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REVIEW PAPER

Channels of Fund-Level Greenwashing: A Systematic Review of Measurement, Performance, and Market Discipline in ESG Funds

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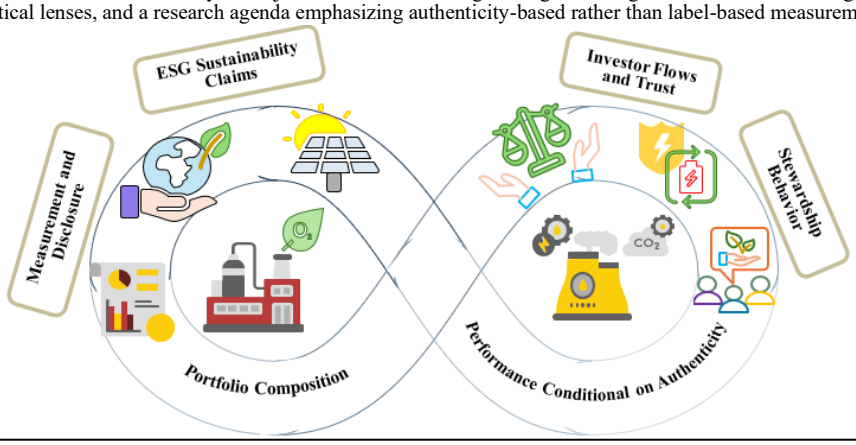
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A B S T R A C T

Although the rapid proliferation of sustainability-labelled investment funds has occurred, the credibility of environmental, social, and governance (ESG) claims remains heavily contested. While extensive literature on ESG fund performance exists, it often appears fragmented, with recent systematic reviews on greenwashing primarily targeting firm-level disclosure, bibliometric mapping, or general definitions rather than specific investment funds. This systematic review addresses this gap by examining how fund-level greenwashing alters the interpretation of ESG performance evidence, synthesizing the four channels through which greenwashing operates, and integrating findings across measurement, performance, investor response, and regulation. Adhering to PRISMA 2020 guidelines, a structured search across Scopus, Web of Science Core Collection, Business Source Complete, and Google Scholar yielded 3,247 records spanning January 2010 to January 2025, alongside foundational pre-2010 theoretical works. Following rigorous screening, 64 studies were included for thematic synthesis, comprising 26 core fund-level studies and 38 contextual studies. Analysis reveals that fund-level greenwashing functions through portfolio composition, stewardship behaviour, disclosure practices, and marketing language. Crucially, performance literature remains conditional on measurement; neutral, positive, and negative results become interpretable once authenticity is measured directly rather than merely inferred. As investor flows respond to simple sustainability signals, regulators in the United States, European Union, and United Kingdom are converging on rules targeting these specific signals, while this review contributes a fund-specific four-channel taxonomy, an adjudication of conflicting findings, an integrative framework linking five theoretical lenses, and a research agenda emphasizing authenticity-based rather than label-based measurement.



1. Introduction

Sustainable investing has become a major feature of contemporary capital markets. Mutual funds, exchange-traded funds, and other managed products now use ESG, sustainable, responsible, climate, transition, and impact labels to communicate investment strategies to institutional and retail investors. This growth has been accompanied by intensifying concern that some funds may overstate their sustainability orientation. In the fund context, greenwashing

refers to a gap between a fund's sustainability claims and its observable investment practices, stewardship behaviour, or disclosed evidence [1,2]. That gap matters because fund investors usually cannot verify sustainability claims with the same ease that they can observe fees, returns, or benchmark composition [3,4].The performance question has dominated much of the sustainable finance debate. Early studies of socially responsible mutual funds often found limited differences between socially responsible and conventional funds after risk adjustment [5-8]. A widely cited meta-analytic review by Friede et al. [9] synthesised more than 2,000 empirical studies and reported a predominantly non-negative ESG-performance relation, though with substantial heterogeneity. Later work produced more conditional conclusions.

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Some studies suggest that material ESG characteristics may be associated with stronger long-run firm performance and lower financing costs [10-12]. Other work shows that green assets may experience periods of strong realized returns because of changes in investor demand, while their expected returns may be lower in equilibrium [13,14]. This mixed evidence does not imply that the literature is incoherent. It shows that ESG performance depends heavily on measurement, sample period, investor preferences, and the distinction between realized and expected returns. Greenwashing complicates this debate. If a fund labelled as ESG is not substantively different from a conventional fund, then its performance should not be interpreted as evidence for or against authentic sustainable investing. Likewise, if a fund markets itself as sustainable but holds companies with weak labour, environmental, or governance records, its returns may reflect conventional exposures rather than ESG skill or sustainability risk management [2]. If a fund signs voluntary sustainability commitments but does not improve portfolio ESG quality or stewardship behaviour, investor flows may reflect signal value rather than substantive ESG implementation [15,16]. The central argument of this review is that fund-level greenwashing changes what ESG fund performance evidence can mean.

Three recent systematic reviews have examined greenwashing from related but distinct angles. Huang et al. [17] conducted a broad systematic review of greenwashing across firms, products, and markets. Lublóy et al. [18] reviewed quantitative firm-level greenwashing measurement. Sneideriene and Legenzova [19] provided a bibliometric analysis of greenwashing prevention in ESG disclosures. None of these reviews takes the investment fund as the primary unit of analysis, and none connects greenwashing measurement to the interpretation of ESG fund performance. The present review addresses that gap.

This review addresses four research questions. First, how is greenwashing conceptualized and measured in ESG fund research? Second, what does the ESG fund performance literature imply once the authenticity of ESG claims is considered? Third, how do investors, markets, and regulators respond to sustainability signals that may be unreliable? Fourth, how can signaling theory, stakeholder theory, legitimacy theory, information asymmetry, and agency theory be integrated to explain the antecedents and consequences of fund-level greenwashing? The manuscript proceeds as follows. Section 2 positions the review within the existing literature, including explicit comparison with the three published systematic reviews above. Section 3 develops the theoretical background. Section 4 presents the review protocol with full PRISMA reporting. Section 5 maps the evidence. Section 6 synthesizes findings across the four channels, performance, investor response, regulation, and the anti-ESG backlash. Section 7 develops the integrative framework. Section 8 presents the research agenda. Sections 9, 10, and 11 cover practical implications, limitations, and conclusions.

2. Experimental

The article differs from broad reviews of corporate ESG, CSR, and greenwashing in three ways. First, it focuses on investment funds rather than operating firms. This distinction is important because a fund does not directly produce emissions, labour practices, or community impacts. It allocates capital, votes shares, engages with portfolio companies, and communicates investment strategy to clients. Fund-level greenwashing therefore arises through intermediation rather than production [20,21].

Second, the review connects greenwashing to fund performance. Many ESG performance studies classify funds by label, mandate, rating, or screening strategy. If those classification variables are noisy, performance estimates may mix authentic sustainable strategies with conventional strategies that use ESG language. This creates an interpretation problem. A null result may mean that ESG does not matter, or it may mean that the ESG signal used to define the sample is weak [4,22]. A positive result may reflect demand pressure or style exposures rather than superior sustainability analysis [14]. A negative result may reflect exclusion costs, high fees, or sector shocks rather than a broad failure of ESG integration [23].

Third, the review separates direct fund-level evidence from contextual evidence. Direct evidence includes studies of ESG mutual funds, hedge funds, fund names, fund flows, portfolio holdings, stewardship, and fund returns. Contextual evidence includes firm-level greenwashing, ESG rating disagreement, CSR disclosure, sustainability reporting, and regulatory studies. Contextual studies are useful because they explain concepts and measurement tools, but they should not be treated as direct evidence on ESG fund behaviour. This separation makes the synthesis more transparent and reduces the risk of overstating what the fund-level literature has established.

2.1. Comparison with Existing Systematic Reviews

Three published systematic reviews map closely onto the present topic, and the contribution of this review must be articulated against them. Table 1 summarizes the comparison. Each of the prior reviews makes a different cut at the literature, and none addresses the fund-level performance interpretation question that motivates the present work.

Huang et al. [17] provided a broad bibliometric and thematic review of greenwashing, covering definitions, drivers, consequences, and measurement across firms, products, and markets. Their review is comprehensive in coverage but is not designed to address how greenwashing affects the interpretation of investment performance evidence, and investment funds appear as one application area among several. Lublóy et al. [18] conducted a focused systematic review of quantitative firm-level greenwashing measurement, organizing the literature around how researchers detect claim-practice gaps in corporate disclosure. Their unit of analysis is the firm, not the fund. Sneideriene and Legenzova [19] carried out a bibliometric analysis of greenwashing prevention in ESG disclosures, mapping authors, outlets, and themes rather than synthesizing evidence on outcomes.

The present review differs from these three prior efforts in four ways. First, the unit of analysis is the investment fund, not the firm. Second, the review explicitly connects greenwashing to the interpretation of ESG fund performance evidence, rather than treating greenwashing as a stand-alone topic. Third, it develops a four-channel taxonomy specific to funds (portfolio composition, stewardship, disclosure, and naming) and links each channel to preferred measurement strategies. Fourth, it incorporates the post-2023 cross-jurisdictional regulatory wave (SEC Names Rule amendments, ESMA fund-name guidelines, FCA Sustainability Disclosure Requirements, and EU SFDR), which the earlier reviews could not fully address given their cutoff dates and scope.

Table 1. Comparison with prior systematic reviews on greenwashing

Review	Scope	Approach	Focus	Distinction from present review
Huang et al. [17]	Greenwashing across firms, products, markets	Bibliometric and thematic, broad scope	Definitions, drivers, consequences, measurement	Limited treatment of fund performance interpretation; investment funds are one application among many.
Lublóy et al. [18]	Firm-level greenwashing measurement	Quantitative measurement focus	How researchers detect claim-practice gaps in corporate disclosure	Unit of analysis is the firm. Does not address fund intermediation, stewardship, or fund flows.
Sneideriene & Legenzova [19]	Greenwashing prevention in ESG disclosures	Bibliometric mapping	Authors, outlets, prevention themes	Maps the field but does not synthesize evidence on investor or performance outcomes.
Present review (2025)	Fund-level greenwashing and its effect on ESG fund performance interpretation	PRISMA-aligned thematic synthesis with four-channel taxonomy	Measurement, performance, investor response, regulation, theoretical integration	Fund-level focus; performance interpretation; cross-jurisdictional regulation including SFDR, SEC Names Rule, ESMA guidelines, FCA SDR; integration of five theoretical lenses.

Note: Comparison is based on the published abstracts, methods, and findings sections of the three reviews. The present review treats Huang et al. [17], Lublóy et al. [18], and Sneideriene and Legenzova [19] as benchmark reviews and uses them throughout the synthesis where relevant.

This review draws on five theoretical lenses that generate distinct, and at points competing, predictions about why fund-level greenwashing arises, how it manifests, and what consequences it has for investors and markets. Asset-pricing and portfolio theory explain why sustainability preferences can affect equilibrium returns. Signaling theory explains why funds invest in observable sustainability cues. Information asymmetry and agency theory explain why those cues can decouple from underlying practice. Legitimacy theory explains why sustainability language has organizational value independent of substantive performance. Stakeholder theory explains why claim-practice gaps matter beyond financial returns. The remainder of this section develops each lens, and Section 7 returns to how they integrate and where they predict different things.

2.2. ESG Funds and the Performance Debate

The ESG fund literature sits between two theoretical views. The first view draws on portfolio theory and asset pricing. If investors impose nonfinancial constraints, they restrict the investment universe and may accept lower expected returns in exchange for nonpecuniary utility [23,24]. Under this view, some ESG investors may willingly accept a financial trade-off. The second view treats ESG information as financially material. Firms with stronger

governance, environmental risk management, and stakeholder relations may face lower downside risk, fewer financing constraints, and lower cost of capital [10-12,25]. Under this view, ESG analysis can improve risk-adjusted returns when it identifies financially material information that markets have not fully priced [26,27].

Recent equilibrium models combine these views. Sustainable investors may prefer green assets, driving up prices and lowering expected returns, while climate shocks and shifts in tastes can generate strong realized green returns during particular periods [13,14]. Pedersen et al. [28] show that the cost of responsible investing depends on the quality of the ESG signal and the investor's preference for sustainability. This insight is central to greenwashing. If the ESG signal is unreliable, the investor may pay for sustainability without receiving the intended exposure. The realized-versus-expected-return distinction is also empirically consequential: a positive realized return for green assets during a demand surge can coexist with a lower equilibrium expected return, so cross-sectional performance comparisons over short windows can mislead in both directions [14,29].

2.3. Greenwashing as a Signal Failure

Signaling theory offers a useful starting point. Funds use names, prospectus language, sustainability ratings, voluntary commitments, and stewardship reports to signal sustainability. Signals are more credible when they are costly, verifiable, and linked to observable action [30,31]. Signals are less credible when they can be produced cheaply through language, branding, or selective disclosure. In an ESG fund market with high information asymmetry, low-cost sustainability signals may attract flows even when they are weakly connected to underlying holdings or stewardship behaviour [15,32,33].

The classic market-for-lemons problem also applies. When investors cannot distinguish authentic funds from greenwashed funds, the credibility of all ESG claims may decline [34]. This does not mean that authentic ESG funds disappear, but it does suggest that weak disclosure, ESG rating disagreement, and inconsistent labels can reduce trust, distort fund flows, and raise the cost of identifying authentic sustainable strategies. Lyon and Maxwell [35] formalise the disclosure side of this problem, showing how the threat of audit shapes which environmental claims firms choose to make and how vague those claims tend to be.

2.4. Stakeholder, Legitimacy, and Agency Perspectives

Stakeholder theory frames ESG funds as intermediaries that claim to allocate capital in ways consistent with broader stakeholder interests [2,36]. Greenwashing represents a breach of that implied promise. Legitimacy theory adds that ESG language can help asset managers gain social approval in a market where sustainability has become a valued norm [37]. This legitimacy may be symbolic if the underlying portfolio, stewardship, or disclosure does not support the claim [38-41]. Empirical work by Testa et al. [42] shows that institutional pressure can encourage symbolic adoption of environmental practices without internalization, providing the organizational mechanism through which legitimacy-seeking translates into observable greenwashing.

Agency theory and information asymmetry explain why greenwashing can persist. Investors delegate investment decisions to asset managers, rely on rating agencies and advisers, and face limits in monitoring portfolio-level ESG quality. These structural conditions create space for sustainability claims to diverge from practice [4,22,43]. Hummel and Schlick [44] integrate voluntary disclosure theory and legitimacy theory to show that good and poor sustainability performers behave differently in disclosure quality, with poor performers using vaguer, less verifiable language—a pattern that has direct implications for fund prospectus analysis. Aragon-Correa et al. [45] review how mandatory and voluntary regulatory pressures shape firms' environmental strategies, providing the policy backdrop for the regulatory section of this review.

2.5. Where the Theories Make Different Predictions

The five lenses agree that fund-level greenwashing is possible. They disagree about which channel it should concentrate in and what the empirical signature should look like. Signaling theory predicts concentration in the naming and marketing channel, because that channel offers the cheapest and most visible signal and the highest cost of verification [30,31]. Information asymmetry and legitimacy theory together predict concentration in the disclosure channel, because narrative content is hardest for outside parties to audit and produces the largest reputational return per unit of verifiable content [34,37,44]. Agency theory predicts concentration in the stewardship channel, because proxy votes, engagement outcomes, and escalation records are delegated to managers, monitored weakly by retail investors, and largely invisible at the point of sale [46,47]. Asset-pricing and materiality theory predicts that the portfolio-composition channel is where authentic ESG implementation should be visible if it exists, because financially material ESG characteristics ought to translate into observable holdings [12,13].

A worked example illustrates how the lenses converge on a single observation. Kim and Yoon [15] document that voluntary affiliation with the Principles for Responsible Investment (PRI) attracts fund flows but is not consistently matched by changes in portfolio ESG characteristics. The signaling lens reads the PRI signature as a low-cost, highly visible signal that should attract flows with limited practice change, which is what Kim and Yoon observe. The information asymmetry and legitimacy lens emphasizes that PRI compliance is difficult for investors to verify and confers legitimacy among institutional audiences regardless of underlying practice. The agency lens points out that the PRI commitment is at the firm level and does not bind portfolio managers at the security-selection stage, so monitoring is weak. The asset-pricing lens observes that if PRI signature does not change material exposures, expected returns should not differ, and the observed flow effect must operate through investor preference rather than through information about future cash flows. The lenses are therefore complementary rather than rival on this case: each picks out a different mechanism by which the same claim-practice gap can persist. Section 6.1 and Section 7 use these mappings to organize the synthesis and the framework.

3. Method

3.1. Methodology

This article reports a systematic literature review conducted in accordance with the PRISMA 2020 statement [48]. The review is systematic in its search logic, inclusion criteria, quality-screening logic, data-extraction categories, and synthesis structure. It is integrative in its treatment of evidence because the relevant literature spans empirical finance, accounting, management theory, legal-policy analysis, and conceptual research [49,50]. A meta-analysis was not appropriate because the studies use different units of analysis, samples, outcomes, ESG measures, and greenwashing operationalizations, which is consistent with the methodological stance taken by Lublóy et al. [18] for the closely related firm-level literature.

The synthesis emphasizes transparent categorization of studies, distinction between direct fund-level evidence and contextual evidence, and careful interpretation of measurement choices. Where conflicting findings appear, the review adjudicates between them by examining sample, period, ESG signal, and unit of comparison rather than by simple vote-counting (Section 6.3).

3.2. Search Strategy

The search strategy was designed to identify literature from finance, accounting, management, business ethics, and sustainable finance. The primary search fields were title, abstract, and keywords. Four databases were searched: Scopus, Web of Science Core Collection, Business Source Complete, and Google Scholar. The search window covered January 2010 to January 2025, with pre-2010 foundational sources retained when they anchored theory or the ESG fund performance debate. Recent 2025 studies and current regulatory materials were included where they directly informed measurement, disclosure, or policy context. The last database search was executed on 22 January 2025.

The search terms combined three blocks. The first block captured greenwashing: greenwashing, greenwash, green-washing, "ESG washing", "sustainability washing", "impact washing", "selective disclosure", "symbolic sustainability", and decoupling. The second block captured funds and sustainable investment: "ESG fund", "sustainable fund", "responsible investment fund", "socially responsible mutual fund", "SRI fund", "impact fund", "green fund", "ESG ETF", "sustainable ETF", "mutual fund", "hedge fund", "asset manager", and portfolio. The third block captured outcomes: performance, return, alpha, "risk-adjusted return", "fund flow", "investor behaviour", "investor behavior", stewardship, "proxy voting", engagement, disclosure, and regulation. Within each block, terms were combined with the Boolean OR operator, and the three blocks were combined with AND. Search strings were adapted to each database syntax. Reference snowballing and forward citation tracking were used to identify influential studies that did not use the exact terminology but clearly addressed the review questions. Table 2 summarizes the review search protocol with the actual record counts retrieved.

Table 2. Search protocol and record counts by source

Source	Search fields	Records identified (n)	Notes
Scopus	Title, abstract, keywords	1,284	Open-access where available; institutional access for paywalled items.
Web of Science Core Collection	Title, abstract, keywords	912	SCI-EXPANDED, SSCI, A&HCI, ESCI indexes.
Business Source Complete (EBSCO)	Title, abstract, subject	451	Limited to peer-reviewed scholarly journals.
Google Scholar	Full-text	600	First 60 pages screened; used for sensitivity and forward citation tracking.

Citation searching	Backward and forward from core studies	22	Seed set: Raghunandan and Rajgopal [2], Kim and Yoon [15], Curtis et al. [20], Liang et al. [16].
Total identified records		3,269	Before duplicate removal.

Note. All searches limited to English-language peer-reviewed journal articles, except where regulatory or foundational works were retained as policy or theoretical anchors. Last search executed 22 January 2025.

3.3. Inclusion and Exclusion Criteria

The review distinguishes between a core corpus and a contextual corpus. The core corpus includes studies that directly examine fund-level ESG claims, fund performance, fund flows, fund holdings, stewardship, proxy voting, ESG fund names, or asset-manager commitments. The contextual corpus includes studies on firm-level greenwashing, ESG disclosure, ESG rating disagreement, sustainability reporting, and regulation. Contextual studies inform theory and measurement, but they are not treated as direct evidence on fund performance. Table 3 presents the inclusion and exclusion criteria.

Table 3. Inclusion and exclusion criteria

Category	Inclusion criteria	Exclusion criteria
Core corpus	Peer-reviewed studies directly examining ESG funds, SRI funds, sustainable mutual funds, ESG ETFs, hedge funds with sustainability mandates, fund flows, fund returns, fund names, portfolio holdings, proxy voting, or PRI signatory behaviour.	Studies that discuss ESG in general without a fund-level unit of analysis.
Contextual corpus	High-quality studies on firm-level greenwashing, ESG disclosure, sustainability reporting, ESG rating disagreement, and sustainable finance regulation that inform fund-level interpretation.	Studies with no clear link to greenwashing, ESG measurement, investor response, disclosure credibility, or sustainable finance regulation.
Quality threshold	Priority given to journals in finance, accounting, management, economics, business ethics, and sustainable finance with recognized quality standing (ABS 3 and above, ABDC A and A*, Scimago Q1 or Q2). Foundational works retained where they anchor theory.	Predatory outlets, non-scholarly commentaries, unsupported opinion pieces, and duplicative versions of the same study.
Regulatory context	Official regulatory materials from the SEC, ESMA, FCA, EU Commission (SFDR), and comparable authorities when used to describe current policy context.	Consulting reports and media coverage unless used only as non-evidentiary context.
Time window	January 2010 to January 2025. Foundational pre-2010 works retained where they anchor theory [8,31,34,36,37].	Pre-2010 works without foundational status.
Language and document type	English-language peer-reviewed journal articles for the primary corpus.	Working papers, theses, books, and conference proceedings unless directly cited by core corpus studies and methodologically anchor a measurement approach.

Note. Quality thresholds reference the Chartered ABS Academic Journal Guide, the Australian Business Deans Council (ABDC) Journal Quality List, and the Scimago Journal Rank. Foundational works are explicitly listed to make their retention auditable.

3.4 .Screening Procedure and Inter-Rater Reliability

Screening proceeded in three stages: (a) duplicate removal and automated exclusion of non-journal and non-English records using EndNote and the Rayyan systematic review tool; (b) title and abstract screening against the inclusion criteria; and (c) full-text eligibility assessment of records retained at stage (b). The review was conducted by the lead author, with screening rigour reinforced through two additional procedures.

First, an independent second reviewer (a doctoral researcher in finance, external to the study) screened a stratified random 15 per cent sample of the 1,778 records that entered title and abstract screening (n = 267). Inclusion decisions on this sub-sample were compared with the lead author's decisions, and Cohen's kappa was computed as a measure of inter-rater agreement. Agreement was $\kappa = 0.87$, which is conventionally interpreted as substantial-to-almost-perfect agreement [51]. The 31 initial disagreements (11.6 per cent of the sub-sample) were resolved by joint discussion and, where the second reviewer's judgement was that a record warranted closer examination, by escalation to full-text review. Second, the lead author re-screened a separate random 10 per cent sample of stage (b) decisions after a two-week interval; intra-reviewer agreement on that sample was 94 per cent, with the small number of disagreements resolved by escalation to full text. Full-text screening (stage c) followed an explicit checklist tied to Table 3, and exclusion reasons were recorded for every excluded report.These two procedures partially mitigate but do not eliminate the limitations of predominantly single-author screening. The design is therefore acknowledged as a limitation in Section 10 rather than as a methodological neutral. The review is reported as a systematic review because it follows PRISMA 2020 search screening, eligibility, and synthesis structure [48]; the limitation note in Section 10 is explicit about which conclusions this design affects most directly.

3.5. Data Extraction

For each included study, the extraction form recorded authors, year, journal, country or region of the sample, unit of analysis, sample period, data source, theory, greenwashing measure (if any), ESG measure, performance or response outcome, key findings, and limitations. The extraction form was piloted on five randomly selected studies before broader application and was revised once to add a field distinguishing label-based and practice-based ESG measures. Particular attention was given during extraction to whether a study measured actual fund practice (holdings, votes, engagement records, disclosure specificity) or only sustainability language. This distinction is central because the review treats greenwashing as a gap between claim and practice.

3.6. Quality Assessment

Quality assessment used a six-criterion checklist applied to each included study: (a) clarity of research question, (b) sample relevance and adequacy, (c) construct validity of ESG and greenwashing measures, (d) research design and identification strategy, (e) robustness tests, and (f) fit with the review questions. Each criterion was rated on a three-point scale (low, medium, high). Studies with two or more low ratings were either excluded or retained only as contextual references with explicit caveats. Table 4 summarises the distribution of ratings across the corpus. The data-extraction template is reproduced in Appendix C, the quality-assessment instrument and detailed rating distribution in Appendix D, and the complete corpus with synthesis roles in Appendix A.

Table 4. Distribution of quality ratings across the included corpus (n = 64)

Quality criterion	High	Medium	Low
Clarity of research question	58 (91%)	5 (8%)	1 (1%)
Sample relevance and adequacy	47 (74%)	14 (22%)	3 (4%)
Construct validity of ESG / GW measures	32 (50%)	23 (36%)	9 (14%)
Research design / identification strategy	41 (64%)	18 (28%)	5 (8%)
Robustness tests reported	39 (61%)	17 (27%)	8 (12%)
Fit with review questions	52 (81%)	10 (16%)	2 (3%)

Note: Construct validity of ESG and greenwashing measures was the criterion on which the corpus scored lowest, reflecting reliance on rating-based ESG classification in much of the performance literature. Three studies that received two or more low ratings were retained as contextual references rather than as core fund-level evidence; they are not used to support any quantitative claim about greenwashing prevalence. Individual study identities are not flagged in Appendix A2 to avoid implicit criticism of published work; the downgrading is recorded in the project's coded extraction dataset, which will be deposited with the OSF repository on acceptance. Identification strategy ratings reflect the heterogeneity of empirical designs (event studies, panel regressions, difference-in-differences, surveys) used in the corpus.

To support reproducibility, the review protocol, full search strings adapted to each database, the deduplicated record list with retention decisions, the data-extraction form, the quality-assessment instrument, and the full corpus characteristics table are made available as supplementary materials accompanying this article. The supplementary package will be deposited in a public repository (Open Science Framework or institutional repository) at the time of acceptance, with persistent identifiers cited in the final publication. The protocol was prepared prior to the final database search and is consistent with PRISMA-P recommendations [48]; the version of record will be linked through the same supplementary package. Five appendices are included with this manuscript: Appendix A presents the full corpus characteristics table (Tables A1 and A2); Appendix B reproduces the Boolean search strings executed in each database; Appendix C presents the data-extraction template; Appendix D presents the quality-assessment criteria and the detailed rating distribution; and Appendix E presents the channel coding of the 26 core fund-level studies. Together these appendices allow the corpus to be inspected and the search reproduced without external access.

3.7. PRISMA Flow

Figure 1 presents the PRISMA 2020 flow diagram. The four databases identified 3,247 records, with a further 22 records identified through backward and forward citation searching from the core studies. After removing 1,182 duplicates and 287 records marked ineligible by automation (non-journal or

non-English), 1,778 records were screened on title and abstract. Of these, 1,541 were excluded as outside scope, 237 were sought for retrieval, and 16 could not be retrieved. Two hundred and twenty-one reports were assessed for eligibility, of which 171 were excluded with reasons recorded in the diagram. Fifty studies from the database search and 14 from citation searching were included, for a total of 64 studies (26 core fund-level and 38 contextual). Figure 1 also shows how these studies distribute across the five high-level synthesis themes (greenwashing measurement and four-channel taxonomy, n = 18; ESG fund performance and flows, n = 16; ESG ratings, signal disagreement, and theory, n = 14; regulation and policy context, n = 9; methodology and prior systematic reviews, n = 7). The eight subsections of Section 6 partition the same 64 studies more finely: Sections 6.1–6.3 elaborate the first theme, Section 6.4 the second, Section 6.5 the investor-response slice of the third, Section 6.6 the fourth, and Sections 6.7–6.8 the regulatory and vehicle-type extensions. The full study-by-study mapping appears in Appendix A.

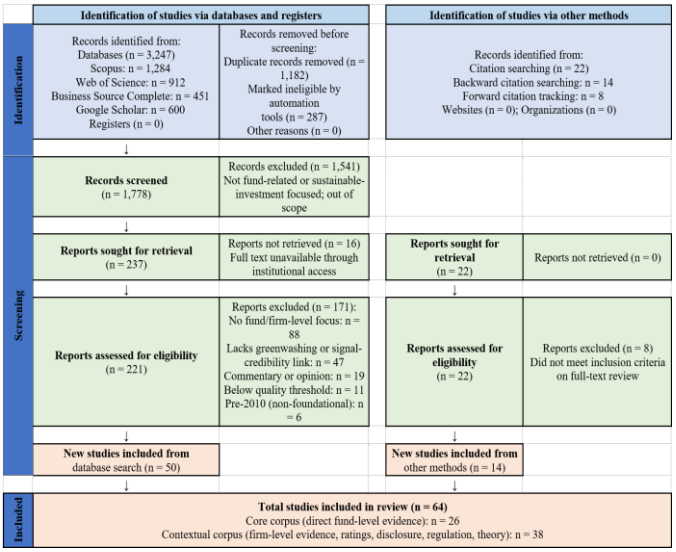


Figure 1. PRISMA 2020 flow diagram for the systematic search and screening process. Adapted from Page et al. [48], https://doi.org/10.1136/bmj.n71,underCCBY4.0.

Note: Adapted from the PRISMA 2020 flow diagram template for new systematic reviews including searches of databases, registers, and other sources [48], distributed under CC BY 4.0. Independent second-reviewer screening on a stratified 15% sample of title/abstract decisions yielded Cohen's κ = 0.87 [51]. Date of last database search: 22 January 2025.

4. Results and Discussion

4.1. Evidence Map

Two tables summarise the evidence base. Table 5 characterises the included studies by discipline, geographic focus, methodological approach, and unit of analysis. Table 6 presents the evidence categories used in the thematic synthesis. The categorisation is designed to help readers distinguish direct fund-level evidence from studies that inform measurement, theory, or policy context.

Table 5. Characteristics of included studies (n = 64)

Dimension	Distribution
Discipline / outlet field	Finance: 28; Accounting: 11; Management & strategy: 12; Business ethics & sustainability: 8; Law and regulation: 5.
Geographic focus of empirical samples	United States: 22; Europe (multi-country): 11; United Kingdom: 4; Cross-country global: 9; China and emerging markets: 6; Other single country: 4; Not applicable (theory, regulation, review): 8.
Methodological approach	Empirical archival: 38; Theoretical/conceptual: 9; Experimental or survey: 5; Regulatory or policy analysis: 5; Review or meta-analysis: 4; Mixed-methods: 3.
Unit of analysis	Fund-level (mutual fund, ETF, hedge fund, fund family): 26; Firm-level: 19; Investor-level: 6; ESG rating / disclosure document: 7; Regulatory regime: 6.
Sample period coverage	Earliest start year: 1990 [5]; most common window: 2010–2023; studies with samples ending in 2022 or later: 16.

Note: Counts sum to more than 64 in some rows because individual studies span multiple categories (e.g., a study covering both fund- and firm-level evidence). Counts within a row sum to 64. The "Not applicable" entry in the Geographic focus row identifies studies with no empirical sample (pure theoretical, regulatory, or review works counted by their primary character). The Methodological approach row counts the same studies by their primary research design: studies that combine a formal model with an empirical companion (e.g., Avramov et al., [22]; Pedersen et al., [28]) are counted under Theoretical/conceptual when the modelling contribution dominates, which is why the conceptual-plus-regulatory-plus-review subtotal in the Methodological approach row exceeds the eight studies marked as "Not applicable" in the Geographic focus row. The breakdown was derived from the extraction form described in Section 3.5.

Table 6. Evidence map: categories used in the thematic synthesis

Evidence category	Included studies	Role in the review
ESG fund performance and flows	Bauer et al. [5]; Bauer et al. [52]; Bollen [6]; Friede et al. [9]; Hartzmark and Sussman [32]; Renneboog et al. [7,53,54]; Riedl and Smeets [55]; Statman [8].	Explains the baseline ESG fund performance and investor-demand debate.
Fund-level greenwashing and authenticity	Curtis et al. [20]; Heath et al. [21]; Kim and Yoon [15]; Liang et al. [16]; Raghunandan and Rajgopal [2].	Provides the most direct evidence on whether ESG fund claims align with holdings, performance, and stewardship.
ESG measurement and rating disagreement	Avramov et al. [22]; Berg et al. [4]; Christensen et al. [43]; Gibson Brandon et al. [56]; Pedersen et al. [28].	Shows why ESG signal quality affects performance interpretation and investor welfare.
Institutional ownership and stewardship	Dimson et al. [46]; Dyck et al. [47]; Krueger et al. [57].	Documents how institutional investors shape ESG outcomes through ownership, engagement, and climate-risk preferences.
Firm-level greenwashing and disclosure	Boiral [38]; Bowen and Aragón-Correa [39]; Delmas and Burbano [58]; Hummel and Schlick [44]; Lyon and Maxwell [35]; Lyon and Montgomery [1]; Mahoney et al. [33]; Marquis and Qian [41]; Marquis et al. [40]; Testa et al. [42]; Yu et al. [59]; Zhang [60].	Provides conceptual and measurement tools for detecting claim-practice gaps.
Asset pricing and sustainability	Bofinger et al. [29]; Cheng et al. [10]; Edmans [26]; Edmans [61]; El Ghoul et al. [11]; Fama and French [24]; Gillan et al. [25]; Hong and Kacperczyk [23]; Khan et al. [12]; Krueger [27]; Pástor et al. [13,14].	Anchors the realized-versus-expected return distinction and the materiality debate.
Regulation and investor protection	Aragón-Correa et al. [45]; European Securities and Markets Authority [62]; Financial Conduct Authority [63]; Steuer and Tröger [64]; U.S. Securities and Exchange Commission [65].	Updates the regulatory context for fund names, disclosures, and anti-greenwashing enforcement, including SFDR Article 8 and Article 9 classification.
Theoretical foundations	Akerlof [34]; Connelly et al. [30]; Freeman [36]; Spence [31]; Suchman [37].	Anchors signaling theory, information asymmetry, stakeholder theory, and legitimacy theory.
Prior systematic and bibliometric reviews	Huang et al. [17]; Lublóy et al. [18]; Sneideriene and Legenzova [19].	Benchmark reviews against which the present review positions its contribution.
Investor use of ESG information	Amel-Zadeh and Serafeim [3]; Du [66]; Walker and Wan [67].	Documents how investors and markets respond to ESG signals and revealed greenwashing.
Systematic review methodology	Page et al. [48]; Snyder [49]; Tranfield et al. [50].	Methodological anchors for the PRISMA-aligned review design.

Note: Studies may appear in multiple categories where their content spans more than one theme. The categories correspond to subsections of the Conclusions synthesis in Section 5.

5. Conclusions

5.1. Fund-Type Taxonomy and Why It Matters

Before synthesising the four channels of greenwashing, it is necessary to operationalise the terms used to label sustainable funds. The literature uses ESG, sustainable, responsible, climate, transition, impact, green, and SRI interchangeably in some studies and as distinct categories in others. Regulators are moving away from interchangeability: ESMA's 2024 fund-name guidelines apply term-specific exclusions, and the FCA investment labels regime distinguishes Sustainability Focus, Sustainability Improvers, Sustainability Impact, and Sustainability Mixed Goals categories [63]. Treating these terms as equivalent in synthesis would conflate strategies that the regulators now treat

as substantively different. Table 7 provides the working taxonomy used in the remainder of this review, distinguishing label, mandate logic, typical screening approach, and regulatory anchor.

Table 7. Working taxonomy of sustainability-labelled fund categories

Label	Mandate logic	Typical screening or selection approach	Regulatory anchor in current regimes
SRI / socially responsible	Values-based exclusion	Negative screens (e.g., tobacco, weapons, fossil fuels) applied to a conventional universe.	Historical category covered by early performance studies [5,8]; pre-dates current regulatory labels.
ESG / ESG-integrated	Materiality and risk integration	Integration of E, S, and G factors into security selection or weighting; may use ratings or proprietary scoring.	Subject to SEC Names Rule 80 per cent policy where used in fund name [65].
Sustainable	Sustainability characteristics or objectives	Portfolio aligned with environmental or social characteristics or sustainable investment objectives; varies widely across regimes.	ESMA 80 per cent threshold and term-specific exclusions [62]; SFDR Article 8 and Article 9 classification.
Climate / transition	Climate alignment or decarbonisation	Portfolio designed around emissions intensity, transition pathways, or climate benchmarks.	Climate-themed names trigger specific ESMA exclusions; transition labels are emerging category under FCA SDR.
Impact	Intentional, measurable contribution to outcomes	Capital allocated with explicit intent to produce measurable environmental or social outcomes alongside financial return.	FCA Sustainability Impact label requires evidence of contribution and measurable outcomes.
Green	Environmental focus	Portfolio focused on environmental themes (renewable energy, clean technology).	ESMA term-specific exclusions apply when "green" is used in the fund name.

Note: The taxonomy is descriptive of how the literature and current regulators distinguish these categories; it is not a normative ranking. Throughout the synthesis, terms are used as the original studies used them, with attention to whether differences across label categories drive any reported conclusion.

5.2. Four Channels of Fund-Level Greenwashing

The fund-level literature identifies four channels through which greenwashing can occur: portfolio composition, stewardship behaviour, disclosure practices, and naming or marketing language. These channels are related but not identical. A fund may hold companies with higher ESG ratings while showing weak

stewardship. Another fund may have credible engagement practices while using broad marketing claims that obscure fossil-fuel or controversial-sector exposures. Treating greenwashing as one binary construct therefore risks measurement error. Table 8 summarises these channels and the preferred measurement strategies, and links each channel to the theoretical lens that most directly applies.

Table 8. Four channels of fund-level greenwashing

Channel	Typical claim-practice gap	Illustrative evidence	Preferred measurement	Primary theoretical lens
Portfolio composition	The fund markets itself as ESG or sustainable, but its holdings do not show stronger stakeholder, environmental, or governance characteristics than relevant comparators.	Raghunandan and Rajgopal [2]; Curtis et al. [20]; Heath et al. [21]).	Compare stated mandate with portfolio holdings, sector exposures, controversies, emissions, labour records, and ESG materiality measures [12].	Signaling and agency theory.
Stewardship behaviour	The fund sponsor claims active ownership or responsible investment commitment, but proxy voting and engagement do not support ESG objectives.	Dimson et al. [46]; Dyck et al. [47]; Kim and Yoon [15]; Liang et al. [16].	Compare stated stewardship policies with proxy votes, shareholder-proposal support, engagement outcomes, and escalation practices.	Agency theory and stakeholder theory.
Disclosure practices	The fund emphasizes positive sustainability claims while omitting limits, exclusions, data uncertainty, or contradictory evidence.	Hummel and Schlick [44]; Marquis et al. [40]; Steuer and Tröger [64]; Yu et al. [59].	Textual analysis, specificity scores, evidence-backed claim coding, and consistency checks against holdings and stewardship data.	Legitimacy theory and information asymmetry.
Naming and marketing	The fund uses ESG, sustainable, impact, green, climate, or transition language without sufficient portfolio or strategy alignment.	Hartzmark and Sussman [32]; regulatory action by SEC and ESMA.	Code fund names, prospectus terms, 80 per cent policy alignment, strategy-binding elements, and regulatory classification.	Signaling and legitimacy theory.

Note: Each channel is consistent with more than one theoretical lens; the primary lens column identifies the lens most directly invoked in the cited evidence. Section 7 returns to how the four channels interact in the integrative framework.

The most direct fund-level studies do not produce a single verdict, but a structured reading shows that the studies are addressing different channels rather than contradicting one another. Table 9 maps the core fund-level

evidence onto the four-channel taxonomy and summarises the headline finding of each study. The mapping makes the analytic role of each study explicit and shows where the evidence base is thickest and thinnest.

Table 9. Core fund-level evidence by greenwashing channel

Study	Outlet	Primary channel addressed	Headline finding
Raghunandan & Rajgopal [2]	Review of Accounting Studies	Portfolio composition	US ESG funds hold firms with weaker realized labour and environmental compliance records than matched conventional funds.
Curtis et al. [20]	Michigan Law Review	Portfolio composition & stewardship	ESG funds (Morningstar-rated) offer modestly higher ESG exposure and vote differently on shareholder proposals than the broader fund universe.
Heath et al. [21]	Review of Finance	Stewardship (firm-level outcome)	Socially responsible investing changes portfolio-firm behaviour to a limited extent; fund-level commitments do not propagate strongly to issuer conduct.
Kim & Yoon [15]	Management Science	Naming & disclosure (voluntary commitment)	PRI signatory funds attract flows after signing but exhibit limited subsequent changes in portfolio ESG quality, consistent with low-cost signalling.
Liang, Sun & Teo [16]	Review of Finance	Naming & stewardship (hedge funds)	Responsible hedge funds attract flows but do not consistently outperform conventional peers; commitment signals are weakly matched by changes in stated investment behaviour.
Hartzmark & Sussman [32]	Journal of Finance	Naming & marketing (rating salience)	Salient sustainability ratings shift fund flows materially even when ratings do not predict future returns, raising incentives to produce visible sustainability signals.

Dimson, Karakaş & Li [46]	Review of Financial Studies	Stewardship	Successful engagements on ESG issues are associated with positive subsequent returns and improved governance, indicating that substantive stewardship is observable when it occurs.
Dyck, Lins, Roth & Wagner [47]	Journal of Financial Economics	Stewardship (institutional ownership)	Institutional ownership is associated with stronger firm-level E and S performance internationally, with effects concentrated where investors face institutional pressure for responsible investing.
Krueger, Sautner & Starks [57]	Review of Financial Studies	Stewardship & disclosure (institutional)	Institutional investors regard climate risk as financially material and act on it through engagement and risk management; supply of climate-risk information varies.
Avramov, Cheng, Lioui & Tarelli [22]	Journal of Financial Economics	Underlying ESG signal (cross-channel)	ESG rating uncertainty changes optimal portfolio choice and reduces the risk-adjusted benefits of sustainable investing, with implications for all four channels.
Berg, Kölbel & Rigobon [4]	Review of Finance	Underlying ESG signal	Documents systematic divergence among major ESG rating providers, undermining the reliability of rating-based classification of fund authenticity.
Pedersen, Fitzgibbons & Pomorski [28]	Journal of Financial Economics	Asset-pricing mechanism	Derives an ESG-efficient frontier in which the cost of responsible investing depends on ESG signal quality and on investor preference intensity.

Note: The table presents the headline finding of each study as reported in the published article; it does not substitute for reading the original. Studies are grouped by the channel they most directly inform; many studies are relevant to more than one channel and reappear in later sections accordingly. The full corpus (n = 64) is presented in Appendix A with study-level extraction details. Section 6.3 next adjudicates the conflict between the first two entries.

Table 10. Adjudication of conflicting evidence on US ESG mutual funds

Dimension	Raghunandan and Rajgopal [2]	Curtis et al. [20]	Implication
Sample frame	Self-labelled ESG mutual funds; broad inclusion of any fund using sustainability-related language.	ESG funds identified using Morningstar Sustainability Rating and prospectus screens; narrower and more rating-anchored.	The two studies are not classifying the same set of funds. Raghunandan and Rajgopal's broader inclusion picks up funds that Curtis et al. would treat as weakly labelled.
ESG signal	Direct firm-level labour and environmental compliance records (e.g., violations, penalties) from regulatory data sources.	ESG rating and disclosure scores from Morningstar and proxy voting records.	Different signals can yield different conclusions about the same fund. Compliance data captures realized stakeholder harm; ratings capture forward-looking assessment.
Comparator	Conventional mutual funds matched on style and size.	ESG funds compared against the broader fund universe and against their own stated policies.	The choice of comparator changes the implied counterfactual.
Outcome variable	Whether ESG funds hold firms with stronger or weaker labour and environmental records.	Whether ESG funds offer increased ESG exposure relative to conventional benchmarks and vote differently on shareholder proposals.	The two studies are answering different questions about the same population.
Time period	Sample period extending into the early 2020s when many newer ESG funds had short track records.	Earlier sample with a focus on established ESG and SRI funds.	Sample timing matters when newer entrants are over-represented and may rely more heavily on naming and marketing channels.
Dimension	Raghunandan and Rajgopal [2]	Curtis et al. [20]	Implication

Note: The table summarises differences as reported in the published studies; it does not attempt to replicate either analysis. The implication column reflects the present review's adjudication.

Two implications follow. First, the disagreement is partly definitional: when ESG is measured through ratings and self-disclosure, ESG funds look better than they do when ESG is measured through realized firm-level compliance outcomes. Second, sample timing matters. The broader inclusion of newer self-labelled funds increases the probability of capturing naming-channel greenwashing, which the four-channel taxonomy in Section 6.2 predicts will concentrate among funds that rely most heavily on cheap-to-produce signals. Both findings can be true: ESG funds can simultaneously provide some ESG

5.3. Reconciling Conflicting Fund-Level Findings

The Raghunandan and Rajgopal [2] finding that US ESG mutual funds may hold firms with weaker labour and environmental compliance is in tension with

the Curtis et al. (2021) finding that ESG funds often deliver on at least some of their stated promises. Treating this as an unresolved disagreement understates what the two studies actually identify. Table 10 adjudicates the conflict by aligning the studies on five dimensions: sample frame, ESG signal used to classify funds, comparator construction, outcome variable, and time period

exposure relative to conventional benchmarks [20] and hold firms with weaker realized stakeholder records than expected from their marketing [2]. The signaling theory lens predicts exactly this pattern when verification is costly and the signal space is wide.A normative question follows from the adjudication: which interpretation should regulators and investors operate under? The two studies are valid for different decisions. For research that asks whether ESG strategies as currently labelled are differentiated from conventional strategies on rating-based criteria, the Curtis et al. [20] framing is appropriate. For consumer-protection and investor-disclosure regulation, however, the Raghunandan and Rajgopal [2] framing is the policy-relevant one: the regulator's concern is whether an investor who chose a fund expecting stakeholder-friendly behaviour actually received it, and that question turns on realized firm-level outcomes rather than on rating-based methodology. The 2023–2024 regulatory wave (SEC Names Rule, ESMA guidelines, FCA SDR) is best read as implicitly adopting the realized-outcomes framing: the 80 per cent thresholds and term-specific exclusions target the binding alignment between fund language and investor expectations rather than the underlying methodology by which ESG ratings are computed. The two studies are therefore not in conflict but speak to different

audiences, and the policy debate has moved toward the audience that Raghunandan and Rajgopal address.

5.4. ESG Fund Performance through the Authenticity Lens

The ESG fund performance literature is best read as conditional rather than conclusive. Studies that find no significant performance difference between ESG and conventional funds suggest that sustainability screens may not impose large costs after risk adjustment [5,7,8]. Studies that find positive effects often point to financially material ESG information, stakeholder quality, lower financing constraints, or underpriced intangibles [10,11,12,26,27]. Studies that find lower expected returns emphasize investor preferences, constraints, exclusion costs, or demand-driven price pressure [13,14,23,24]. Table 11 synthesises these performance patterns and their implications for greenwashing research.

Greenwashing adds a classification problem. If the ESG label does not reliably identify authentic ESG exposure, then ESG fund performance estimates may be attenuated or misinterpreted. A fund's return may reflect conventional sector bets, style exposures, fees, or investor demand rather than sustainability skill. For this reason, future performance studies should measure authenticity directly. At minimum, researchers should combine fund label data with holdings-based ESG characteristics, stewardship records, disclosure specificity, and naming-rule compliance. As noted in Section 3.1, the Pástor et al. [14] decomposition of green returns is directly relevant here for separating demand-driven realized returns from underlying expected-return differences in short-window comparisons.

Table 11. Performance evidence and implications for greenwashing research

Finding in ESG performance literature	Representative studies	Implication for greenwashing research
Neutral performance after risk adjustment	Bauer et al. [5]; Renneboog et al. [7]; Statman [8].	Neutral results may reflect offsetting benefits and constraints, but they may also reflect noisy

		ESG classification that mixes authentic and weakly-labelled funds.
Positive ESG–performance relation	Cheng et al. [10]; Edmans [26]; El Ghoul et al. [11]; Friede et al. [9]; Khan et al. [12]; Krueger [27].	Positive effects are more plausible when ESG measures capture financially material information and substantive practice rather than self-labelling.
Lower expected returns or underperformance risk	Fama and French [24]; Hong and Kacperczyk [23]; Pástor et al. [13,14].	Lower expected returns may be consistent with investor preference for sustainability and price pressure, not necessarily poor fund management.
Investor flows respond to sustainability signals	Bollen [6]; Hartzmark and Sussman [32]; Riedl and Smeets [55].	Greenwashing incentives rise when flows reward simple labels and ratings more than verified practice.
ESG signal uncertainty matters	Avramov et al. [22]; Berg et al. [4]; Christensen et al. [43]; Gibson Brandon et al. [56].	Rating disagreement and measurement error reduce the credibility of ESG claims and complicate performance attribution.
Climate and transition risk pricing	Bofinger et al. [29]; Krueger et al. [57]; Pástor et al. [14].	Climate risk preferences among institutional investors and demand shocks shape both realized green returns and fund-flow dynamics.
Finding in ESG performance literature	Representative studies	Implication for greenwashing research
Neutral performance after risk adjustment	Bauer et al. [5]; Renneboog et al. [7]; Statman [8].	Neutral results may reflect offsetting benefits and constraints, but they may also reflect noisy ESG classification that mixes authentic and weakly-labelled funds.
Positive ESG–performance relation	Cheng et al. [10]; Edmans [26]; El Ghoul et al. [11]; Friede et al. [9]; Khan et al. [12]; Krueger [27].	Positive effects are more plausible when ESG measures capture financially material information and substantive practice rather than self-labelling.
Lower expected returns or underperformance risk	Fama and French [24]; Hong and Kacperczyk [23]; Pástor et al. [13,14].	Lower expected returns may be consistent with investor preference for sustainability and price pressure, not necessarily poor fund management.
Investor flows respond to sustainability signals	Bollen [6]; Hartzmark and Sussman [32]; Riedl and Smeets [55].	Greenwashing incentives rise when flows reward simple labels and ratings more than verified practice.

Note: Conclusions should be interpreted in conjunction with the four-channel taxonomy in Table 8 and the adjudication in Table 10.

5.5. Investor Response and Market Discipline

Investor behaviour is central to the persistence of greenwashing. Hartzmark and Sussman [32] show that salient sustainability ratings can shift fund flows, even when ratings do not predict future performance. Riedl and Smeets [55] show that social preferences help explain why investors hold socially responsible funds. Bauer et al. [52] provide experimental evidence that individuals value sustainability characteristics. Amel-Zadeh and Serafeim [3] survey investor use of ESG information and find heterogeneous motives, including financial materiality, ethical conviction, and client demand. These findings imply that ESG labels can attract capital for both financial and nonfinancial reasons. They also create an incentive problem. If investors reward visible ESG signals more than costly ESG practice, funds may have incentives to produce the appearance of sustainability.

Market discipline can punish revealed greenwashing, but detection is uneven and often delayed. Firm-level studies show that symbolic environmental actions can damage financial outcomes when stakeholders identify the gap between words and actions [60,66,67]. In fund markets, detection is harder because investors must evaluate portfolio holdings, changing exposures, stewardship records, and complex ESG data. Rating agencies, advisers, platforms, and regulators mediate much of this information. If these

intermediaries disagree or use opaque methods, the market may discipline greenwashing only after reputational damage or enforcement action.

5.6. Regulatory Response

Regulatory developments increasingly target the same signals emphasized by the academic literature: names, disclosures, and evidence behind claims. The SEC amended the Investment Company Act Names Rule in 2023 to require more funds, including funds whose names suggest thematic or ESG characteristics, to adopt an 80 per cent investment policy and conduct periodic compliance reviews [65]. ESMA's 2024 guidelines on fund names using ESG or sustainability-related terms similarly establish an 80 per cent threshold tied to environmental or social characteristics or sustainable investment objectives and apply exclusions depending on the terms used [62]. The UK FCA's Sustainability Disclosure Requirements (SDR) and investment labels include an anti-greenwashing rule, naming and marketing rules, four product labels, and consumer-facing disclosures [63]. The EU Sustainable Finance Disclosure Regulation (SFDR), which entered application in 2021 and has been operationalised through Article 8 and Article 9 product classification, has produced a large empirical literature on classification choices, downgrades, and the interpretation of "sustainable investment" [64]. Table 12 summarises these developments.

Table 12. Selected regulatory developments relevant to ESG fund greenwashing

Jurisdiction	Regulatory instrument	Main provisions	Relevance for the review
United States	SEC Names Rule amendments (2023)	Expand the 80 per cent investment policy requirement to more funds, including funds using ESG-related thematic language; require periodic review of compliance.	Targets naming greenwashing by linking fund names to portfolio policy and disclosure.
European Union	ESMA Guidelines on fund names using ESG or sustainability-related terms (2024)	Establish an 80 per cent investment threshold and apply term-specific exclusions for transition, environmental, social, governance, sustainable, and impact terms.	Targets the signalling role of ESG and sustainability terms in fund names; differentiates across categories of label.
European Union	EU Sustainable Finance Disclosure Regulation (SFDR)	Establishes entity- and product-level sustainability disclosure obligations; Article 8 products promote environmental or social characteristics, Article 9 products have sustainable investment as their objective.	Classification choices and Article 9-to-Article 8 downgrade waves have become focal evidence for fund-level claim-practice gaps.
United Kingdom	FCA SDR and investment labels (PS23/16)	Introduce an anti-greenwashing rule, naming and marketing rules, four product labels (Sustainability Focus, Improvers, Impact, Mixed Goals), and consumer-facing disclosures.	Moves beyond names by connecting claims, labels, disclosures, and investor-facing communication.
Jurisdiction	Regulatory instrument	Main provisions	Relevance for the review
United States	SEC Names Rule amendments (2023)	Expand the 80 per cent investment policy requirement to more funds, including funds using ESG-related thematic language; require periodic review of compliance.	Targets naming greenwashing by linking fund names to portfolio policy and disclosure.

Note: Regulatory instruments are summarised at a high level. The review uses these instruments as boundary conditions in the integrative framework (Figure 2) and as natural experiments for the difference-in-differences research designs proposed in Table 13.

These regulatory actions are relevant for theory. They convert some sustainability signals from low-cost language into more verifiable claims. They may also create new forms of compliance-oriented greenwashing if funds satisfy minimum thresholds without improving broader sustainability outcomes. Future research should therefore test whether regulation reduces claim-practice gaps or simply moves greenwashing from names into portfolio construction, exclusions, or disclosure framing.

5.7. The Anti-ESG Backlash and Greenhushing

The regulatory tightening described above has unfolded alongside a significant political and legal backlash to ESG in the United States, with implications for fund-level signals that the existing literature is only beginning to address. Edmans [61] argues that the term ESG has become so contested that financialmateriality analysis would be better decoupled from the ESG label. State-level legislation in several US jurisdictions has restricted public-sector use of ESG investment strategies, and several large asset managers have moderated public ESG commitments, withdrawn from voluntary climate alliances, and softened proxy-voting positions. These developments are relevant to the review because they generate a new pattern that mirrors greenwashing in reverse: greenhushing, in which funds quietly reduce visible ESG language while continuing or modestly altering underlying practice.From a signaling perspective, greenhushing reduces the informational content of fund names and marketing language without necessarily changing portfolio or stewardship behaviour. From an agency perspective, it can shift the channel through which claim-practice gaps appear, away from naming and towards disclosure framing. From a legitimacy perspective, it suggests that the legitimacy benefits of visible ESG language are jurisdiction-dependent. The review identifies this as an under-researched area: only one study in the included corpus [61] directly engages with the anti-ESG backlash, and the corpus pre-dates the most pronounced phase of the political pushback. The remainder of this subsection therefore identifies an emerging pattern from regulatory and industry developments rather than synthesising primary corpus evidence. Section 8 includes greenhushing as a priority for future research.

5.8. Hedge Funds and Non-Mutual-Fund Vehicles

Most of the fund-level greenwashing literature focuses on mutual funds and ETFs. Liang et al. [16] extend the analysis to hedge funds that signal

responsible investing through PRI signatures or similar commitments. They find that responsible hedge funds attract flows but do not consistently outperform conventional hedge funds, and that the signal of responsible-investment commitment is not always matched by changes in stated investment behaviour. The hedge-fund case is theoretically informative because hedge funds operate under lighter disclosure requirements than mutual funds, which raises information asymmetry and reduces the cost of producing low-credibility signals. Agency theory predicts that greenwashing should therefore be more difficult to detect in hedge funds, and the available evidence is broadly consistent with that prediction.

Other vehicle types—private credit, separately managed accounts, model portfolios, and unit-linked insurance products—are largely outside the current academic literature. The four-channel taxonomy is plausibly applicable to these vehicles, but the empirical work has not yet been done. The disclosure environments differ enough across vehicle types that the channels are likely to be differentially salient: stewardship and naming may matter more for retail-facing mutual funds and ETFs, while portfolio composition and disclosure framing may matter more for hedge funds, private credit, and institutional products. The research agenda in Section 8 includes cross-vehicle comparison as a priority area.

5.9. Integrative Conceptual Framework

The synthesis can be integrated into a single framework that explains how antecedents, greenwashing channels, market mechanisms, and outcomes are connected, and how five theoretical lenses generate different predictions about each link. Figure 2 presents the framework graphically. Three features distinguish it from a simple checklist of factors. First, the four greenwashing channels from Table 8 sit between antecedents and market mechanisms, so the framework treats greenwashing as a process rather than an attribute. Second, each row is anchored in a primary theoretical lens, so the framework predicts where each theory should generate the strongest empirical signature. Third, boundary conditions (jurisdiction, fund vehicle, investor type, ESG materiality, and time period) are explicit moderators rather than residual caveats.

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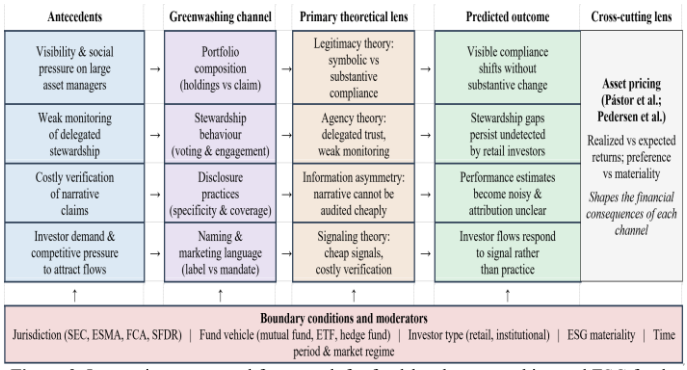


Figure 2. Integrative conceptual framework for fund-level greenwashing and ESG fund performance

Note: The framework integrates the four-channel taxonomy of fund-level greenwashing (Table 8) with five theoretical lenses (Section 3). Each row pairs a greenwashing channel with the primary theoretical lens that best explains why claim–practice gaps emerge in that channel: legitimacy theory for portfolio composition, agency theory for stewardship, information asymmetry for disclosure, and signaling theory for naming and marketing. Asset-pricing theory [13, 14,28] appears as a cross-cutting lens because it governs how each channel's effects translate into observable returns. Moderators are explicit boundary conditions rather than residual caveats.

Antecedents include visibility and social pressure on large asset managers, weak monitoring of delegated stewardship, costly verification of narrative claims, and investor demand combined with competitive pressure to attract flows. These antecedents do not act directly on outcomes. They are filtered through the four greenwashing channels: portfolio composition, stewardship behaviour, disclosure practices, and naming or marketing language. Each channel is matched in the figure to a primary theoretical lens that the literature identifies as the most natural explanation of why that channel exhibits claim-practice gaps: legitimacy theory for portfolio composition (visible compliance under social pressure), agency theory for stewardship (delegated trust under weak monitoring), information asymmetry for disclosure (narrative content is costly to audit), and signaling theory for naming (cheap-to-produce signals with costly verification). Predicted outcomes follow from the channel–lens pairings: visible compliance can shift without substantive change, stewardship gaps persist undetected by retail investors, performance estimates become noisy and difficult to attribute, and investor flows respond to signal rather than practice.

Asset-pricing theory appears in Figure 2 as a cross-cutting lens rather than as the primary lens of any one channel. This placement is deliberate. Asset-pricing models govern how each of the four channel-specific outcomes maps into observable fund returns: the realized-versus-expected-return distinction [14] determines whether a claim-practice gap will translate into measurable performance differences over a given horizon, and the preference-versus-information distinction [28] determines whether the financial consequences operate through demand pressure or through pricing of material information.

Asset-pricing therefore shapes the financial signature of greenwashing in every channel, even though it does not itself predict where greenwashing concentrates.

Regulation occupies a distinctive position in the framework. It is simultaneously a moderator (changing the cost of producing low-credibility signals) and an outcome (triggered by visible claim-practice gaps). The SEC Names Rule, ESMA fund-name guidelines, FCA SDR, and EU SFDR each raise the cost of one channel of greenwashing while leaving others relatively untouched. The framework therefore generates a testable channel-shift hypothesis: as the naming channel becomes more constrained, greenwashing pressure may migrate toward disclosure framing, stewardship practices, or the choice of ESG rating provider. This is a hypothesis derived from signaling logic rather than an established finding; no study in the included corpus directly demonstrates channel-shift after a naming-rule intervention, and Table 13 places empirical evaluation of this hypothesis as the first priority research question.

5.10. Future Research Agenda

The framework in Figure 2 generates testable hypotheses that the current literature has not yet adequately addressed. Table 13 presents priority research questions, each tied to a theoretical prediction, a proposed empirical design, and the channel and outcome it addresses. The questions are not exhaustive, but they identify gaps where the marginal value of new evidence is high.

Table 13. Priority research questions and proposed designs

Research question	Specific question	Theoretical prediction	Proposed empirical design
Channel-shift after regulation	Does the SEC Names Rule, ESMA fund-name guidelines, or FCA SDR reduce overall	Signaling and legitimacy theories predict channel-shift when the cost of one signal rises but others remain cheap.	Difference-in-differences using regulatory implementation dates, with channel-level

	fund-level greenwashing, or does it move greenwashing from naming into disclosure framing or stewardship?		outcomes (name change, prospectus language, proxy votes, holdings ESG quality).
Practice-based ESG performance	Does ESG fund performance estimated using authenticity-weighted classification differ from performance estimated using label-only classification?	Asset-pricing theory predicts that performance estimates should depend on whether the classification captures preference, information, or label.	Construct an authenticity score (combining holdings ESG quality, stewardship, and disclosure specificity) and re-estimate ESG–performance relations against the label-only baseline.
SFDR Article 8 / Article 9 dynamics	What predicts Article 9-to-Article 8 downgrades, and do downgrades correspond to substantive changes in portfolio or only to changes in interpretation of 'sustainable investment'?	Information asymmetry predicts that classification choices reveal more about disclosure interpretation than about underlying portfolio.	Event study around downgrade waves; compare pre- and post-downgrade portfolio ESG characteristics and stewardship metrics.
Greenhushing under political backlash	Do funds reduce visible ESG language without changing portfolio composition or stewardship in jurisdictions experiencing anti-ESG political pressure?	Legitimacy theory predicts that legitimacy benefits of ESG language are jurisdiction-dependent, generating divergence between language and practice in opposite directions from classical greenwashing.	Compare prospectus and marketing language pre- and post-state-level legislation against concurrent changes in holdings and votes.
Cross-vehicle comparison	Does the four-channel taxonomy hold for hedge funds, private credit, separately managed accounts, and model portfolios, or do different vehicles concentrate greenwashing in different channels?	Agency theory predicts that channels with lighter disclosure (hedge funds, private credit) show stronger portfolio and stewardship channel gaps; mutual funds and ETFs show stronger naming and disclosure channel gaps.	Comparative study across vehicle types using harmonised channel measures; partial replication of Liang et al. [16] extended beyond hedge funds.
Investor learning and detection	Do flows respond to revealed greenwashing events (regulatory action, downgrades, media exposure), and does the response persist?	Market discipline depends on detection; signaling theory predicts that costly verifying events should durably reduce the value of weak signals.	Event studies around enforcement actions, SFDR downgrades, and high-profile media exposures, with attention to persistence beyond initial outflow.

Note: The proposed designs are illustrative. Each design assumes access to standard fund-level databases (Morningstar, CRSP, holdings filings, proxy-voting data) supplemented with regulatory filings (Form N-PX, SFDR disclosures, FCA labels).

5.11. Practical Implications

Practical implications follow directly from the findings, and are tied to specific results rather than offered as general advice. For asset managers, the four-channel taxonomy in Table 8 implies that defensible ESG positioning requires consistency across portfolio composition, stewardship, disclosure, and naming. Naming-rule compliance alone does not address the disclosure and stewardship channels, and the channel-shift hypothesis in Section 7 suggests that compliance work focused only on names risks displacing greenwashing into less visible channels. The Curtis et al. [20] and Raghunandan and Rajgopal [2] evidence taken together implies that asset managers can simultaneously satisfy rating-based ESG criteria and hold firms with weaker realized stakeholder records; reconciling these two evaluations is a manageable but explicit governance task. For institutional investors, the rating disagreement evidence [4,43,56] implies that reliance on a single ESG rating overstates measurement certainty. Multi-provider triangulation, combined with holdings-level checks, stewardship records, and disclosure consistency, is a more reliable due-diligence approach than rating-only screens. The SFDR Article 8 / Article 9 downgrade literature shows that even regulatory classification can change without corresponding changes in portfolio, so classification-only due diligence is insufficient. For retail investors, Hartzmark and Sussman [32] imply that salient sustainability signals can dominate decision making even when they are weakly informative. Standardized labels under FCA SDR and the ESMA name guidelines reduce but do not eliminate this risk. Useful protections include comparing fund prospectus claims to top-ten holdings and to voting records, and being cautious about funds whose ESG message rests primarily on the name rather than on the strategy section of the prospectus.For regulators, the channel-shift hypothesis implies that any single anti-greenwashing tool addresses only part of the problem. Naming rules (SEC, ESMA), disclosure rules (SFDR, FCA SDR), and anti-greenwashing principles (FCA) operate on different channels. Effective enforcement will likely require coordinated attention to portfolio composition, stewardship, disclosure framing, and naming together. Cross-jurisdictional convergence on minimum thresholds reduces arbitrage, but the literature also suggests monitoring for new channels (model portfolios, private credit, separately managed accounts) where coverage currently lags.

5.12. Limitations

Five limitations bound the conclusions of this review, and each affects a specific subset of conclusions rather than the review as a whole. First, the review was conducted by a single lead author. Two procedures were used to mitigate this design: an independent second reviewer (an external doctoral researcher in finance) screened a stratified random 15 per cent sample of title and abstract decisions, yielding Cohen's $\kappa = 0.87$ [51]; and the lead author re-screened a separate random 10 per cent sample after a two-week interval, yielding 94 per cent intra-reviewer agreement. These procedures, together with the explicit eligibility checklist documented in Table 3, reduce but do not eliminate the risk of selection bias associated with predominantly single-author screening. This limitation primarily affects the breadth of the corpus rather than the interpretation of any individual study; readers should treat the synthesis as one informed mapping of the literature rather than as a definitive census.Second, the search window emphasizes 2010–2025 work, with foundational pre-2010 studies retained explicitly. This choice ensures that the review covers the modern ESG-fund regulatory environment, but it under-represents earlier

SRI work whose findings may still be relevant to some sub-questions, particularly those involving long-horizon fund performance.

Third, the included corpus is predominantly English-language and skews toward US and European samples. This limitation affects the external validity

of conclusions about investor behaviour and regulatory effectiveness in other jurisdictions, particularly in Asia-Pacific and emerging markets where the regulatory architecture differs.

Fourth, no meta-analysis was attempted because of methodological heterogeneity across studies. The synthesis is therefore thematic rather than

quantitative, and statements about the magnitude of greenwashing effects across channels are necessarily directional. This limitation affects claims about effect size rather than about the existence or channel structure of greenwashing.

Fifth, the fast-moving nature of regulation and the anti-ESG backlash means that the specific institutional details summarised in Table 12 and the discussion of greenhushing in Section 6.7 will require updating beyond the January 2025 search cutoff. This limitation does not affect the theoretical framework or the four-channel taxonomy, which are designed to be robust to regulatory turnover.

Fund-level greenwashing is best understood as a multi-channel phenomenon that operates through portfolio composition, stewardship behaviour, disclosure practices, and naming language. Its presence changes how the ESG fund performance literature should be read: mixed and conditional findings become more interpretable once authenticity, signal quality, and the realized-versus-expected-return distinction are taken seriously. The conflicting US ESG mutual fund evidence reviewed in Section 6.3 is not a contradiction but a function of different sample frames, signals, comparators, and outcomes.

The review's contribution is not to settle the performance debate but to reframe it. ESG fund performance estimates are difficult to interpret without a clear measure of how authentic the underlying ESG positioning is. The four-channel taxonomy and the integrative framework provide a structure for this work, and the research agenda identifies where marginal evidence is most needed: channel-shift after regulation, practice-based performance estimation, SFDR classification dynamics, greenhushing under political pressure, cross-vehicle comparison, investor learning, the role of ESG rating disagreement, and cross-jurisdictional comparison.Two more general implications follow. First, sustainable finance research should treat the ESG label as data to be evaluated rather than as a sampling category to be trusted. Second, the regulatory wave that began with the SFDR and continued through the SEC Names Rule, ESMA guidelines, and FCA SDR has produced natural experiments that allow

researchers to test the central predictions of the framework. These regulatory shifts, combined with the political backlash and the rise of greenhushing, create the empirical conditions under which the next generation of fund-level greenwashing research can produce evidence that is both rigorous and policy-relevant.

Author Contributions

The author was solely responsible for the conception, preparation, and writing of this manuscript.

Conflict of Interest

The author, while observing publication ethics in the referencing, declares the absence of any conflict of interest.

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