Assurance on Sustainability

Five Recent Papers on ESG and Assurance

F/AR Foundation *for* Auditing Research

Table of Contents

What does research say about ESG and assurance?

The introduction of the Corporate Sustainability Reporting Directive (CSRD) and the European Sustainability Reporting Standards (ESRS) turn out to meet reservations. The EU is still debating whether it should fully implement CSRD and ESRS.[1] One worry pertains to the competitive position of EU-based firms that compete worldwide. Another is that a full application may turn out to be inconceivable.

Also, the provision and implementation of ESG assurance is not a settled matter. Various standards exist, assurance levels differ, and there are multiple methodological challenges. Additionally, questions arise about the role that auditors and other assurance providers can and should play.

This booklet summarizes five recent research papers that discuss possibilities and impediments when it comes to ESG assurance. How can artificial intelligence make the assurance process more efficient? Does 'diversity washing' wrongfully boost ESG ratings and investments? Can assurance help prevent greenwashing? What is the impact of assurance on the quality of sustainability accounting? And what effects does it have on the future emission performance of companies? Answers to these questions are summarized in this booklet. Auditors, regulators, and companies looking to strengthen their ESG reporting can use the presented findings to elevate assurance to a higher level.[2]

We hope this booklet stimulates both insights and efforts regarding your ESG journey and we welcome your input and ideas regarding these topics.

Het FAR-team

1) For reference, see the QR-code.
2) For a complete overview of the findings, we refer to the corresponding articles.

Artificial intelligence and ESG assurance

Article: *'Using Artificial Intelligence in ESG Assurance' by Nichole Li, Meehyun Kim, Jun Dai, and Miklos Vasarhelyi. Published in Journal of Emerging Technologies in Accounting (2024) 21 (2): 83–99.*

PURPOSE OF THE STUDY

The researchers describe how artificial intelligence can enhance the efficiency and effectiveness of ESG assurance. They propose solutions using artificial intelligence technologies and external data.

MAIN FINDINGS AND PRACTICAL RELEVANCE

Artificial intelligence can help automate and improve the ESG assurance process. This study introduces an innovative framework for ESG assurance from an artificial intelligence (AI) perspective, with a three-layer structure: a data layer, a technology layer, and an application layer. The researchers also outline how AI can contribute to each phase of the ESG assurance process, using the same phases as in traditional financial audits. They provide examples of AI applications for each phase. The findings are relevant for auditors, regulators, supervisors, and other stakeholders.

Background

The importance of ESG information is growing rapidly. ESG reporting is crucial for transparency, while ESG assurance enhances reliability, uncovers weaknesses, and strengthens stakeholder trust. Without assurance, ESG reports appear less credible. Research shows that most investors incorporate ESG information into their decisions. Also, consumers, societal stakeholders, and regulators are placing increasing value on sustainability.

However, many executives indicate a lack of measurement tools to adequately assess sustainability, and fewer than 20 percent use these measurements to adjust their strategies. This highlights the need for improved ESG assurance. Key challenges include greenwashing, the absence of a uniform framework, and a lack of binding regulations.

ESG assurance is still in its early stages and is less developed than financial assurance. The complexity of ESG data—combining financial and non-financial elements with difficult-to-verify textual content—makes providing assurance challenging. Big data and AI offer promising solutions. AI can collect and analyze unstructured data, automate reporting, and improve efficiency and data quality. Additionally, AI aids in regulatory compliance, predictive analysis, and real-time monitoring.

> *'Without assurance, ESG reports appear less credible'*

Research and results

The study introduces a three-layer AI framework for ESG assurance, consisting of a data layer, a technology layer and an application layer.

The **data layer** focuses on ensuring the credibility of information through advanced data collection, processing, and transmission methods. With the rise of big data, auditing has evolved, as new data sources provide additional audit evidence alongside traditional sources. ESG reporting requires a broader range of external data due to its wider scope, including environmental and societal impacts. Independent sources, such as environmental agencies or media reports, play a critical role in verifying ESG reports and detecting potential greenwashing.

The **technology layer** includes AI technologies that can assist in providing assurance. The researchers highlight the following technologies:

- Web crawlers gather extensive external data from online sources, which helps to identify ESG performance and risks.
- Internet of Things (IoT) devices collect detailed real-time ESG indicators, like the carbon footprint and water quality.
- Optical Character Recognition (OCR) converts documents into searchable text.
- Data mining detects patterns in large and complex datasets.
- Natural Language Processing (NLP) extracts meaningful insights (e.g., recognizing sentiment) from unstructured text.
- Generative AI models (such as GPT and DALL·E) support report generation, risk analysis, data enrichment, and visualizations.

These technologies can improve the efficiency, accuracy, and depth in ESG assurance.[3]

The **application layer** integrates AI technologies to enhance ESG assurance by supporting data collection, processing, and reporting. Voice and image recognition extract ESG-related information from unstructured data. Web crawlers and IoT devices gather real-time, non-financial data from various sources. Data mining and NLP techniques analyze patterns, anomalies, and sentiment in textual and numerical data, providing deeper insights into ESG issues. Generative AI creates dynamic, interactive assurance reports, facilitates real-time risk alerts, and supports continuous ESG monitoring. These innovations enable more responsive, accurate, and tailored assurance processes. By leveraging public data, AI technologies help validate ESG reports and support the ongoing improvement of sustainability practices.[4]

3) Table 1 on page 90 of the article provides an overview of various AI technologies, highlighting their key advantages, suitability for different ESG tasks, required data types, model training, usage strategies, and validation methods.

4) The article also includes two examples (Violation Tracker and Glassdoor) of using external data to improve ESG assurance. We refer to the article for more details.

AI-enabled ESG assurance procedures

In the final part of the article, the researchers outline how artificial intelligence can be applied during the different phases of the ESG assurance process. They use the same phases as in financial audits. The overview below provides examples of possible applications.

Obtain/retain engagement

- Web crawler to collect negative news of the client and feed the system.
- Textual analysis (e.g., NLP) to obtain ESG- related information from news articles and social media.
- Classification techniques (e.g., decision trees) to identify ESG risks.
- Generative AI to assist in creating tailored proposals for potential clients.

Engagement planning

- Predictive algorithms (e.g., k-NN) to predict the time budget, taking the identified ESG risks into consideration.
- Generative AI to automatically draft sections of audit planning documents.

Risk assessment

- Process mining to verify proper internal control implementation.
- Anomaly analysis to alert abnormal GHG emissions compared to historic data.

Substantive procedures

- Generative AI to automate extraction of audit samples and evidence from structured/unstructured data.
- Textual analysis to verify qualitative assertions using exogenous data.
- Cluster analysis to group types of ESG information together and identify abnormal trend.
- Deep learning (e.g., neural networks) to validate GHG emissions based on satellite images.

Reporting

- Predictive algorithms to identify content that are interested to certain users.
- Expert system to grade continuously on ESG reports.
- Generative AI to generate interactive ESG reports.

Conclusion

The integration of artificial intelligence and ESG assurance can enhance the efficiency and effectiveness of assurance, thereby improving the reliability, transparency, and efficiency of ESG reporting. This study highlights the value of an AI-supported ESG assurance framework. ■

Available via:

Lack of assurance: diversity washing misleads investors

Article: *'Diversity washing' by Andrew Baker, David Larcker, Charles McClure, Durgesh Saraph, and Edward Watts. Published in Journal of Accounting Research (2024), Vol. 62 (5): 1661-1702.*

PURPOSE OF THE STUDY

The article examines how diversity washing misleads investors when investing in firms that claim to have a DEI policy in place.

MAIN FINDINGS

The authors state that 'firms that discuss DEI excessively relative to their actual employee gender and racial diversity ("diversity washers") obtain superior scores from environmental, social, and governance (ESG) rating organizations and attract more investment from institutional investors with an ESG focus. These outcomes occur even though diversity-washing firms are more likely to incur discrimination violations and have negative human-capital-related news events.' The evidence presented in the paper confirms allegations of misleading statements from firms about their DEI initiatives and highlights the potential consequences of selective ESG disclosures.

PRACTICAL RELEVANCE

Assurance of DEI policy implementation could impede firms from making claims that are not substantiated by their actions.

Background

Misrepresenting environmental, social and governance (ESG) activities impact the trust that market parties may have in a firm's intentions. These misrepresentations ('greenwashing' or 'social washing') are particularly concerning when market parties must rely on unaudited firm disclosures. Given these misrepresentations, investors, consumers, regulators, and other stakeholders have trouble in assessing companies' ESG performance. Consequently, poor ESG information may adversely affect ESG-oriented stakeholders' decision making and lead ESG-conscious investors to misallocate their capital. The authors examine whether measurement problems exist. They assess the inconsistency between firms' public commitments to diversity, equity, and inclusion (DEI) in their financial filings and the underlying diversity of their employees.

'Diversity-washing firms are not serious about enacting meaningful changes'

Research and results

The authors determine the amount of DEI discussion by developing a DEI dictionary based on discussion in the annual reports, counting the frequency of DEI-related terms in financial documents (10-Ks, 8-Ks, and proxy statements). The evidence shows that these discussions chiefly relate to employee diversity and firm policies to create equal opportunities regardless of race or gender. They find that the dispersion of these discussions increased significantly. They document a significant increase in the frequency of DEI-related discussions in SEC filings over time, involving terms related to racial diversity and workplace culture. The study finds a positive (but weak) relationship between actual diversity and DEI disclosures, indicating that firms with more diversity discuss DEI more frequently. However, in the overall variation regarding these types of public commitments, DEI commitment reflects less than one percent. The huge amount of unexplained variation 'suggests many firms may opportunistically use selective voluntary DEI disclosures to engage in "diversity washing" (i.e., firms misrepresenting their actual commitments to diversity).' To examine this speculation on the diversity commitment behavior and its consequences the authors create a simple firm-year measure that compares the relative underlying diversity of firms with the relative amount of DEI discussion in their disclosures. They create a measure of an 'abnormal' amount of DEI discussion, under the assumption that firms should discuss DEI in line with their underlying diversity (i.e., diversity in hiring). DEI discussion that is considered abnormal would indicate 'diversity washing' of DEI policies.

'These firms typically use vague and ambiguous language'

The authors show that diversity-washing firms are not serious about enacting meaningful changes to their ESG practices. Diversity-washing firms are more likely to report on ESG policies without setting concrete goals for diversity and other ESG-related topics. In addition, diversity washers typically use a plethora of platforms to emphasis their DEI 'commitment', such as CSR reports and Twitter. Furthermore, the authors observe that diversity washers hire fewer diverse candidates in the future, even among their most junior employee ranks. They do so despite their tendency to use more forward-looking language when discussing DEI.

Diversity washers appear to get higher overall ESG and social ratings. And diversity washers also experience higher ownership levels by ESG-oriented mutual funds. Hence, diversity washers are seemingly successful in misleading contracting parties, or they are at least able to spread misunderstanding among market participants about their diversity policies. Diversity washers are also more likely to present a diverse workplace culture and equity despite exhibiting less diverse hiring. These firms typically use vague and ambiguous language in an attempt to mislead investors.

Conclusion

The study provides large-sample evidence of firms featuring significant discrepancies between their disclosed commitments to diversity and their actual hiring practices. The study demonstrates that diversity washing firms exhibit more outflows of diverse employees, more discrimination-related fines, and adverse human-capital events. While these firms de facto produce negative DEI outcomes, diversity-washing firms typically get better ESG scores from rating organizations and attract more investments from ESG-focused institutional investors. It seems important to consider that, to a very high extent, assurance could impede the opportunity to mislead. ■

Available via:

Can auditors save the environment, and can the environment save auditors?

Article: *'Greenwashing and sustainability assurance: a review and call for future research' by Clinton Free, Stewart Jones, and Marie-Soleil Tremblay. Published in Journal of Accounting Literature.*

PURPOSE OF THE STUDY

The article provides an overview of the existing literature on greenwashing and sustainability assurance and outlines a research agenda with questions relevant to both practice and academia. In this abstract, the focus is on the research agenda, which can stimulate relevant discussion within audit practice.

MAIN FINDINGS

The researchers identify three key themes for future research: (1) the future of standards related to greenwashing; (2) the relevance of the auditing profession (versus other providers) in assurance for sustainability reports (labeled as 'professional jockeying'); and (3) opportunities and challenges concerning capital markets.

PRACTICAL RELEVANCE

The researchers outline suggestions for (practically relevant) research questions related to the three research themes.

Background

The demand for assurance on sustainability reports has increased significantly in recent years. This is partly due to stricter regulations on greenwashing (the misleading presentation of sustainability information). For the auditing sector, the researchers see a development that falls between two extremes. In an optimistic scenario, auditors will play a central role as auditors and assurance providers for sustainability information, leading to improved reporting and significant commercial opportunities for auditors. In a pessimistic scenario, sustainability assurance itself could become a tool for greenwashing. In this case, companies may be reluctant to publicly share their sustainability goals and claims, reducing the reliability of assurance and potentially leading to its replacement by alternative solutions. According to the researchers, within this tension, it is essential to continue researching the developments and opportunities in assurance and sustainability.

'Collaboration between auditing and environmental sciences offers promising opportunities'

Key themes for future research

According to the researchers, the growing focus on greenwashing will significantly influence expectations and requirements concerning auditing and assurance. Future research can focus on three main themes related to this development. These themes can provide valuable insights for both practice and for academic research:

1. The future of standards related to greenwashing. This theme relates to research on the effectiveness, implementation, and enforcement of regulation and the impact on mitigating greenwashing risks.
2. The relevance of the auditing profession (versus other providers) in assurance for sustainability reports (labeled as 'professional jockeying'). This theme concerns competition within and between professional service providers in sustainability assurance and calls for research on how this rivalry affects the quality, objectivity, and credibility of assurance.
3. Opportunities and challenges concerning capital markets. This theme explores the impact of greenwashing risks on investment decisions and the opportunities for greater transparency and innovation in financial markets.

The researchers provide the following suggestions for research questions related to these themes.

The future of standards related to greenwashing

- What are the potential roles and responsibilities of different actors, including governments, non-governmental organizations and industry associations, in the future of standard setting for sustainability assurance to prevent greenwashing?
- What are the impacts and consequences of partisan politics in the future of sustainability assurance and sustainability reporting?
- What are the lobbying strategies adopted by corporate managers and assurance experts to influence the future of sustainability assurance and sustainability reporting?
- What type of knowledge tends to dominate the production of sustainability assurance standards when the source of the knowledge advantage is more subjective and less experience-based?
- What should the normative foundation of sustainability reporting and assurance standards look like?
- How can standard-setting organizations enhance the credibility and rigor of sustainability assurance processes to effectively detect and prevent greenwashing practices?
- How can standard-setting frameworks evolve to address the complexities of measuring and verifying sustainability claims across different industries and geographical regions?

Professional jockeying in sustainability reporting assurance

- At both the firm and professional level, how have auditors sought to claim and defend market share in the sustainability assurance market?
- What are the challenges and complexities involved in transferring traditional audit techniques and mindsets to new assurance areas?
- What skills and attributes are prized by clients in this new audit space?
- How will audit firms deploy Big Data and emerging technologies to capture evidence from the physical world and provide accurate assurance on ESG reports in a timely manner?
- How has this sustainability assurance market impacted university curricula and recruitment and professional development by large audit firms?
- What is the role of technology and data analytics in improving the efficiency and effectiveness of sustainability reporting and assurance?
- How do auditors consider the risk of their audits contributing to greenwashing

Capital market opportunities/ challenges

- How does greenwashing impact key capital market variables and indicators, such as abnormal returns, cost of capital, information asymmetry and market volatility?
- How can the capital market impacts of greenwashing be effectively measured and quantified?
- How do capital markets price in or differentiate between different types of greenwashing activity?
- How does greenwashing impact a firm's access to equity and debt markets?
- In what ways does greenwashing impact the growth and operation of sustainable investment markets, including green finance markets, social investment markets and secondary markets such as social stock exchanges?
- In what ways does greenwashing impact longer- term value creation/ destruction?
- What kinds of regulatory supervision in the capital market are necessary to prevent or deter corporate greenwashing effectively?
- How does greenwashing impact the dynamics between companies that adopt pay-for- CSR performance strategies and capital market performance?
- To what extent does independent assurance of a firm's CSR performance mitigate the adverse market effects of greenwashing?
- In what ways can the greenwashing mitigation effects of sustainability assurance create a better alignment of values among capital market participants?

Conclusion

The researchers argue that auditors not only make a positive contribution to the environment but that the environment also contributes to making auditors more relevant. According to the researchers, the themes and issues discussed in this article are crucial for both the future of the auditing sector and of the planet. Research on sustainability assurance and its role in addressing greenwashing will likely integrate insights, methods, and data from various academic disciplines. Collaboration between auditing and environmental sciences offers promising opportunities in this regard. ■

Available via:

Assurance improves the quality of carbon accounting

Article: *'Carbon Accounting Quality: Measurement and the Role of Assurance' by Brandon Gipper, Fiona Sequeira, and Shawn X. Shi. Stanford University Graduate School of Business Research Paper No. 4627783.*

PURPOSE OF THE STUDY

This article examines the impact of assurance on the quality of carbon accounting. To assess this, the researchers use a measure that evaluates carbon accounting quality based on the deviation between reported emissions and a model-predicted emission level. Additionally, two supplementary measures are used: the level of uncertainty in emissions reporting and the time an organization takes to return the Carbon Disclosure Project (CDP) questionnaire.

MAIN FINDINGS

The results show that providing assurance is associated with higher carbon accounting quality. This relationship strengthens as the assurance becomes more thorough and pervasive (i.e., the relationship becomes stronger for reasonable assurance than for limited assurance). Assurance improves carbon accounting quality by identifying weaknesses in a company's carbon accounting system. Addressing these weaknesses ultimately leads to fewer omissions and error corrections. Furthermore, the researchers demonstrate that countries with mandatory assurance for non-financial reporting (France, Italy, and Spain) show improvements in corporate carbon accounting quality following the introduction of this requirement.

PRACTICAL RELEVANCE

The results emphasize the importance of external assurance in improving the quality of carbon accounting.

Background

Addressing climate change is an urgent global issue. More than 100 countries have committed to carbon net neutrality targets. It is crucial for organizations to accurately calculate their carbon footprint to assess and track progress toward neutrality. This study develops a measure to assess carbon accounting quality and examines the role of assurance in improving this quality.

'Countries with mandatory assurance show improvements in corporate carbon accounting quality'

Research and results

Previous research often used the amount of environmental disclosure to assess carbon accounting quality. In this study, the researchers define carbon accounting quality as the extent to which reported emissions align with an organization's actual emissions. There are two reasons why carbon accounting may deviate from actual emissions:

1. the measurement standard may be inadequate (e.g., the GHG Protocol); and
2. errors can arise due to estimations and judgments within the carbon accounting system.

The first reason relates to measurement errors, while the second concerns implementation issues, such as the absence of proper measuring equipment. Since the GHG Protocol is widely adopted as a measurement standard, the researchers assume that deviations in accounting are primarily due to implementation problems.

Therefore, they expect the most significant benefit of assurance to be the improvement of carbon accounting quality by identifying and addressing these implementation issues (assuming assurance also evaluates processes).[5] The study focuses on Scope 1 (direct emissions from controlled assets) and Scope 2 (indirect emissions from energy consumption) of the GHG Protocol, as these are within a company's control.[6]

The researchers base their quality measure on the literature related to earnings quality. They compare assessing carbon accounting quality to estimating 'abnormal accruals' as a measure of earnings quality. In their model, they link reported carbon emissions to a company's fundamental economic characteristics, such as production activities and technologies. They define 'abnormal emissions' as the difference between actual reported emissions and the emissions predicted by the model (which are considered to be normal).

'The researchers base their quality measure on the literature related to earnings quality'

Using a sample of U.S. companies that reported their carbon emissions between 2010 and 2020, the researchers find a strong negative relationship between assurance and abnormal emissions for both Scope 1 and Scope 2 emissions, meaning emissions are lower when assurance is provided. This relationship is confirmed for two alternative measures of carbon accounting quality: the level of uncertainty in emissions reporting and the time an organization takes to return the Carbon Disclosure Project (CDP) questionnaire. So, assurance improves carbon accounting quality (and the effect is stronger when a higher level of assurance is provided).

5) Interestingly, the researchers explain that ESG assurance does not necessarily improve the quality of a carbon accounting system. This is because assurance (and its oversight) is not yet mandatory in many countries, there are no uniform standards, and the level of assurance provided varies. Moreover, companies can choose to meet only the minimum assurance requirements and still achieve higher scores on, for example, GRI indicators.

6) Scope 3 includes other indirect emissions in the value chain, such as those from suppliers and customers.

Additionally, the researchers demonstrate that assurance enhances carbon accounting quality mainly by identifying issues within the carbon accounting system. This leads to the inclusion of more emission sources and better correction of errors in reported emission figures.
The implementation of the Non-Financial Reporting Directive (NFRD) in Europe required certain publicly traded companies to prepare non-financial reports. While this directive mandates reporting, three member states (France, Italy, and Spain) also introduced a requirement for mandatory assurance on corporate sustainability reports. The study finds that in these three countries, compared to other EU nations, carbon accounting quality improved after the NFRD was introduced.

Conclusion

The results show that assurance improves the quality of carbon reporting, especially when conducted in a more comprehensive manner. This is because assurance helps identify issues and encourages companies to enhance their reports. By analyzing the implementation of the NFRD within the EU, the study demonstrates that mandatory assurance can further improve reporting quality. Additionally, the research contributes by introducing a practical method for measuring emissions reporting and by highlighting the economic benefits of assurance. The study also suggests that even a limited form of assurance can have a positive impact on carbon accounting quality. ■

Available via:

Assurance in carbon accounting reduces future carbon intensity

Article: *'On the Importance of Assurance in Carbon Accounting' by Florian Berg, Jaime Oliver Huidobro, and Roberto Rigobon.*

PURPOSE OF THE STUDY

The aim of this study is to examine the impact of assurance on the absolute volume of carbon emissions and on carbon intensity (emissions related to a company's activities).

MAIN FINDINGS

Companies that obtain assurance for their carbon emission reports show, on average, a 9.5 percent higher CO_2 intensity than similar companies without assurance. The researchers find no evidence that companies with Science Based Targets Initiative (SBTi) goals reduce their future emissions (when controlling for the impact of assurance). However, companies that obtain assurance reduce their future CO_2 intensity with 3.3 percent.

PRACTICAL RELEVANCE

The findings have implications for portfolio managers and ESG raters. Interpreting higher reported CO_2 emissions negatively may unfairly disadvantage companies that are genuinely committed to reducing emissions. This highlights the need for mandatory assurance in mandatory CO_2 reporting, especially since these emission data are often used in regulation.

Background

Companies are at different stages of decarbonization, influenced by factors such as reducing capital costs and improving energy efficiency. While some companies lead with ambitious goals verified by the SBTi, others limit themselves to superficial reporting.

'Corporate efforts should focus on improving CO_2 efficiency'

The path to decarbonization consists of two key steps: maintaining accurate CO_2 accounting and actually reducing emissions. Many companies do not report their emissions, requiring the use of estimated data from external sources such as TruCost or Clarity AI. However, these estimates can be unreliable, as they are often based on financial and industrial characteristics rather than actual emissions data.

Additionally, companies that do report their emissions may choose to omit data, use methods that present a more favorable picture, or obtain assurance for their reports. Moreover, many targets focus on the long term (e.g., 2050), which may not necessarily drive immediate action and could serve a more symbolic purpose.

Therefore, it is crucial to determine whether companies report their emissions accurately and whether they genuinely reduce their future emissions as claimed.

Research and results

In the dataset used, the researchers combine reported and estimated CO_2 emissions, the assurance status of these emissions, and SBTi decarbonization targets.[7] The focus is on Scope 1 emissions as defined by the Greenhouse Gas Protocol. These emissions originate directly from sources owned or controlled by an organization. The dataset also includes CO_2 intensities (emissions per unit of activity). Both measures are important for achieving societal decarbonization goals. Ultimately, reducing absolute emissions is key to lowering global CO_2 levels. However, at the company level, absolute emissions are closely tied to production scale or company size. Therefore, corporate efforts should focus on improving CO_2 efficiency rather than merely reducing absolute emissions.

'Assurance is a signal that companies are reducing their future emissions'

The dataset includes 30,926 unique publicly traded companies from 2016 to 2021. The final analysis focuses on data reported by companies rather than estimated data (as estimates tend to overstate emissions). This results in approximately 20,000 year observations.

When both CO_2 targets and assurance are included in a regression model, the results show that both factors influence reported emissions and CO_2 efficiency. Having SBTi targets leads to 32.7 percent lower reported absolute emissions and 27.1 percent lower CO_2 intensity. Assurance results in 13.7 percent higher reported absolute emissions and 9.5 percent higher CO_2 intensity.

When both CO_2 targets and assurance are included in a regression model, the results show that changes in future absolute emissions of companies are related to assurance but not to targets. Companies that obtain assurance reduce their future absolute emissions by 7.5 percent and their future CO_2 intensity by 3.3 percent. In other words, assurance appears to be a signal that companies are reducing their future emissions.

[7] *The SBTi targets were chosen because they require a rigorous approval process for decarbonization pathways. Companies must first commit to achieving the target, after which it is evaluated and then either accepted or rejected.*

Conclusion

This study shows that:

- companies that obtain assurance for their emissions, report higher current emissions;
- companies that set SBTi targets do not reduce their future emissions (when controlling for the effect of assurance); and
- companies with assurance reduce their future carbon intensity by 3.3 percent.

These findings suggest that relying on reported emissions may disadvantage companies that are genuinely committed to CO_2 reduction. The results highlight the need for mandatory assurance when CO_2 reporting is mandatory. The findings also suggest that companies that do not obtain assurance may use more favorable assumptions or omit key elements in their estimation of CO_2 emissions.

In contrast, companies that obtain assurance reduce their future CO_2 emissions. This may indicate that companies pay for assurance as a signal to stakeholders to distinguish themselves from companies that have no plans to reduce their CO_2 emissions. These companies also accept that the signal comes with higher current CO_2 emissions. ■

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