human AI advisory models, and perceived security features is a primary determinant of retail green investment participation among younger and digitally engaged investor cohorts. Platforms that proactively address greenwashing concerns through blockchain verification, audited ESG scoring, and transparent impact dashboards are likely to generate higher long term investor loyalty and green investment commitment than those that treat ESG integration as a marketing feature rather than a foundational design principle.

For policymakers and regulators, the evidence supports a dual track approach: strengthening the supply side of green investment markets through certification standards, disclosure requirements, and anti-greenwashing enforcement; and strengthening the demand side through financial literacy education targeted at specific demographic segments particularly women, younger investors, and lower income retail participants. The policy potential of fintech enabled financial inclusion as a mechanism for green investment democratisation is significant but requires regulatory frameworks that ensure digital green investment platforms meet minimum standards of ESG data credibility, algorithmic transparency, and investor protection. The RBI and SEBI would benefit from developing regulatory sandboxes for fintech enabled green investment products, consistent with emerging evidence on fintech enabled sustainable investment platforms.

For financial educators and academics engaged in investor education, the consistent finding that green financial literacy is the critical moderator of the green investment intention behaviour gap (Ghosh et al., 2025; Thapa & Kafle, 2025) suggests that targeted green finance literacy programmes covering green bond mechanics, ESG rating methodologies, environmental impact measurement, and greenwashing identification would yield high returns in terms of increasing retail green investment participation. Such programmes should be designed with demographic sensitivity, recognising that the content, delivery channel, and trust mechanisms appropriate for Gen Z digital native investors differ substantially from those appropriate for older, less digitally engaged investor populations.

10.4 Limitations of the Review

This review is subject to several limitations that should be acknowledged transparently. First, despite systematic search procedures, the corpus may not be fully exhaustive particularly with respect to non-English language publications, grey literature, and studies published in regional journals not indexed in the major databases searched. Publication bias, the tendency for positive findings to be published more readily than null results may have shaped the corpus in ways that overstate the consistency of the attitude behaviour relationship in green investment contexts. Second, the geographic concentration of the corpus

in Indian and Southeast Asian contexts limits the generalisability of findings to other cultural, regulatory, and market contexts. Third, the decision to restrict the review to the 2015 - 2025 period, while justified by the Paris Agreement inflection point, necessarily excludes earlier foundational behavioural finance literature that might provide additional theoretical grounding for the findings synthesised here. Fourth, the integrated conceptual framework proposed in this review is, by construction, a theoretical model awaiting empirical testing; it represents a synthesis of available evidence rather than an established empirical finding, and future research is needed to validate, refine, or challenge its core propositions. Future research is needed to validate, refine, or challenge the framework's core propositions.

10.5 Concluding Remarks

The retail green investment behaviour field has reached a critical inflection point one that closely mirrors, at the micro level, the macro level inflection that the Paris Agreement created for green finance markets more broadly. The infrastructure for retail green investment participation is increasingly in place: green bonds are being issued and certified, ESG labelled mutual funds are proliferating, regulatory frameworks are strengthening, and fintech platforms are making sustainable investment options accessible to investor populations that were previously excluded by high minimum thresholds, information barriers, and advisory cost structures. What remains inadequate is the scholarly understanding of the psychological, cognitive, and behavioural architecture of the retail investor, the individual human being who must ultimately decide, in the face of information asymmetry, cognitive bias, and competing financial priorities, whether to direct their savings toward a sustainable future.

This review has sought to advance that understanding by synthesising 71 scholarly works across six thematic dimensions, proposing a theoretically integrated conceptual framework, and delineating a structured future research agenda. The ambition of the Paris Agreement and the United Nations Sustainable Development Goals will only be achieved if the private capital of retail investors, not merely institutional investors or sovereign wealth funds, is progressively oriented toward green investments. That orientation depends, ultimately, on understanding and engaging with the psychology, the biases, the trust dynamics, and the digital behaviours of the individual retail investor. The present review contributes toward that understanding, providing a theoretically grounded foundation upon which future empirical inquiry may build.

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