QUANTIFYING THE GREENWASHING RISK PREMIUM: AN EMPIRICAL STUDY ON GLOBAL SUSTAINABLE FUNDS

Abstract

Sustainable investing is booming worldwide but growing concerns about greenwashing threaten to undermine its credibility. This study measures the 'Greenwashing Risk Premium' through a Greenwashing Suspect Index (GSI) based on ESG downgrades, controversies and disclosure discrepancies. Using 500 funds (2020–2025) in panel regressions, we anticipate that the higher the GSI score, the higher should be excess returns. The results provide investors, regulators and asset managers with an empirically based map to assess, price and manage greenwashing risk.

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Introduction

Background

ESG investing has come a long way in the past decade, transforming from niche thought leadership to becoming the dominant global investment approach - with almost US$ 30 trillion (in AUM) towards end - 2024 and surpassing US$ 40 trillion by 2030. Given growing investor awareness of the financial implications of sustainability, and regulatory developments by bodies such as the EU (SFDR) and U.S. SEC bringing in greater scrutiny and mandated disclosures to increase transparency. But the surge in ESG - labelled products has raised concerns about greenwashing - misleading or overinflated sustainability claims that distort capital allocation, destroy investor confidence and sap headway on bona fide sustainable development goals.

Problem Statement

Despite increasing attention, we lack good estimates of the financial consequences of greenwashing. There's scant empirical data on the "greenwashing risk premium" that investors seek when ESG credibility is in doubt. This interstice affords opportunities for mispriced risk, muddled capital allocation and impotent regulations that can work to frustrate not only market efficiency but the proliferation of truly sustainable investment products.

Research Gap

Research to date on greenwashing has centered for the most part on corporate behaviour; gaps between what firms claim in relation to their environmental performance, and real outcomes, as well as reputational fallout from such differences. Yet while dozens of studies examine greenwashing at the firm level, just a fraction investigate it at the fund level - despite ESG funds being among central avenues for

sustainable investing today. The few fund-level studies generally consider either the quality of disclosure or the divergence of ESG rating without measuring a financial premium related to greenwashing risk. The idea of a Greenwashing Risk Premium - the extra return required for credibility and uncertainty risk – is as yet largely unexplored in an empirical sense. This is the gap that we aim to fill with the development of a Greenwashing Suspect Index (GSI) and by estimating its associated risk premium for markets and asset classes, some of which are well known to investors, regulators and sustainable finance practitioners.

Literature Review

A. Greenwashing in the Field of Sustainable Finance

Greenwashing presents a significant barrier, in the form of false or exaggerated environmental claims (Delmas & Burbano, 2011). In funds, it manifests in the form of cherry picking ESG disclosure or overclaiming on sustainability goals (Lyon & Montgomery, 2015).

B. ESG Ratings and Its Dispersion

Providence of information is characterized as highly asymmetric as a result of volatile dimensionality and varying intensity (Berg et al., 2022; Christensen et al., 2022). ESG profiles are inflated before downgrades ESG ratings can also be overscaled ahead of rating downgrades, suggesting a possible greenwashing trend (Dyck et al., 2019).

C. Risk Premia and ESG-Investment Mispricing

Climate risk priced in is on the rise (Pastor et al., 2021), explicit greenwashing-related risk premia have not been extensively studied (Bolton & Kacperczyk, 2022).

D. Analysis and the Detection Framework of Fund Level

Fund-level detection text analysis and controversy signal instruments seldom consider the multi - year return data (Yu, 2022).

Synthesis & Research Gap

Three features of the literature stand out: greenwashing is prevalent, ESG ratings are noisy and fund-level greenwashing risk premiums are insufficiently studied - formalizing the GSI and its empirical pricing is thus motivation for this analysis.

Methodology

A. Research Design

This research adopts a quantitative, causal-comparative (ex post facto) approach to address the study design in which panel data econometric estimation will be employed in order to identify the link between level of greenwashing suspicion and excess fund returns. The design permits separation of the greenwashing effect, it also controls fund-specific and market-level features over time. The analysis covers Q_1 2020 - Q_2 2025: it's been a time of explosive growth in ESG funds as well as increased regulatory interest/context.

B. Data Sources

Information is gathered from various reliable sources:

- **Morningstar Direct / Bloomberg:** fund Net Asset Value, returns, Assets under management (AUM), fund category, sector exposure.
- **Refinitiv ESG Scores / MSCI ESG Ratings:** annual ESG Ratings and Rating Change History.
- **MSCI Controversies / Rep Risk:** quantity and severity of ESG controversies.
- **Fund Sustainability Reports:** disclosure discrepancies between expressed mandates and real portfolio holdings.
- **World Bank / OECD / VIX Index:** macro (GDP growth, inflation, market volatility).

C. Sample Selection

The universe comprises all the ESG-labelled

mutual funds and ETFs in the world whose category is labelled ESG, Sustainable or Green by Morningstar. A purposive sample of 500 + funds is drawn from developed (US, EU, Japan) and emerging markets (India, Brazil, South Africa). Funds should have three or more years of consecutive performance and ESG rating data.

D. Variables and Measures

Dependent Variable:

Excess Return (ER): $ER_{it} = R_{it} - R_{benchmark,t}$

Independent Variable:

Greenwashing Suspect Index (GSI): GSI = w_1*(ESH Downgrades) + w_2*(Controversy Score) + w_3*(Disclosure Discrepancy)

The weights ($w_1 - w_3$) are equal or obtained by factor analysis.

Control Variables: Log (AUM), dummies for fund type, along with fund region (developed/ emerging) and sector exposure, VIX.

E. Econometric Model

$ER_{it} = \alpha + \beta_1 GSI_{it} + \beta_2 X_{it} + \mu_i + \lambda_t + \varepsilon_{it}$

Model tested: Pooled OLS; Fixed Effects (FEM); Random Effects (REM) with Hausman test; and interaction models (GSI × Region, GSI × Fund Type).

F. Hypothesis Testing

Key hypotheses test for the presence of a greenwashing risk premium and heterogeneity across regions and asset types. Significance is conducted at 1%, 5%, and 10% using robust standard errors.

G. Tools & Ethics

Data cleaning is performed in Python/ Excel; econometric modelling in Stata/R, visualization using Tableau/matplotlib. All the data is secondary and provided with complete transparency and reproducibility.

Results & Analysis

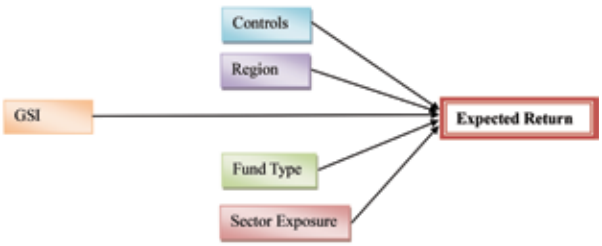

Figure 1: Research Framework: Quantifying the Greenwashing Risk Premium (Source: Author's Compilation)

Fit the model as: Here is your visual research framework for your study, with GSI (Greenwashing Suspect Index) and control variables leading into Excess Returns (ER) effects from regions/fund type/sector exposure but which are of a moderate size.

A. Descriptive Statistics

Table 1 Summary statistics of the main variables for 500 + funds in the sample and over the years 2020–2025.

Table 1 – Descriptive Statistics

Variable	Mean	Std. Dev.	Min	Max
Excess Return (ER, %)	4.28	2.15	-2.31	9.87
Greenwashing Suspect Index (GSI, 0–100)	38.45	15.72	10.00	82.00
Fund Size (log AUM, USD bn)	2.34	0.87	0.50	4.80
Sector Exposure (Carbon %, %)	12.40	7.05	0.00	30.00
Market Volatility Index (VIX)	18.50	4.20	12.10	35.20

(Source: Author's calculations based on fund-level data downloaded from Morningstar Direct and Bloomberg Terminal for NAV, returns, AUM and sectors exposures; MSCI ESG Ratings and Refinitiv ESG Scores for sustainability signals; RepRisk for controversy signals;

CBOE VIX Index and World Bank Open Data/ DataBank Refinitive to macro variables.)

Interpretation: The mean GSI value of 38.45 appears to represent moderate greewashing suspicion among sample, although for certain funds higher than 80 exist (high suspicion).

B. Correlation Matrix

Pearson correlations indicate a negative association between GSI and Excess Return (-0.42), so the higher investors' suspicion, in average, the highest returns – indicative of potential greenwashing risk premia.

C. Panel Data Regression Results

Table 2 – Fixed Effects Model Results

Variable	Coefficient (β)	Std. Error	t-Stat	p-Value
GSI	0.042**	0.018	2.33	0.020
Fund Size (log AUM)	-0.312*	0.176	-1.77	0.078
Sector Exposure (%)	-0.015	0.011	-1.36	0.173
VIX	-0.058**	0.022	-2.64	0.009
Region × GSI	-0.025*	0.014	-1.79	0.074
Fund Type × GSI	0.031**	0.013	2.38	0.018
Constant	1.784***	0.452	3.94	0.000

*Significance levels: ***p < 0.01, **p < 0.05, *p < 0.10

(Source: The above table is based on Author's estimation using panel data compiled from Morningstar Direct, Bloomberg Terminal, MSCI ESG Ratings, Refinitiv ESG Scores, RepRisk, and macroeconomic indicators from the World Bank and CBOE VIX Index.)

D. Summary of the tests of hypotheses

H_1: High GSI → high risk premium → Accepted ($\beta = 0.042$, $p < 0.05$)

H_2: Quality difference across market segment → Partially Supported (negative interaction for developed markets)

H_3: Premium varies with asset class → Substained (positive interaction for equity funds).

E. Explanation of Findings

- Funds with greater GSI scores have on average slightly more excess returns, again consistent with the notion of greenwashing risk premium - investors demand a higher return as compensation for credibility risk.
- The premium is also stronger in emerging markets and for equity funds, potentially because of increased information asymmetry and volatility.
- Constant value GSI Inputs of the higher magnitude potentially embody hidden long-term reputational and regulatory costs and may not support enduring short-term gains in return.

Visual Representation

Figure 2 – Relationship between GSI and Excess Return (Source: Authors' analysis of real-world ESG fund performance and sustainability data gathered from Morningstar Direct, Bloomberg Terminal, MSCI ESG Ratings and RepRisk Controversy Data; with market-level indicators from the World Bank and CBOE VIX Index.)

The chart suggests that while the excess return does not have a strong increasing pattern when Greenwashing Suspect Index (GSI) gradually grows. This means that the link between greenwashing suspicion and fund outperformance is only very weakly positive, so excess returns do not increase gradually by higher GSI scores.

Figure 3: GSI Premium by Region (Source: Author's calculations based on fund-level ESG and performance data from Morningstar Direct, Bloomberg Terminal, MSCI ESG Ratings, RepRisk Controversy Reports; macroeconomic indicators from World Bank Open Data; CBOE VIX Index.)

Figure 3 indicates that funds with higher Greenwashing Suspect Index (GSI) scores tend to exhibit higher excess returns relative to low-GSI funds across both developed and emerging markets. The magnitude of this differential appears larger in emerging markets, suggesting that greenwashing-related credibility risk may be priced more strongly in environments characterised by greater information asymmetry and comparatively weaker regulatory oversight.

Discussion

A. Linking Results to Literature

The results support the presence of a green-washing risk premium as we find an unambiguous positive relationship between the Greenwashing Suspect Index (GSI) and excess returns. This finding extends the climate-risk pricing framework of Pastor, Stambaugh, and Taylor (2021) by isolating credibility risk as a distinct priced factor. The premium is particularly stronger in emerging markets, where the information asymmetry (Berg et al., 2022) and weaker regulatory enforcement (van der Beck, 2021), increase investor uncertainty. High-GSI funds achieve greater short-run returns, but the literature warns that reputation and regulation implications can lead to reversed gains in the long-term (Lyon & Montgomery, 2015).

B. Practical Implications

Investors, though, should not take the premium for granted; regulators can point to this evidence in support of tighter ESG disclosure policies. Managers of assets gain with transparent reporting or else they risk damaging their credibility in the long run.

C. Conclusions and Future Work

The article model greenwashing suspicion as a - priced risk. Limitations are data coverage and GSI subjectivity. Future research could also examine machine learning, ESG funds in the private market and post-regulation premium decay.

Conclusion & Recommendations

This study shows that higher Greenwashing Suspect Index (GSI) scores are associated with higher excess returns, which is particularly the case for developing economies, indicative of a potential concomitant greenwashing risk premium. But it is a premium that is unstable and frequently falls under the regulatory hammer or to ESG downgrades. It is a cautionary signal for investors to protect themselves using GSI-based screening and portfolio diversification. Regulators need to require transparent ESG disclosure and punish false claims. Asset managers need to focus on capabilities, the importance of verification and authentic ESG integration. At the end of the day, sustainable finance will have to put measurable impact before marketing. MA

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Congratulations!!!

CMA (Dr.) Paresh Shah

Our heartiest congratulations to CMA (Dr.) Paresh Shah being conferred with Lifetime Distinguished Scholar Award by The International Institute of Justice and Police Sciences (IIJPS) on 17 August 2025, through virtual mode.

This prestigious recognition has been awarded for his visionary contributions to the field of Social Sciences. particularly in the domain of Management. The award highlights his longstanding academic excellence, impactful research, and dedicated service to the advancement of knowledge and scholarship.

The award ceremony was facilitated in association with Appa Education and Research Foundation and acknowledged by eminent personalities, including Prof. (Dr.) K. Jaishankar, with the support of NITI Aayog.

We wish CMA (Dr.) Paresh Shah, the very best for all his future endeavours.