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# *Bridging the Information Gap: How Disclosure and Verification Address the "Lemon Problem" in ESG*

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***Abstract.*** As environmental, social, and governance (ESG) factors become increasingly important to investment decisions, a key problem has arisen: information asymmetry between corporations and their stakeholders. Companies possess exclusive knowledge of their real ESG performance, while investors and the general public have difficulty distinguishing true sustainability from "greenwashing." This paper focuses on how the combination of ESG disclosure and third-party verification can serve as tools to mitigate this asymmetry. Using Akerlof's "lemons problem" as a theoretical lens, the paper argues that without reliable signals, the market for responsible investment may face adverse selection—genuinely sustainable companies are undervalued, while greenwashers obtain capital. The paper examines the limitations of disclosure alone and explores the contributions of verification, standardization, and regulatory enforcement to building stakeholder confidence. Through an examination of greenwashing incidents and regulatory responses, this paper concludes that effective ESG governance requires not only mandatory disclosure but also robust verification mechanisms capable of transforming soft information into credible commitments.

***Keywords:*** Information asymmetry, ESG disclosure, Greenwashing, Stakeholder trust, Corporate governance

## 1. Introduction

The rapid expansion of ESG investing comes with a core problem: investors, regulators, and the general population lack quality data on companies' real environmental, social, and governance performance. Firms hold private knowledge about their own sustainability efforts, while stakeholders must depend on voluntary reports that may be incomplete, unverified, or misleading. This information asymmetry sets the stage for adverse selection—a process in which low-quality firms drive out high-quality ones, thereby defeating ESG's original purpose as a means of directing capital toward sustainable activities. As Du points out, ESG has shifted from an industry-led initiative to a binding restriction on corporate activity, yet the methods for ensuring its credibility remain debated [1]. Zhang & Bao also note that sound corporate governance generates social value through innovation, taxation, and employment [2], but this logic holds only if stakeholders can trust that governance is indeed sound.

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This paper addresses two main research questions. First, what is the nature of information asymmetry in ESG markets and how much does mandatory disclosure help to alleviate the "lemons problem"? Second, what role does third-party verification (assurance, auditing, certification) play in ensuring that ESG disclosures are credible and restoring trust among stakeholders? The analysis unfolds in three sections. Section 1 lays out the theoretical background by applying Akerlof's lemons problem to ESG and discussing adverse selection and moral hazard in this setting. Section 2 evaluates disclosure as a governance mechanism, examining its advantages and disadvantages, including the issue of greenwashing. Section 3 investigates verification as a vital complement to disclosure, demonstrating how verification fosters trust through case studies of greenwashing and regulatory measures.

This paper contributes to the ESG governance literature by integrating insights from information economics with practical issues in ESG markets. It offers a framework for understanding why disclosure is insufficient and how verification systems can transform ESG from an area of uncertainty into a cornerstone of long-term value creation.

## 2. Information asymmetry in ESG: the "lemon problem"

### 2.1. Applying Akerlof to ESG

The famous lemons problem by George Akerlof describes a market where sellers know product quality while buyers cannot tell quality apart before buying. Since buyers only pay an average price, sellers of high-quality goods leave the market, leaving only "lemons" [3]. This dynamic directly applies to ESG. Companies (sellers) know their actual ESG performance, including carbon emissions, labor practices, governance quality. Investors and stakeholders (buyers) can't easily check this information before investing. Without credible signals, investors may assume the worst or offer only an average ESG premium, thereby undervaluing genuinely sustainable firms and weakening ESG investment incentives. This isn't just a theoretical idea. ESG ratings from different agencies vary widely, showing deep uncertainty about measuring and comparing ESG performance. When expert raters disagree, the information asymmetry problem is severe.

### 2.2. Adverse selection and moral hazard in ESG

Two related problems arise from this information asymmetry. First, adverse selection: if investors cannot tell good ESG performers from poor ones, they may demand a "greenium" (premium) that averages across the entire market. High-quality firms find this inadequate and may scale back their ESG efforts or leave the market altogether. Second, moral hazard: once a company receives ESG certification or sustainable financing, it may have less incentive to keep up high standards, knowing that monitoring is imperfect. Both problems damage trust and hinder ESG's ability to channel capital toward sustainable results. Zhang & Bao emphasize that strong governance (G) creates social value by enabling innovation, taxation, and employment [2]. However, this depends on stakeholders being able to identify which firms are genuinely well-governed. If information asymmetry prevents such identification, the social value that governance is meant to produce may never materialize.

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## 3. Disclosure as a governance mechanism: promise and limits

### 3.1. The case for Mandatory disclosure

Disclosure is the main governance response to information asymmetry. Mandatory ESG reporting frameworks—such as the EU's Corporate Sustainability Reporting Directive (CSRD), China's SASAC guidelines for state-owned enterprises, and the International Sustainability Standards Board (ISSB) standards—require firms to disclose standardized information on ESG metrics. The reasoning is persuasive: when information is public and comparable, investors can accurately price ESG performance, rewarding good performers and punishing poor ones. Disclosure also allows stakeholders (employees, consumers, and communities) to hold companies accountable, creating reputational incentives for improvement. Du explicitly treats disclosure as a key governance mechanism, noting that the design of ESG evaluation systems should steer firms toward focusing on material issues and advancing their development [1].

### 3.2. The limits of disclosure alone

Nevertheless, disclosure in itself is insufficient for three reasons. First, comparability remains hard to achieve: even with standardization efforts, firms still have discretion in how they measure and report ESG metrics, making direct comparisons difficult. Second, disclosure does not guarantee honesty: as Marquis et al. note, firms engage in selective reporting—highlighting positive actions while hiding negative ones—when verification is weak [4]. Third, there is information overload: investors are flooded with ESG data but lack the expertise or tools to check its accuracy. These limitations create room for greenwashing—the practice of making misleading or unsupported claims about ESG performance. As Edmans warns, when ESG becomes a label rather than a substance, the whole framework risks losing meaning [5].

### 3.3. Greenwashing as a manifestation of the lemons problem

Greenwashing happens when firms exploit information asymmetry to present a false picture of their ESG performance. Examples include Volkswagen's "Dieselgate" (claiming emissions compliance while using defeat devices), fast-fashion brands advertising "sustainable" lines while maintaining environmentally harmful core operations, and investment funds labeling themselves "ESG" while holding fossil fuel assets. When greenwashing is common, skeptical investors may lower their willingness to pay a premium for ESG-labeled products or investments, hurting genuinely sustainable firms—a classic lemons dynamic. Lyon and Montgomery identify various forms of greenwashing, from selective disclosure to symbolic actions that lack real change [6]. This phenomenon directly undermines the creation of social value: if investors cannot trust ESG claims, they will not allocate capital based on governance quality, thereby breaking the virtuous cycle in which good governance generates social value.

## 4. Verification as the missing link: building credibility

### 4.1. The role of third-party assurance

In order to seal the credibility gap, disclosure should be combined with verification. Third-party assurance—offered by auditors, certification bodies, or rating agencies—transforms soft information into hard, reliable promises. Assurance has three functions. First, it prevents misrepresentation:

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when firms are aware that their statements will be verified, they have more incentives to report correctly. Second, it helps in comparison: standardized verification procedures (e.g., ISAE 3000 on sustainability assurance) establish a common benchmark. Third, it builds trust: stakeholders can rely on the verified information, which minimizes the uncertainty that drives the "lemons" problem.

### 4.2. Regulatory responses: from voluntary to mandatory verification

Regulators are increasingly requiring verification. The EU's CSRD mandates limited assurance on sustainability reporting, with plans to replace it with reasonable assurance in time. China's SASAC guidelines promote third-party verification for state-owned enterprises, based on the view that government-owned firms should lead in credibility. In the financial sector, sustainability-linked loans and green bonds increasingly demand external verification of both how proceeds are used and impact metrics. These regulatory changes show a growing recognition that disclosure alone is not enough—credibility needs independent substantiation. Mandatory verification acts as guidance: it does not add new substantive requirements but guarantees that existing commitments are believable.

### 4.3. Case study: greenwashing and the limits of self-regulation

The lack of self-regulation is well reflected in the case of Volkswagen and "Dieselgate." Over a number of years, Volkswagen stated that its diesel cars conformed to emissions requirements, based on self-reported data. It was only when independent testing revealed defeat devices that the deception was revealed. The consequences were dire: billions in penalties, reputational damage and long-term mistrust of the automotive sector. This case demonstrates that disclosure mechanisms fall apart without independent verification. Simultaneously, it reveals the strength of verification: once the deception was discovered, the market penalized the company, and regulatory norms were strengthened. The message for ESG is clear: self-reported metrics, however detailed, cannot replace independent verification.

## 5. Synthesis: toward a governance framework for credible ESG

Bringing the analysis together, a strong governance framework for ESG must include three components. First, mandatory disclosure provides a baseline of comparable information. Second, standardized verification ensures that disclosed information is credible and consistent. Third, regulatory enforcement deters greenwashing by imposing penalties for misrepresentation. These elements work together: disclosure without verification is just public relations; verification without enforcement has no teeth; enforcement without disclosure leaves stakeholders in the dark. This integrated framework transforms ESG from a "lemons market" into an environment where genuine sustainability can be rewarded.

## 6. Conclusion

This paper has examined how information asymmetry threatens the integrity of ESG markets and explored the roles of disclosure and verification in reducing this problem. Drawing on Akerlof's "lemons" problem framework, the paper has argued that without credible signals, ESG markets risk adverse selection , in which genuinely sustainable firms are undervalued and greenwashers capture capital. Disclosure, while essential, is not enough on its own. It can be weakened by comparability issues, strategic reporting, and information overload. Verification—through third-party assurance,

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standardized protocols, and regulatory enforcement—provides the missing link that converts soft information into hard commitments.

These findings carry important implications. For regulators, the evidence supports moving from voluntary disclosure to mandatory, verified reporting frameworks that impose meaningful consequences for misrepresentation. For investors, the analysis suggests that ESG ratings and certifications should be treated with caution unless backed by independent verification. For firms, the lesson is that a genuine ESG commitment requires not only reporting but also a governance infrastructure that ensures credibility.

The study has limitations. It is mostly theoretical and case-based, not an empirical test of the relationships between disclosure, verification, and market outcomes. Future studies can quantitatively explore the correlation between mandatory verification and a reduced cost of capital or enhanced ESG performance. Moreover, cross-country comparisons of regulatory strategies for ESG verification would provide insights into which institutional designs are most effective in reducing information asymmetry. Comparative research on the practice of verification in various ESG areas (environmental, social, governance) may also be informative.

In the end, the credibility of ESG depends not on the quantity of disclosures but on the quality of the information disclosed. We can regain trust and make sure that ESG does live up to its promise as a sustainable capital allocation tool by closing the information gap through verification. It is not just a technical issue of measurement and reporting; it is a basic governance problem. Good governance generates social value, yet such value can be achieved only when governance is transparent, credible, and accountable—conditions that verification helps establish.

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