

RESEARCH ARTICLE

Sustainable Investment Portfolio of Institutional Investors: Systematic Literature Review

Sevara Kamilova

PhD, Tashkent State University of Economics, Uzbekistan

VOLUME: Vol.06 Issue09 2026

PAGE: 7-17

Copyright © 2026 Journal of Management and Economics, this is an open-access article distributed under the terms of the Creative Commons Attribution-Noncommercial-Share Alike 4.0 International License. Licensed under Creative Commons License a Creative Commons Attribution 4.0 International License.

Abstract

Sustainable investment has moved from a niche ethical practice to a systemic feature of global capital markets, yet the literature remains fragmented across investor types and divided between portfolio-formation mechanisms and portfolio-evaluation criteria. This article addresses that gap by synthesizing the theoretical, empirical, and regulatory literature into a single integrated framework covering all major classes of institutional investor: banks, pension funds, insurance companies, sovereign wealth funds (SWFs), and mutual and hedge funds. Using a PRISMA-style systematic literature review of 38 core sources drawn from Scopus, Web of Science, ScienceDirect, NBER, IMF, BIS, SSRN, and UN PRI repositories, the study maps how environmental, social, and governance (ESG) considerations are operationalized at the formation stage (screening, integration, engagement, thematic allocation, green-bond allocation, ESG risk overlays) and how outcomes are assessed at the evaluation stage (risk-adjusted return metrics, non-financial KPIs, and blended impact metrics). The article concludes with five policy recommendations and five-point research agenda and situates emerging markets including Uzbekistan within the global landscape.

KEY WORDS

Sustainable investment; ESG integration; institutional investors; portfolio theory; ESG ratings; responsible investing; green bonds; impact-weighted accounts.

INTRODUCTION

The integration of environmental, social, and governance (ESG) considerations into institutional asset management has become one of the defining structural shifts in twenty-first-century finance. What began in the 1970s as values-based exclusionary screening by faith-based and ethical investors has evolved into a mainstream discipline encompassing ESG integration, socially responsible investment (SRI), and impact investing. The Global Sustainable Investment Alliance reports that fund assets disclosing the use of responsible or sustainable investment approaches reached USD 16.7 trillion in 2024 on a narrowed Morningstar-based methodology (GSIA, 2024). The United Nations-supported Principles for Responsible Investment (PRI) had grown to more than 5,300

signatories representing approximately USD 128 trillion in assets under management as of end-October 2024 (PRI, 2024).

This expansion has coincided with the rising systemic weight of institutional investors. Pension funds, insurers, sovereign wealth funds, banks, and asset managers collectively intermediate most of the world's professionally managed capital, and their allocation decisions exert a first-order influence on the cost of capital, corporate behaviour, and the trajectory of the real economy. As universal owners holding broadly diversified slices of entire markets, the largest of these investors internalise economy-wide externalities in ways that

smaller agents do not, which gives ESG integration a distinctive financial logic for them.

Despite voluminous literature, a critical gap remains. Research tends to treat either the formation of sustainable portfolios (how ESG enters allocation, weighting, and security selection) or their evaluation (how ESG-adjusted performance and impact are measured), but rarely both within a single integrated framework. Equally, studies typically focus on one investor type, leaving the structural differences across banks, insurers, SWFs, and hedge funds undertheorised. This article addresses that gap.

1. Research question, objectives, and hypotheses

Research question: How do different types of institutional investors form sustainable investment portfolios, and by what mechanisms can the financial and non-financial performance of those portfolios be evaluated?

The study tests four hypotheses through literature:

H1. The relationship between ESG performance and corporate/portfolio financial performance is predominantly non-negative.

H2. ESG functions simultaneously as a systematic risk factor and an investor-preference parameter, rather than as a pure alpha source.

H3. The financial materiality of ESG issues drives value relevance.

H4. ESG-rating divergence systematically undermines the

reliability of both portfolio formation and evaluation.

METHODOLOGY

1. Review design

The study employs a systematic literature review structured according to a PRISMA-like protocol (identification, screening, eligibility, inclusion). The approach is qualitative-synthetic rather than meta-analytic: it integrates theoretical models, empirical findings, and regulatory texts into a unified analytical framework rather than pooling effect sizes statistically.

2. Databases and search strategy

Sources were drawn from Scopus, Web of Science, ScienceDirect, NBER, IMF, BIS, SSRN, and the publications of the UN PRI, the IFRS Foundation, IOSCO, the OECD, and the European Commission. Search terms combined 'ESG', 'sustainable investing', 'responsible investment', 'portfolio', 'institutional investors', 'green bonds', ESG ratings', and investor-type qualifiers.

3. Inclusion and exclusion criteria

Included: peer-reviewed journal articles, working papers from recognised research institutions, and primary regulatory/standard-setting documents; English-language; published between 1952 and 2025. Excluded: non-peer-reviewed commentary, marketing material, sources without identifiable methodology, and duplicate versions.

4. Analytical framework

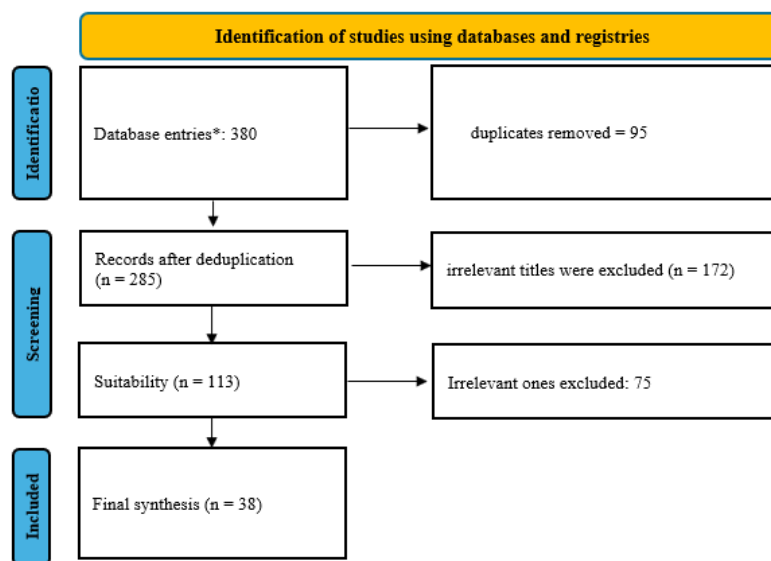


Figure 1. PRISMA-like literature-selection flowchart

The synthesis proceeds along three axes: (1) extensions of portfolio theory from Markowitz (1952) through CAPM and factor models to ESG-augmented asset pricing; (2) ESG measurement and data infrastructure, including rating divergence and materiality; and (3) regulatory analysis. These axes are mapped onto the formation-evaluation dichotomy across investor types.

RESULTS

1. Theoretical foundations

Modern portfolio theory originates with Markowitz (1952), whose mean-variance framework formalised diversification: rational investors select portfolios on the efficient frontier that maximise expected return for a given level of variance. Sharpe (1964) extended this into the capital asset pricing model (CAPM), in which a single systematic factor prices all assets through beta, and idiosyncratic risk is diversified away. The empirical inadequacy of the single-factor model gave rise to multifactor models, culminating in the Fama-French three-factor model (market, size, value) and its later five-factor extension (Fama & French, 1993). Statman (1987) contributed by showing that a well-diversified portfolio requires at least 30-40 stocks - a result directly relevant to ESG strategies that constrain the investable universe through exclusions.

The modern theoretical synthesis resolves the tension between ESG constraints and optimality. Pedersen, Fitzgibbons and Pomorski (2021) formalise the ESG-efficient frontier, in which each security's ESG score both conveys information about fundamentals and enters investor preferences directly; their solution yields an ESG-adjusted CAPM in which ESG can raise or lower required returns depending on whether it proxies for risk or for taste. Pastor, Sambaugh and Taylor (2021) provide the equilibrium counterpart: green assets command lower expected returns because investors derive utility from holding them and hedge climate risk, yet green assets can outperform *ex post* when the ESG factor receives positive shocks. Together these models support H2: ESG operates as a systematic risk factor and a preference parameter, not as a dependable standalone alpha source.

2. ESG measurement and data infrastructure

The operational backbone of sustainable investing is the ESG data and rating industry, dominated by providers such as MSCI, Sustainalytics (Morningstar), S&P Global, Moody's ESG, and Bloomberg. The central methodological problem is rating

divergence. Berg, Kolbel and Rigobon (2022), analysing six prominent raters, document an average pairwise ESG-rating correlation of 0.54 (ranging from 0.38 to 0.71) far below the ~0.99 correlation among credit ratings with governance the least correlated dimension (average 0.30). They decompose divergence into measurement (56%), scope (38%), and weight (6%), and further identify a 'rater effect' whereby a provider's overall view of a firm contaminates its category-level measurements. This evidence strongly supports H4.

Materiality frameworks discipline data. The SASB developed industry-specific materiality maps; the GRI embodies a broader multi-stakeholder impact-materiality lens; and the TCFD structured climate disclosure around four pillars. These initiatives have now substantially converged: the ISSB issued IFRS S1 (general sustainability-related disclosures) and IFRS S2 (climate-related disclosures) in June 2023, effective for annual periods beginning on or after 1 January 2024. The TCFD itself was disbanded in October 2023, its monitoring role transferred to the IFRS Foundation. The decisiveness of materiality for value relevance is established by Khan, Serafeim and Yoon (2016), who found that firms scoring well on material sustainability issues significantly outperform those scoring poorly, while firms scoring well on immaterial issues do not — confirming H3.

3. Portfolio-formation mechanisms by investor type

3.1 Banks

Banks engage with sustainability principally through the asset (lending) side of the balance sheet. Mechanisms include green lending and ESG-linked credit scoring, allocation to green bonds on the banking book, and sustainable lending frameworks. The pre-eminent instrument is the Equator Principles, a project-finance risk-management framework now in its fourth iteration (EP4, effective October 2020), adopted by 116 institutions in 37 countries as of March 2021. Basel III/IV capital rules increasingly intersect with green finance through the 'green supporting factor' debate.

3.2 Pension funds

Long-dated liabilities make pension funds natural long-horizon ESG integrators. They typically overlay ESG considerations on liability-driven investing, vote and engage as stewards, and are heavily represented among PRI signatories. Their fiduciary framing has shifted from viewing ESG as a constraint to treating material ESG factors as risk-management inputs consistent with fiduciary duty, a position now widely endorsed

by legal guidance in the UK, EU, and Australia.

3.3 Insurance companies

Insurers face climate risk on both sides of the balance sheet: as underwriters of physical risk and as large asset owners exposed to transition risk. Krueger, Sautner and Starks (2020), surveying institutional investors, find that respondents regard climate risks — especially regulatory risks — as already beginning to materialise, with risk management and engagement preferred over divestment. Insurers' formation mechanisms accordingly emphasise asset-liability matching with ESG overlays, integration of physical and transition climate scenarios, and TCFD/IFRS S2 alignment.

3.4 Sovereign wealth funds and national investment funds

SWFs combine very long horizons, the absence of short-term redemption pressure, and a universal-owner perspective, making them structurally well-suited to ESG. The benchmark case is Norway's Government Pension Fund Global (GPGF), the world's largest SWF, valued at 19,742 billion kroner (~USD 1.77 trillion) at end-2024 and managed by Norges Bank Investment Management under ethical guidelines in force since 2004. Its toolkit comprises product-based and conduct-based exclusions, active ownership, and risk-based observation; by end-2024 it had excluded 104 companies. Notably, in 2025 the Norwegian parliament suspended the Council on Ethics' exclusion recommendations pending a review a cautionary illustration of the political contingency of even the most institutionalised ESG regime.

3.5 Mutual funds and hedge funds

These deploy the widest menu of screening strategies: negative/exclusionary, positive and best-in-class, norms-based, ESG integration, thematic investing, and ESG-momentum strategies. Under the EU SFDR (effective March 2021), funds self-classify as Article 6 (no sustainability focus), Article 8 ('light green,' promoting environmental/social characteristics), or Article 9 ('dark green,' with sustainable investment as the objective). Hedge funds additionally exploit ESG signals in long-short and relative-value strategies.

4. Evaluation frameworks and performance metrics

Evaluation operates on three layers. First, financial performance metrics carry over directly: the Sharpe ratio (excess return per unit of total risk), the Treynor ratio (per unit of systematic risk), Jensen's alpha (CAPM-based abnormal

return), and the information ratio (active return per unit of tracking error). In the ESG context these are computed on ESG-constrained portfolios and compared with conventional benchmarks; the ESG-efficient frontier of Pedersen et al. (2021) provides the theoretical reference.

Second, non-financial KPIs: portfolio-level carbon intensity (weighted-average carbon intensity, tonnes CO₂e per million revenue), financed emissions, biodiversity footprint, social-impact metrics, and governance scores. The SFDR's Principal Adverse Impact (PAI) indicators have standardised a core set for European market participants.

Third, blended metrics: impact-weighted accounts (IWA), developed by the Harvard Business School Impact-Weighted Accounts Initiative, monetise environmental and social externalities so that impact and financial performance appear in common units (Serafeim, Zochowski & Downing, 2019). In its 2018 environmental dataset of ~1,800 firms, the Initiative found that 252 out of 1,694 companies with positive EBITDA (15%) would have had their entire profit more than erased by monetised environmental damage, and 543 (32%) would have seen EBITDA cut by at least 25% (Cohen & Serafeim, 2020). SDG-alignment scoring maps holdings to the seventeen Sustainable Development Goals.

5. Regulatory and institutional landscape

The European Union leads the regulatory architecture. The SFDR (effective 10 March 2021) imposes entity- and product-level disclosure and the Article 6/8/9 taxonomy of funds; the EU Taxonomy Regulation provides science-based technical screening criteria, with the first two climate objectives applicable from January 2022; and the EU Green Bond Standard and CSRD complete the framework with its double-materiality requirement.

In the United States, the Securities and Exchange Commission adopted climate-disclosure rules on 6 March 2024, stayed them on 4 April 2024 pending litigation, voted on 27 March 2025 to end its defence of the rules, and in 2026 proposed to rescind them entirely. Singapore's MAS has advanced guidelines on environmental risk management and a green taxonomy. On prudential treatment, the Basel III/IV debate centres on whether a 'green supporting factor' or a 'brown penalising factor' should be introduced; prudential regulators have generally resisted risk-insensitive adjustments.

IOSCO published in November 2021 ten recommendations for oversight of ESG ratings and data-product providers,

emphasising transparency of methodology and management of conflicts of interest; this catalysed regulatory regimes in the EU, UK, Japan, India, and Singapore.

3.6 Empirical evidence on performance

The single most influential synthesis is Friede, Busch and Bassen (2015), combining the findings of 2,200 individual studies and reporting that roughly 90% find a non-negative ESG-CFP relation, with the positive impact appearing stable over time strong support for H1. Crisis-resilience evidence comes from Albuquerque, Koskinen, Yang and Zhang (2020), who show that during the Q1 2020 COVID-19 crash, US stocks with high environmental and social ratings earned significantly higher returns and exhibited lower volatility. Long-run firm-level evidence is provided by Eccles, Ioannou and Serafeim (2014), whose matched sample of 180 firms shows that 'high sustainability' companies outperform 'low sustainability' peers over 18 years in both stock market and accounting terms.

The evidence is not uniformly positive, which is precisely what theory predicts. Hong and Kacperczyk (2009) document that 'sin stocks' earn positive risk-adjusted abnormal returns because norm-constrained institutions shun them. Hartzmark and Sussman (2019), exploiting Morningstar's 2016 globe-rating shock, find causal evidence that investors value sustainability (low-rated funds saw outflows exceeding USD 12 billion) but find no evidence that high-sustainability funds subsequently outperformed consistent with a preference-driven rather than return-driven mechanism. Kempf and Osthoff (2007) report that a best-in-class long-short SRI strategy generated abnormal returns of up to 8.7% per year, while Khan, Serafeim and Yoon (2016) condition such results on materiality. Regional heterogeneity is pronounced: the ESG-CFP relation and data infrastructure are stronger in developed markets.

Table 1. ESG Integration Strategies by Institutional Investor Type

Investor Type	Primary ESG Strategy	Key Instruments	Regulatory Framework	Typical ESG KPI
Banks	Green lending; ESG-linked credit risk	Green loans, green bonds on banking book, SLLs	Equator Principles (EP4); Basel III/IV; EU Taxonomy	Financed emissions; green asset ratio
Pension Funds	Long-horizon ESG integration; stewardship	LDI with ESG overlay; proxy voting; engagement	PRI; SFDR; national pension codes; IFRS S2	Portfolio carbon intensity; governance scores
Insurance Cos.	Asset-liability matching with climate risk	Green bonds; climate scenario analysis; underwriting screens	TCFD/IFRS S2; Solvency II; MAS guidelines	Physical & transition VaR; carbon intensity
Sovereign Wealth Funds	Exclusions + active ownership; universal-owner stewardship	Product/conduct exclusions; engagement; green infrastructure	National ethical guidelines; PRI	No. of exclusions; engagement coverage
Mutual Funds	Screening (negative, positive, best-in-class, norms) + integration	ESG ETFs; Article 8/9 funds; thematic funds	SFDR (Art. 6/8/9); EU Taxonomy; IOSCO	PAI indicators; ESG score; SDG alignment
Hedge Funds	ESG integration; ESG-momentum; long-short	Long-short ESG; relative-value; activist stakes	SFDR; SEC (limited); IOSCO	Alpha vs. ESG factor; ESG-tilt exposure

Table 2. Major ESG Evaluation Frameworks and Metrics

Framework	Issuing Body	Scope	Key Metrics	Mandatory/Voluntary
TCFD	Financial Stability Board (absorbed by ISSB, 2023)	Climate (physical & transition)	Governance, strategy, risk mgmt, metrics & targets	Voluntary (via IFRS S2)
GRI	Global Reporting Initiative	Broad impact (multi-stakeholder)	Impact materiality indicators	Voluntary
SASB	Value Reporting Foundation (now ISSB)	Industry-specific financial materiality	Industry materiality metrics	Voluntary (in IFRS S1/S2)
IFRS S1/S2	ISSB (IFRS Foundation)	Sustainability (S1) & climate (S2)	Material risks/opportunities; financed emissions	Voluntary → mandatory by jurisdiction (eff. Jan 2024)
EU Taxonomy	European Commission	Environmentally sustainable activities	Turnover/CapEx/OpEx alignment %	Mandatory (EU)
SFDR	European Commission / ESAs	Fund & entity disclosure	PAI indicators; Art. 6/8/9 classification	Mandatory (EU)
UN SDGs	United Nations	17 development goals	SDG-alignment scoring	Voluntary
PRI	UN-supported (UNEP FI / Global Compact)	Six responsible-investment principles	Annual reporting & assessment modules	Voluntary (signatory obligation)

Table 3. Empirical Evidence on ESG Portfolio Performance

Study	Year	Sample	Method	Key Finding	ESG-CFP Direction
Markowitz	1952	Theoretical	Mean-variance optimisation	Diversification frontier; foundation of portfolio theory	n/a (foundational)
Sharpe	1964	Theoretical	CAPM	Systematic risk priced via beta	n/a (foundational)
Statman	1987	US equities	Diversification analysis	30-40 stocks needed for diversification	n/a (relevant to exclusions)
Kempf & Osthoff	2007	US KLD-rated stocks	Long-short, 4-factor alpha	Best-in-class long-short earns up to 8.7%/yr alpha	Positive
Hong & Kacperczyk	2009	US 'sin' stocks 1965-2006	Factor regressions	Sin stocks earn positive abnormal returns; norms raise their cost of capital	Negative for ESG (sin premium)
Eccles,	2014	180	Matched-	High-sustainability	Positive

Ioannou & Serafeim		matched US firms, 18 yrs	sample panel	firms outperform in stock & accounting terms	
Friede, Busch & Bassen	2015	~2,200 studies (meta)	Meta-synthesis	~90% non-negative ESG-CFP relation; stable over time	Predominantly positive
Khan, Serafeim & Yoon	2016	US firms (SASB map)	Calendar-time & panel regressions	Material ESG outperforms; immaterial ESG does not	Positive (conditional on materiality)
Hartzmark & Sussman	2019	US mutual funds (Morningstar shock)	Natural experiment	Investors value sustainability; no outperformance of high-ESG funds	Neutral (preference-driven)
Krueger, Sautner & Starks	2020	Survey of institutional investors	Survey analysis	Climate risks viewed as material; engagement preferred to divestment	Risk-relevant
Albuquerque et al.	2020	US stocks Q1 2020	Event study (COVID crash)	High-ES stocks: higher returns, lower volatility during crash	Positive (resilience)
Pastor, Stambaugh & Taylor	2021	Theoretical + empirical	Equilibrium model	Green assets: lower expected returns; outperform on positive ESG shocks	Risk-factor (negative ex ante)
Pedersen, Fitzgibbons & Pomorski	2021	Multi-dataset	ESG-efficient frontier / ESG-CAPM	ESG = information + preference; ESG can raise or lower required return	Conditional
Berg, Kolbel & Rigobon	2022	6 ESG raters	Decomposition of divergence	Rating correlation 0.54 (range 0.38-0.71); measurement 56% of divergence	Methodological (undermines all)

Table 4. Comparative Portfolio-Formation Mechanism Matrix

Mechanism	Description	Applicable Investor Types	Stage	Complexity	Evidence Quality
Negative screening	Exclude sectors/firms violating norms or thresholds	All; classic for SWFs, pension funds	Formation	Low	High (well documented)

Positive/best-in-class screening	Select ESG leaders within each sector	Mutual funds, pension funds	Formation	Medium	High (Kempf & Osthoff 2007)
ESG integration	Systematic inclusion of ESG in fundamental/quant analysis	All, esp. asset managers	Formation	High	Medium-High
Engagement & stewardship	Voting and dialogue to change corporate behaviour	Pension funds, SWFs, large asset managers	Formation & Evaluation	High	Medium
Impact investing	Intentional, measurable social/environmental impact + return	Mutual funds, SWFs, development investors	Formation & Evaluation	High	Medium (measurement-dependent)
Thematic ESG	Allocate to sustainability themes (clean energy, water)	Mutual/hedge funds, insurers	Formation	Medium	Medium
Green-bond allocation	Allocate to use-of-proceeds labelled bonds	Banks, insurers, SWFs, funds	Formation	Low-Medium	Medium-High
ESG risk overlay	Adjust weights/hedge for ESG/climate risk	Insurers, pension funds, banks	Formation & Evaluation	High	Medium

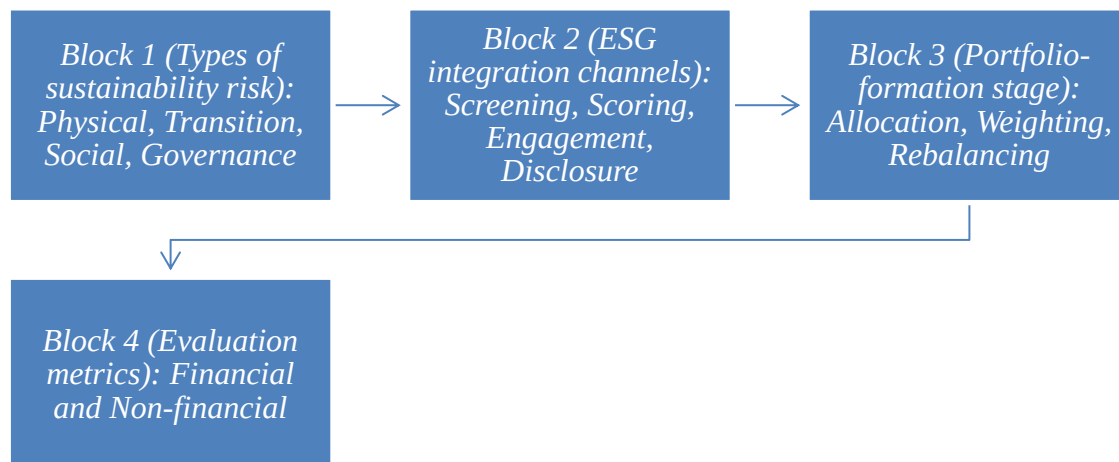


Figure 2. Conceptual framework

DISCUSSION

1. Hypothesis synthesis

Literature provides robust support for H1: the ESG-CFP relation is predominantly non-negative (Friede et al., 2015), reinforced by crisis-resilience (Albuquerque et al., 2020) and long-run (Eccles et al., 2014) evidence. H2 is strongly supported by the equilibrium and frontier models (Pastor et

al., 2021; Pedersen et al., 2021) and corroborated by the sin-stock premium (Hong & Kacperczyk, 2009) and the preference-driven fund-flow result (Hartzmark & Sussman, 2019): ESG is best understood as a risk-and-preference phenomenon rather than a reliable alpha engine. H3 is confirmed by Khan et al. (2016): materiality, not aggregate ESG, drives value. H4 is confirmed by Berg et al. (2022): rating divergence is pervasive and systematically degrades both

formation and evaluation.

2. Theoretical implications

The central theoretical contribution of the recent literature is the reconciliation of the 'ESG-as-systematic-risk-factor' and 'ESG-as-investor-preference' models within a single asset-pricing architecture. This matters for practice: if ESG is priced risk, then ESG integration is consistent with fiduciary duty and standard optimization; if it is preference, then sustainable investing trades expected return for non-pecuniary utility and real-world impact. Both channels coexist, and the empirical balance between them is time-varying and shock-dependent.

3. The rating-divergence problem

Rating divergence (Berg et al., 2022) is the methodological keystone. It corrupts formation (different raters yield different 'sustainable' universes), evaluation (portfolio ESG improvement is rater-dependent), and empirical research (results are sensitive to the chosen data vendor). It also amplifies greenwashing risk and weakens the disciplining effect of ESG on the cost of capital. The IOSCO recommendations (2021) and IFRS S1/S2 convergence are the principal institutional responses, but divergence in measurement (56% of the gap) will persist even with harmonised disclosure, because raters apply different judgements to the same data.

4. Investor-type heterogeneity

A structural conclusion emerges SWFs and pension funds are better suited to ESG integration than banks. Their long horizons, absence of short-term redemption pressure, universal-owner exposure, and liability profiles align with the long-dated, systematic nature of ESG (especially climate) risk. The GPFG exemplifies institutionalised exclusion-plus-engagement on a scale. Banks, by contrast, intermediate ESG mainly through lending and project finance (Equator Principles) and face prudential constraints that resist risk-insensitive capital adjustments; their securities portfolios are smaller and more liquidity-constrained. Insurers are uniquely exposed to physical climate risk on the liability side (Krueger et al., 2020). Mutual and hedge funds are the most strategy-diverse but the most subject to flow-driven, preference-led behaviour (Hartzmark & Sussman, 2019). The 2025 suspension of the GPFG's Council on Ethics is an important cautionary note: even the strongest ESG regimes are politically contingent.

4. Emerging markets and Uzbekistan

Emerging markets face a distinct constellation of challenges: scarce and unstandardised ESG data, weak mandatory disclosure, thin institutional-investor bases, and elevated greenwashing risk — all of which depress the reliability of both formation and evaluation. Yet regulatory pressure and issuance are growing. Uzbekistan is an instructive frontier case. It is at an early stage of developing ESG reporting and green-finance infrastructure. In July 2021, under an SDG Bond Framework developed with UNDP support and a Sustainalytics second-party opinion, Uzbekistan issued a US\$235 million UZS-denominated sovereign SDG-bond tranche, becoming the first country in Central Asia and the second in the world to issue a sovereign SDG bond (UNDP, 2022). In 2023 it followed with its first green sovereign Eurobond (UZS 4.25 trillion, USD 350 million). The OECD estimates Uzbekistan's annual green-investment gap at USD 6 billion, motivating the green-bond strategy and a nascent domestic green taxonomy (OECD, 2023). The broader Central Asian context features state-dominated economies, underdeveloped capital markets, and dependence on multilateral and bilateral support; Uzbekistan's frontrunner status is relative to a low regional baseline.

6. Limitations

Several limitations qualify the synthesis. First, ESG-data heterogeneity makes cross-study comparison hazardous (Berg et al., 2022). Second, much empirical work is US- and Europe-centric, limiting external validity for emerging markets. Third, endogeneity and reverse causality (profitable firms can afford ESG) complicate causal inference. Fourth, short sample periods and the post-2015 ESG boom raise concerns about regime dependence and look-ahead biases. Fifth, the rapidly shifting regulatory landscape (e.g., the US SEC reversal, the GPFG ethics-council suspension) means institutional findings date quickly.

CONCLUSION

This article has integrated the theory, evidence, and regulation of sustainable institutional investing into a single framework spanning both portfolio formation and evaluation across all major investor types. Against the four hypotheses, the literature supports a predominantly non-negative ESG-performance relation (H1), a dual risk-factor/preference interpretation of ESG (H2), the primacy of materiality (H3), and the corrosive effect of rating divergence (H4).

1. Policy recommendations

Regulators should accelerate convergence on a global disclosure baseline (IFRS S1/S2) while preserving double-materiality options where mandated, to reduce the scope component of rating divergence.

Regulators and IOSCO should move from voluntary codes to supervised registration of ESG-rating providers, with mandatory methodology transparency and conflict-of-interest controls.

Institutional investors should anchor formation on financial materiality (SASB/ISSB maps) rather than aggregate scores, and should disclose rater choice and its portfolio impact.

Long-horizon owners (SWFs, pension funds) should institutionalise engagement-plus-exclusion frameworks and insulate them from short-term political reversal through statutory anchoring.

Emerging-market authorities, including Uzbekistan's, should adopt phased disclosure regimes, develop domestic green taxonomies aligned with international standards, and use sovereign thematic issuance to seed local markets and crowd in private capital.

2. Research agenda

Causal identification of the ESG-return relation using exogenous shocks and natural experiments beyond the US.

Quantifying the persistent (measurement-driven) component of rating divergence after disclosure harmonisation.

Investor-type-specific asset-pricing models that incorporate liability structure and investment horizon.

Impact-measurement validation: testing whether impact-weighted accounts and SDG-alignment scores predict real-world outcomes.

Emerging-market sustainable finance, including performance and spillover effects of sovereign green and SDG bonds in Central Asia.

The systemic importance of the topic is unambiguous: institutional investors intermediate most of the global capital, and the mechanisms by which they form and evaluate sustainable portfolios will materially shape both market efficiency and the real-economy transition. Resolving the measurement and governance challenges identified here is therefore not merely a technical matter but a precondition for sustainable finance to deliver on its dual promise of competitive returns and genuine impact.

REFERENCES

1. Albuquerque, R., Koskinen, Y., Yang, S., & Zhang, C. (2020). Resiliency of environmental and social stocks: An analysis of the exogenous COVID-19 market crash. *The Review of Corporate Finance Studies*, 9(3), 593-621. <https://doi.org/10.1093/rcfs/cfaa011>
2. Berg, F., Kolbel, J. F., & Rigobon, R. (2022). Aggregate confusion: The divergence of ESG ratings. *Review of Finance*, 26(6), 1315-1344. <https://doi.org/10.1093/rof/rfac033>
3. Cohen, R., & Serafeim, G. (2020, September 3). How to measure a company's real impact. *Harvard Business Review*. <https://hbr.org/2020/09/how-to-measure-a-companys-real-impact>
4. Eccles, R. G., Ioannou, I., & Serafeim, G. (2014). The impact of corporate sustainability on organizational processes and performance. *Management Science*, 60(11), 2835-2857. <https://doi.org/10.1287/mnsc.2014.1984>
5. Equator Principles Association. (2020). The Equator Principles EP4. Equator Principles Association.
6. European Commission. (2019). Regulation (EU) 2019/2088 on sustainability-related disclosures in the financial services sector (SFDR). *Official Journal of the European Union*.
7. European Commission. (2020). Regulation (EU) 2020/852 on the establishment of a framework to facilitate sustainable investment (EU Taxonomy Regulation). *Official Journal of the European Union*.
8. Fama, E. F., & French, K. R. (1993). Common risk factors in the returns on stocks and bonds. *Journal of Financial Economics*, 33(1), 3-56.
9. Friede, G., Busch, T., & Bassen, A. (2015). ESG and financial performance: Aggregated evidence from more than 2000 empirical studies. *Journal of Sustainable Finance & Investment*, 5(4), 210-233. <https://doi.org/10.1080/20430795.2015.1118917>
10. Global Sustainable Investment Alliance. (2022). *Global Sustainable Investment Review 2022*. GSIA.
11. Global Sustainable Investment Alliance. (2024). *Global Sustainable Investment Review 2024*. GSIA.

12. Hartzmark, S. M., & Sussman, A. B. (2019). Do investors value sustainability? A natural experiment examining ranking and fund flows. *The Journal of Finance*, 74(6), 2789-2837. <https://doi.org/10.1111/jofi.12841>
13. Hong, H., & Kacperczyk, M. (2009). The price of sin: The effects of social norms on markets. *Journal of Financial Economics*, 93(1), 15-36.
14. International Financial Reporting Standards Foundation. (2023). IFRS S1 General requirements for disclosure of sustainability-related financial information; IFRS S2 Climate-related disclosures. ISSB.
15. International Organization of Securities Commissions. (2021). Environmental, social and governance (ESG) ratings and data products providers: Final report (FR09/2021). IOSCO.
16. Kempf, A., & Osthoff, P. (2007). The effect of socially responsible investing on portfolio performance. *European Financial Management*, 13(5), 908-922. <https://doi.org/10.1111/j.1468-036X.2007.00402.x>
17. Khan, M., Serafeim, G., & Yoon, A. (2016). Corporate sustainability: First evidence on materiality. *The Accounting Review*, 91(6), 1697-1724. <https://doi.org/10.2308/accr-51383>
18. Krueger, P., Sautner, Z., & Starks, L. T. (2020). The importance of climate risks for institutional investors. *The Review of Financial Studies*, 33(3), 1067-1111. <https://doi.org/10.1093/rfs/hhz137>
19. Markowitz, H. (1952). Portfolio selection. *The Journal of Finance*, 7(1), 77-91.
20. Norges Bank Investment Management. (2024). Responsible investment 2024 / Annual report 2024. Norges Bank Investment Management.
21. Organisation for Economic Co-operation and Development. (2023). Financing Uzbekistan's green transition. OECD Publishing. <https://doi.org/10.1787/27d2489d-en>
22. Pastor, L., Stambaugh, R. F., & Taylor, L. A. (2021). Sustainable investing in equilibrium. *Journal of Financial Economics*, 142(2), 550-571. <https://doi.org/10.1016/j.jfineco.2020.12.011>
23. Pedersen, L. H., Fitzgibbons, S., & Pomorski, L. (2021). Responsible investing: The ESG-efficient frontier. *Journal of Financial Economics*, 142(2), 572-597. <https://doi.org/10.1016/j.jfineco.2020.11.001>
24. Principles for Responsible Investment. (2024). Annual report 2024. PRI Association.
25. Serafeim, G., Zochowski, T. R., & Downing, J. (2019). Impact-weighted financial accounts: The missing piece for an impact economy (White paper). Harvard Business School.
26. Sharpe, W. F. (1964). Capital asset prices: A theory of market equilibrium under conditions of risk. *The Journal of Finance*, 19(3), 425-442.
27. Statman, M. (1987). How many stocks make a diversified portfolio? *Journal of Financial and Quantitative Analysis*, 22(3), 353-363. <https://doi.org/10.2307/2330969>
28. Statman, M. (2000). Socially responsible mutual funds. *Financial Analysts Journal*, 56(3), 30-39. <https://doi.org/10.2469/faj.v56.n3.2358>
29. Task Force on Climate-related Financial Disclosures. (2017). Recommendations of the Task Force on Climate-related Financial Disclosures. Financial Stability Board.
30. United Nations Development Programme. (2022). Uzbekistan's first SDG bond allocation and impact report. UNDP.