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Auditors' Professional Judgment on Sustainability in the Age of AI: from Regulatory and Technical Challenges to Algorithmic Bias

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Abstract

The accounting profession, and more specifically that of auditor, is one of the most impacted by the rise of artificial intelligence (AI) and sustainability information regulation. AI is profoundly changing traditional auditing methods, altering the role, approach and responsibilities of auditors, while requiring new skills.

This transformation is particularly striking in the specific field of sustainability auditing, which is becoming increasingly important in a context of heightened demands for corporate transparency and ESG accountability. AI enables the automation and rapid processing of large volumes of data from reporting or external databases, freeing auditors from repetitive tasks. In theory, this automation should allow them to refocus on interpreting results, exercising professional judgement, making critical decisions and managing ESG issues.

However, this new situation raises several major questions, centred on one key issue: what conceptual framework should guide the training of professional judgement by sustainability auditors in a context of regulatory and technological change?

As we do not yet have the necessary perspective on such practices, nor any consolidated empirical data, this article is intended as a conceptual essay aimed at exploring and enriching the existing framework for professional judgement. It proposes a conceptual framework for structuring judgement training in sustainability auditing practices, integrating both enhanced European standards and the disruptive transformations brought about by AI.

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The analysis is based on a critical review of academic literature, European and international regulations, and the authors' experience. It is complemented by a qualitative approach using focus groups, which aimed to validate the proposed analysis framework and identify the emerging skills that are essential in this new professional paradigm.

As part of this research, the authors used generative AI (GPT-4 version, 2025) to facilitate documentary research, particularly in the collection of empirical examples illustrating the contributions, technical challenges and algorithmic biases associated with these technologies.

Key words: generative AI; audit; sustainability; judgement; algorithmic bias; conceptual framework;

JEL Classification: M41, M42, Q52

*"Without your expertise and ability to ask questions, I cannot produce such relevant and tailored insights."*¹

Introduction

The accounting profession, and more specifically that of auditor, is one of the most impacted by both the rise of artificial intelligence (AI) and sustainable development regulations. Auditors must not only keep pace with technological and regulatory developments, but also adapt to the ever-changing *reporting* requirements of the entities they audit.

The year 2025, the first year of implementation of the European CSRD (*Corporate Sustainability Reporting Directive*, EC 2024), marks a major turning point in sustainability *reporting*, which aims to harmonise and strengthen the quality of information produced by

¹ ChatGPT – response to a prompt by the authors regarding the lack of relevance in the answers provided by ChatGPT, June 8, 2025

companies and reduce the risk of environmental and social misinformation. Companies are now required to publish accurate material information on their environmental, social and governance (ESG) risks, opportunities and impacts, in accordance with the principle of double materiality. This involves identifying and communicating not only the impact of ESG issues on the company's performance, but also the impact of the company's activities on the environment and people. Reports must comply with the new *European Sustainability Reporting Standards (ESRS)*, which introduce cross-cutting requirements while covering a wide range of environmental, social and governance issues. The CSRD requirement, which also mandates external audit by a statutory auditor or independent third party for limited assurance, gives auditors a key role in ensuring the reliability and transparency of sustainability statements, thereby promoting a more responsible and resilient economy. Putting sustainability *reporting* on an equal footing with financial *reporting* enhances the credibility of sustainability information and gives it a structuring role in the transformation of business models and strategies.

The broadening of the scope of auditing under the CSRD is accompanied by a profound transformation of practices, driven by digitalisation and the growing integration of artificial intelligence into *reporting* and audit processes. In this context, AI appears to be a major driver of innovation: it facilitates the collection, analysis and structuring of massive volumes of ESG data, accelerates the detection of anomalies and enables the generation of more reliable and faster synthesis. However, it also raises major challenges: mastering technical complexity, managing bias, interpretability of results, data governance and compliance with the ethical and regulatory requirements set out in the AI Act (EC 2025).

The changes in external auditing in the context of the CSRD (amended by the Omnibus Directive) (EC 2025) and the AI Act reflect a profound restructuring of practices, skills and responsibilities and raise questions about the professional judgement of auditors who are expected to provide limited assurance on sustainability statements. The sustainability information auditor is now facing novel challenges related to: the normative institutionalization of double materiality, the expansion of the reporting scope, the increasing sophistication of analyses, the connection between financial and sustainability information, and heightened governance and ethics requirements.