

ESG Regulatory Intensity and Investor Behavior: An Institutional Explanation of Rating Signals

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Abstract. This study examines how the intensity of ESG (Environmental, Social, and Governance) regulation influences investor behavior and asset allocation by shaping the credibility and interpretative power of ESG ratings. Through comparative case studies of companies like Unilever, Nestlé, and Wahaha, as well as the investment strategies of the Norwegian Sovereign Wealth Fund (NBIM), the analysis reveals that regulatory environments significantly impact the reliability of ESG scores. In highly regulated regions (e.g., the EU), stringent disclosure requirements enhance rating transparency, enabling investors to use scores as reliable signals for risk assessment and capital allocation. Conversely, in weakly regulated markets (e.g., China), inconsistent data and voluntary disclosure frameworks reduce rating credibility, leading investors to discount scores or demand risk premiums. The findings highlight that ESG ratings are not purely technical but are deeply embedded in institutional contexts, with regulatory intensity acting as a critical determinant of their effectiveness. The study underscores the need for global regulatory harmonization to improve the universality and comparability of ESG metrics, offering insights for investors navigating cross-market ESG-driven strategies.

Keywords: ESG Regulation, Investor Behavior, Cross-market ESG Strategies

1. Introduction

With the growing popularity of sustainable development concepts, ESG has rapidly evolved from a fringe topic to a mainstream investment strategy. In recent years, global asset managers have been incorporating ESG factors into their investment processes, leading to significant growth in related funds and assets. An increasing number of listed companies are proactively disclosing ESG information to attract capital market attention. Investors are also using ESG performance as a key screening criterion, preferring to increase holdings or hold long-term positions in companies with outstanding performance.

However, ESG rating systems are not entirely objective; their results are profoundly influenced by the institutional context and regulatory environment. Disclosure standards, audit intensity, and regulatory oversight vary significantly across countries and regions. For example, the European Union has implemented mandatory disclosure regulations, such as the Sustainable Finance Disclosure Regulation (SFDR) and the EU Taxonomy, while the United States emphasizes voluntary disclosure and market-driven approaches [1]. Nipper et al. note that differences in regulatory

frameworks directly impact the completeness of corporate disclosures and the rating agencies' assessments [2].

This difference has important implications for investor behavior. While investors generally favor highly rated companies, their signaling power is weakened when ratings are subject to regulatory differences, noise, or information gaps. Frankel et al. found that high regulatory intensity generally leads to greater information transparency and rating consistency, enabling investors to make decisions based on ratings with greater confidence [3]. Conversely, in low-regulation regions, ratings fluctuate significantly, making it difficult to truly reflect a company's sustainability performance.

Therefore, the core question of this article is: How does the intensity of ESG regulation, through its impact on the ratings system, further influence investor behavior and asset allocation? This study not only focuses on direct investor reactions to ESG performance but also explores how regulation shapes the credibility of ratings and, therefore, influences capital flows.

The significance of this study lies in three aspects: first, it provides investors with a regulatory perspective for cross-regional asset allocation, helping to identify institutional risks and rating biases; second, from the perspective of information intermediaries, it deepens the understanding of the relationship between "ESG ratings and capital market performance"; third, it provides empirical reference for global ESG regulatory coordination.

The article is structured as follows: the second part introduces the scoring framework and regulatory dependence of major rating agencies; the third part analyzes how investors adjust their behavior based on the rating and regulatory background through case studies of listed companies; the fourth part discusses the macro-system; the fifth part summarizes the entire article and proposes future research directions.

2. The diversity of ESG rating structures: a dimensional analysis perspective

While mainstream ESG rating agencies, such as Bloomberg, MSCI, and Sustainalytics, all base their scoring on environmental (E), social (S), and governance (G), they differ significantly in their methodologies and indicators. These differences are considered a key factor influencing investor behavior and corporate capital costs [4].

Further exacerbate these rating discrepancies. The EU promotes mandatory disclosure and transparency, requiring ESG to be integrated into financial information frameworks; the US, on the other hand, relies primarily on voluntary market practices, placing greater emphasis on market reputation and investor responsiveness. Consequently, the same company can receive vastly different scores across different rating systems, sending differing signals to investors. These discrepancies ultimately reflect the varying intensity of regulation across regions.

3. Indicator comparison: taking the environmental dimension as an example

Taking the "environmental" dimension as an example, rating agencies differ significantly in their indicators and algorithms. A comparison of the scores of the same energy company under the Bloomberg and MSCI systems reveals that the discrepancies stem primarily from the ratings logic, rather than corporate behavior. This discrepancy directly impacts investor judgment. When ESG ratings are used for risk screening, capital allocation, and even investment access, differing results imply different expectations for a company's future returns and risks.

Research by Galluzzi et al. shows that companies with strong regulatory support and high ESG scores are significantly associated with a lower cost of equity [5]. Investors not only consider the

score itself but also whether the score comes from a system with high institutional credibility. In regions with stricter regulation, ESG scores are more likely to be viewed as reliable signals, thus having a greater impact on capital allocation [6].

4. Extended comparison: heterogeneous settings of the S and G dimensions (projection of institutional culture and regulatory expectations)

In addition to the environmental dimension, differences in scores for the social (S) and governance (G) dimensions are also influenced by the institutional environment. On the social dimension, Sustainalytics focuses on labor policies and community relations, while Bloomberg emphasizes quantitative indicators such as employee safety incident rates and diversity. This reflects the fact that Europe places greater emphasis on the impact of social engagement, while the United States prioritizes the comparability and transparency of compliance data.

The differences in governance are even more pronounced. MSCI emphasizes board independence, anti-takeover mechanisms, and shareholder rights protection, while Refinitiv and Bloomberg prioritize management incentives, audit structures, and transparency. These choices reflect the differing understandings of "good governance" between common law and civil law systems.

Overall, differences in ESG ratings stem not only from institutions' business logic but also reflect differences in institutional culture and regulatory expectations. These differences, by influencing ratings, in turn influence investor behavior and corporate capital costs. Identifying these structural differences can help develop more robust investment strategies that adapt to diverse institutional environments.

5. Unilever: a "signal amplifier" in a highly regulated environment

Starting in 2024, the EU's Corporate Sustainability Reporting Directive (CSRD) will require large companies to disclose over 1,000 sustainability data items and to label the environmental contributions of their operations according to the EU Taxonomy [7]. Unilever not only fully submitted three questionnaires on climate, forests, and water, but also incorporated "carbon neutrality in operations by 2030 and net zero across the entire value chain by 2039" into its board charter, with progress reviewed quarterly by its Audit Committee.

The Bloomberg ESG Terminal gives Unilever a 70/100 score for adequacy of disclosure, placing it in the top 10% of the global daily chemical industry. The dual endorsement of CDP's "Climate-A List" and Bloomberg's high score has led asset managers to view Unilever as a "low-risk target with highly credible information." In the second half of 2024, three major Nordic pension funds increased their holdings by a combined £260 million. The €1 billion sustainability-linked bond issued during the same period has a coupon rate 25 basis points lower than bonds without ESG clauses. Investors stated in their inquiry documents that "CSRD oversight combined with high-scoring ratings" can be considered "regulatory insurance" for counterparty compliance.

Internal governance is also deeply tied to ratings. Starting in 2023, Unilever will link 20% of executive bonuses to emissions reduction performance and require its top 300 suppliers with the highest emissions to set science-based carbon targets (SBTs) [8]. Rating indicators are embedded in compensation and procurement contracts, creating a positive cycle of "regulation-disclosure-rating-capital": stricter regulation leads to a higher signal-to-noise ratio; more credible ratings lead to lower capital costs, further strengthening disclosure incentives. This case demonstrates that in highly regulated regions, ESG ratings are not only a tool for investors to identify risks but also a powerful

signal of companies' commitment to sustainability. Unilever's experience demonstrates that high-quality ratings, supported by institutional frameworks, can effectively reduce market uncertainty, enhance investor confidence, and achieve a win-win situation for corporate governance, access to capital, and sustainable development goals.

6. Nestlé vs. Wahaha: amplified institutional differences within the same model

Similar to Unilever's highly regulated environment, Nestlé also benefits from a stable regulatory and disclosure system, making its ESG rating highly comparable and credible [9]. However, not all companies enjoy similar institutional safeguards. A comparison of Nestlé with Wahaha, a private Chinese beverage company, reveals how, under the same rating model, the institutional environment profoundly influences the explanatory power of rating scores and capital market responses. MSCI uses a uniform weighting system for global food and beverage companies: key indicators such as packaging materials (14%), water stress (10%), and supply chain traceability (9%) form the basis of the score. As a Swiss company, Nestlé is subject to both the Swiss Corporate Responsibility Act and EU supply chain regulations, enabling it to submit a complete data chain from farm to consumer. As a result, it has maintained an MSCI AA rating for four consecutive years and disclosed a "medium-low risk" score of 24.3 from Sustainalytics in its 2024 Non-Financial Report. Nestlé also signed a CHF 1.5 billion sustainability-linked loan agreement with seven international banks, stipulating that if its ESG rating falls below AA, the loan interest rate will increase by 10 basis points annually. The rating score thus directly impacts its financing costs, creating a "ratings are currency" logic. Meanwhile, Nestlé's weighting in several European green ETFs has continued to rise, making it a leading ESG investment target in the industry. For investors, an "AA" rating in a highly regulated jurisdiction represents low default risk and can be directly used as a beta adjustment in the Capital Asset Pricing Model (CAPM).

In stark contrast, Wahaha, a privately held Chinese company, remains within an ESG framework that relies primarily on voluntary disclosure. Its publicly available data is primarily limited to factory-level energy consumption and water conservation metrics, lacking data supporting key MSCI indicators such as supply chain traceability and packaging raw material composition. On the MSCI data platform, many of Wahaha's indicators are labeled "NR (Not Rated)" or "Insufficient Data," severely limiting the ability to accurately assess its industry position. These institutional differences are directly reflected in the financing market: Nestlé enjoys a 0.3%–0.5% coupon discount in the Euro green bond market, while even Wahaha, which raises funds through cross-border debt channels, is required by investors to pay an additional 50–80 basis point "transparency premium" to mitigate the potential risks associated with uncertainty regarding its ESG information.

This demonstrates that when companies operate in an environment lacking mandatory disclosure, even unified rating models struggle to maintain consistent interpretative power. Nestlé's "tradable scores" are significantly discounted in Wahaha's case. This case clearly demonstrates that ESG ratings are not purely technical; their effectiveness relies heavily on the underlying institutional foundation and data availability. In the absence of weak regulatory constraints, rating models inevitably become high-variance tools, making it difficult to achieve cross-market pricing functionality, further undermining the credibility of ESG as a global investment principle.

7. The Norwegian Sovereign Wealth Fund's cross-market trade-offs (regulatory context reshapes the meaning of scores)

After analyzing how regulatory intensity impacts the credibility of ESG ratings at the corporate level, we expand our perspective to the investor side, observing how global asset allocators "reinterpret" ESG scores based on institutional context. As one of the world's largest long-term institutional investors, the Norwegian Sovereign Wealth Fund (NBIM)'s strategic choices are a significant indicator of the ESG market. While using Sustainalytics risk scores for initial screening, NBIM also sets "human rights and governance red lines" to identify high-risk investment targets. In its 2024 Responsible Investment Report, the fund announced the exclusion of 14 companies, including Adani Ports, primarily due to significant information deficiencies in their Myanmar port project disclosures and human rights disputes [10].

Interestingly, the model-based score differences between NBIM's holdings of Germany's Siemens AG (Sustainalytics score of 19, categorized as "low risk") and Adani Cement (scored 22-24) are not significant, and by conventional standards, are insufficient to trigger buy/sell decisions [11]. However, NBIM introduces the institutional variable of "jurisdictional enforceability" as a realistic supplement to ESG scores. India's environmental penalty cap is less than 0.1% of the relevant transaction value, indicating weak institutional enforcement. Conversely, Germany's "Corporate Due Diligence Act," implemented in 2023, not only requires large companies to fulfill ESG due diligence obligations but also allows for civil prosecution of board members and the imposition of substantial punitive damages. NBIM views this discrepancy as a primary source of potential tail risk and, accordingly, has increased the ESG risk scores of companies like Adani by 30 basis points in its internal investment model. Based on this, the fund decided to reduce its holdings in Adani Group-related assets and add Siemens to its overweight list. Furthermore, NBIM has formally incorporated the "regulatory intensity x information transparency" factor into its ESG decision-making threshold model, publicly emphasizing in its annual report: "High ratings without institutional backing will be viewed as signals of inadequate risk disclosure."

This case demonstrates that, in a cross-market investment context, institutional investors do not blindly adhere to the "static scores" output by rating models. Instead, they incorporate the regulatory environment as a "dynamic interpretative framework" to reframe their ESG risk perceptions. This "score reassessment" logic not only reflects the importance attached to institutional effectiveness but also highlights the limitations of ESG ratings as the sole basis for investment decisions in weakly regulated markets. Therefore, if rating agencies ignore regulatory heterogeneity when promoting their models globally, they risk undermining the credibility and global applicability of the ratings themselves. For long-term capital, institutional enforceability is becoming an indispensable "implicit indicator" beyond ESG ratings.

8. Macro discussion: how the intensity of ESG regulation shapes rating implications and investment behavior

Therefore, the intensity of ESG regulation has become a crucial institutional variable influencing capital market behavior. Its impact goes far beyond compliance with information disclosure requirements and serves as an institutional signal, profoundly shaping investors' perceptions of risk, return, and rating tools. In highly regulated environments, such as those under the EU CSRD or Germany's Due Diligence Act, companies are required to disclose extensive, high-standard, auditable ESG data and submit it to external verification, significantly enhancing the transparency and credibility of this information. For investors, this institutional constraint not only reduces the

scope for false disclosure but also creates a low-noise ratings foundation, transforming ESG scores from "declarative indicators" into "risk-pricing tools." Investors have greater trust in companies in highly regulated jurisdictions and are more willing to use their ratings in investment decisions, for example, viewing them as alternative signals of low default risk or stable cash flows.

This trust-conversion mechanism not only alters investor behavior but also materially influences their risk appetite and return expectations. In markets with stronger regulation, corporate ESG performance is more realistic and predictable, leading investors to reduce their concerns about potential tail risks, accept lower risk premiums, and even proactively incorporate ESG performance into their beta coefficient and discount rate estimates. The interest rate differential between green bonds and sustainability-linked loans is, in part, a reflection of this expectation mechanism. Conversely, in markets with weaker regulation, ratings, lacking institutional support, are often perceived as "high-variance information," significantly discounting their pricing power. Ratings are no longer indicators, but rather variables that investors must reinterpret and adjust.

It's worth noting that ESG regulatory systems and rating tools aren't independent of each other; rather, they interact and feed back into each other in practice. On the one hand, strong regulation provides rating agencies with more standardized and complete data inputs, improving the stability and explanatory power of model operations and reducing the propagation of errors caused by missing information. The credibility of ratings from Bloomberg, MSCI, Sustainalytics, and others in the European market is significantly higher than in regions with insufficient data disclosure. It's precisely this institutional foundation that determines the effectiveness of the models. On the other hand, regulators also reference the rating agencies' data structure and scoring logic when setting policy indicators. For example, the construction of the "significant adverse impact indicator" in the EU SFDR partially draws on the variable system of mainstream ESG models. This two-way nested "regulation-rating" trend has transformed ESG ratings from market tools into institutional benchmarks, thereby enhancing their public good properties.

Overall, the intensity of ESG regulation isn't simply a variable of institutional context; it's a crucial prerequisite for investors to understand ratings, assess risks, and build expectations. The availability and effectiveness of rating scores increasingly depend on the supportive institutional environment within which they operate. Therefore, as global capital allocation becomes increasingly ESG-focused, promoting the harmonization of regulatory rules and enhancing data transparency have become essential for achieving global universality of rating signals.

9. Conclusion

Through theoretical analysis and analysis of three typical cases, this article explores how the intensity of ESG regulation influences investor behavior and asset allocation decisions through institutional signals, data credibility, and risk assessment mechanisms. Research shows that in regions with stronger regulation, investors are more likely to trust ESG ratings, using them as a basis for long-term investment and increasing their allocation weights accordingly. In contrast, in regions with weaker regulation, ratings are often discounted, and investors are more inclined to wait and see or avoid them. For cross-market investors, their decisions are also constrained by both regulatory arbitrage opportunities and the reliability of rating tools. This suggests that regulatory intensity has become a significant institutional variable influencing ESG investment and should be considered in investment evaluation and asset allocation models.

It should be noted that this article primarily relies on case studies. While the selected companies and regions are representative, the limited sample size may not fully reflect the prevailing patterns across regulatory environments. Furthermore, due to the current limitations of mainstream rating

agencies in fully disclosing their scoring criteria, some analysis of differences in scoring mechanisms still relies on industry reports and public literature, which may introduce certain information biases. This article has not yet conducted empirical quantitative analysis, and therefore cannot systematically identify the causal relationship between regulatory intensity and capital flows. There is still room for further methodological refinement.

Future research could explore the construction of a more systematic quantitative indicator system for regulatory intensity, integrating horizontal dimensions such as mandatory disclosure requirements, enforcement frequency, and policy transparency to conduct cross-national and cross-market comparisons. Furthermore, it is recommended to incorporate panel data and dynamic regression methods to empirically examine the long-term impact of regulatory changes on capital flows, risk premiums, and rating premiums. Furthermore, as emerging markets gradually establish their own ESG frameworks, studying the regulatory transition process and its impact on foreign investment allocation behavior will provide a more comprehensive understanding of the strategic significance of regulatory intensity in the global sustainable investment landscape.

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